

TECHNOLOGY

New Instruments Study Earth's Internal Make-up

► SCIENTISTS are taking a fresh look at the internal structure of the earth by means of new and sophisticated instruments for picking out subtle earth vibrations.

This report by a University of California at Los Angeles team follows observations made during the Chilean and recent Alaskan earthquakes.

The group members, Drs. Louis B. Slichter, Gordon J. F. MacDonald, Michele Caputo, and Clarence L. Hager of the Institute of Geophysics and Planetary Physics used two LaCoste-Romberg gravimeters, new and sensitive instruments that can measure slow global vibrations, or modes, during large earthquakes.

Detecting modes during a shattering earthquake is somewhat like trying to pick out each separate note and overtone from a piano crashing off a truck.

"First we must have very acute instruments, then we have to strain the raw information through a computer to unscramble the mess, and then we spend months interpreting what we've got," Dr. Slichter explained.

Previously, scientists relied mainly on measuring the travel times of high-frequency seismic waves to probe the earth's interior.

The new method complements the older one, and each can serve as a check on the other. For instance, in analyzing the modes of the Alaska earthquake, the scientists found that the radial vibrations have a shorter period than expected from older earth-models.

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GENERAL SCIENCE

Nobel Winners Endorse Johnson and Humphrey

► THIRTY-THREE Nobel Prize winners, including Dr. Glenn T. Seaborg, head of the Atomic Energy Commission, and author John Steinbeck, have announced their support of President Lyndon B. Johnson and Senator Hubert H. Humphrey in the current election campaign.

A statement issued by the group said, "... the next President of the United States must be responsible . . . patient . . . (and) a man who understands and appreciates the nature of a nuclear age . . ."

"We have carefully examined the record of President Johnson and that of Senator Barry M. Goldwater. We believe President Johnson meets these qualifications and that his opponent does not."

Dr. Konrad Bloch of Harvard University, whose work with cholesterol and fatty acids won him this year's Nobel Prize in Physiology or Medicine together with Prof. Feodor Lynen of the Max Planck Institute in Munich, was included among signers of the statement.

Of the 14 physics prizewinners in the group, all but one received their awards for research in atomic energy, beginning with Dr. Carl D. Anderson, now with the

California Institute of Technology, who discovered the positron in 1936.

The most recently awarded physicist on the list is Dr. Maria Geoppert-Mayer of the University of California, who shared with another scientist her 1963 Nobel award for work on the shell theory of the atomic nucleus.

Besides the physics prizewinners, the group includes 14 prizewinners in medicine and physiology, four in chemistry and one in literature.

The group declared itself united by the belief that "... the great issue of the impending election is the issue of war and peace."

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GENERAL SCIENCE

Two Eminent Scientists Disagree on Candidates

► DIFFERING OPINIONS on what will happen to science when Barry M. Goldwater or Lyndon B. Johnson is elected President are voiced by two renowned scientists in Science, 146:380, 1964.

Standing behind Senator Goldwater is Dr. Edward Teller, associate director of the Lawrence Radiation Laboratory in California, and a member of the Republican Task Force on Science, Space and the Atom.

In favor of President Johnson's election is Dr. George B. Kistiakowsky of Harvard University, co-chairman of Scientists and Engineers for Johnson.

Under President Johnson, the U.S. could expect continuing Federal support of science, technology and education, says Dr. Kistiakowsky, who served as science adviser to President Eisenhower. He stated that Senator Goldwater, on the other hand, advocates a withdrawal of government funds from a whole series of programs, including education.

"Senator Goldwater's attitude toward Federal support of science in general or basic research in particular is difficult to determine," Dr. Kistiakowsky added. However, "his actions have been and are most likely to be counter to Federal support of many vital scientific activities."

Dr. Teller, who played a key role in the development of the hydrogen bomb, feels that under a Goldwater administration, there might be a lesser emphasis on big science and greater encouragement for individual and local initiatives to continue America's exploration of science.

"Our space program may begin to look more like science and less like a stunt," Dr. Teller said, commenting upon the "extravagance" of the "crash program" for the moon shot.

By advocating less Federal spending on programs such as education, Senator Goldwater stands for a decentralized education plan, Dr. Teller believes.

The Senator is not a typical professional politician, but a man personally interested in the world of technology, states Dr. Teller.

