SOLAR DIVISION Bulletin

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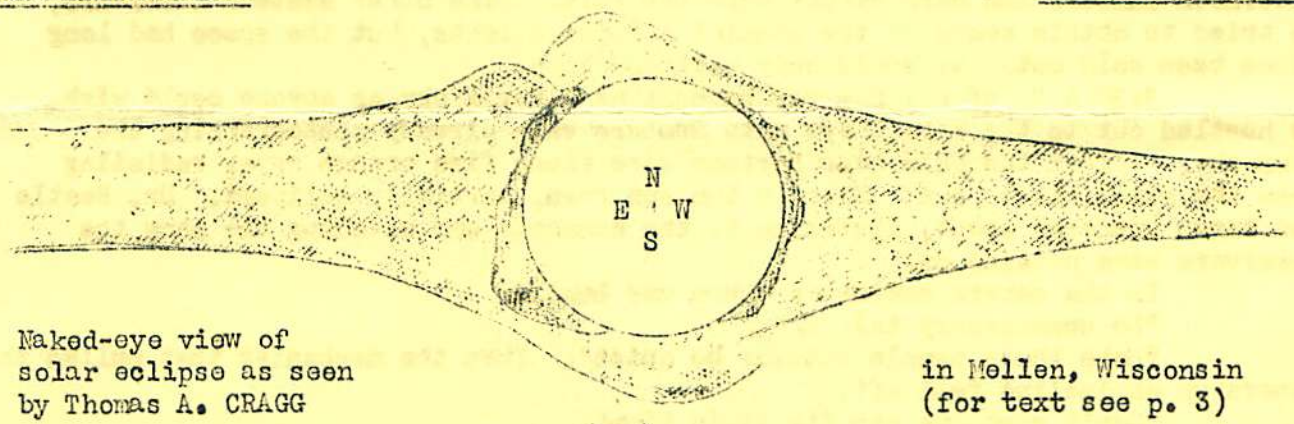
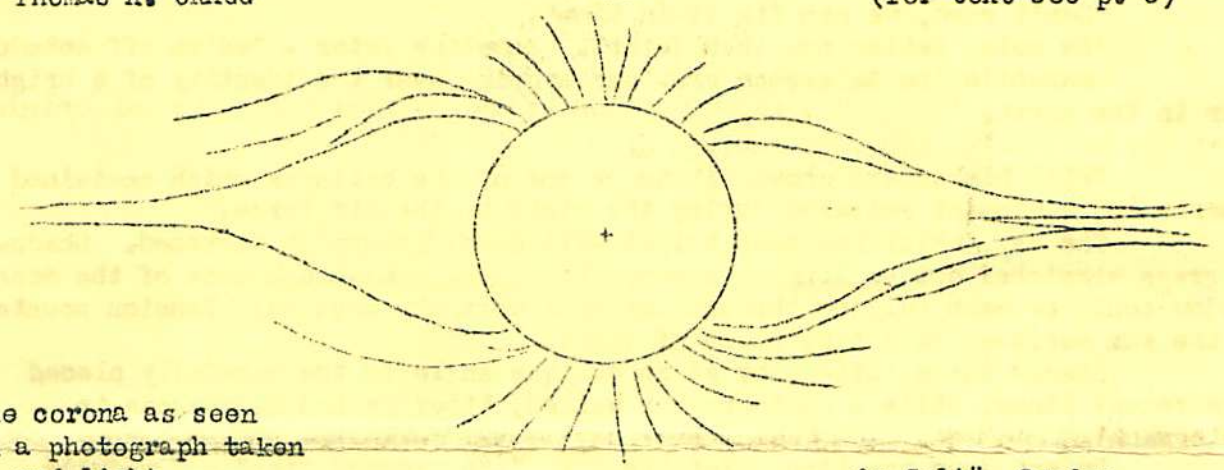
OCTOBER 1954 Number 98.



