DARK SKIES for May 2017:

M/T May 1/2	1:38 a.m. -	4:01 a.m.
T/W May 2/3	2:21 a.m. -	3:59 a.m.
W/T May 3/4	2:59 a.m. -	3:57 a.m.
T/F May 4/5	3:32 a.m. -	3:55 a.m.
F/S May 5/6	none	
S/S May 6/7	none	
S/M May 7/8	none	
M/T May 8/9	none	
T/W May 9/10	none	
W/T May 10/11	none	
T/F May 11/12	none	
F/S May 12/13	none	
S/S May 13/14	10:13 p.m. -	10:44 p.m.
S/M May 14/15	10:15 p.m. -	11:32 p.m.
M/T May 15/16	10:17 p.m. -	12:17 a.m.
T/W May 16/17	10:18 p.m. -	12:58 a.m.
W/T May 17/18	10:20 p.m. -	1:36 a.m.
T/F May 18/19	10:22 p.m. -	2:10 a.m.
F/S May 19/20	10:24 p.m. -	2:43 a.m.
S/S May 20/21	10:25 p.m. -	3:15 a.m.
S/M May 21/22	**10:27 p.m. -**	**3:26 a.m.**
M/T May 22/23	**10:29 p.m. -**	**3:24 a.m.**
T/W May 23/24	**10:30 p.m. -**	**3:23 a.m.**
W/T May 24/25	**10:32 p.m. -**	**3:21 a.m.**
T/F May 25/26	**10:34 p.m. -**	**3:20 a.m.**
F/S May 26/27	**10:35 p.m. -**	**3:18 a.m.**
S/S May 27/28	**10:37 p.m. -**	**3:17 a.m.**
S/M May 28/29	11:31 p.m. -	3:16 a.m.
M/T May 29/30	12:19 a.m. -	3:15 a.m.
T/W May 30/31	1:00 a.m. -	3:13 a.m.
W/T May 31/1	1:35 a.m. -	3:12 a.m.

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 BEGINNINGS OF AMERICAN ASTRONOMY

(continued)

The chronograph of the Bonds, the Zenith Telescope of Talcott, and the break-circuit chronometer of Winlock are universally used to-day. The diffraction gratings of Rutherfurd were the best to be had in the world till they were replaced by those of Rowland. The use of a telescope as a collimator was first proposed by Rittenhouse. The pioneer opticians of the United States were Holcomb (1826), Fitz (1846 or earlier), Clark (1845), Spencer (1851). Only the Clarks have a world-wide reputation. Würdemann, instrument maker to the United States Coast Survey (1834), had a decided influence on observers and instrument makers throughout the United States, as he introduced extreme German methods and models among us where extreme English methods had previously prevailed. The system of rectangular land surveys which proved to be so convenient for the public lands east of the Rocky Mountains was devised and executed by Mansfield, a graduate of the Military Academy.

The list of army officers who became distinguished in civil life as professors in the colleges of the country is a very long one. Courtenay (class of 1821 at West Point) was professor of mathematics at the University of Pennsylvania, 1834-'36, at the University of Virginia, 1842-'43, and was the author of admirable text-books. Norton (class of 1831) became professor at New Haven, and wrote a very useful text-book of astronomy in 1839; and the list could be much extended. The excellent training in mathematics at West Point (chiefly in French methods) early made itself felt throughout the whole country. The mathematical text-books of Peirce, of Harvard, and of Chauvenet, of the Naval Academy, brought the latest learning of Europe to American students. Mitchel (class of 1829 at West Point) was the only graduate who became a professional astronomer (1842-'61). His direct service to practical observing astronomy is small, but his lectures (1842-'48), the conduct of the Cincinnati Observatory (1845-'59), and his publication of the "Sidereal Messenger" (1846-'48), together with his popular books, excited an intense and widespread public interest in the science, and indirectly led to the foundation of many observatories. He was early concerned in the matter of using the electric current for longitude determinations, and his apparatus was only displaced because of the superior excellence of the chronograph devised by the Bonds. His work was done under immense disadvantages, in a new community (Ohio), but the endowment of astronomical research in America owes a large debt to his energy and efforts.

The navy and the United States Naval Academy (founded by Bancroft in 1845, at the suggestion of Chauvenet) were very active in astronomical work. Chauvenet (Yale College, 1840) published a text-book of trigonometry, in 1850, which had an important share in directing attention to rigid, elegant, and general methods of research. His "Astronomy" (1863) is a handbook for all students. Walker, Gilliss, Coffin, Hubbard, Ferguson, Keith, Yarnall, Winlock, Maury, Wilkes, were all connected with the navy more or less intimately. Walker's career was especially brilliant; he graduated at Harvard College in 1825, and established the observatory of the Philadelphia High School in 1840. He was the leading spirit in the United States Naval Observatory at Washington (1845-'47), and introduced modern methods into its practice at the beginning. From the observatory he went to the Coast Survey to take charge of its longitude operations, and he continued to direct and expand this department until his death, in 1853. To him, more than to any single person, is due the idea of the telegraphic method ("the American method") of determining differences of longitude. His assistant in this work was Gould, who succeeded to the charge of it in 1853. His researches extended to the field of mathematical astronomy also, and his theory of the planet Neptune (then newly discovered) marks an important step forward. His investigations and those of Peirce were conducted in concert, and attracted general and deserved attention.

Edward S. Holden, *Science*, June 18, 1897