Ten Vacuum Mile Beam for Light Check

Physics

Reflecting a beam of light back and forth ten times through a pipe a mile long, from which the air has been exhausted, is the experiment soon to be undertaken by Prof. A. A. Michelson, famous physicist of the University of Chicago. Professor Michelson is now in Pasadena, California, where the experiment will be performed in order to check more closely the speed of light.

His interest in the speed of light began forty-six yeras ago, while he was an instructor at the U. S. Naval Academy at Annapolis. Two years ago he completed a series of experiments along the same line which involved sending a beam of light from Mt. Wilson to a neighboring peak and back. These experiments showed that light travels 186,284 miles every second, and gave the most accurate figure for it that has ever been obtained.

But Prof. Michelson is still not entirely satisfied. In a second a beam of light might travel as much as a quarter of a mile more or less than 186,284 miles. Close as this is, he thinks that he can get it still closer, and so he will not be satisfied until he has done so.

One possible way of getting increased accuracy is to increase the length of the path over which the light has to travel. Last year he tried to send the light from Mt. Wilson to a peak about a hundred miles away and back, but found that the air was not clear enough to get a satisfactory image. And determinations in open air, of this kind, involve such factors as temperature, air pressure and humidity. These may vary slightly in a long path, and even though corrections are made for them they introduce uncertainties.

By putting the light beam in a vacuum these troublesome factors can be eliminated. Another advantage will be that he can personally measure the length of the light path in the pipe. In the mountain experiments the U. S. Coast and Geodetic Survey measured the distance between the peaks with an accuracy of one part in a million. Though he does not question the accuracy of their survey, he wants to be able to check all the factors personally. With the use of the pipe he can do this with a steel tape to a very high degree of precision.

"I am well satisfied with the accuracy of the present figures of the speed of light," said Prof. Michelson today as he paused from the preparations for his trip, "but the vacuum may enable a further correction of one or two parts in a million, and at any event will serve as a check on the previous method".

Prof. Michelson said that he may also make another repetition of the famous Michelson-Morley experiment, the failure of which, when performed in 1887, to show the earth's supposed motion through the ether, finally led to the theory of relativity. Last year he repeated it in Pasadena, and still failed to get any appreciable effect, but now he may repeat it again on Mt. Wilson. In this way he can check a possible effect of altitude.

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Twisters Over Average

Meteorology

The tornadoes of 1929 are writing weather history and the number of twisters and the loss of life caused by them during the first four months of the year are well above the average.

So far figures compiled tentatively by the U. S. Weather Bureau show that 60 to 80 tornadoes have occurred and that the death lists have numbered 250 to 280.

Somewhat unusual are the ways in which the tornadoes have grouped themselves in the last fortnight. The storm that swept northwestward during the latter part of last week (May 1 to 4) left in its wake a succession of debris and dead due to whirling masses of air in Arkansas, Tennessee, Virginia, Maryland, Pennsylvania and perhaps Vermont. Fortunately the loss of life was not as high as the toll of 80 taken by the St. Louis storm of September, 1927, which the weather experts rate as the most recent major tornado judged from the loss of life.

Last year was notable because of the large number of tornadoes and the low loss of life. Already the death toll of this year exceeds the 1928 record of 78, but the 1928 total of 180 tornadoes may not be exceeded this year.

The southwestern end of Virginia, hard hit by the school disaster at Rye Cove, had previously been singularly free from destructive tornadoes for at least a hundred years.

So far this year Georgia, Arkansas and Wisconsin are the states that lead in tornado toll.

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Swedish Stone Age City

Archæology

A complete Swedish stone age village is gradually being brought to light from the swamps at Dag, in the central province of Ostergothland. This season's excavations, now completed, were under the supervision of Dr. Otto Froedin, Stockholm archæologist with the Swedish government supplying necessary funds.

The finds show remnants of what once must have been a large community, built on the marshes and surrounded by a stockade. The houses had heavy log floors laid on the swampy ground. Why this city was erected in so dismal and inhospitable place is hard to determine, but Dr. Froedim believes that the location was ideal for a successful defense against warring tribes. The only means of communication with the outer world consisted of a narrow bridge, leading from the marsh to the surrounding firm ground, and this could be drawn at will.

Signs of road construction are evident in a street paved with flat stones which crosses the greater part of the ancient city. Among the relics discovered in the slimy ground are fireplaces covered with ash, coal, and charred bones. A quantity of weapons and implements of stone and horn have also been found during the summer's excavations.

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155,000,000-year-old Plants

Paleobotany

Fossil plants 155,000,000 years old, that grew on the earth when it was ruled by the dinosaurs, have been found in the Sutschansk mines near Vladivostok by Prof. A. N. Kristovitsch, Russian paleontologist. They take rank with the oldest of all known higher seed-plants, specimens of which have hitherto been known from only three places on earth: Greenland, the Potomac shales of the United States, and Portugal.

The plants discovered in the Siberian rocks are represented by leaf-prints only, but these are recognizable as belonging to the genus Aralia, and the new fossil species has been given the name Aralia lucifern.

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