ASTRONOMY

Clue to Sun's Heat

Simultaneous observations of sun's outer envelope with both radio and optical telescopes may yield information on its temperature.

➤ A CLUE to the temperature of the various layers of the sun's envelope may lie in a series of pictures taken at Khartoum, Anglo-Egyptian Sudan, during the total solar eclipse of Feb. 25.

These pictures, just developed and enlarged, may be the connecting link between optical observations of the sun and studies conducted with radio equipment, Dr. Walter Orr Roberts, superintendent of the High Altitude Observatory, Boulder, Colo., told SCIENCE SERVICE.

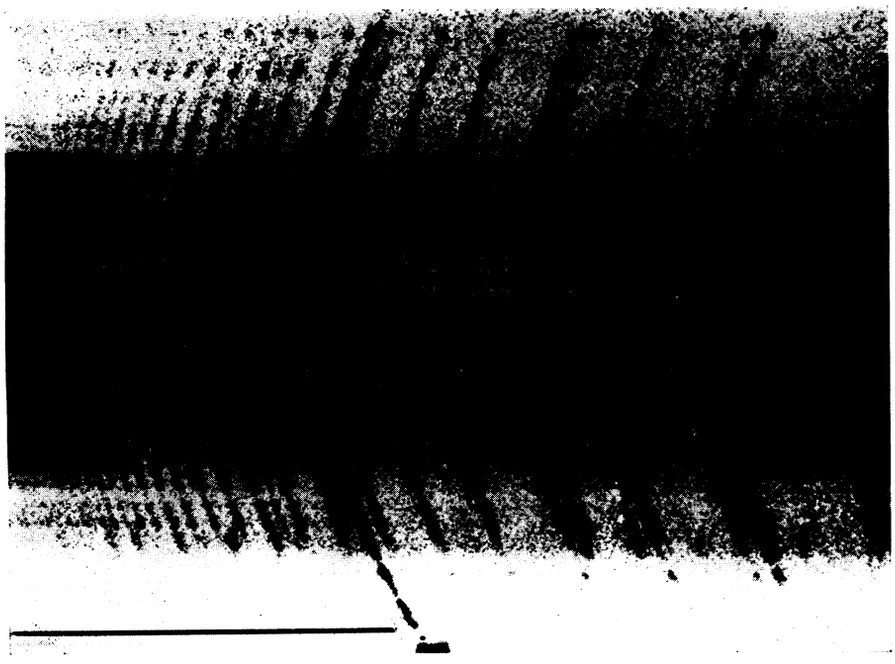
Astronomers using radio telescopes to listen to hisses from the sun and those minutely examining the rainbow colors of the sun's spectra have gotten conflicting figures for the temperature of the sun's outer atmosphere.

Studies with radio telescopes indicate that the lower chromosphere, situated just above the intensely brilliant visible surface of the sun, is relatively cool. But from there out to the tenuous corona, pale envelope of the sun visible only during a solar eclipse, the temperature rises rapidly, radio astronomers believe. Optical data, on the other hand, show great heat deep within the chromosphere, where the temperature apparently reaches about 30,000 degrees Centigrade.

During the recent total eclipse, which lasted a little over three minutes at Khartoum, simultaneous observations of the sun's outer envelope were made with radio telescopes and with the more traditional optical telescopes. This expedition, organized by the Naval Research Laboratory, was led by Dr. Edward O. Hulbert.

Spectra of different layers of the sun's outer envelope were snapped in a fraction of a second during the eclipse by a group working under the direction of Dr. J. W. Evans of the High Altitude Observatory. It is the hydrogen lines in the ultraviolet part of the spectrum that are expected to reveal more exactly than ever before the temperature of the corona.

Taken at the beginning and end of the eclipse, these pictures of the "flash spectrum" show bands of light produced by the sun's outer envelope. In addition to the familiar red and blue lines due to intensely hot hydrogen gases, these spectra pictures show about 35 other ultraviolet hydrogen lines. Although most of these lines have been observed before, the Boulder astronomers believe desired details are shown more clearly in these pictures than previously.



HYDROGEN LINES—Those underlined are in the ultraviolet part of the flash spectrum and are due to hydrogen in the sun's outer envelope. They were photographed at Khartoum, Anglo-Egyptian Sudan, during the recent total solar eclipse by Dr. J. W. Evans of the High Altitude Observatory at Boulder, Colo.

Science News Letter, April 19, 1952

ARCHAEOLOGY

Text on Bronze Scroll New Treasure from Cave

➤ NEW TREASURE has been unearthed from the rich archaeological "mines" in the caves along the banks of the Dead Sea, Prof. A. Henry Detweiler of Cornell University reported in Ithaca, N. Y.

This time the find is an ancient manuscript engraved in square Hebrew letters on a pair of tightly rolled bronze sheets. No one yet knows what literary gem was thus preserved in lasting metal, but it was in this same area that archaeologists found a parchment scroll with a Hebrew text of the Book of Isaiah and other early Biblical manuscripts.

These rich finds and the discovery by Bedouins of other manuscript fragments in a nearby cave encouraged scientists to organize an expedition to search all the caves in the area. Forty have now been located and explored.

The problem of cleaning and unrolling the eight feet of bronze sheet is an extremely delicate one. Archaeologists have found that metal, especially copper and bronze, that has laid in the ground for a long time crystallizes and becomes very brittle. Any attempt to lay it out flat is likely to cause it to crumble into small bits. Usually neither heat nor chemicals will restore the metal to its original pliable state.

Science News Letter, April 19, 1952

MEDICINE

Blue Dye With Cancer Affinity Aids X-raying

➤ A BLUE dye with an affinity for tumor tissue may make X-ray treatment of cancer more effective, Dr. John H. Heller of Yale University School of Medicine reported at the meeting of the International Association of Medical Museums in New York.

The dye is called isamine blue, or, chemically, naphthylpararosaniline. When injected into the blood stream, the dye seeks out the tumor, staining it blue. And the dye in the tumor or cancer seems to make it more susceptible to X-ray destruction.

So far, Dr. Heller has not tried the blue dye treatment in human patients because he has not been able to get a pure form of the dye. But in rats the dye seems to help. Tumors with dye stain were considerably smaller after X-ray treatment than tumors given the same X-ray dosage without blue staining first.

Science News Letter, April 19, 1952