

magnitude star. This refers to the blue light which most affects the photo-electric cell, which is not very different from the photographic plate in color sensitivity.

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THE RECENT AURORAS AND SUN SPOTS

THE object of this preliminary communication is to call attention to the coincidence with the recent magnetic displays of a huge disturbance on the sun approximately parallel to the sun's equator and over 205,000 miles long so situated that the whole of it approximately passed centrally requiring at least two days for its passage over the sun's center. The group of spots consisted of at least six larger and numerous smaller ones, all stringing along in a line. My first observation of it was on the 23d of March when most of the group had already passed the center by about a day. If the group existed prior to the 23d without essential modification, it began to pass the center between the 20th and 21st, showing a lag in the propagation from the sun to the earth, if there be such, of something like two days. This seems to favor Professor Snyder's recently announced statement that there is a lag of 48 hours. The observation seems at least to point to the fact of there being some kind of propagation. The central passage required about two days and the aurora was evident on the evenings of the 22d and 23d at least.

Again on the 16th of April a medium-sized spot became central. It was probably one of the six spots of the before mentioned group. It was followed by a small spot some 200,000 miles after and also central about two days later. It was possibly another remnant of the old group, but too small to be of any consequence. It had disappeared by the 19th. Two or three days before the medium-sized spot became central, I remarked to several of my colleagues that I would not be surprised at auroral display or at least magnetic disturbances after it passed the center. I saw no aurora, the sky was unfavorable, and probably also the time, but on the morning of the

17th telegraph operators noticed a disturbance, which must have been due to the alleged propagation. If so the lag was about one day in this case.

My measurements of the positions of all the spots were made on the sun's disc directly with the micrometer and will yield heliographic latitudes and longitudes of all the points observed, but I have had no time to make the computations. I would wish this communication to be considered as a first approximation to more accurate values.

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April 24, 1920

POSSIBLE CONNECTION BETWEEN SUNSPOTS AND EARTHQUAKES

IN Monthly Notices of the Royal Astronomical Society for April, 1919, Professor H. H. Turner has discussed data taken from the Catalogue of Destructive Earthquakes compiled by Milne and from the Catalogue of Chinese Earthquakes. He publishes tables of earthquakes extending back to 49 A.D. and refers to old Chinese records dating to 1820 B.C.

From these data he slightly modifies two suspected earthquake periods, first published in the Report of the Seismological Committee to the British Association in 1912. The short period is shown by him to have minor and major limits of 14.8421 and 14.8448 months. The long period is taken as seventy-eight years. His tables show these periods almost certainly as real.

Nine times the limits of the short period give 11.1316 and 11.1336 years. Newcomb has derived the sunspot period as 11.13 years and Larmor and Yamaga as 11.125 years. The chance that this close commensurability is accidental is as the difference, which is less than one one-hundredth of a year, is to the period of about 1.24 years. That is about one in two hundred and fifty.

If the short period is so nearly commensurable the long period must be also. Seven times the sunspot period is 77.91 years, agreeing to 0.09 years with his round figure of seventy-eight years.