Naked-eye view of solar eclipse as seen by Thomas A. CRAGG in Mellen, Wisconsin
(for text see p. 3)



The corona as seen on a photograph taken in red light by Mr. Edgar Mädlow (VdS) in Geltö, Sweden
(for text see p. 4)

The June 30th 1954 solar eclipse could easily serve as a prototypr of the ideal "minimum" corona. This was as if the "script" were followed literally. Its symetry was striking. Long equatorial streamers extending to a distance of a few solar diameters both East and West. The polar regions were surrounded by numerous, often multiple narrow streamers. The inner corona could be seen even through thin clouds. Four or more prominences were seen by most observers. Coronal arches and other detail in the corona were recorded. We shall read a great deal more about this eclipse as the results are released.

On the following pages you will find a number of fine accounts of this eclipse and the "human elements" involved./What would an eclipse be without man?/ The expectations, frustration, the awe, all are well depicted. I wish to express my heartfelt thanks to all who made this Bulletin possible. HLB

The Eclipse of June 30th, 1954

By 6:00 A.M. of June 26th, the car was loaded and our family, consisting of Dr. Alan A. Beetle, Karen and myself, was ready to leave for the eclipse. We planned to collect grasses and shells enroute and arrive on the site two days in advance of the big show. My husband, a professor of range management, felt that with the weather not apt to cooperate, we might as well collect and have something to show for the trip.

Our destination was Crystal, Minnesota, a suburb of Minneapolis, in a wide field with good horizons. About twenty members of the New York Amateur Astronomers' Association made up the party. There were several makes of telescope and camera, including the nine foot telescope made by the club for the 1937 eclipse in Peru.

Wyoming was heavily overcast, and so was South Dakota. As we drove east, the weather reports were consistently gloomy. In the two days on the site, afternoon showers and dark clouds were the rule. Like other amateur observers, we tried to obtain seats on the special eclipse flights, but the space had long since been sold out. We could only wait and hope.

3:30 A.M. of eclipse day brought as clear a sky as anyone could wish. We hustled out to the site where some members were already photographing the dawn sky. Across the pale blue horizon were flung five orange rays, radiating from the still hidden sun. Shortly the sun rose, partially eclipsed. Dr. Beetle and Karen wandered about, listening to the comments and watching the show the observers were putting on.

In the camera enclosure there was bustle.

"No unnecessary talking".

"Make those people outside be quiet". Then the mechanism that pulled the camera up an incline fell off.

"Don't rush, we can fix it in time".

"Be calm, better now than later". Sometime later - "we're off schedule".

Meanwhile the telescope crew was arguing over the identity of a bright star in the north. "It's Venus." 'It can't be.' "What else is so bright?" 'But Venus is behind the sun.'...

Until binoculars showed it to be one of the balloons which contained cameras and equipment released during the night by the Air Force.

The sky, which had been bright with dawn, gradually darkened. Shadows of grass stretched out as long as a man. The smoky grey-black cone of the moon's shadow could be seen falling through the southwest sky upon us. Tension mounted as the sun narrowed to a tiny slice of light.

Shadow bands flitted by at an oblique angle to the carefully placed measurement lines, while a photographer wailed, "they're too diaphanous to photograph".

Up and down the line burst the cry, "the diamond ring". Carefully rehearsed schedules were forgotten while amateurs froze in various attitudes, enjoying the show. The corona shone forth with polar and elongated equatorial streamers, a pearly luminescence. In the telescope I counted four rosy prominences. No photograph does justice to their filmy quality - the dark sky showing through them.

In the excitement I forgot to locate the position of the prominences. Many pictures remained untaken. Someone yelled as the shutter of his camera stuck.

The diamond ring flashed again, and darkness sped away.

"That couldn't have been 76 seconds", cried the group as one. We did agree that the trip was worth the spectacle even if none of the photographs turned out and those taken by my husband did not.

"Darn", cried a voice, "I forgot to use my stopwatch".

DOROTHY E. BEETLE
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Laramie, Wyoming

Partial Eclipse of Sun. 0.76, observed at Pirton Hartfordshire, England on June 30th, 1954.

