

700,000 Miles of Sunspots

Astronomy

Extending for 700,000 miles across the face of the sun, a string of spots that astronomers have recently been observing shows unusual solar activity. They are shown in our cover illustration, a photograph made Friday, November 29, at the Yerkes Observatory by Charles D. Higgs. The photograph was made with the 40-inch telescope, largest in the world with a lens. The spots are in several groups, three of which could be seen with the unaided eye when properly protected with smoked glass or exposed photographic film. The largest single spot was 40,000 miles in diameter, with an "umbra," the dark inner portion, about 20,000 miles across. Several spheres the size of the earth, 8,000 miles in diameter, could be dropped into this spot. This large spot was on the sun's center line, as seen from the earth, Saturday, November 30.

The number of spots on the sun varies over a period of approximately eleven years. In the spring and summer of 1923 they were at a minimum. Then the numbers increased until a maximum was attained in July, 1928. Since then they have decreased in numbers, and many astronomers thought that they were definitely on the downward trend.

Last December, at the meeting of the American Astronomical Society in New York, Dr. Harlan T. Stetson, then of Harvard but now director of the Perkins Observatory at Ohio Wesleyan University, predicted still greater numbers this fall. He and Dr. Greenleaf W. Pickard, a radio engineer, have been studying the relation between sunspots and radio. Their work showed that there was a secondary cycle of about 15 months in which the spots varied. In January, 1926, there were many spots. Then they decreased, but by April, 1927, were still more numerous. They declined once more, but in July, 1928, there were even more.

"The quiescent period in the early part of 1929 followed by the extraor-

dinarily great rise in solar activity this Fall has more than confirmed the late 1929 maximum I predicted," Dr. Stetson told Science Service "It now seems likely that this may prove the real maximum of the present sunspot cycle period. Measures of radio reception during the past few weeks bear out the correlation studies of Dr. Pickard and myself recently recorded.

"The year 1930 should see a general decrease in solar activity with a corresponding decrease in the ionization of the earth's atmosphere. This will favor the return of radio reception to normal conditions. During the subsidence period spasmodic outbreaks in the sun are to be expected at intervals, but with lessening intensity over the next 5 or 6 years."

Sunspots occur in the surface of the sun—the layer that astronomers call the photosphere. A mass of hot gases shoots up from the interior of the sun to the surface, rapidly revolving like a bullet in a rifle barrel. As they get to the surface, a whirlpool of gases results, the pressure is reduced and they are rapidly cooled. This sudden cooling causes a reduction in brilliance, and so the spots appear dark against the more brilliant solar background. They shoot out streams of tiny electrical particles, or electrons, which may reach the

earth when the spot is on the right side of the sun. These electrons, acting in conjunction with the magnetic field of the earth itself, produce such effects as the northern lights, and the magnetic storms that may tie up telegraphic communication.

Science News-Letter, December 7, 1929

Extinct Indians

Archæology

Along the Susquehanna River have been found village sites once occupied by the Conestoga Indians. Eighty-nine complete pottery vessels and many other everyday possessions of this extinct tribe have been unearthed by G. B. Fenstermaker of Lancaster, in cooperation with the Pennsylvania State Museum.

Capt. John Smith, who first encountered the Conestoga in 1608, described them as being warlike and far superior in physique to other neighboring tribes. Yet they were conquered by the Iroquois Indians in 1675, and less than a hundred years later the twenty warriors that were the only remnants of the once powerful tribe were massacred by white men near Columbia, Pa.

Growing interest in Pennsylvania's prehistory has lately aroused the state legislature to appropriate \$20,000 to the Historical Commission for the purpose of conducting researches within the state.

An expedition along the Monongahela River has recently found evidence of two hitherto unknown Indian tribes. Representatives of one tribe were beetle-browed and had peculiar bits of excess enamel, resembling small pearls, in the roots of their teeth.

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It is found that airplanes are transporting on their tires some of the stickers, spines, and burrs of troublesome weeds.

The Field Museum has a collection of 52 ancient Egyptian tombstones including those of a king, priests, nobles, and ordinary citizens.

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