

GEOPHYSICS

Strategy for Studying Earth and Sun Outlined

► FROM THE EARTH'S interior to the sun, four and perhaps six international scientific programs to improve man's knowledge of the universe will be developed in the next several years.

"The effort may well prove to be one of the most exciting periods in the history of science," in the opinion of Dr. Joseph Kaplan, newly elected president of the International Union of Geodesy and Geophysics.

Dr. Kaplan is professor of physics at the University of California at Los Angeles and a member of the U.S. Committee for the International Year of the Quiet Sun.

Preparations are now underway for the following four major programs:

1. International Years of the Quiet Sun, a study of sun-earth relationships during the 1964-65 period of minimum solar activity.

2. International Upper Mantle Project, a study of the earth's interior extending roughly from 20 to 450 miles below the crust, which is expected to shed much light on the earth's origin and history.

3. World Magnetic Survey, in which a string of worldwide observation stations will help map the earth's magnetic field.

4. International Hydrological Decade, an intense scientific investigation of the world's water resource problems.

In addition, Dr. Kaplan hopes for two other developments:

Creation of a Committee on the Atmospheric Sciences to interpret the flood of scientific information from meteorological satellites.

Raising the level and range of geophysical activity in the newly developing nations.

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TECHNOLOGY

Computer Types Up Shorthand Notes

► A COMPUTER that will rapidly convert machine shorthand notes into pages of type-written transcript is being developed.

Dr. Emanuel R. Piore, research and engineering vice president of International Business Machines Corporation, described the system to members of a special House education subcommittee studying a bill to set up a national clearing house for all research data.

Dr. Piore showed the congressmen two pages of a court trial transcript typed by a computer that had analyzed the wide paper tape of a stenotype keyboard. The transcripts looked as if they had been typed by a skilled stenographer.

Dr. Piore told also about IBM's attempts to build better machines for reading printed pages and storing the information electronically. Big problems, he said, are in adapting to many different type fonts, handling pages, and separating and storing graphic material such as diagrams and pictures.

Both systems are still in early research stages, he said, but they look as if they will

be helpful in relieving the impact of what Chairman Roman C. Pucinski (D-Ill.) calls "the world's knowledge explosion."

"In the scientific disciplines alone, the United States accumulates more than 100,000 Government reports a year, 450,000 articles and countless books and papers," said Thomas J. Watson Jr., chairman of IBM's board.

"On a worldwide basis, this literature is growing at the rate of an estimated 60 million pages a year."

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PUBLIC HEALTH

Medical Health Care Foundation Is Model

► OFFSETTING the federal medical care program, doctors in at least one community—Syracuse, N. Y.—have quietly gone ahead with their own controlled vending plan. The plan is in the form of a foundation being hailed as a model that might even be tried in the City of New York.

The Onondaga County Medical Society has signed up more than 70% of its member physicians as participants and members of the Onondaga Foundation for Medical Care.

The new nonprofit organization in Syracuse is not a medical care plan but is a vendor of physicians' services.

New York Medicine, 19:521, 1963, says the foundation members are willing to cut their fees to 80% of the schedule for persons receiving under \$4,000 per family per year.

Dr. Robert E. Westlake, president of the foundation, explained that the organization contracts with any licensed insurance carrier or nonprofit plan to carry out the provisions of the insurance policy on behalf of physicians on a fixed fee basis.

It takes great foresight, and "a high degree of sophistication in socio-economics," New York Medicine comments, for a medical society to adopt a plan such as this. It also takes a wise physician to see the wisdom of abiding by the fee schedule, even if it is much less than he might collect in a rare case from some superwealthy patient.

If the system succeeds in upstate New York, it can serve as a model for the rest of the state.

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ENGINEERING

Drivers Should Set Own Speed Limits

► SPEED LIMITS should be based on the top speed used by a large percentage of drivers, a Purdue University highway engineering professor believes.

Since speed is not usually the main cause of accidents, raising the speed limits would improve the traffic flow without increasing accident risk, said Prof. Harold L. Michael, associate director of the Indiana Joint Highway Research Project.

