

APPENDIX III

Instruments and Other Equipment Used at Shirakawa Station

No	Item	Number of Items	Loaned/ Entrusted/ Purchased	Owner	Remarks
1	Horizontal Photoheliograph (Clark) Focal length: 40 ft	1	Loaned	U.S. Naval Observatory	Operated by Prof. Todd.
	◊ Objective (5 in)				Placed 14.4 ft south of the center of the transit.
	Dry plate (17 in × 20 in)	Over 10	Purchased in Japan		◊ For corona photographs. ◊ Exposure times: to be 1, 4, 16, 64, 32, 8 and 2 seconds in sequence. ◊ Image of the sun: 4 ½ in.
	Wet plate (7 in × 7 in)	Over 100	Purchased in Japan		◊ For partial phase. ◊ Exposure times: every 15 seconds immediately before and after totality.
2	Heliostat (Clark) ◊ Mirror (7 in, unsilvered)	1	Loaned	U.S. Naval Observatory	For partial phase.
	◊ Mirror (7 in, silvered)	1	?	?	◊ For corona photographs. ◊ To be replaced immediately before totality. ◊ Silvered by J. A. Brashear.
3	Telescope Focal length: 9 ft	1	Entrusted by Prof. E. C. Pickering	Harvard College Observatory	◊ Corona photographs, with exposure times to be 1, 2, 4, 8, 16, 8, 4, 2 and 1 second successively. ◊ Sequence of photographs of the partial phase on one plate. ◊ Without clockwork. ◊ Operated by Lt. Southerland.
	◊ Objective (7¼ in) (Clark)		Loaned to Prof. E. C. Pickering	Amherst College Observatory	Belongs to the equatorial telescope in the Amherst College Observatory.
	Dry Plate (8 in × 10 in)	10	Entrusted by Prof. E. C. Pickering	Harvard College Observatory	◊ Exposed: 7 plates. ◊ Image of the sun: 1 in.
4	Double camera Focal length: 3 ft	1	Entrusted by Prof. E. C. Pickering	Harvard College Observatory	◊ Operated by Dr. Ames. ◊ For studying the brightness and the shape of the faint light surrounding the corona.
	◊ Lens (5 in)	2			
	Dry Plate (4 in × 5 in)	8			

5	Single camera	1	Entrusted by Prof. E. C. Pickering	Harvard Collage Observatory	◇ Operated by Dr. McCartee. ◇ For studying the shape and brightness of the corona.
	◇ Lens (4 in)				
	Dry Plate (size unknown)	?			
6	Plate holder	?	Entrusted by Prof. E. C. Pickering	Harvard Collage Observatory	Customized.
7	Draw tube telescope	1	Loaned	Signal Service, U.S. Army	
	◇ Objective (2 in)				
8	Reflecting telescope (Beck)	2	Loaned	Naval Observatory, Tokyo	◇ Operated by Dr. Holland for corona drawing, particularly near the solar poles. ◇ For observing first and second contact. ◇ For searching for inter-mercurial planets.
	◇ Objective (3½ in)				
9	Sunshine recorder	1	Loaned	Harvard Collage Observatory	
	◇ Sensitized paper	?	Donated		
10	Telegraphic longitude instruments	1	Loaned	U.S. Naval Observatory	
11	Morse Code Device	1	Loaned	Ministry of Communications, Japan	For longitude-signal exchange.
12	Prismatic transit instrument	1	Loaned	U.S. Coast & Geodetic Survey	Placed at 374.9 m above sea level.
13	Zenith telescope	1	Loaned	U.S. Coast & Geodetic Survey	Mounted on the prismatic transit.
14	Sphere level	1	/	Amherst College Observatory	
15	Meantime chronometer No. 2083 (Bliss & Creighton)	1			
16	Sidereal Chronometer No. 1254 (Negus)	1	Loaned	U.S. Naval Observatory	
17	Meantime Chronometer No. 1217 (Birch)	1	Loaned	U.S. Naval Observatory	
18	Sidereal chronometer No. 1722 (Negus)	1	Loaned	Naval Observatory, Tokyo	