Sun plainly visible through thin clouds.
11:15 Sun well defined and at 11:16 first contact very sudden and "on time". Not too good definition later, but moon could be seen slowly covering the sun.
11:50 The moon's edge was quite uneven and the mountains could be seen in profile.
12:30 Atmosphere has dull appearance. Clouds look dark, a twilight effect. Temperature falls 6° - 8° . The cusps were quite sharp except when a mountain on the moon caused a blunting temporarily. When the light was measured with an actinometer it was found to have declined to 1/2 its usual brightness. A photograph would need a 4X increase in exposure above normal.
13:00 Light returning to normal and definition good.
13:50 Last contact was plainly observed at predicted time.

J. E. THRUSSELL
Pirton-Hitchin
England

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The eclipse was perfect from Mellen, Wisconsin. I was with Drs. Whitford and Code at their site where they were engaged in photo-electric observations. Had time, however, to make a drawing of the corona as seen with the naked eye. Certain differences between the drawing and the photographs you must have seen by now are rather apparent. The equatorial streamers were not difficult out two diameters either side of the sun (as measured from the near limb). You will also note the absence of the polar streamers! I suspected some fine structure in the region, but could not see it well enough to put it down. This was a little disappointing as I had anticipated seeing them rather easily. I did not see Baily's Beads at either second or third contact; probably no deep lunar valleys at the limb at that time. The "diamond ring effect" lasts no more than a few tenths of a second. One really had to be on his toes to get it recorded photographically. The shadow bands were rather apparent for about two minutes before and after totality as seen against the east side of the tent housing the recording equipment. Instead of being nice diffraction bands they more resembled heat waves in a rather bad seeing pattern. They were quite definite, however.

THOMAS A. CRAGG
246 West Beach Avenue
Inglewood 3, California

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A log book on the eclipse as observed here*, was kept by Mr. E.H.Pilsworth:
5:17 a.m.-Sun is emerging from behind a cloud bank.
5:18 a.m. Moon has cut in at upper righthand corner of the sun.
5:18 3/4 a.m. Sun is becoming clearer, the moon appears black.
5:25 a.m. Eclipse is cloud-covered.
5:33 a.m. Sun reappearing. Air appears unsteady but with telescope we can see mountains on edge of moon.
5:39½ a.m. Sun is again covered by clouds.
6:20 a.m. Sun in eclipse breaks through clouds.
6:21 a.m. Eclipse again visible and by this time the moon's shadow is at upper left....

*) from "The Battle Creek ENQUIRER and NEWS" as received from Mr. E.H.Pilsworth P.O.Box 964, Battle Creek, Michigan.

In Sweden...

The VdS (Vereinigung der Sternfreunde), the league of the Amateur Astronomers in Western Germany, made an expedition to southern Sweden in order to observe the total sun eclipse. 35 Amateurs with 15 instruments (Schmidt reflector, coelostat and telescopes, most of them built by the Amateurs themselves) were brought to Galtö, a small island near the coast of Bohuslan, and mounted their instruments on the shore of the sea. From June 26th till 29th, the weather was abominable. On the morning of June 30th, there was as strong a wind as on the seven days before, but between the clouds there were glimpses of blue sky.

The first contact of the eclipse was recorded, and our home-made coelostat connected with a movie-camera yielded a nice film of the eclipse though ofter interrupted by clouds. Some three minutes before totality that part of the sky about the sun cleared up although big banks of threatening clouds were gathering around. And literally three seconds after the "diamond ring" appeared again, the first cirrus sailed over the sun! The weather then continued to be cloudy, until about 5 P. M., the sky was entirely overcast.

