



### ME AND MY SHADOW

*Man shakes hands with his shadow at New York World's Fair.*

#### PHYSICS

## Man Loses His Shadow In World's Fair Exhibit

**S**HADES of Peter Pan! Science has done it. A man has lost his shadow! It's a piece of World's Fair scientific magic manufactured by G. E. There sits scientist-magician in front of a screen, coated with phosphorescent material, stuff that shines back light several minutes after the illumination is switched off. Where shadow was, there is no phosphorescence. So scientist-magician moves into another position. He shakes hands with his shadow. He slaps it on its back. He even rolls it up and puts it away! Next probable step: Use of this device in a detective thriller, G. E. scientists consulting.

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#### GEOLOGY

## Pacific Coast Glaciers Have Their Age Reduced

**T**HOUSANDS of years of antiquity are shaved off the glaciers of the Sierra Nevada mountain range on the Pacific Coast when Francois E. Matthes of the U. S. Geological Survey told the Sixth Pacific Congress at Berkeley, Calif., that they are not remnants of ancient "ice age" glaciers but a new crop born as late as 4,000 years ago.

Large glaciers of the Pacific Northwest have survived from the Pleistocene or ice age epoch of about 10,000 years ago, Mr. Matthes said.

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#### ENGINEERING

## Newest Vacuum Tube To Give Eleven Years of Service

**New High in Length of Life for Such Devices Is Set  
By Mercury Vapor Thyatron Used to Turn AC to DC**

**A** VACUUM tube that will give nearly eleven and a half years of continuous service, night and day, has been developed by Dr. A. W. Hull of the General Electric Company. The tube, setting a new high in length of life for vacuum tube devices, is a mercury vapor thyatron which is used to convert alternating current into direct current.

Tubes of this type carry very large electrical currents and can be used as commutators for direct current motors such as in elevators. They also are employed in experimental methods of power transmission by direct current.

The new tubes exceed by 100 per cent, in their probable length of life, the famous 50,000-hour tubes which early this year gained public notice by investigations of the Temporary National Economic Committee in Washington. Dr. Frank B. Jewett, president of the Bell Telephone Laboratories, was questioned actively by the committee about vacuum tubes, giving 50,000 hours of useful serv-

ice, which were employed by the telephone company as "repeaters" on its long-distance telephone lines.

High-cost precision construction explained the long-life of the telephone tubes. It was disclosed that while they were adaptable to the average radio set they would outlast the set several times and that the set would be obsolete long before its tubes were worn out. Their higher cost rendered them economically impracticable for ordinary radio use, it was explained.

Dr. Hull's new vacuum tube owes its long life, in contrast, to a new type of cathode which emits the electrons within the tube. Ordinary cause of tube failure, he explains, comes because the electron-emitting material on the cathode (barium oxide) is gradually used up and finally fails.

In the new Hull-type of thyatron there is built inside the tube a reservoir of the active electron-emitting material. Known as a "dispenser cathode" this

reservoir serves the dual function of a heater (to make the electrons go off) and as a dispenser of the coating.

Some of the new type tubes have been in experimental service for 30,000 hours, or nearly three and a half years.

One tube, accidentally broken at about 20,000 hours was examined. It was found that less than half of the barium oxide supply had left its container at that time and that half of this half was still within the cathode enclosure doing its job of emitting electrons.

This means that 20,000 hours is probably less than a quarter of the life of the tube. This is the reasoning behind the statement that the tubes may last 100,000 hours or nearly eleven and a half years.

The thyatrons under test are carrying very high currents, 175 amperes, but have not yet shown any deterioration of their vacuum. The new tube is described in *Physical Review*. (July 1)

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