



LIGHTNING BRIGHTENS SKY—The entire sky is temporarily brightened by a flash of lightning. The long white line in this photograph represents the sky brightness facing away from the flash, the tall pips show the change in brightness with each discharge. These changes occurred in 1/10 of a second.

ASTRONOMY

Whole Sky Brightened

Lightning flashes illuminate entire sky, not just part in which they occur. Photomultiplier caught the light changes during study of twinkling.

➤ A FLASH of lightning not only illuminates the part of the sky in which it occurs, but temporarily brightens the entire sky many times.

Such brightening of the sky away from a flash has just been recorded by A. A. Hoag of the U. S. Naval Observatory. The relative brightness of each discharge and its duration is clearly registered.

The light changes were caught by a photomultiplier, a sensitive light receiver. This is probably the first time that a device of this type has been used to study lightning.

The lightning occurred quite opportunely when Mr. Hoag was trying to measure the over-all twinkling of a part of the sky. His equipment was simple—a large cardboard box with a hole in one end and in the other a photomultiplier which converts the light into electrical impulses. These impulses caused "pips" on the attached oscilloscope screen. A continuously moving film camera permanently recorded the pips.

The instrument was facing the south. With the sky still nine-tenths clear, a thunderstorm appeared in the northwest. Thus the instrument caught not the lightning itself, but the brightness of the sky due to the scattering of the light from the lightning.

Looking like a futuristic representation of a city skyline at night when all lights are ablaze, each lightning discharge shows up as a tall, many-storied building. The height of the "building" is governed by the intensity of the discharge.

Blurring caused single up and down lines on the screen to be spread out and gives apparent width to the "buildings."

Thus the equipment proved an excellent means of measuring the time between individual discharges and their relative intensities.

Usually the intense light disappeared from the sky within a thousandth of a second. But light from one discharge lasted 30 times this long, turning the "building" into a steeply pitched roof.

"Equipment of this type might be useful in monitoring a thunderstorm," Mr. Hoag pointed out. "It would record all lightning flashes in the storm."

Unfortunately, the photomultiplier does not separate out individual flashes, Mr. Hoag said. If two flashes occur simultaneously, it will show a single great increase in brightness in the sky. Perhaps a rotating camera, frequently used in study of lightning, should be used along with it to record the flashes themselves and give a complete picture of the lightning.

Science News Letter, July 21, 1951

PHYSICS

Something in it Despite Title: Vacuum

➤ THERE IS something in the latest scientific journal, *VACUUM*, despite its name. This new British publication, to be issued quarterly, contains information on high-vacuum techniques and processes which have become of greater importance in science and industry in the past three decades.

Science News Letter, July 21, 1951

MEDICINE

Treat Arthritis Successfully With Postpartum Plasma

➤ ARTHRITIS CAN be successfully treated, even in cases where cortisone and ACTH are not effective, by use of fluids recovered after childbirth, known as postpartum plasma, Dr. Louis W. Granirer of Jamaica, N. Y., reports in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (July 14).

Although the treatments are administered only once a week, the pooled postpartum plasma is reported to have produced a gradual and sustained remission in 13 out of 15 patients treated during the past three years, while the two patients who failed to respond had a short course of therapy of only six treatments.

Patients who were unable to close their hands due to crippling rheumatism and swelling joints were able to clinch their fists after treatments.

They gained weight, felt better, lost chemical abnormalities in their blood, had no serum effects and experienced no side effects as in treatments with ACTH and cortisone.

Science News Letter, July 21, 1951

ICHTHYOLOGY

Little Fish Survive 1,000 Lb./Sq. In. Pressure

➤ SHALLOW-WATER fingerling trout and salmon are indestructible in the crushing pressures of the sea, 2,000 feet below the surface where a man—even in a diving suit—cannot live.

The experiments that established this fact were conducted by Andreas Rechnitzer who wanted to observe the reaction of young fish to high hydrostatic pressures.

The small, frail-looking fish showed no apparent damage after being in water in pressures up to 1,000 pounds per square inch, the equivalent of water approximately two-fifths of a mile deep.

Origin of the experiments was the desire to know if small fish could survive rapid descents from high levels necessitated by devices proposed by engineers to allow passage of fingerlings down dammed streams.

Science News Letter, July 21, 1951