We had the incredible good luck to observe totality from the first to the last, and to see most of the phases of the eclipse. Two big and some small prominences were to be seen through our finder telescopes as all telescopes were provided with devices allowing us to make photos of the corona with filters of different colors, from 6500 A to 8500 A. Most of the plates turned out well. The photometric measurements are not yet completed. On some photos the structure of the corona is visible most clearly. Mr. Edgar Madlow (Wilhelm Förster Obs., Berlin) made a drawing, the copy of which I include. The coronal spikes at the poles were seen as well as the long cones of the streamers stretching far away from each side of the equator.

The sky was very dark, the color of grey steel. On the western horizon, from where the light of the sun after totality was to come, the color in between the clouds was yellow like the sunset on a rainy day. Venus shone clearly, but the other bright stars like Aldebaran, Betelgeuse and Rigel were hidden by clouds.

We were surprised by the extreme cold setting in with totality and much impressed by the sallow darkness that had fallen over the landscape. It was not the warm darkness of a summer night, but looked strange and sinister. The black disk of the sun surrounded by the pearly grey of the corona was an entirely unforgettable impression.

DR. HUBERTA von BRONSART
Heubergstrasse 52,
Stuttgart 13,
Germany

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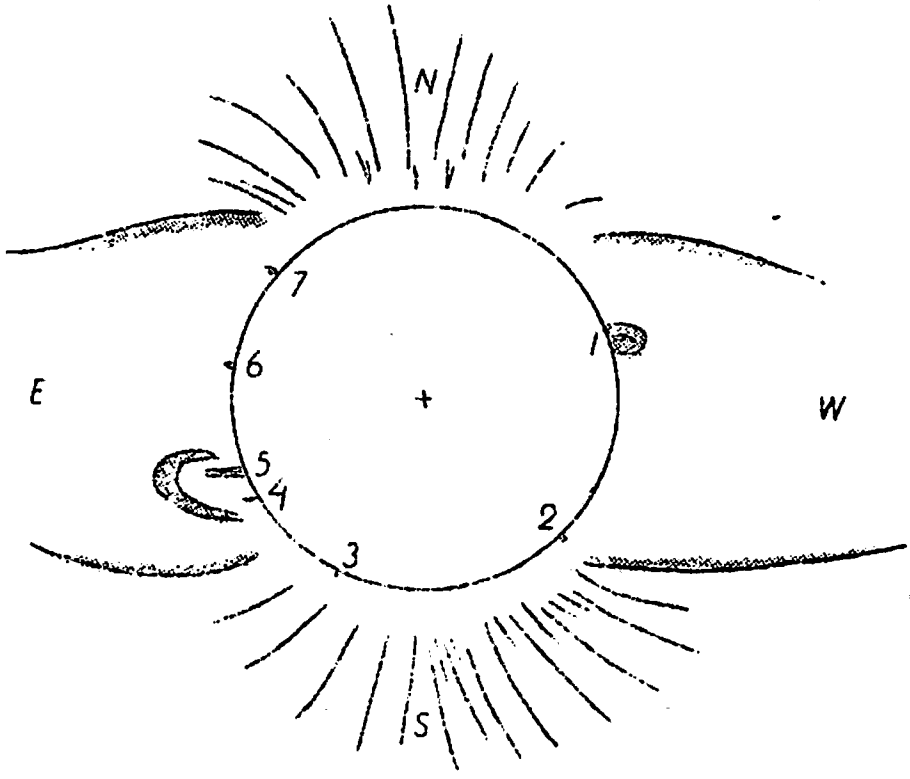
The pages of this Bulletin carry reports of observations made at the following places here and abroad:



EXPEDITION BLACKOUT - ECLIPSE REPORT

A study of the negatives and movies by Expedition Blackout* has shown the presence of seven prominences. Five of the prominences appeared on the East limb of the sun and two on the West limb. Not all of these prominences were visible at one time. The color movies showed prominence number 3 becoming visible a few seconds after totality started and then disappearing a few seconds later as the moon moved Eastward. Prominence number 2 was also small and did not become visible until totality was fairly well over.

The full height of the largest prominence, number 5 (seen in the Southeast quadrant), as measured at the beginning of the eclipse was 1/11.6 of the lunar diameter or approximately 75,000 miles high.