"Motorists, as a group, can be relied on to determine what the proper top speed should be under all but unexpected circumstances," he said, "and under unexpected circumstances almost any speed is too fast."

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CONSERVATION

Wilderness Area Saved For Future Generations

► ANOTHER CHUNK of green earth has been snatched from the gnashing jaws of man-made machines.

Glacier-fed mountain lakes and clear fishing streams of the Minarets Wilderness in California have been declared an official wilderness area by Secretary of Agriculture Orville L. Freeman.

This means that no roads can be carved through the area, and man may enter only on foot, on animal or by boat. One large hydroelectric power development, authorized by the Federal Power Commission before the area was established, is allowed to remain.

Located in the Sierra and Inyo National Forests, the new wilderness area has approximately 109,500 acres.

The rugged spires of the Minarets is the second area to be officially set aside for protection this year, a U.S. Department of Agriculture official said.

The first was the Dome Land Wild Area in California. Any primitive area more than 100,000 acres is called a "wilderness area." When the virgin land is less extensive, it is called a "wild area."

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SOCIOLOGY

World Population Up By 60 Million in 1962

► POPULATION GROWTH is "running away," especially in Latin America and Asia where there is not a decent living level, the Population Reference Bureau said in its 1962 annual report.

During the 12-month period covered by the report, world population increased by 60 million persons, equal to one third of this country's people.

The fate of the world could well hang on the outcome of the race between production and reproduction, the report states. By the end of the 1960s world population will really be soaring.

The Bureau, a nonprofit educational organization in Washington, D. C., said that although the 1960s are a critical period, governments cannot do the whole job of controlling human fertility.

This can only be accomplished when "hundreds of millions of husbands and wives limit the size of their families in the interests of world peace, the national welfare and the stability of their own homes."

Since scientists discovered how to prolong life, and the death rate began to drop dramatically, births and death have been dangerously out of balance—two being born for each person who dies.

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CE FIELDS

NATURAL RESOURCES

Hunters Do Not Reduce Quail and Game Supply

► WEATHER, FOOD and the amount of underbrush determine the numbers of quail and other small game—not shooting.

This means that hunters offer no threat to the survival of these creatures, the Wildlife Management Institute in Washington, D. C., reported.

Careful field studies of quail, pheasants, rabbits, squirrels and other animals show that their yearly numbers fluctuate because of environmental problems concerning their natural habitat—and hunters have little or no impact.

Take the quails, for instance. No matter whether the population is up or down, hunters take considerably less than even the most conservative bag and possession limits allow.

According to a ten-year study by the Arizona Game and Fish Department in the Oracle Junction and Pinnacle Peak areas, the percent of the quail population taken by hunters is directly proportional to the size of their population.

When quail numbers are down, less quail are shot, for the simple reason that they are difficult to find. Persistent hunters get little for their efforts except exercise and fresh air, and they give up long before they become a threat to the quail population.

This type of information shows that shooting seasons can be lengthened to provide more opportunity for outdoor recreation without jeopardizing the basic breeding stock of game animals, the Wildlife Institute said.

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AGRICULTURE

Cows Now Spray Selves Against Biting Flies

► COWS NOW TRIGGER automatic spraying over their bodies to kill off annoying flies by stepping on an automatic mat like those that open doors at supermarkets.

Biting flies such as horn flies, stable and house flies have been known to irritate cows so much that milk production is reduced as much as 20%.

Many farmers spray their cattle automatically with devices using a photoelectric cell. As each animal passes through the light beam, the current is cut and the sprayer starts. However, the spray sometimes drifts in front of the photo cell and causes the sprayer to continue working even after the cow has gone.

With the new step-on mats, less pesticide is used and less maintenance is needed, agriculture scientists of the U. S. Department of Agriculture at the Livestock Insect Laboratory in Kerrville, Texas, said.

A step-on mat installed last year at a

dairy farm by USDA scientists I. L. Berry and R. A. Hoffman is still in excellent condition after being stepped on 32,000 times by Holstein cows.

