

SUNDOGS AND HALOS SEEN AT NJORO 93

2 inches. Head green, legs and claspers green, latter rather hairy. Generally, uniform clear grass green. A supra-spiracular longitudinal pale yellow band connects the processes on 2 with the tail points. On this on each segment two brighter chrome spots. 2. Margined fore and aft with black narrowly. Processes yellow tipped with black. 4 and 5 each with two simple blue-black dorso-lateral spines sprouting from orange tubercles. Tail points yellow. Ostmateria green. Before pupation the larva shrinks considerably (to about 1 inch in length) and becomes a very pale clear green. Pupation effected in three minutes.

Pupa.—The resemblance to *P. Agamemnon* continued. Attached by tail and short body, strung to a stem of the food-plant under a leaf.

The head ends in two points, fairly sharp. The thorax is keeled and produced forward into a fairly long horn. Otherwise the pupa tapers gradually and evenly to the sharp anal point. In colour it imitates the leaf of the food-plant, every segment being regularly veined. A pale green spiracular stripe from tip of horn to tail. Two longitudinal subdorsal slightly divergent stripes of a similar colour from base of horn to tail, where they unite. Pupal period, eleven to twelve days.

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NOVEMBER 5, 1909

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The rainbows to the N. and S. of the sun appear to vary, at times appearing to be concentric with the sun, at others to have their centres N.E. and S.E. on or about the horizon.

Maximum brilliance of phenomenon about 9.15 or 9.30 A.M., Figs. 4 and 5, when red (brunze) part of spectrum of figures surrounding the sun very pronounced.

10 A.M.—Fig. 6. Surrounding circle and ellipse nearly

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coalesced. Light ellipse with sun on edge very faint. All phenomena much contracted.

Sundogs; November 5, 1909; Njoro; 5.45 A.M.

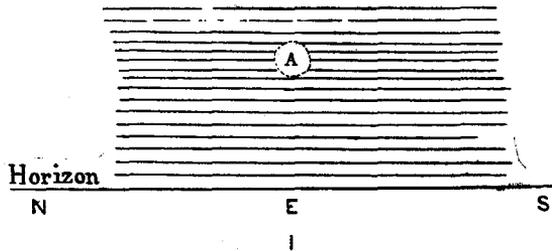


FIG.—1. Sun below the horizon.
Brilliant indefinite concentration of light 'A' in clouds above position of sun.

10.15 A.M.—Surrounding circle and ellipse seen to have coalesced with red edge towards the sun. Fig. 6. Bright in-

Sundogs; November 5, 1909; Njoro; 6.15 A.M.

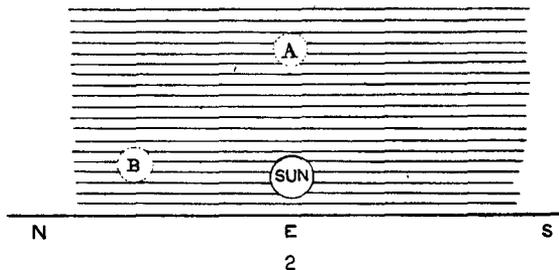


FIG. 2.—Brilliant indefinite concentrations 'A' and 'B' of light in clouds above and to the north of sun. (None on the south of the sun.)

definite band outside. All phenomena have red portion of spectrum towards the sun.

Upper light ellipse of Fig. 5 almost disappeared. Time given taking sunrise as 6 A.M.

Sundogs, November 5, 1909; Njoro, 8.45 A.M.

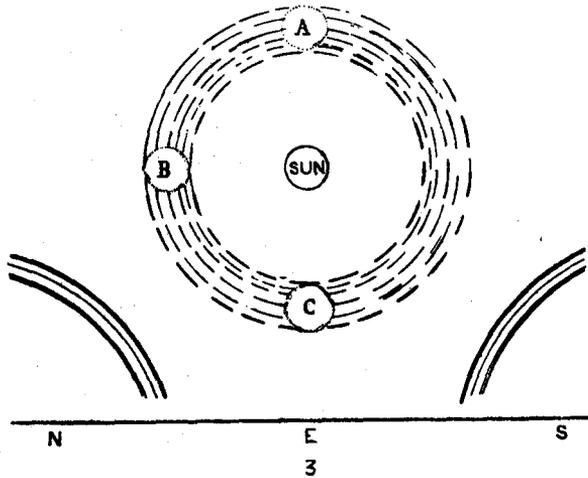


FIG. 3.—Bright circle round the sun. Very definite above, less definite to the north, and invisible to the south. Concentrated under the sun into a very brilliant patch of light (C). To north and south dull but very definite segments of rainbows (?), the red portion towards the sun.

