ECLIPSE AS SEEN IN SOUTH.

Crowd at Wadesboro Views the Weird Spectacle and the Scientists Do Hard Work.

[BY A STAFF CORRESPONDENT.]

Wadesboro, N. C., May 28.—[Special.]—Five seconds in advance of computed time the solar eclipse of 1900 was observed this morning in totality along a patch roughly defined from Norfolk to New Orleans. Visually observed at Wadesboro, it was devoid of sensational features, and photography will have to give whatever additions may be made to astronomical knowledge. To this means are left the determination of the coronium line, the discovery of an intermercurial planet, and definitions of the corona. The successful work of the Chicago men is almost entirely photographic.

To the unastronomical and the amateur astronomers gathered in Wadesboro from all quarters of the country it was a magnificent spectacle in inspiring and awe-producing conditions. Three phases of the scene in the heavens were passed in two hours and a half—the gradual encroachment of the moon, the total obscuration with its weird effects, and the flooding back of the light, bursting from its seeming cover.

All the manifestations traditional to the eclipse were observed. These were the features: The fall of the rushing shadow, the flitting of mysterious shadow bands, the burst of seemingly phosphorescent colors from the obscured sun, the flashing out of the delicately colored streamers of the corona—then an instant of deathlike quiet, the horizon gleaming in the hues of a twilight, Mercury shining brightly from its close position to the sun, and Venus low in the sky—then a flash around the semi-circle of the dark planet and a burst of vivid, quickening light which poured over the landscape.

The eclipse was in perfect weather with a cloudless sky, a slight mistiness being the only drawback.

Great Crowd Views Phenomenon.

Multitudes of sightseers had been brought into Wadesboro from all over the State, from within the path of totality and from without. Such spectators were kept from the inclosure occupied by the observers' stations and large numbers congregated on Carr's Mountain and Silk Mill Hill at the back of Wadesboro. From these positions the spectacular effects of the eclipse were seen to best advantage. A broad sweep of wooded country extended to the gray limits of the foothills of the Blue Ridge Mountains.

Two astronomers stationed on the small elevation known as Carr's Mountain noted the phases of the eclipse for the benefit of the spectators. Whites and negroes were in almost equal numbers. If there were any superstitious fears among the negroes it was not manifested.

A low cry from some watchful observers who, with timepiece in hand, had been looking at the sun through a burned glass, an-

nounced the first contact, and the spectacle began as the moon's shadow invaded the upper rim of the sun. A curvature, at first scarcely perceptible, was gradually eaten from the outline. It increased slowly until a crescent-shaped obscuration was visible. Changes then came more rapidly. The landscape had not been affected until almost a crescent had been obscured, leaving what seemed through the telescope to be a silver half-moon.

Day Melts into Night.

Then a change came upon the country, and light, which had been clear and sharp, faded slowly. The faraway foothills of the Blue Ridge Mountains, which had been gray and misty, changed to darker hues. A buzzard which had been flying through the valley disappeared. Song birds in the thickets were heard in uneasy chirps. A meadowlark began its song and stopped. From all the neighboring farms the crowing of cocks sounded. Chickens turned to their roosts.

The crescent narrowed to a thinner band, and the hills became blacker. The observers were crowded on the hillside to catch the momentary glimpse of the great shadow. They had been warned that its approach would be with a velocity almost beyond imagination—the actual shadow of the moon sweeping along the path of totality, a shadow fifty-five miles broad rushing northeast across the corner of the continent.

Strange Lights Invade Earth.

A moment or two before the slight silver rim that remained of the sun disappeared strange, wavering lines of light went dancing across the country, these being particularly noticeable on the white sheets which had been spread out to catch them. It was only an instant, seemingly, before final darkness fell.

Meanwhile other changes had come. The temperature had dropped perceptibly. The uncanny darkness had increased and the small animal life of the fields and woods was hushed. The quiet, the chill, and the gloom brought the impression that a weird presence was about to overwhelm the world.

If the rushing shadow of the moon as it swept from the gulf to the Atlantic came as it has been seen to come in other eclipses, like a vast wall of black moving with incredible speed, it was undetected by the watchers on Carr's Mountain. It swept over the spot upon which the spectators stood almost the instant it fell upon the faraway foothills of the Blue Ridge.

