SCIENCE NEWS

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THE APPROACHING ECLIPSE OF THE SUN

AN eclipse of the sun that begins the month after it ends is the paradoxical event coming soon. If you happen to be at a point in northeastern Siberia, at latitude 59 degrees 56 minutes north, and longitude 124 degrees 35 minutes east, on July 1, at the time your watch, set to standard time for that part of the world, indicates 2:34 A.M., the sun will rise. As it does so, you will soon notice that a small piece is nicked out of the edge, as the moon is starting to pass in front of it.

But Siberia is rather inaccessible, so instead you may prefer a point in the Atlantic Ocean, north of the Canary Islands, at latitude 46 degrees 43 minutes north, and longitude 23 degrees 19 minutes west, not far from the paths of some transatlantic steamers. If you are there on the late afternoon of June 30, you will also see the sun covered by the moon. If your watch is set to the proper standard time, as it reads 7:25 P.M., the sun will be setting, and the moon will be just at that moment passing from in front of the sun. This will bring to an end the partial solar eclipse that you might have seen start in Siberia early the next morning, and the next month!

All this sounds like some of the paradoxes that have been associated with the relativity theory by which, assuming it possible to travel faster than light, one could travel backwards in time. However, it is much simpler than that. It is a consequence of the International Date Line, that curious place in the Pacific Ocean where one day changes to the next. Every one knows that when it is noon in New York it is 11:00 A.M. in Chicago, 10:00 A.M. in Denver and 9:00 A.M. in San Francisco. Every time you travel 15 degrees of longitude to the west, you set your watch back an hour. Fifteen degrees is just one twenty-fourth the distance around the earth, so when you have gone completely around, your watch, if it had a calendar attachment, would indicate the preceding day. To avoid this, the International Date Line has been established, where, as you cross it from the eastern to the western side, you change immediately from one day to the next, thus compensating for the day you have gained around the west of the world.

Another way to think of it is to picture the day as starting at the date line, and then creeping around the earth from east to west, until it has encircled the globe, and then the next day starts, also at the date line. Consequently it is Monday, July 1, in eastern Siberia long before it is Monday in Europe or America. The total duration of the eclipse is less than three hours, so that it is over before the day has been able to catch up to it. The astronomer avoids any such confusion, as he expresses the hour of such events in Greenwich time, which is used in England, and five hours later than eastern standard. Thus the eclipse begins at 6:34 P.M., Greenwich time, and ends at 9:25 P.M., all on Sunday, June 30.

The paradox of the times of this eclipse is about the only thing to make it of more than passing interest. At no time, as seen from any part of the earth, will the moon completely cover the sun, producing a total eclipse. It is only at the time of a total eclipse that the astronomers can make the observations for which eclipse expeditions are often sent half way around the earth. Even where the coming eclipse is seen at its height, less than a third of the sun's diameter will be covered. In addition to northern Siberia, it will be seen from the British Isles, Norway, Sweden, Greenland, Iceland and the north pole.

HEALTH PROTECTION

To reach every individual citizen of the United States with the scientific knowledge and scientific leadership necessary to protect health—this was the ideal held before the conference of State and Territorial Health Officers meeting at Washington to plan the expenditure of $8,000,000 which it is expected that the Congress will appropriate in connection with the pending social security bill now before the Senate.

The money, if provided by the Congress, will be used to expand the present health services of the nation so that every individual community may develop an adequate service, according to the plans adopted by the conference. New services, including a maternal and child health program, will be provided for.

Half of the $8,000,000 fund, or $4,000,000, will be allocated to the states on a *per capita* basis. Of this amount, one half will be used to match, dollar for dollar, existing appropriations, and the other half will be used to match new appropriations that may be made by state legislatures as a part of this expanding health program.

Another thirty per cent. of the total fund, $2,400,000, will be devoted to an attack on the special health problems of individual states, including the training of personnel so that they will be competent to handle them. The hookworm of the southern states and the malaria of mosquito-ridden regions are among the special problems that this fund will be used to combat.

Since properly trained personnel is one of the major problems in a battle of this sort, half of this $2,400,000 fund will be devoted to the establishment of suitable training centers and the payment of the expenses of young professional men and women to fit them for this work.

Allocation of the remaining $1,600,000 will be on the basis of financial need. A small part of this amount, $400,000, will be distributed equally to all the 51 states and territories. The remainder, $1,200,000, will be used for aiding those states least able to provide funds for adequate health service.

It is anticipated that not all the money available will be spent in the immediate future. Allocation of funds to a state will not necessarily mean that all the funds so allocated will be paid out. Careful plans will be made, and only such amounts approved for spending as can be wisely spent. The building of a permanent health service for the nation rather than a stop-gap care of the present emergency was emphasized.