The corona in the immediate vicinity of the twin prominences in the Southeast quadrant and the prominence in the Northwest quadrant seemed to be slightly less bright than the rest of the corona in the surrounding area. As will be seen in the sketch these areas of lesser brightness were looped around the prominences.

*)at Ironwood, Michigan

CHARLES CUEVAS
4816 38th Street
Long Island City, N.Y.

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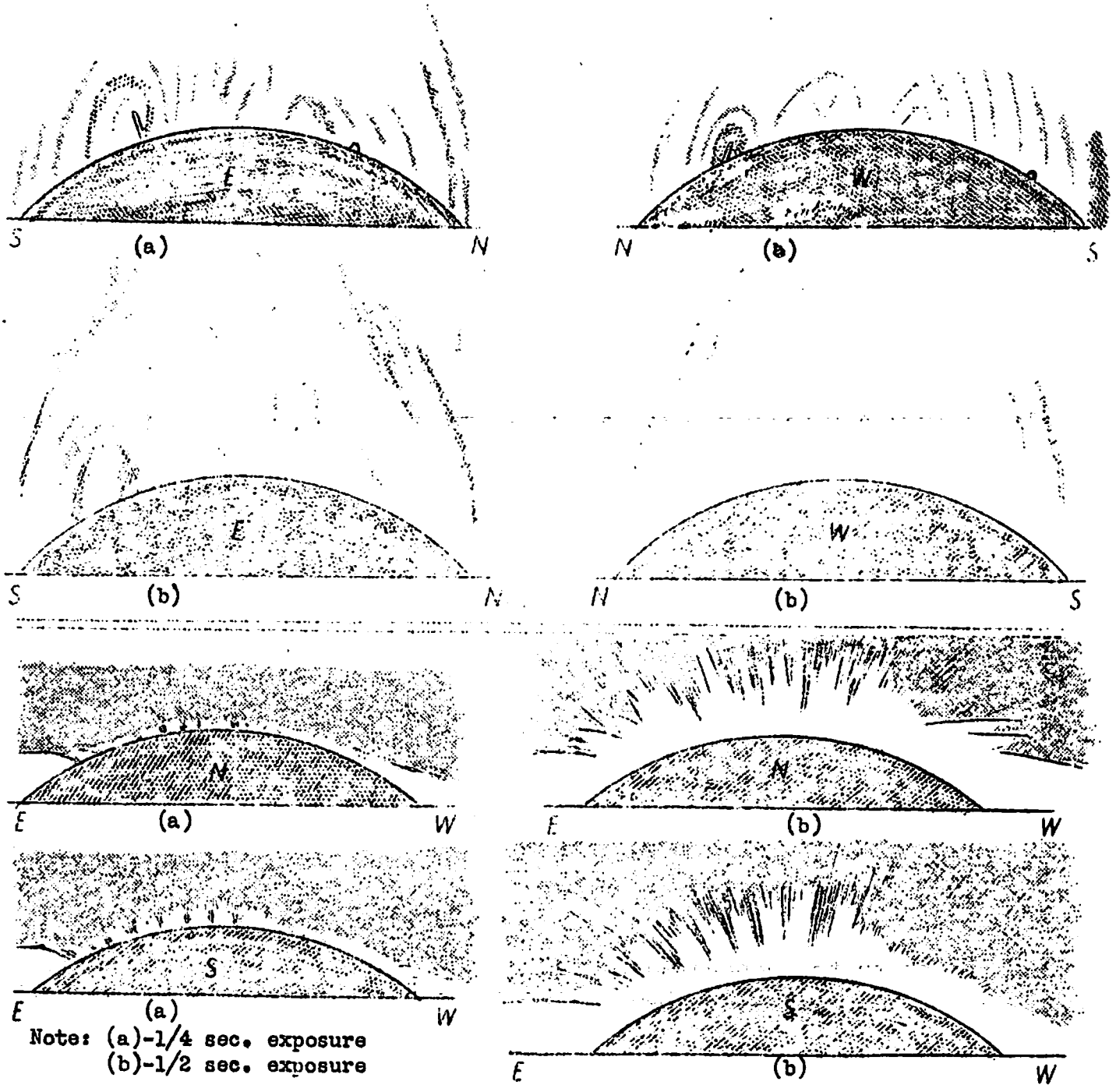
Ed.note: For more detail about the highly successful "Expedition Blackout" see SKY AND TELESCOPE -September and October 1954 issues or the ECLIPSE SUPPLEMENT of the "Eye-piece", bulletin of the Observing Group (OG), Amateur Astronomers Association (AAA), Mr. Edgar E. Paulton, Chairman.