Sundogs, November 5, 1909; Njoro, 9 A.M.

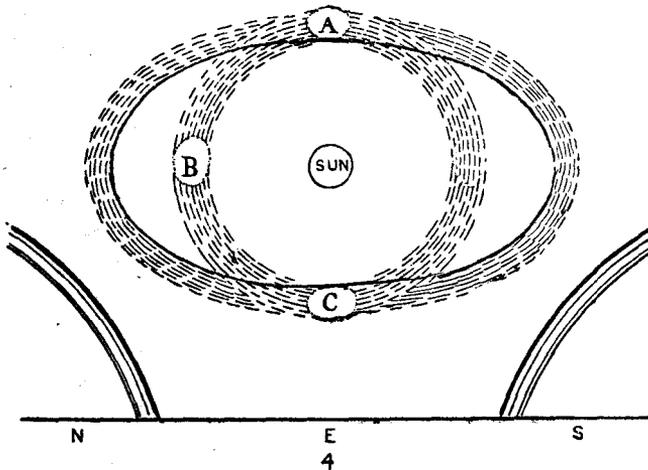


FIG. 4.—Faint rainbows to N. and S. much larger than at 8.45. Large bright ellipse developed, surrounding the circle round the sun. Concentrated patches A and C edged with faint spectrum colours on sides next the sun. Practically no clouds, but a great deal of vapour (?) in suspension.

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During the phenomena there has been a haze in the upper strata of air which does not appear to be suspended moisture.

There appear to be three strata of air. The surface S.I.E., an upper one E. or W., and a higher one S.E. or N.W.

Sundogs, November 5, 1909; Njoro, 9.45 A.M.

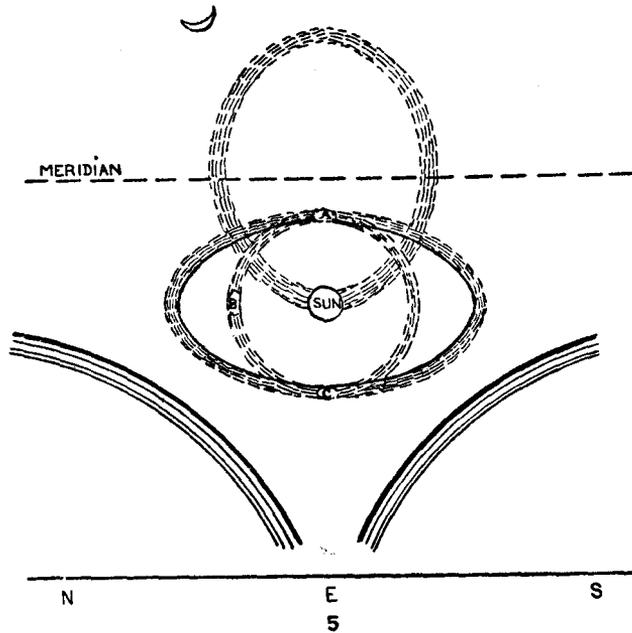


FIG. 5.—New large white ellipse developed about this time, with sun on periphery and intersecting original circle and ellipse. New ellipse extends well above meridian. Lowest points of N. and S. rainbows no longer touch horizon. Moon in last quarter.

Clouds.—E. cumulo-stratus; W. cumulus; zenith, very small cirro-cumulus.

10.45 A.M.—White upper ellipse of Fig. 5 still traceable, but very faint.

10.45 A.M.—Large ellipse of Fig. 6 has developed purple end of spectrum.

10.55 A.M.—Upper ellipse of Fig. 5 disappeared. Inner circle and concentric ellipse no longer separate.

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11 A.M.—Surrounding circle (ABC) getting indistinct.