"I believe he will not take a superficial view of the development of science," he said.

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IN SCIENCE

TECHNOLOGY

New Computer Technique Designs Furnace Walls

► DESIGNERS of big commercial furnaces can save time and money by using an electronic computer, thanks to the Federal Bureau of Mines.

The bureau has developed a computer technique that will compare insulating properties, wall thickness and costs of many different wall materials, eliminating tedious paper-and-pencil methods. The procedure can be applied to many types of furnaces, from those used in power plants to heating units for large buildings.

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PUBLIC HEALTH

Encephalitis Hits More Women Than Men

► COOL WEATHER in New Jersey has driven the mosquito *Culex pipiens* indoors and as a result, twice as many women as men have been hit by insect-borne encephalitis, SCIENCE SERVICE has learned.

Dr. Harry D. Pratt, a scientist director in the U.S. Public Health Service, with headquarters at the Communicable Disease Center, Atlanta, Ga., said that 32-degree weather in New Jersey had driven the infected mosquitoes into chicken coops, garages and houses.

"Mosquitoes get the encephalitis infection from birds when the insects bite them," Dr. Pratt said. "Then if the mosquitoes live two weeks the infection gets into their salivary glands and people get infected from the insect's saliva. That thing that bites you is injecting infected saliva."

Although birds are the normal reservoir for St. Louis encephalitis, which is the type in New Jersey for the first time, public health service officials are doing an extensive job in that state trapping other wildlife such as bats, rabbits and squirrels to see if these animals also harbor the virus.

Encephalitis has reached a new high in the United States this year, with nearly half of the more than 2,000 suspected cases caused by mosquitoes. Encephalitis is also known to follow measles and mumps.

A total of 938 cases of suspected mosquito-borne encephalitis has been reported in 1964. The previous high in any one year was 625 suspected cases in 1956.

Dr. Pratt, who received the 14th annual Gorgas medal in Washington, Oct. 21, during the annual convention of the Association of Military Surgeons of the U.S., is credited with leading the program that wiped out malaria in Puerto Rico in 1946. He is now working on eradication of the *Aedes aegypti* mosquito where it still exists in the U.S. This type of mosquito breeds near houses and transmits both yellow fever and dengue fever.

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CE FIELDS

SPACE

NASA Seeks Scientists For Space Flights

► THE NATIONAL AERONAUTICS and Space Administration announced that it will recruit between 10 and 20 volunteer scientists to accompany U.S. astronauts on future manned space flights.

The program is beginning at once and selection of the first group should be completed by next spring.

NASA officials said that applicants must be U.S. citizens, under six feet tall and have been born on or after Aug. 1, 1930. In addition, certain academic and medical standards must be met.

Screening of candidates will be conducted by NASA's manned space flight center at Houston, Tex., where applicants will be required to take part in a limited space simulation program.

Those scientists selected will be given pilot training where necessary, NASA officials pointed out.

The deadline for filing applications is Dec. 31, 1964.

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COMMUNICATIONS

TV Sends Microscope Image Over Phone Lines

► AN electron microscope image was sent for the first time over ordinary telephone lines using slow-scan television.

With a system called Videx, developed by the International Telephone and Telegraph Corp., the images were sent 25 miles from the Argonne National Laboratory, Argonne, Ill., to the McCormick Place Exposition Center, Chicago, scene of the National Electronics Conference. The pictures were carried over the regular commercial voice telephone lines of Illinois Bell Telephone Co.

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MILITARY SCIENCE

Making Nuclear Bomb Easier All the Time

► BASIC PROBLEMS connected with developing a nuclear device have been simplified in recent years.

Advanced nations such as Sweden, West Germany, Austria, Belgium, The Netherlands, Switzerland, Norway and Italy could follow the footsteps of Red China and also develop a bomb if they really want to.

Red China is believed to have begun its nuclear program during the Korean War with large technological boosts from Russia.

Nuclear researchers have eliminated much of the expensive and time-consuming work that went into the U.S. Manhattan Project, which led to the development of the first atom bomb.

Aspiring nuclear scientists from all over the world can now find most of the information they need to build a bomb in their own public library. This fact, together with the great reduction in costs of equipment and raw materials, has taken away most of the difficulty of A-bomb construction.