HLB



Note: (a)-1/4 sec. exposure
(b)-1/2 sec. exposure

Detail in the corona's equatorial streamers and polar plumes as seen on Mr. Charles Cuevas' two photographs.

It is impossible to render exactly on a mimeograph stencil that which even the photographic film reveals only vaguely after a careful examination. The shaded portions in the above sketches (not tracings) are those which appear darker on the positive slides. This should also apply to the regions outside of the corona in the equatorial streamers. However, it is too difficult to render this even remotely, since (outside of the north and south boundary) the transition from bright to dark portions in the central region is too gradual and indefinite. This state could only be approached by densitometric isophotes. It should also be clear that "different eyes"-than those of this writer-could see more or even different features. Thus no claim for real accuracy could be made. (see text)

H.L.B.

Some comments about pictures taken by "Expedition Blackout".

Several pictures of the June 30th eclipse were taken by Mr. Charles Cuevas and his friends from the Observing Group-AAA. The objective lens used was a 5" - 12 foot focal length/f29/achromat (actually from Mr. Cuevas excellent "camera obscura"); the film used was Kodak Royal Pan developed in D76 for 17 minutes. The sketches on the opposite side should illustrate two exposures - one about 1/4 sec., the other about 1/2 sec.

The inner corona: The 1/4 sec. exposure shows the inner corona, prominences, coronal arches and the very lowest regions of the polar plumes. At a glance the inner corona is fairly evenly bright along both sides of the equator up to about 60 lat., where the polar plumes start. This is in fair agreement with the intensity distribution of the Red /6374A/ coronal emission line as observed at the High Altitude Observatory. The polar regions are less bright. A closer look reveals however, that the brightness near the prominences is lessened. The double prominence (SE) is surrounded by a dark coronal arch, which is roughly three times the height of the large prominence. This arch starts just about south of the smaller prominence (see Cuevas sketch p.5), then becomes widest at its peak and then returns just north of the larger prominence. In fact it almost appears that this prominence is partly projected against the darker arch. Some very faint detail suggests itself inside the loop. Outside, there is another arch, first a bright one and then another dark one, the latter not quite closed. Three or more parallel and partial arches reach to great distances. The NW prominence appears to be surrounded by a dark "dome"; not an arch, since its interior seems almost uniformly dark up to the prominence itself. Outside there is a bright arch, a dark one and one or two more partial arches. The dark NW "dome" is about twice the height of its prominence. The Western region of the inner corona suggests two other, though very faint, arch structures and then a row of parallel loops up to the very dark and almost sharplydelineated "bounding ray" of the equatorial streamer. The SW and NE limits of these streamers are very distinct, those at NW and SE facing the 'large' prominences - are highly diffuse and gradual.

The polar plumes in the inner corona appear only something like faint tufts, separated by fairly sharp "dark rays", which reach right down to the limb. Looking at these "dark rays" it is difficult to view them as mere rifts between bundles of bright rays. (see Yngve Öhman - Observatory No. 881; August 1954 pp. 174-175). Be it as it may, these "dark rays" are very distinct. They too are more prominent in the direction of the NE and SW equatorial "bounding ray", away from the prominences.

