

ASTRONOMY

Spicules Short-Lived

► TINY prominences of the sun have been found to be much more frequent and of shorter duration than was previously realized. These spike-like prominences, called spicules, lasted only four or five minutes from the time they were first detected until they faded out entirely.

The existence of a large number of these spicules, which had previously been noticed in some of the best eclipse photographs, was discovered in a series of photographs taken with the coronagraph at the Fremont Pass Station of Harvard College Observatory, Climax, Colo., by Dr. Walter O. Roberts.

The typical spicule showed up first as a barely detectable lump on the limb of the sun. The lump rapidly enlarged, growing both broader and taller, and was brightest just before it reached its full height.

After the prominence had reached its maximum elongation, which occurred usually a minute or two after it first appeared, it began to fade out gradually without any detectable motion.

The entire lifetime of most of the spikes from first to last appearance was on the average only four or five minutes. These tiny prominences usually were about 4,500 miles wide. They were but 1,700 to 1,800 miles high, as contrasted with some of the larger solar prominences which sometimes are 500,000 miles high.

The largest spicules sometimes last 11 minutes, and some of the smallest only two minutes. The small ones probably occur numerous, and the large ones only occasionally.

At a given moment it is frequently possible, Dr. Roberts reports, to see at one time as many as 25 of the spicules in a 60 degree arc in the polar regions of the sun.

Typical spicules erupt more frequently from regions of the sun which usually show little disturbance of any sort. They are not likely to occur near large prominences or in areas where there are sunspots. They are most commonly seen in polar regions where such disturbances are infrequent.

The photographs from which the study of the spikes was made were taken at the rate of one picture each minute. Special sensitized film prepared for use on prominence photographs was employed.

The spicules may possibly be a link

between the solar granules and polar coronal plumes, but further study will be needed. The spicules are the only solar features so far known which seem to indicate a continuous flow of material out through the chromosphere, the gaseous layer of incandescent hydrogen which surrounds the sun, into the regions of the sun's corona.

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TECHNOLOGY

Heavy Rolling Produces Improvement in Leather

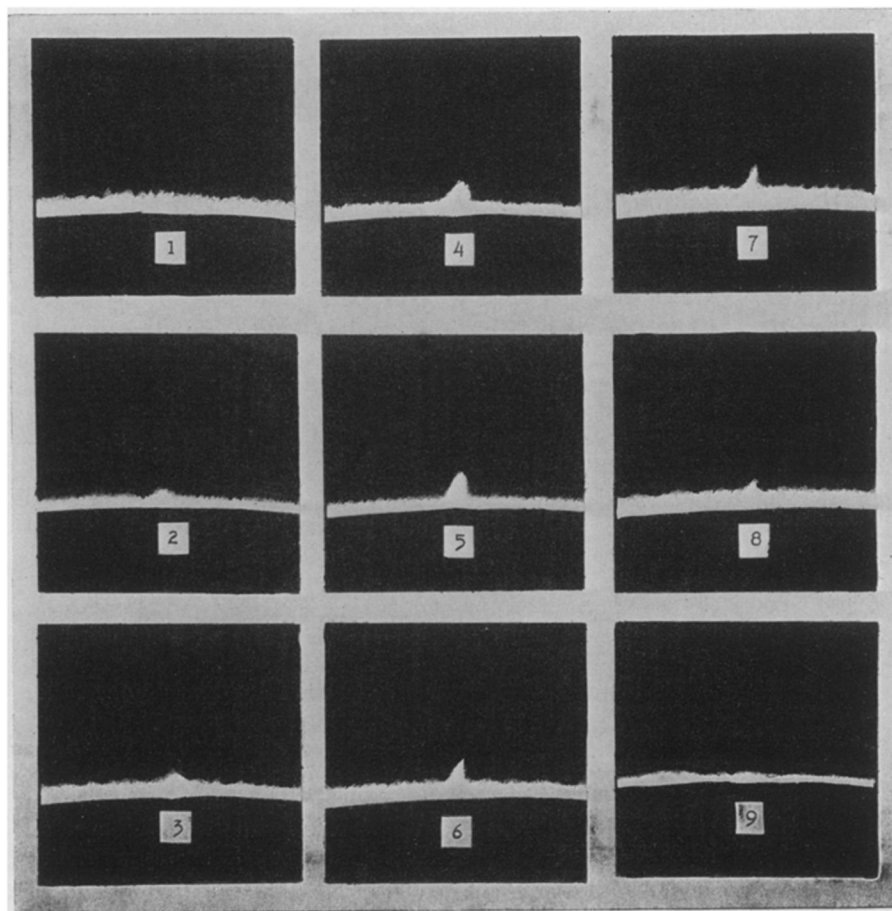
► HEAVY rolling of shoe sole leather, or compression by other means, produces an improvement in wear, it is

found by recent tests made by the National Bureau of Standards, in which a regiment of soldiers in an officer candidate camp were used, together with some civilian workers in war industries.

The tests showed also that differences in the wearing quality of 20 commercial tannages of vegetable sole leather were very small, with no significant difference in the wear of leather tanned from domestic and from cold-storage hides. They showed further that water-soluble materials and grease are lost from soles in service, the greatest loss being shown by water-soluble ash.

The so-called "rubber" abrasive machines are of little use, it was found, in predicting the wearing qualities of tannages. The wearing quality can be estimated, to a degree, by the water-soluble content, the firmness, and the degree of tannage of the leather.

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SHORT-LIVED—Tiny prominences rising from the brilliant gaseous layer surrounding the sun, spicules last only a few minutes and disappear. The average spicule passes through all the stages shown in this series of photographs taken by Dr. Walter O. Roberts, of Harvard College Observatory, in but four or five minutes. It is usually brightest in its early stages, as shown in the fourth picture.