Cattle are reluctant to step on treadles or platforms that move or that protrude more than an inch above ground. The new switch-on mat gives Bossie no worries, because it is securely held flush with the ground. The switch is sealed under a piece of quarter-inch cardboard and rubber carpeting.

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SPACE

Shimmer Ruins Pictures From Orbiting Satellites

► PHOTOGRAPHS of earth taken from orbiting satellites are limited in clarity by shimmering but those of the moon will be better.

This is because there is no lunar atmosphere to produce the shimmer as it does for earth. The earth's dancing atmosphere makes stars "twinkle," Dr. John Harding of Sylvania Electronic Systems, Waltham, Mass., told the Open Space and Peace Symposium in Palo Alto, Calif.

Therefore, he branded the building of larger and larger cameras "pointless," since the cameras also enlarge the shimmer.

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ORNITHOLOGY

Mating Urge of Birds Controlled by Light

► BY USING artificial lights to represent varying lengths of days, scientists have been able to control the mating urge in laboratory birds.

The amount of light in the environment of many types of birds, it has been shown, influences the growth of their testicles, which in turn leads to increased hormonal activity and the start of mating seasons.

During short-day periods typical of winter, testicle size of California house finches is that of a grain of sand. As days lengthen in the spring, the structure begins to grow and in two weeks is the size of a pea.

Using a short light period, typical of a winter day, followed by very long dark periods, William M. Hamner III, a University of California at Los Angeles graduate zoologist, demonstrated that the finches may have a mysterious 24-hour rhythm. This rhythm appears to be used as a biological clock, which enables the bird to tell the time of year.

It is this mechanism that likely controls the mating urge. Finches are not migratory birds, but this same sort of clock may be related to migration in other birds.

Not only does light stimulate a seasonal awakening in birds, it also launches daily activities. With the exception of a few species specially adapted to night life, birds cease activity at dusk.

When night falls, or a cover is placed over the bird cage, they perch. With dawn's light, they are off and twittering.

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ANTHROPOLOGY

Moderns Hail Quints; Primitives Not So Sure

► MODERN MAN welcomes quintuplets wholeheartedly, but primitive man has mixed feelings about such things.

The birth of the Fischer quint of Aberdeen, S. Dak., is "an event of great national pride," said President and Mrs. Kennedy in their telegram of congratulations. They voiced the feelings of the American people. The Igorot tribe of Northern Luzon, Philippines, would not be so happy. They, as many primitive peoples do, believe that multiple births are a return to the animal state.

It is not human to bear a litter of babies, they maintain. So the Igorots allow only one of the babies to live and to be a human child.

Other peoples, not quite so harsh, merely refuse to let the mother of twins or "super-twins" take part in planting or harvesting. Their reasoning for this is:

No man can father more than one child at a time. A woman who has more than one child at a time has been unfaithful to her husband. An unfaithful woman is out of favor with the gods. A woman disfavored by the gods will ruin the crops.

Some primitive societies do welcome and cherish multiples. The people of upper New Guinea, for example, believe a multiple birth is a good omen. The god of fertility and plenty, they say, has favored the family and the tribe.

In such a society, the babies receive special housing, diets and ornaments and are thought to have supernatural powers of prediction and immunity to disease.

American multiples also have special powers. For the Fischers these include the power to receive a tremendous number of bassinets, to be released from paying doctor's fees and, should the legislation of Sen. George McGovern (D-S. Dak.) be passed, to be exempt from federal and estate taxes until the babies reach age 21.

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TECHNOLOGY

Sensitive Thermometer Uses Quartz Crystal

► A SENSITIVE THERMOMETER that can detect changes as small as one hundred-thousandth of a degree centigrade has been developed by scientists at Bell Telephone Laboratories.

Heart of the device is a precision oscillator. The frequency of the oscillator is determined by temperature of a quartz crystal and can be measured with great accuracy by a transistor circuit, thus revealing the temperature.

The quartz crystal thermometer is the most sensitive temperature-measuring device yet discovered.

It is usable over a wide range of temperatures extending from minus 454 degrees Fahrenheit up to 212 degrees, it was reported in Bell Laboratories Record, 41:246, 1963.

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