The polar plumes of the bright corona extend some 3/4 of a lunar diameter into space or further. Aside from the dark divisions which give the polar plumes their shape, it seems to this writer that the North polar streamers taper off in space into narrow rays, while the South polar streamers, mostly in bundles, actually become wider with distance".

The equatorial streamers on the 1/2 sec. exposure show very little interior detail, both start with a width of almost the full diameter, taper off at a distance of about 1/2 lunar diameter into graceful giant cones which are surrounded both north and south with two or more long bright curved streamers separated by dark lanes. (This is well illustrated on the sketch by Mr. Edgar Madlow - see front cover.)

All this the more to regret what I missed. H. L. BONDY

You asked about my eclipse trip. I went to the Keweenaw Park Resort, near Copper Harbor, with some other AAVSO'ers, the Beidlers from Chicago. We picked our observing site on the golf green in front of the clubhouse, about 400' above Lake Superior and southeast of Brockway Mountain. We had a perfect view of the sunrise on June 27th, 28th and 29th. About 3 A.M. on the 30th, a thunderstorm broke over the peninsula, but the clouds broke away just before sunrise. At the same time, we could see fog banks over the Lake and could hear foghorn blowing. At about sunrise, the wind changed and we could see the fog rolling in from the Lake over the mountain, and finally over us— a heartbreaking sight. We followed the progress of the eclipse through the fog, without dark glasses. Just before totality it opened up a bit more, and we had a glorious view of the diamond ring, Baily's beads, the inner corona, and then the beads and diamond ring again.

The fog bank thickened then, and we saw very little more of the final phases. Later we learned that our two members from Seattle, T. P. Maher and Howard Thomas, were completely fogged in at Copper Harbor. The Brockway Mountain drive, a steep grade-two-lane road with a few turnouts, was packed with about 800 cars and buses, two traffic policemen and probably 4,000 people! The fog bank there was very spotty. Our secretary, Clinton Ford, realizing that the site on the shore of the Lake at Eagle Harbor was hopeless, drove up the mountain but saw nothing of totality. At the next turnout, 100 feet away, the people had a fairly good view of the inner corona. And so it went on the Keweenaw Peninsula.

MARGARET W. MAYALL, AAVSO Recorder

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Emil Pierson and I had tentatively chosen either the town of Ironwood or Wakefield, Michigan as a likely site for viewing the eclipse. Ironwood was directly in the center of the path of totality. Emil found a good location overlooking Lake Gogebic which is approximately 25 miles NE from Ironwood. We stayed in a tourist cabin and had an unobstructed view of the eastern horizon across the lake.

We arose about 3:30 A.M. CST on the morning of the eclipse and set up our instruments. Emil came equipped with a 3" refractor, spectroscope, motion picture and snapshot cameras, while I provided a 35mm camera and binoculars. The sky was clear overhead with only a low bank of clouds over the eastern horizon. At about 4:00 A.M., however, low hanging clouds began to drift in swiftly from the direction of Lake Superior to the North. The partial phases began shortly thereafter. At approximately 15 minutes before totality, however the cloud layer began to thin out and it became a race with time.

Well time ran out on us and totality occurred before the eclipsed sun could emerge from behind the clouds. Nevertheless, the overcast thinned out sufficiently so that we could glimpse the diamond ring which occurred a moment before totality and then, during totality, the innermost and brightest portion of the solar corona. Unfortunately, the broad equatorial streamers were not visible. Prominences were not seen since we did not attempt to observe them through the telescope. Towards the west several of the brighter stars appeared.

Emil observed the flash spectrum through his spectroscope and took motion pictures and snapshots. I was fortunate enough to obtain on 35mm Kodachrome what I think is a very beautiful photograph of the diamond ring as seen through the thin layer of clouds.

FRANK BOLLMEYER
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Bronx 61, New York

AN OFF-AXIS OBSERVATION OF THE JUNE 30, 1954 SOLAR ECLIPSE

My observations of the June 30th total solar eclipse were of little scientific value, but were most fascinating to me, and for those of you who never saw such a phenomena, might prove interesting.