11.10 A.M.—Surrounding circle very brilliant again, and large arc of Fig. 6 much reduced in size and brilliance.

Sundogs, November 5, 1909; Njoro, 10 A.M.

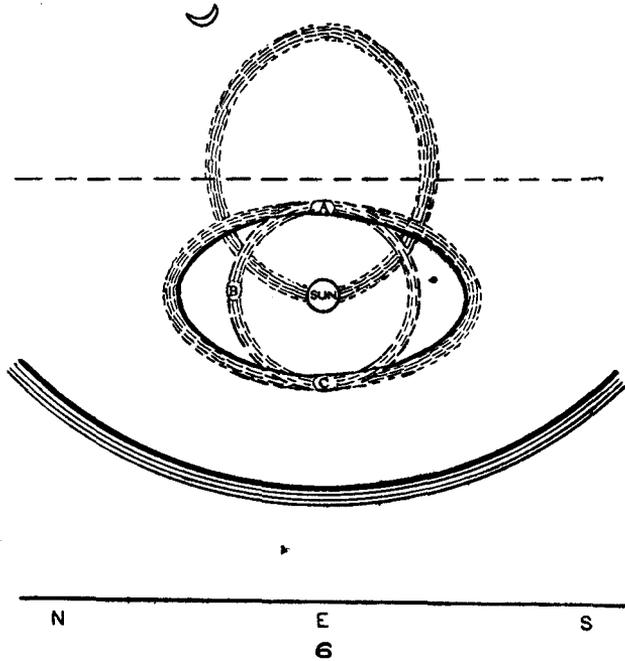


FIG. 6.—N. and S. rainbows joined permanently at lower ends and form large ellipse outside main phenomenon.
Rainbow ellipse about $\frac{1}{3}$ periphery.

Am almost convinced that phenomenon is *not* due to moisture, as there is at present little haze in the sky in the region of the sun, and the brilliance does not seem to be affected by the amount of haze.

11.30 A.M.—Fig. 7. Large outer arc of Fig. 6 disappeared. Surrounding circle very bright. Bright haze concentrated round the sun.

11.45 A.M.—Phenomenon disappearing.

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12.30 A.M.—Phenomenon almost disappeared.

1 P.M.—Very bright haze on horizon on due *West*, otherwise phenomenon entirely dispersed.

Sunday, November 7.—Indications of Fig. 1 at sunrise, and

Sundogs, November 5, 1909; Njoro, 11.30 A.M.

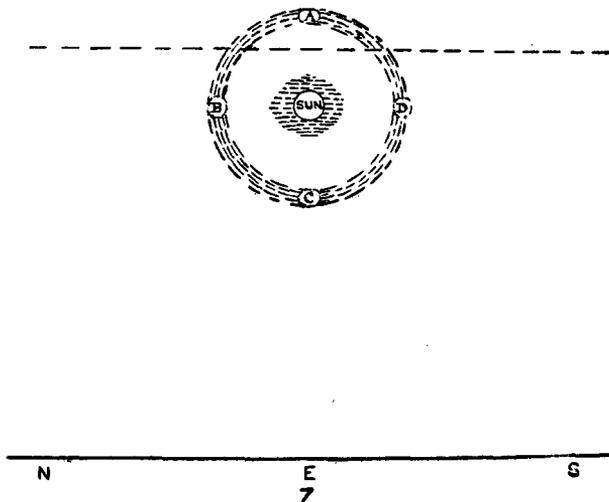


FIG. 7.—Other phenomena dispersed. A bright haze round the sun. Original halo only remaining. Width of original halo exaggerated to give more prominence to bright mock suns (A, B, C and D).

indications of circle round the sun later. Peculiar horse-tail clouds very filmy, converging due W.

January 3, 1914.—Have seen pre-sunrise phenomenon once or twice since, but nothing approaching the above in interest.

In the above phenomenon the spectrum colours, although pronounced, were dull, the red being more of a brown, and the blue indistinguishable from and fading into the blue of the sky behind.