Turn with Cry to Sun.

As the darkness fell all turned with a cry towards the sun. Instantaneously with the disappearance of the silver rim the brilliant corona burst into view, its streamers flashing millions of miles out from the sun and the glittering metallic dust falling about it.

Around the horizon the lines of a dim autumnal twilight were glowing. Low in the sky the evening star gleamed, and Mercury, the seldom-seen companion of the sun, shone brilliantly. For the seconds of totality these conditions continued. Then, with a flash, the dark rim melted, and a ball of liquid fire spread over the dark surface of the moon, which disappeared instantly from sight.

One of the curious phenomena of the eclipse was the rapidity with which the light came pouring back when once totality had passed. The encroachment of the moon upon the sunlight had been gradual, but when once the sun had burst from the darkness the return of light was in a flood.

Work of the Scientists.

This was the spectacle as the unastronomical saw it. They were more fortunate than the astronomical. Cooped within the houses and tents which covered their apparatus, half of the observers who had spent months in preparation for the event saw nothing but the reflected image of the sun and moon as they were cast by mirrors through the lens of the cameras upon the plates, or as they watched the spectrum. It was not an old experience to the astronomers, for to the majority it was their first total eclipse. Professor Young has seen five, and Secretary Langley is a veteran, but they are exceptions. Within the inclosures not a sound was heard other than the tapping of the time marking instruments, the tone of the warning bells, and the voice of the enunciators calling off the periods of time. Each was working with clocklike precision, the result of painstaking drill.

Professor Hale of the Chicago crowd, who was engaged with delicate instruments in an attempt to discover the heat radiations of the streamers, was embarrassed by a disturbance to his bolometer. An assistant unavoidably dropped a small stick within the house occupied, and its fall disarranged the delicate instrument.

Its movements were affected radically, and a part of the ninety-two seconds had to be used in readjustments. In spite of these drawbacks a mass of material was secured from which valuable information is expected to be forthcoming.

Professor Young's disappointment was the keener in that it had been his hope to rehabilitate a theory advanced by him in 1870, and subsequently seemingly overthrown. He had discovered a line in the coronal spectrum, which seemed to correspond to an old line known as the 1,474 line. This theory was declared incorrect as the result of the India eclipses. It was observed to be out of direction with the 1,474 line.

It was the hope of Professor Young to confirm his original theory by his observations today. What the difficulty was is not known. It has been suggested that the eyes of the observers were dazed by the glare of the sun. Whatever may have been the trouble the result was that no line at all was found.

Disappointment to Some.

To many of the prominent astronomers at Wadesboro the observations brought disappointment. Several problems on which it had been hoped to secure satisfactory knowledge remain unsolved so far as the visual tests are concerned. Developments of the hundreds of plates exposed for photography may add what observation failed to collect. As the larger part of the work was photographic the results will be issued from the different observatories as the plates are developed.

Statements agree that the Smithsonian timekeeper was slow in announcing the beginning of the eclipse. Arrangements were perfected to call the time by five-second periods in the different camps. A bell in the Smithsonian camp marked those important periods for all, from which the subsequent callings were expected to be made. These periods were the first contact, or the beginning of the eclipse, the second contact, or the beginning of totality, and the third contact, or the end of totality. The computed time between the second and third contacts, or the period of totality, was ninety-two seconds. Every second of this period was valuable to carry out in full the schedules which had been arranged.

As a result of the confusion of time Princeton was at work on the eclipse five seconds before the warning bell of the Smithsonians announced that the eclipse had begun. Whether the observation of Princeton was made prior to the fact or whether the timekeeper of the Smithsonian was slow in announcing the first contact is something which the astronomers do not attempt to state. The professors connected with the national institution admit their timekeeper may have been at fault. The consequences were not so grave as might have been expected.

Chicago Men Hampered.

The Chicago men were the most affected, as they had been depending absolutely upon the Smithsonian signals for their photographs. The seven large ones which were being taken with the sixty-foot lens camera were being exposed according to a carefully planned and practiced schedule.

