

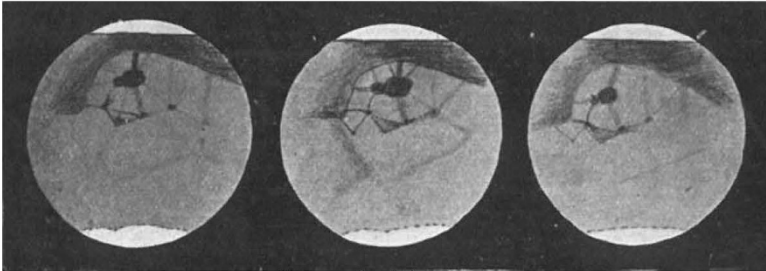
MARS, IN 1907.

OBSERVATIONS AT THE LOWELL OBSERVATORY.

IN answer to the request of the editor of NATURE for an authoritative statement of the observations so far made here at this opposition, I have the honour to communicate two or three of the more important results obtained. They exceed what seemed likely, in view of the unfavourable declination of the planet, a position so southern as to render it practically unobservable in England, France, or the northern part of the United States.

The first of these relates to the polar caps. From the fact that the observations were begun in March, three months and a half before opposition, it was possible to catch both caps at an interesting phase of their careers—the southern one at its maximum, the northern at its minimum, extent. The moment was more propitious than has ever been the case before at the times at which the planet has been observed, because it was then upon an even keel as regards the earth, the equator lying nearly in the plane of sight. The southern cap at this epoch stretched across ninety-five degrees of latitude, counting from one side of it to the other; the northern only over eight.

From that date the dwindling of the southern cap and the making of the northern has been carefully watched to a complete confirmation of the curious manner in which the latter is formed, as witnessed here at the two previous oppositions.¹



Photographs of Mars in 1907.

The next point has been the observed development of the canal system in the antarctic and south temperate zones. After the melting of the south polar cap had got well under way, canals began to make their appearance about it, running thence down the disc. These canals left its edge and joined the rest of the system in lower latitudes. Connected with such polar phenomena was the appearance of the most southern of the light regions of the planet, Thaumasia. This region, lying around the Solis Lacus, or Lake of the Sun, first showed symptoms of awaking activity. The Solis Lacus stood composed of two portions, a large oval patch on the east and a smaller round one to the west; from both of which canals ran into the dark areas. Now those on the south, such as the Ambrosia and the Bathys, were darker and more pronounced than those running north, the Tithonius, for example, which showed evidence of being in its dead or skeleton condition, while the former were in full tide of development. Meanwhile, the equatorial canals were steadily fading out. The process of evolution was in keeping with the method of development found here for the northern canals in 1903. The fact is of the nature of a prophecy fulfilled, and not only supports the previous observations, but proves the theory deduced from them to have been correct. It

¹ See Lowell Observatory Bulletin 30.

is a direct *sequitur* from this that the planet is at present the abode of intelligent, constructive life.

I may say in this connection that the theory of such life upon Mars was in no way an *a priori* hypothesis on my part, but the deduced outcome of observation, and that my observations since have fully confirmed it. No other supposition is consonant with all the facts observed here.

Another result of this opposition has been the success of the photographs taken of the planet. These have proved delineatory beyond expectation. The increased size of disc has enabled the method worked up by Mr. Lampland to be put into even more effective practice than at the last opposition. Plates have been taken by both Mr. Lampland and myself, and the amount of detail they show may be judged from the fact that I have already counted fifty-six canals on my plates, that the twin Gihon has been photographed double, and that such delicate markings as the Fons Juventae and the little canals leading to it appear unmistakably in the prints. Such grosser matters as the dwindling of the southern snow-cap show beautifully, and it looks as if a result in which Mr. Crommelin was much interested, the positioning of points of Martian topography by measures of the photographs, was in process of realisation.

Of the success of the expedition to the Andes to observe and photograph the planet sent out by this observatory under Prof. Todd, and with Mr. E. C. Slipher as the photographer, I prefer to speak later when fuller details come to hand. We already know by cable that their success has been beyond expectation.

PERCIVAL LOWELL.

PROF. H. C. VOGEL.

ASTRONOMERS, and especially spectroscopists, will have received with profound regret the brief announcement from the Potsdam Observatory which conveyed the sad intelligence that Prof. H. C. Vogel, the director of that institution, had died on August 13.

His scientific life extends over a period during which all the great triumphs of the spectroscopy have been won, and he has been in the front rank of that energetic band of astronomers who have given new direction and increased interest to the science of astronomy. Hence to sketch his life would be to trace the history of spectroscopy from the time that Ångström published the map of the normal spectrum, or from that of the epoch-marking Indian eclipse, when the riddle of the chromosphere was first read; when the application of the Doppler principle was first applied to star spectra; or when cometary spectra were first studied. Men's minds were still excited over these novel pursuits, and the possibilities they suggested, when Vogel took charge of the Bothkamp Observatory and began that career of continued and successful observation which only terminated with his death. How much has been accomplished since will be appreciated if we recall the fact, that Vogel's earliest work gave us accurate information of the peculiarities of the planetary spectra, and showed the effect of solar rotation in displacing the Fraunhofer lines.

In 1874 came the foundation of the Potsdam Observatory, and Prof. Vogel was seen in a new light as the director of the first purely astrophysical observatory. The staff was small, and the instruments