



the computations are subject to this much uncertainty, it may be that from this position there will just barely be a total eclipse, with the sun's disk completely covered, but if so, it will be very brief.

A total eclipse permits complete observation of the sun's outermost layer, the corona, as well as other effects visible only at such a time. The remaining ring of sunlight prevents these at an annular eclipse, so ordinarily astronomers pay little attention to them. This time, however, the National Geographic Society, in collaboration with the State Department, the Coast and Geodetic Survey, the National Bureau of Standards, the Army, Navy and Air Force, will make observations from a number of locations along the path. Their aim will not be more knowledge of the sun, but of the earth. If the observations are successful, and made with sufficient precision, their analysis will yield the most accurate determination ever made of the size and shape of our globe. These should permit relative positions on the earth to be pinpointed within 150 feet or less. Now, in some cases, the precision of determination of a place may be in error by as much as several hundred feet up to a mile. In case of a war using long range missiles guided by automatic means, this increased precision might mean the difference between a hit and a miss on a vital target.

A rather curious feature of this eclipse, which is true of any that starts in the eastern hemisphere and ends in the western, is that it ends the day before it starts! The beginning of the 5,320-mile path is west of the International Date Line, at 180 degrees longitude, where it is already Sunday, May 9. But on the eastern side of the line it is still Saturday, May 8. By Eastern Daylight Saving Time, the eclipse will begin, at the western end of its path, at 8:45 p.m., and will reach the eastern end at 12:06

a.m. Over most of Asia, the northern part of the Pacific Ocean, Alaska and northwestern Canada, a partial eclipse will be seen, but nothing of this will be visible from the United States.

Time Table for May

May	EST	
1	8:00 p. m.	Moon farthest, distance 251,-200 miles
4	early a. m.	Meteors coming from direction of constellation of Aquarius
8	9:30 p. m.	New moon—annular eclipse of sun
12	4:33 a. m.	Moon passes Venus
15	3:14 a. m.	Moon passes Saturn
	11:00 a. m.	Moon nearest, distance 229,-800 miles
	7:55 p. m.	Moon in first quarter
16	12:15 a. m.	Moon passes Mars
18	4:00 a. m.	Venus at greatest brilliance.
22	7:37 p. m.	Full moon
24	5:57 p. m.	Moon passes Jupiter
28	8:00 p. m.	Mercury farthest east of sun, visible for a few days around this date shortly after sunset
29	3:00 p. m.	Moon farthest, distance 251,-200 miles
30	5:43 p. m.	Moon in last quarter

Subtract one hour for CST, two hours for MST, and three for PST.
Add one hour for the corresponding Daylight Saving Time.

Science News Letter, May 1, 1948

ATOMIC ENERGY

Uranium Is too Scarce for Use as Source of Fuel

➤ THE atomic bomb element, uranium, is so scarce it should not be used as a major source of fuel or power, a famous physicist warned.

Dr. Robert Andrews Millikan, Nobel prize winner in physics and retired head of the California Institute of Technology, declared that the world's supply of uranium is "easily exhausted."

He discussed atomic energy as a guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

Uranium, he pointed out, is only six parts in a million in the earth's crust. It is "not quite as rare as gold, but it is exceedingly rare."

Even with other heavy elements as

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Do You Know?

Color is the chief factor in grading *maple sirup* for quality.

Most mammals, except man and certain primates, seem to be *color-blind*.

Germans are reported to have used *electronic heating* during the war in lumber drying, wood gluing, cigarette curing, plastics heating, lice killing, and food processing.

Jackrabbits have played a large part in scattering juniper trees, often called cedar, on prairie grasslands in Texas and Oklahoma; the rabbits eat the berries of the tree but do not crack the seeds and they pass through the digestive tract uninjured.

Teamsters of earlier years are said to be responsible for the American custom of passing on the right; they rode the left rear horses of their four-to eight-horse teams so that their right, or whip, hand would be free to reach all animals, and passed on the right to see clearance with other wagons.

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possible sources of atomic energy, Dr. Millikan said, the world's atomic resources are limited.

"They are easily exhausted and therefore they will be increasingly costly," he cautioned.

The scientist declared that the suggested use of the lightest element, hydrogen, for the release of atomic energy, a process which is believed to take place on the sun, "is forever unattainable on earth."

Only four important deposits of uranium are known, Dr. Millikan reported. These are in Belgian Congo, Czechoslovakia, Canada's Big Bear Lake and the carnotite ores of southwestern Colorado and southeastern Utah. Most important are the ones in Belgian Congo and Canada.

New sources of the atomic bomb element may be found, but "uranium will continue to be a very scarce element," he

predicted. Calling for conservation of atomic resources, he asserted uranium "should not be used for any major fuel or power purpose."

Without using uranium, Dr. Millikan said, we already have unlimited sources of atomic energy. Gas, oil and coal, "three forms of bottled sunlight," are really a form of atomic energy, he explained.

The atomic process in the sun that gives us these standard forms of fuel is due to "atom-building," instead of "atom-disintegrating," which is used in the atomic bomb, the scientist added.

"The greatest service to mankind of the atomic bomb and atomic energy," Dr. Millikan suggested, "would be to make clear as crystal to all classes and conditions of men the world over the necessity for eliminating aggressive war."

Science News Letter, May 1, 1948

ZOOLOGY

Cancer Cells Transformed

► TRANSFORMATION of cancer cells to normal cells was reported by Drs. S. Meryl Rose and Hope M. Wallingford of Smith College at the meeting of the National Academy of Sciences in Washington.

The transformation was accomplished by transplanting a cancer from a frog into the limb of a salamander and, after the cancer graft had taken, cutting off the limb through the cancer.

In all cases the salamander grew a new limb in the normal way. Within the new, regenerated salamander limb were patches of normal frog muscle, cartilage and fibrous connective tissue. These had grown, or regenerated, from the transplanted frog cancer. Most of them were next to unchanged cancer cells which remained in the old part of the salamander limb above the line of amputation.

Normal tissues in regenerating limbs, the scientists pointed out, go back to the embryonic state in which the cells are undifferentiated. Then, as the cells grow they differentiate into new tissues, just as the embryo cells differentiate into muscles, bones, nerves, and glands.

Because cancerous tissue seems to be abnormally differentiated, the scientists tried to see whether it could be forced back to the embryonic state of no differentiation from which it would be transformed into normal tissue as the cells regenerated.

Frog cancers were transplanted into

salamander limbs so that the former cancer cells could be recognized if they did go back to normal. The frog cancer cells have small nuclei, whereas salamander limb cells have much larger nuclei. The difference in size of cell nucleus made it possible for the scientists to tell which cells in the new salamander limb were salamander cells and which were originally frog cancer cells transformed to normal.

Science News Letter, May 1, 1948

GEODESY

Parachuted Flares Aid In Charting Locations

► RADIO-timed flares dropped on parachutes from high-flying planes, instead of lights on top of high skeleton towers, are the newest technique for enabling geodetic surveyors to pin-point locations on charts with great accuracy. The method was described before the meeting of the American Geophysical Union in Washington by Lt. Comdr. F. R. Gossett of the U. S. Coast and Geodetic Survey.

A tryout tying in the coasts of Florida and the Bahamas has given assurance that results are valid if conditions are right. The weather has to be perfect, so that six flares dropped simultaneously, three over accurately known locations and three from undetermined spots, can be seen at the same time. Possible ranges run up to 200 miles.

Science News Letter, May 1, 1948