Secretary Langley of the Smithsonian immediately after the first contact came to Professor Barnard in the dark room of the Yerkes outfit and told him that the eclipse was five seconds ahead of time. Preparations were made accordingly. The third bell of the Smithsonian should have sounded ten seconds before the end of totality. It came just three seconds ahead and the Chicago men doing spectroscopic work were barely able to finish. Professor Barnard finished his last photograph just as the sun broke out of the eclipse and flashed on the plate.

The drills of the Chicago men had indicated that they would have five seconds to spare in the work they had planned. As their movements had been with all the regularity and smoothness of their drills the supposition was that five seconds had been lost. In operations requiring a monumental amount of work in ninety-two seconds the loss of such a period of time was serious. Princeton proceeded upon its own count and was not embarrassed.

Differences in the time as observed in the stations were so marked as to demand careful averaging before it can be announced officially. Common report among the astronomers placed the eclipse five seconds ahead of time. The record of Professor Albert S. Flint of Madison, Wis., placed the first contact seven seconds ahead of computed time, the second four seconds ahead, the third nine, and the fourth nine. By his record the period of totality was decreased from ninety-two seconds to eighty-seven seconds.

If the variations in time continued to stand as at present it would be considered remarkable, but revision, averaging, and reference are expected to bring a satisfactory statement out of the confusion.

The astronomers say the eclipse was "an average sun spot minute eclipse." The corona was smaller than had been forecast. There was less of the seemingly phosphorescent flashes of color visible to the eye, prepared by being bandaged for a period directly before totality. The effect of the shadow falling upon the earth was one of a sudden plunge into gloom and its coming was not perceptible. The shadow bands furnished an interesting study for the detail of observers assigned to that phase and to the amateurs who marked their course on sheets spread on the ground.

Observations of the Corona.

The results of visual observation of the corona and the streamers were thus discussed by Professor Child of the Smithsonian party:

"Fifteen streamers were observed in the north polar regions of even and regular structure, with bright centers. The streamers radiating from the south polar regions were not from the center, but from near the limb, and were somewhat finer in structure. Some were crossed.

"On the west limb a pronounced eruptive prominence was observed, together with a detached fan which extended one-tenth the diameter of the sun. It was scarlet red, with corona of bluish green."

Mr. Erdman of the Princeton party observed the shadow bands. He found them to travel at an approximate speed of sixty-nine miles an hour, moving from southwest to northeast at intervals of from three to six inches. The Smithsonian's observers, however, reported that the shadow bands moved in an opposite direction at their position a quarter of a mile away.

This apparent contradiction would seem to confirm the theory of Professor Young, who holds that the shifting shadow effects are influenced by the wind, if not directly caused by it. The wind this morning was variable at the time of totality.

Success in Heat Test.

The formal official statement of observations and results was made by Secretary Langley of the Smithsonian. He affirmed success in the tests of coronal heat. It follows:

"The total eclipse of the sun was observed here under a cloudless sky. All the observations planned by the Smithsonian's party were carried out without miscarriage, so far as now can be determined. Numerous photographic exposures were made with 135-foot focus telescope upon the reflected image of the corona, and to obtain a flash spectrum independently with a thirty-eight-foot focus telescope, pointed directly in the sun, while an automatic appartus was used to determine with precision the time of the four contacts.

"Five cameras were employed in a study of the outer corona and in a search for intermercurial planets. The bolometer was used today for the first time in an eclipse of the sun, and by its aid the heat of the corona was successfully observed, probably for the first time also the shadow bands were seen and photographed under favorable conditions, and meteorological observations conducted.

"Visual observations and sketches were made and the observations will, it is hoped, prove successful throughout."

Work of Chicagoans.

"So far as the photographic operations were concerned we were highly successful," said Professor E. E. Barnard of the University of Chicago party. "We obtained our seven photographs with the large camera and many small corona pictures. We shall not develop our plates until we get back to the observatory. The plates are too large to be handled here and there is nothing to be gained by doing so. The eclipse, as I could see it reflected on the slide, seemed to be an average sun spot minimum eclipse. The corona was smaller than had been computed."

"The Chicago work with the bolometer in testing the heat of the streamers was discomcerted by an unavoidable accident, but readjustment enabled us to procure results," said George E. Hale, head of the Yerkes party. "What this mass of material will show can be computed only after our return to the observatory."

As a Woman Saw It.

