

## DARK SKIES for January 2018:

M/T Jan.	1/2	none	
T/W Jan.	2/3	none	
W/T Jan.	3/4	6:20 p.m.	- 6:53 p.m.
T/F Jan.	4/5	6:21 p.m.	- 8:05 p.m.
F/S Jan.	5/6	6:22 p.m.	- 9:16 p.m.
S/S Jan.	6/7	6:23 p.m.	- 10:25 p.m.
S/M Jan.	7/8	6:24 p.m.	- 11:31 p.m.
M/T Jan.	8/9	6:25 p.m.	- 12:34 a.m.
T/W Jan.	9/10	6:25 p.m.	- 1:36 a.m.
W/T Jan.	10/11	6:26 p.m.	- 2:36 a.m.
T/F Jan.	11/12	6:27 p.m.	- 3:34 a.m.
F/S Jan.	12/13	6:28 p.m.	- 4:31 a.m.
S/S Jan.	13/14	6:29 p.m.	- 5:25 a.m.
<b>S/M Jan.</b>	<b>14/15</b>	<b>6:30 p.m.</b>	<b>- 5:48 a.m.</b>
<b>M/T Jan.</b>	<b>15/16</b>	<b>6:31 p.m.</b>	<b>- 5:48 a.m.</b>
<b>T/W Jan.</b>	<b>16/17</b>	<b>6:32 p.m.</b>	<b>- 5:48 a.m.</b>
<b>W/T Jan.</b>	<b>17/18</b>	<b>6:33 p.m.</b>	<b>- 5:47 a.m.</b>
T/F Jan.	18/19	6:38 p.m.	- 5:47 a.m.
F/S Jan.	19/20	7:37 p.m.	- 5:46 a.m.
S/S Jan.	20/21	8:38 p.m.	- 5:46 a.m.
S/M Jan.	21/22	9:40 p.m.	- 5:45 a.m.
M/T Jan.	22/23	10:43 p.m.	- 5:45 a.m.
T/W Jan.	23/24	11:48 p.m.	- 5:44 a.m.
W/T Jan.	24/25	12:55 a.m.	- 5:43 a.m.
T/F Jan.	25/26	2:04 a.m.	- 5:43 a.m.
F/S Jan.	26/27	3:14 a.m.	- 5:42 a.m.
S/S Jan.	27/28	4:24 a.m.	- 5:41 a.m.
S/M Jan.	28/29	5:29 a.m.	- 5:41 a.m.
M/T Jan.	29/30	none	
T/W Jan.	30/31	none	
W/T Jan.	31/1	none	

Times listed are for Dodgeville, Wisconsin when

(1) Moon is below the horizon

(2) Sun is > 18° below the horizon (astronomical twilight)

## Time Travel

conducted by David Oesper

### THE RISE AND FALL OF EDWARD S. HOLDEN: PART 1

DONALD E. OSTERBROCK, University of California

He summarized the meagre available data on the spectrum of the nebula, mostly from the observations of William Huggins in England, in the last two pages of his 221-page monograph. In a final addendum he described the early photographs of the Orion Nebula, taken by his friend Draper. The first of these photographs was taken in September 1880; the best, taken 14 March 1882, is reproduced in the monograph. Exposed 137 minutes, it is a good picture, about equivalent in brightness level reached to a one-minute exposure with a modern Schmidt camera. Holden clearly recognized that photography was the technique of the future, for it would provide accurate and permanent records of the appearance of nebulae. So it has, proving among other things that there are no relative surface-brightness variations in the Orion Nebula over any time scale that we have yet observed.

Overall, this memoir clearly shows that Holden had tremendous powers for reading, assimilating and organizing information. He was forward-looking, and was willing and even eager to accept the new. But he had little original creative power, or even research skill. He did not produce any new ideas, and nowhere showed that he could look at what he had done critically, and modify his approach to get new information.

Holden had a lively, alert mind, and many interests outside of astronomy. He wrote one of the first popular articles on cryptanalysis, taking as his example the huge mass of enciphered telegrams that became public knowledge after the Hayes-Tilden disputed presidential election of 1876. He tried, less successfully, to apply the same methods to deciphering the hieroglyphic writings on stones and tablets found in the ruins of Yucatan. And, on a more practical level, he revised Newcomb's university textbook on astronomy into an elementary version, suitable for high schools and colleges, that returned royalties to the two of them for years.

Holden's energy and initiative impressed Newcomb greatly, and they became intimate friends. Newcomb included his young assistant in the discussions with the Lick trustees from almost his first meeting with D. O. Mills in 1874. Initially, at least, Newcomb suggested that a director be chosen in advance of building the observatory, and recommended Holden for the post, but as soon as he realized that it would be years before work could begin, he withdrew this advice. Nevertheless, the trustees and Newcomb considered Holden the probable eventual director from that time on. Newcomb, just under forty years old, was already the outstanding astronomer in America, an extremely busy man who was trying to carry out an important research programme of his own and at the same time provide answers to all the many government agencies, politicians, scientists and university presidents who bombarded him with pleas for his expert advice. His hard-working, intelligent assistant was willing and even eager to help out, especially where the Lick Trust was concerned. Holden could see that if he played his cards right, the future might belong to him, while Newcomb was so involved and successful in the present that he had little time or need to think of tomorrow.

In 1875 when Newcomb was offered the directorship of Harvard College Observatory, Holden urged him to stay at the Naval Observatory. All it needed to become a first-class research institution was "an infusion of some military order administered by someone who is an astronomer"—like Newcomb. By this time Holden had his own contacts in California, and was passing on what he could learn of the thinking of the Lick trustees and James Lick himself to his older friend. Much of the advance planning for the observatory to be built on Mount Hamilton was done in Washington, with Newcomb providing the big ideas in the time he could spare, and Holden fleshing them out and putting them into written form.