

and sketched as "Baily's Beads." Near the extremities of the crescent these fragments were so short as to appear almost like points, while at the center a considerable arc had but one break in it when it vanished.

A halo appeared about the moon a few seconds before totality, and as the sun disappeared the corona shot out in all its glory. Surrounding the moon's disk and immediately adjacent to it there was a bright light of varied height and of regular but blurred outline. Where the sun was last seen this light arose to a height of about 4'. At the opposite side it was barely visible, while halfway between it rose to about 2'. These heights are merely approximate, the light fading off so gradually that it was exceedingly difficult to fix its limit. As the eclipse progressed it became lower on the first side, increased in height on the opposite side until the sun appeared and then vanished with the rest of the corona. For want of a better name I shall call it the *glow*. It resembled the brief trail of bright light left by the setting sun on a clear day. It undoubtedly appertained to the sun. Its gradual unveiling on the one side and obscuration on the other settle that point.

Outside of the *glow* streamed forth the radial portion of the corona. To keep a distinction I shall call this portion the streamers, and when using the word corona shall refer to the glow and streamers, collectively. The streamers extended generally about 15' in height, though they were considerably shorter, say 12' high, in the direction of the sun's axis. The intervening dark lines radiated from the moon's center and extended from the outer edge of the corona to the *glow*, where they were lost in the brighter light. These dark lines were well marked, clearly visible to the naked eye and straight, except in those portions where the photograph shows openings. Even here I saw no curves, but an amateur observer stationed near me saw them. I had unfortunately selected the opposite side of the corona for my special scrutiny. The streamers did not alter their relative positions but frequently flashed out at greater length and with brighter light, not unlike the flashing of the aurora borealis. For a moment I thought this might be due to passing clouds, but the waves flashed constantly from the center and this fact caused me to change my opinion. The general boundary of the corona was an irregular, jagged line, though it was impossible to give it a definite outline on account of the flashing and the gradual fading off of the light at the exterior. This vagueness and changing of outline will account for the failure of the attempt made by an amateur observer to trace an image of the corona thrown upon ground-glass by Professor Young's comet-seeker.

The color of the corona was a silver white, with a rosy tint near the moon's disk tinging the *glow* and the inner portion of the streamers.

The protuberances were numerous, but I was unable to detect any relation between them, and the structure, shape, or dimensions of the corona.

The effects of the phenomenon upon animate nature were what have often been described, and have no bearing upon the scientific objects of the expedition.

Very respectfully, your obedient servant,

O. H. ERNST,

Captain of Engineers, United States Army.

Professor JOSEPH WINLOCK,
Cambridge, Massachusetts.

Notes to accompany sketch.

At the commencement of totality the corona appeared to consist of straight rays tolerably evenly distributed; after an interval of about 10 seconds, however, two bundles of curved rays appeared distinguishable from the other parts by a rather greater length, and without any definite limits. The remaining portions seemed to extend about half the diameter of the disk, all round. The tint of the corona was a light grayish-blue, and was darker over the prominences.

Between the curved portions a bright prominence was seen of branched shape and distinct form. On the right upper surface a brilliant corruscation formed the distinguishing feature, in

length about one-fifth of the circumference, but of inconsiderable width; there were also three other sharply defined prominences.

The prominences appeared coincident in duration with the totality; the corona, however, seemed to continue a short time longer, no estimation of which could be made owing to the clouds.

The effect on the horizon of the eclipse could not be seen owing to the clouds, these appearing of a dense purple with intervening horizontal streaks of a bright orange. The landscape including the town, as seen from the Recreo Station, was in intense shadow. During the totality the shadows of the surrounding objects were peculiarly distinct.

JOSEPH C. GORDON.

JEREZ DE LA FRONTERA, *December 22, 1876.*