Due to the long drive from Pittsburgh to St. Paul with five people and baggage for a two week vacation in the car, I was unable to take my telescope and had to confine my observations to the naked eye variety, partly aided by exposed photographic plate as a filter. As is well known by this time, the skies around St. Paul were perfect. We were up most of the preceding night during which I noted stars remained visible right down to the horizon. There was no ground haze whatever.

The preliminary partial phases of the eclipse will no doubt be well covered by more skilled observers, as will the various aspects of the corona during totality. What fascinated me most was the effect of the corona's light on the people and landscape.

Up until actual totality, there had been much chatter of anticipation back and forth among the several hundred people near our position at the airfield. When totality became a reality, a breathless hush swept through the crowd, with practically no conversations audible. Even those seemed confined to whispers or low pitched personal remarks. The click of shutters and grinding of movie cameras seemed intense and indiscreet. Most faces were grave and indicated the viewers were awestruck by this long awaited spectacle. All of us knew exactly what was taking place and how long it should last, yet I sensed a feeling of trepidation among my fellow watchers. The thoughts which tumbled through my mind might center on the theme "so this is what it would be like without sunlight as we know it".

Without the color reflecting rays of sunlight, peoples skin appeared uniformly wax-like. Lips appeared black and eyes seemed to have no comparative depth and of course no color. I particularly noticed the effect on the surrounding landscape as I stole quick glances away from the eclipse itself. All was either dark or light. Grass and trees appeared black with the various shades of green invisible, so far as I can remember. The sandy soil and cement were intensely bright. Since June 30th I have noticed that a cloudy day does not give the same effect for apparently the color bearing rays which penetrate clouds are quite different than the corona's light.

With the appearance of the diamond ring effect a great murmur spread across the field followed by excited exclamations when the sunlight burst forth again with overwhelming brilliance. Where only a hazy ring had been, now again was golden sunlight. Everything returned to normal but the awesome effect of totality will linger in my mind for years to come. Witnessing a total eclipse is really a high point in anyone's life.

CHARLES H. LEROY
R.D. No. 11
Pittsburg 15, Pa.

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* Ed. note: Due to lack of space our regular column "Solar Activity"
** by Mr. Thomas A. Cragg and this writer could not be included in
** this issue, but will again appear in our November issue.
** The Solar Division was fortunate to get six new members, who
** were accepted into the AAVSO at the annual convention in Provi-
** dence earlier this month. More about that next time. HLB
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AMERICAN RELATIVE SUNSPOT NUMBERS -RA'-for AUGUST and SEPTEMBER 1954

Day:	RA' August	September		RA'	August	September
1	5	0		16	0	0
2	12	0		17	0	0
3	13	0		18	0	0
4	12	2		19	0	0
5	15	2		20	1	0
6	20	1		21	16	0
7	16	0		22	19	0
8	4	0		23	19	0
9	15	0		24	15	0
10	17	0		25	10	0
11	17	0		26	1	0
12	13	0		27	2	0
13	8	0		28	0	0
14	1	1		29	0	0
15	0	1		31	0	-

Monthly mean RA' for August: 8.1; RA' for September: 0.3

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PROVISIONAL SUNSPOT NUMBERS for AUGUST and SEPTEMBER 1954
Dependent on observations at ZURICH Observatory and its stations in Locarno and Arosa.

Day	RZ August	September		Day	RZ August	September
1	8	0		16	0	9
2	9	0		17	0	0
3	16	0		18	0	0
4	9	7		19	0	0
5	12	0		20	0	7
6	19	0		21	9	0
7	14	0		22	15	0
8	10	0		23	18	0
9	13	0		24	16	0
10	23	0		25	11	0
11	14	0		26	7	0
12	14	0		27	7	0
13	8	0		28	0	0
14	0	0		29	0	0
15	0	7		30	0	6
				31	0	-

Monthly mean RZ for August: 8.1; RZ for September: 1.2

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