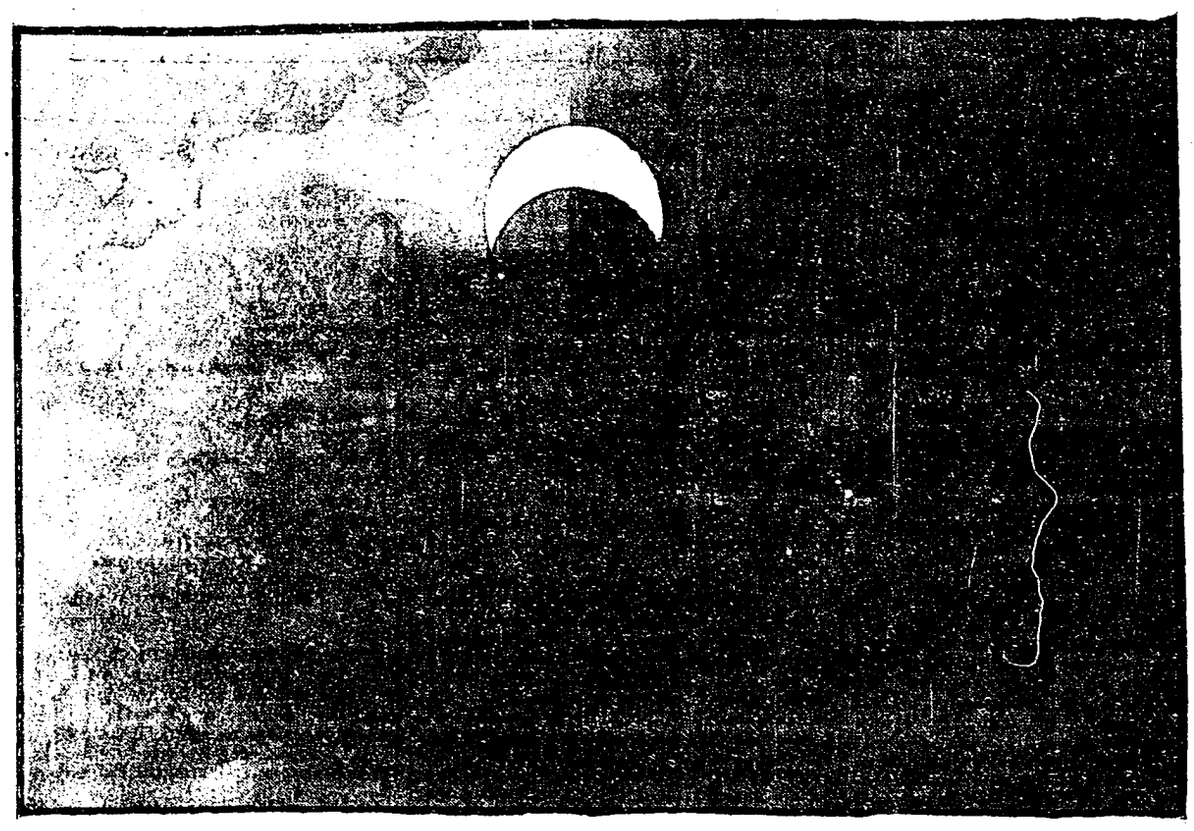
Mary W. Whitney, professor of astronomy at Vassar College, said of the eclipse:

"This eclipse is what would be called a 'bright' eclipse, similar to that of 1898, visible in India—that is to say, the sky was not as dark as often happens, and did not lose its blue color. This brightness interfered quite seriously with some of the important observations.

"The great glory of totality, the corona, was brighter than usual. From this extended wonderfully delicate rays, which today were striking. One long, pointed ray extended further than the sun's diameter. On the opposite side was a broader, larger ray, much less definitely pointed, and beautifully rounded in form."