19	Meantime chronometer No. 1624 (Fletcher)	1	?	?	
20	Pocket chronometer (stopwatch) (C. O. Fasoldt)	1	?	C. O. Fasoldt	
21	Pocket chronometer No. 43105 (Dent)	1	Loaned	Naval Observatory, Tokyo	
22	Theodolite ◇ Objective: 3 in	1	Loaned	U.S. Coast & Geodetic Survey	
23	Reflecting circle (Pistor & Martins)	1	Loaned	Johns Hopkins University	
24	Chronograph	1	Loaned	U.S. Geological Survey	
25	Chronograph with weight (Hiff)	2	Loaned	Naval Observatory, Tokyo	
26	50 ft steel tape	1		Amherst College Observatory	
27	100 ft steel tape	1	Loaned	U.S. Coast & Geodetic Survey	
28	Aneroid barometer	2			
29	Pocket compass	1	Loaned	Naval Observatory, Tokyo	
30	Deck watch with two keys	1			
31	Mercurial Barometer No. 1289 (Negretti & Zambra)	1			Meteorological observation by Lt. Southerland.
32	Standard Thermometer (F°) No. 18538	1			Meteorological observation by Lt. Southerland.
33	Artificial horizon	1			
34	Filters and stand	2			
35	Racks	2			
36	Brass scale	1			
37	Silk wire	?			
38	Red lamp	1			
39	Ebonite tray	4			
40	Ceramic plate (small)	2			
41	Silver nitrate solution	1	Donated		
42	Todhunter - Mensuration	1	Loaned		Books, Magazines.

43	Abney - Treatise on Photography	1	Loaned	Naval Observatory, Tokyo	Books, Magazines.
44	Merriman - Method of Least Squares	1			
45	Scott - Instructions in Use of Meteorological Instruments	1			
46	Loomis - Practical Astronomy	1			
47	Chanvenet - Astronomy	1			
48	Astronomical and Meteorological Observations	1			
49	Transit of Venus	1			
50	Report of Eclipse	1			
51	Transit of Venus of 1874	1			
52	Chanvenet Astronomy	2			
53	American Catalogue of Stars	1			
54	Ball - Astronomy	1			
55	Newcomb - Astronomy	1			
56	Brunnow - Astronomy	1			
57	Royal Astronomical Society (Vol. and No. unknown)	1			
58	Royal Astronomical Society, Vol. XLV, No.7	1			
59	Royal Astronomical Society, Vol. XLVI, No.1	1			
60	Royal Astronomical Society, Vol. XLVI, No.4	1			
61	Royal Astronomical Society, Vol. XLVII, No.4	1			
62	Ledger - The Sun	1			
63	Roscae - Spectrum Analysis	1			
64	Chamber - Astronomy	1			
65	Newcomb and Holden - Astronomy	1			
66	Instruction for Observing Eclipse	1			

67	Total Eclipse of Sun	1			
68	Chanvenet - Trigonometry	1			

<References>

The David Peck Todd Papers, MS 496B, Manuscripts & Archives, Yale University Library.

1. Todd, D. P. (1889, April 12). *Report of the American Eclipse Expedition to Japan, 1887, Part I.* (final report).
2. Todd, D. P. (1887, June 3–Aug. 19). Diary.
3. Hitchcock, W. R. (1887, July 30–Aug. 20). *Record of Operations in the Photographic House.*
4. Southerland, W.H.H. (1887, July 28–Aug. 21). *Chronometer Comparison.*
5. Palmer, H. S. (1887, Sept. 7). The Recent Solar Eclipse. *The Japan Mail.*
6. List of items loaned from the Naval Observatory, Ministry of the Navy of Japan.
7. The U.S. Naval Observatory. (1887, May 29). *Record of Chronometer 1217.*
8. The U.S. Naval Observatory. (1887, May 29). *Record of Chronometer 1254.*