

"We believe that a state of irreversible shock was prevented," Dr. Trusler and associates state, "and that her life was saved by the repeated intravenous administration of properly balanced fluids, the most important components of which were blood and blood plasma."

They also stress the value of oxygen and describe the treatment of the burned area. In this connection, however, they declare that "no local application can be expected to save life after a large burn."

*Science News Letter, January 20, 1940*

great influence in changing the prevailing scientific opinion."

*Science News Letter, January 20, 1940*

ENGINEERING

### Highway Jacked Apart To Make Divided Roadway

HOW a four-lane highway was "jacked" apart to make a divided roadway and thus reduced fatal accidents over 83%, was described at the meeting of the Highway Research Board of the National Research Council in Washington by Arnold H. Vey, traffic engineer of the State of New Jersey.

New Jersey took a popular four-lane highway and split it down the middle, jacking up separate concrete slabs and moving them sideways. Two roadways, separated by a dividing center strip, thus resulted.

A study of accident figures on this road in 1933-34, before the division, and for 1937-38, after the division, showed that fatal accidents dropped 83.3%. Non-fatal accidents decreased 48.5% and accidents involving property damage were cut 17.6%. The reduction for accidents of all kinds was 40.4%.

Particularly valuable was the new divided highway at night, for accidents were then decreased by 47.2% while during the day they dropped only 31.4%.

The cost for the unique jacking and moving job was \$50,000 per mile, Mr. Vey reported. By applying National Safety Council figures to the reduction in accidents, it was found that the saving in accident costs are sufficient to pay for the conversion in slightly over three years.

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MATHEMATICS

## Mathematical Study Confirms Theory of Solar Radiation

### Statistical Work of Dr. Abbot, Evidence of Periods Of Solar Activity, Is Now Confirmed at Harvard

POSSIBILITY of statistical error in the theory that there are significant periodic changes in the sun's radiation which predictably affect the earth's weather has been eliminated by a Harvard mathematician.

The findings, made by Dr. Theodore E. Sterne, Harvard lecturer on astrophysics, are believed to eliminate one of the major objections raised against the solar radiation-weather tie-up recently advanced by Dr. Charles G. Abbot, secretary of the Smithsonian Institution in Washington.

Dr. Abbot's deductions, based on years of solar radiation observations at stations spotted throughout the world, have been questioned as due to either statistical errors in analyzing the data, or systematic errors of observation. The Harvard research removes this first objection.

In his findings, Dr. Abbot discovered evidence for changes in solar radiation in periods of 7, 8, 9 $\frac{3}{4}$ , 11, 21, 25, 34, 39 $\frac{1}{2}$ , 46 and 68 months. Dr. Sterne believes that three of these periods may be due to statistical error—those of 7 months, 8 months and 34 months.

The other seven periods, Dr. Sterne has found, are not attributable to this and the Harvard mathematician has gone so far as to say that the odds against these seven periods being purely statistical error are about 30,000 to one, or even higher, running in some cases into the millions.

Dr. Sterne emphasized that his studies were concerned purely with the statistics of Dr. Abbot's researches and not at all with the question of observational technique.

The periods in question were worked out by Dr. Abbot during the 15 years

from 1920 to 1934 and are built on the average of solar radiation in many parts of the world three times each month. Dr. Abbot measured the amount of radiation received in calories per minute per square centimeter at right angles to the sun.

The average during this 15-year period, he found, was 1.9410 calories per square centimeter per minute.

Informed of the Harvard announcement regarding statistical studies of his observations on solar radiations, Dr. Abbot said:

"The weight of scientific opinion for many years has been opposed to the variability of the sun or its importance.

"I am convinced, on the contrary, that the variation in the sun is the main cause of weather on the earth and believe that the work of Dr. Sterne, made from a skeptical point of view, will have