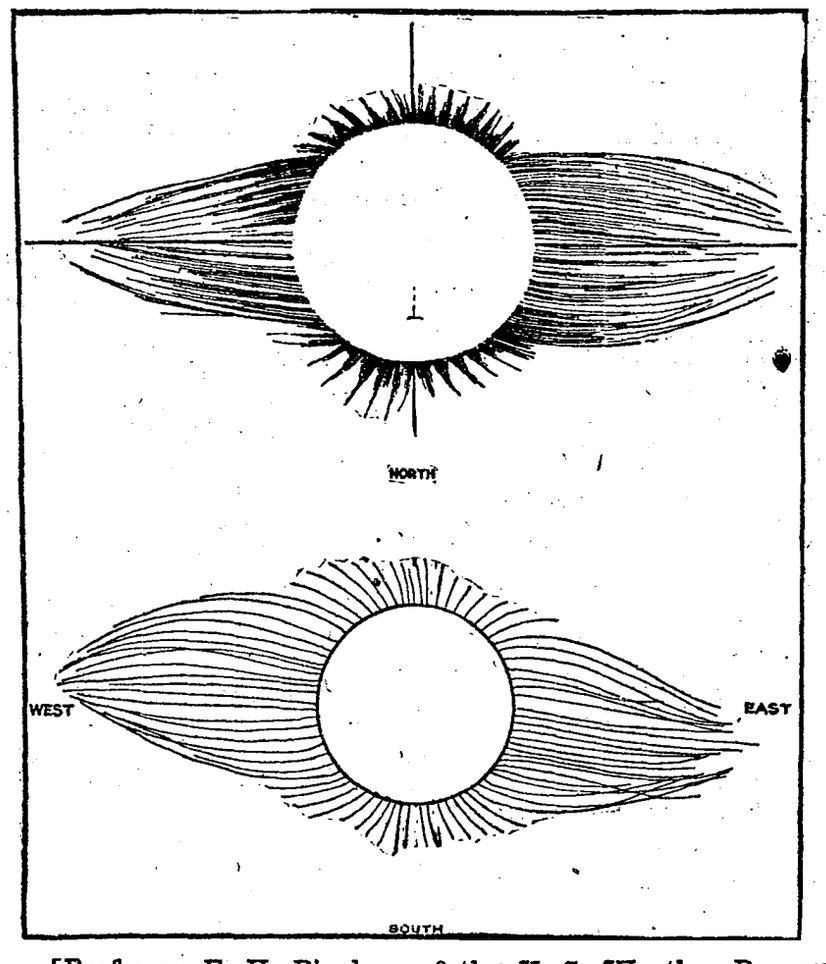
The plates of the astronomers, which carry the secrets of eclipse observations, were packed this afternoon and will be sent to the different observatories.

ECLIPSE OF THE SUN AS OBSERVED AT 8:10 A. M. FROM EVANSTON, ILL.



For a few moments the clouds broke and allowed residents of the suburb to see the crescent-shaped sun. This sketch was made for The Tribune.

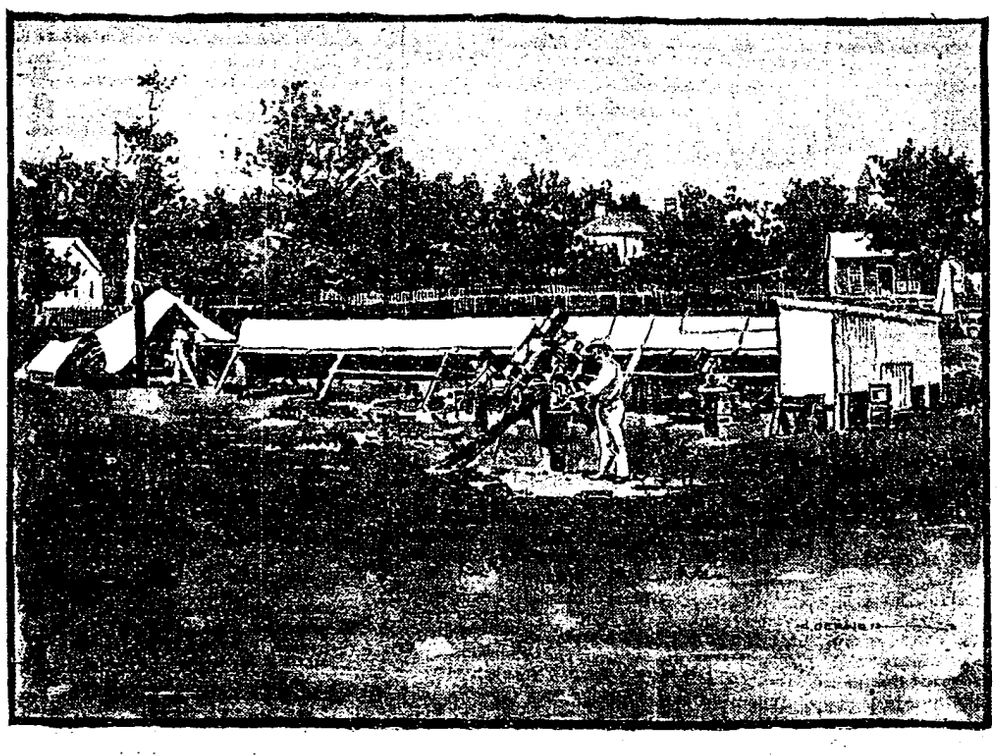
THE SUN'S CORONA: A CORRECT FORECAST.