The Red Chinese explosion did not generate the public shock that the first Russian atomic blast did. As far back as 1960, American and British scientists had predicted Red China would soon follow France in the development of an atomic bomb.

It is estimated that the Red Chinese will not have an effective delivery system, such as missiles, to threaten anyone until the mid-1970s. So, as long as Red China is unable to take the bomb beyond her own backyard, most observers feel there is no immediate cause for alarm.

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DENTISTRY

Army Dentists Still Treat Arrow Wounds

► BAMBOO SPEARS and arrows cause jaw and facial injuries to infantrymen fighting in primitive areas such as Viet Nam—injuries requiring dental surgery at forward medical units.

Col. Charles C. Alling, U.S. Army chief of military dental research, told the 71st annual meeting of military surgeons of the United States in Washington that the largest number of casualties to the mouth and jaw occur among infantry riflemen—the thin hard edge of the combat army.

"During the hot peace of the last decade," said Col. Alling, "U.S. Army oral surgeons have trained and served on permanent and field hospital staffs throughout the world as integral members of the total military health team."

Lightweight, rugged, dependable field equipment will be necessary for the military dentist to serve combat troops in the remote battlefields of the future, Col. Alling said. Simple equipment must be kept up under the shocks of air drops and the extremes of temperature and humidity.

The following are some of the needs of oral surgeons who serve fast-moving ground combat forces today:

Simpler methods for sterilizing instruments and soldiers' mouth wounds; anesthetics that will act unusually fast and allow rapid recovery; materials for repair work that would be strong enough for chewing, would stop decay and could easily be placed in a quickly and incompletely prepared tooth; artificial denture frames developed from techniques that could be used in the field.

Research projects to fill these needs are now being conducted by the Army, and Col. Alling anticipates fewer losses from duty for dental and mouth treatments in the near future. Army inductees also lose time for much dental work before they are ready for army service because of poor dental hygiene.

Maj. Gen. Joseph L. Bernier, chief of the Army Dental Corps, collaborated in the research reported by Col. Alling.

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MEDICINE

Circumcision Urged To Prevent Cancer

► ALL BOY BABIES should be circumcised to prevent cancer of the male sex organ and to cut down the number of malignancies of the neck of the womb (cervical cancer) among women, advised a New Jersey physician.

The reason for circumcision is cleanliness, to prevent accumulation of an irritating mixture called smegma in the narrow space between the male glans and the overlying foreskin. There is little cervical cancer among Jewish women, studies have shown, and this is believed due to the fact that Jewish males are customarily circumcised.

Dr. Sidney A. Gladstone of Paterson, N.J., told the American Society of Clinical Pathologists meeting in Bel Harbour, Fla., that mounting evidence showed the protective value of circumcision.

About 25,000 women in the United States develop cervical cancer every year, and somewhere between 2,000 and 6,000 men are variously reported as having sex-organ cancer.

A recent study of 120 cancers of the male sex organ, reported by Dr. Archie L. Dean Jr., of the New York Memorial Hospital for Cancer and Allied Diseases, showed that none of the patients had been circumcised in infancy. Among the Hindus of India and China, who do not practice circumcision at all, the number of cases of male sex-organ cancer is very large. Nearly 20% of the cancer in Chinese males is this type of cancer, and as many as 10% of male cancer victims in India are afflicted.

Cervical cancer becomes apparent about 20 years after a woman's sexual intercourse begins, Dr. Gladstone said. This type of cancer does not occur in the absence of sexual intercourse, as among nuns, but prostitutes have it most commonly. He said this is presumably because they have the greatest exposure to smegma from contact with a large number of uncircumcised men.

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MEDICINE

Mongrel Dog Survives Liver Transplant

► THE LIVER may prove to be less of a transplant problem than the kidney if an animal experiment in Denver is an indication of what can be expected of humans.

A mongrel Denver dog has been living seven months since the transplant, two months without the drug imuran. This drug is used to offset the immunity problem that usually causes rejection.

Dr. Thomas E. Starzl of the University of Colorado Medical School and the Veterans Administration Hospital, Denver, told the 50th annual meeting of the American College of Surgeons in Chicago that the dog liver had been transplanted from an unrelated mongrel and so far the organ had been accepted without problems.

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