THE USE OF WATER-ABSORBING SILICA GEL IN AIR CONDITIONING

A STRANGE substance which looks like sand but has the power to absorb water vapor from air and which seems destined to reduce the cost of air conditioning to within reach of average home owners, was described before the meeting of the American Society of Heating and Ventilating Engineers at Toronto by W. E. Stark, of Cleveland.

This substance, known as silica gel, was widely used in gas masks during the war to absorb poison gases. Until recently it was mainly a laboratory curiosity, although some of its properties have been familiar to science for many years. Its use in air conditioning is a new development where it has been proved to be an ideal dehumidifier.

Each crystal of silica gel consists of hard core surrounded by many submicroscopic pores which, while invisible, reveal their presence in laboratory experiments. The air conditioning device contains silica gel reactivated by passing ordinary natural or coke gases through.

Use of the new system may result in the simplification of air conditioning systems which up to now have been largely confined to large buildings because of the cost of installing the required equipment. Silica gel was envisioned as playing a leading rôle in lowering the cost and making air conditioning available to small residences.

The water-absorbing compound is now industrially used as a purifying agent in oil processing and for removing moisture from dry ice. It is also used medically in powdered form to absorb certain poisons from the intestinal tract. Professor Auguste Piccard carried silica gel on his stratosphere flights to keep the gondola free of moisture.

THE ABATEMENT OF NOISE

A NOISE ABATEMENT EXHIBITION in London has been arranged by the Anti-Noise League, formed eighteen months ago to reduce nerve-racking noises of all kinds. A full-size house has been built within the science museum to show the many methods and devices that can now be used to deaden sound.

External noise—the worst enemy—is defeated by having special ventilators whose long and tortuously curved air passages filter out such sounds as are not repelled by steel reflectors or absorbed by wood-fiber "baffles." The double windows are kept closed.

To bring home the differences between ceilings that are sound-insulated and those at the other extreme of construction: the ground floor of the house has two small rooms side by side, separated by an air-space. The floor of the large room is continuous, but the portion above the first room is scientifically laid and insulated, while that above the second is the old, slap-down style of flooring. Across the entire floor walk two mechanical feet, back and forth. They are propelled by electrical mechanism, and each hits the ground with the force equal to the average pressure of a shod human foot. Visitors to the exhibition are invited to go first into one of the small downstairs rooms, then into the other. In the first room they hear no footsteps overhead—nor, for that matter, the radio going full-blast in another downstairs room. But in the second room there is a loud and maddening "clump, clump," rising and falling in intensity as the mechanical feet tread their unceasing measure.

The house has literally noiseless bells. The bell-pushes are linked through a newly-invented relay system with the electric lamp circuits. When the door "bell" is pressed in the daytime, no bell rings. Instead, on come the kitchen lamps. After dark the lamps—already on—flicker up and down until attention is called to them.

ITEMS

A NEW object in the heavens has been reported to astronomers throughout the world by the International Astronomical Union bureau at Copenhagen. The object may be either a comet or an asteroid. It was discovered by Dr. John Jackson, of the Royal Observatory, Cape of Good Hope, who was formerly chief assistant at Greenwich Observatory, England. Of the thirteenth order of astronomical brightness, the object is much too faint to be seen with the naked eye. It appears low in the southeast sky just north of the bright star Antares, in the constellation of Scorpius. The astronomical coordinates of the new object, which will be named after Dr. Jackson, are: right ascension, sixteen hours, forty-four and three-tenths minutes; declination, minus nineteen degrees and forty-eight minutes.

FLOODS in the Southwest are likely to continue, according to the rivers and floods division of the U. S. Weather Bureau. The Arkansas, already in high flood, is due to reach a stage of 33 feet. This is a close approach to its record of 36.7 feet, established in the great flood of 1927. The Rio Grande is also in flood, with fairly high stages in its lower course. There have been wide-spread and rather heavy rains in the Upper Mississippi basin, but as yet the only flood threat is in the Des Moines River, which is bank-full from Ottumwa, Iowa, to its mouth. In New England also there have been very heavy rains, but so far the short, steep-coursed rivers of the region have been able to pour their waters into the sea without raising any major mischief.

A NEW method of sorting out the good parts of what was formerly waste rock and hence make possible high-grade cements from low-grade material was described before the recent meeting of the American Institute of Mining and Metallurgical Engineers. Professor Benjamin L. Miller, of Lehigh University, and Charles H. Brierwood related how the oil flotation process, used widely in concentrating metal ores, can be applied to what was once considered low-grade cement rock. Flotation is the method of stirring crushed rock in a bath of foaming fluid. Each bubble in the foam attracts certain parts of the crushed rock or ore mass and carries it off. Thus the desired material is concentrated. For cement-making lime and alumina were desired. By the flotation method these were obtained and iron and silica rejected.