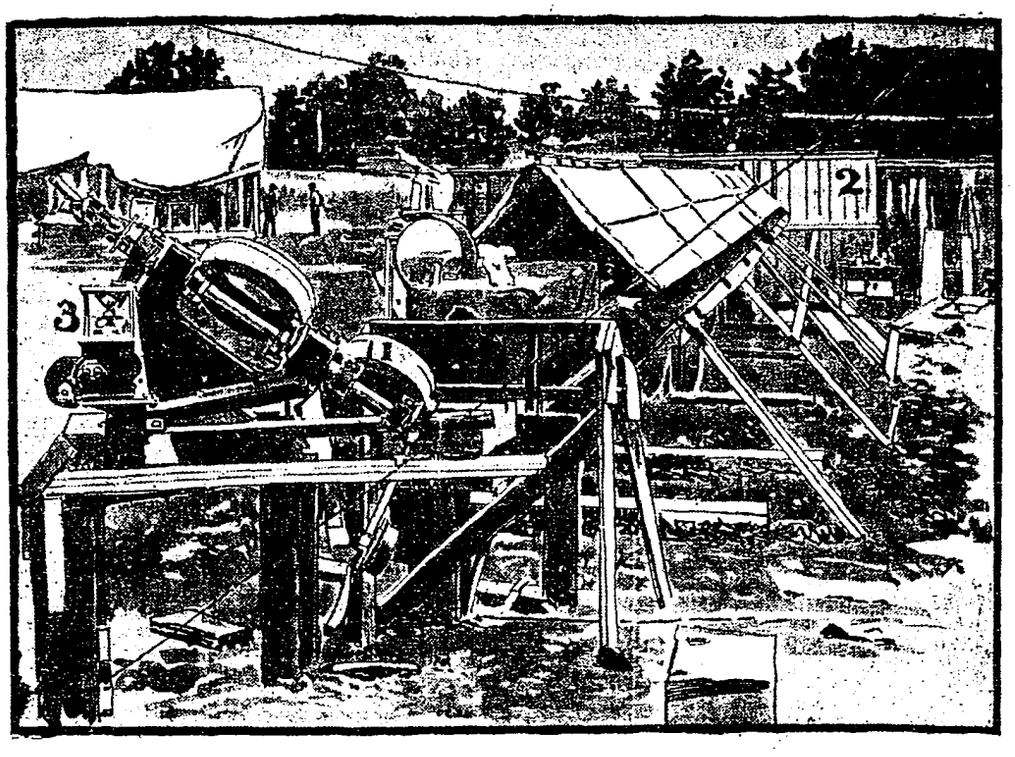
[Professor F. H. Bigelow of the U. S. Weather Bureau made the above sketches, which were published in the May number of the Popular Science Monthly. (Copyright, 1900, by D. Appleton & Co.) Observers in the belt of totality found the shape of the Corona of yesterday's eclipse tallied closely with these forecasts.]

YERKES' OBSERVATORY INSTRUMENTS AS SET UP IN THE CAMP AT WADESBORO, N. C.

(From Photographs by a Tribune Staff Correspondent.)



Prof. Barnard in working clothes at one of the small cameras.



THE COOLOSTAT. 1—Mirrors. 2—Dark room into which image is flashed by mirrors. 3—Clock device to keep the lens with the sun.