THE ARCHIVES OF THE
CALIFORNIA INSTITUTE OF TECHNOLOGY

THE DRAWINGS OF RUSSELL W. PORTER (1871-1949)

Records: 1928-1949
Subject area: Astronomy, architecture, World War II
Linear feet: 5.75
Processed by: Charlotte E. Erwin
Processing completed: September 1998; revised July 2004; April 2005
Supplements: January 1999; July 2000; July 2003; April 2005; April 2014

THE DRAWINGS OF RUSSELL PORTER

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THE DRAWINGS OF RUSSELL W. PORTER

BIOGRAPHICAL SKETCH

Although trained as an architect, Russell Williams Porter (1871-1949) made his principal mark in the field of astronomy, in both the technical and popular realms of the discipline. He served as a member of the design team for the 200-inch Mount Palomar telescope—then the biggest telescope in the world—but he is also widely recognized in the US as a leader in the amateur telescope making movement.

Porter was born in Springfield, Vermont, on December 13, 1871, and attended the Massachusetts Institute of Technology, where he studied to be an architect. While still at MIT he attended a stereopticon lecture by Robert E. Peary in 1892—this was some years before Peary's discovery of the North Pole. Smitten with "arctic fever," Porter urged Peary to include him in his next expedition but Peary declined. However, over the next thirteen years Porter would make six arctic forays, three of these with Peary. On the last of these, with the Fiala-Ziegler expedition, the party lost their ship to ice floes and were marooned in Franz Josef Land for two years. Porter himself never reached the North Pole, but during these arctic excursions he taught himself celestial navigation and timekeeping by the stars. He also recorded in many drawings and paintings his own adventures in, and impressions of, the arctic world. These are published in part in *The Arctic Diary of Russell Williams Porter*, ed. Herman Friis (Charlottesville, 1976).

Porter returned from Franz Josef Land to Maine, married Alice Belle Marshall, and established himself as an architect, building a little community at Port Clyde on the coast. By 1910 he had begun to study telescope making, and he would continue to study and build instruments, and to encourage other amateurs to do so for the rest of his life. In 1915 Porter returned to Boston to teach architecture at MIT. Towards the end of World War I, he was called to the National Bureau of Standards to put his knowledge of optics to use. Then, having been invited by his childhood friend James Hartness to work in the latter's precision tool manufacturing company, Porter returned to his old home in Springfield, Vermont.

During these years in Springfield, Porter's fame as a telescope maker spread. His local club, the Telescope Makers of Springfield, with their clubhouse Stellafane (temple of the stars, completed in 1924), was written up in *The Scientific American.* That magazine's editor, Albert G. Ingalls, collaborated with Porter in the writing of the book *Amateur Telescope Making*, which became a bible in its field. Annual conventions began to take place during summers at Stellafane.

In 1928 Porter was recruited by George Ellery Hale, the famous solar astronomer and director of the Mount Wilson Observatory in Pasadena, to work on the construction of the new 200-inch telescope. The world's largest telescope would eventually be operated by the California Institute of Technology in cooperation with the Carnegie Institution of Washington. Funded by the Rockefeller Foundation, the construction of the observatory and telescope on Palomar Mountain in San Diego County took approximately twenty years. During this time, Porter undertook the

architectural designs for the necessary shops, labs and offices on the Caltech campus, and he contributed substantially to the mechanical and optical design work for the telescope. Almost every summer he managed to return to Vermont for the annual conventions at Stellafane.

One particular aspect of Porter's genius was his ability to do three-dimensional cutaway drawings of all kinds of mechanical objects. He had perfected this skill during work on the 200-inch telescope. With the outbreak of World War II he found that his draftsman's skills were highly desired by the military to demonstrate the design of rockets and other ordnance and equipment prior to the building of prototypes. Porter also became closely involved in the design and production of the so-called roof prism, used in new, high-precision optical sights on artillery.

Although he had suffered a serious heart attack as early as 1935, Porter lived to see the completion of the 200-inch telescope, which was dedicated on June 3, 1948. Porter died at his home in Pasadena on February 22, 1949.

For a complete biography, see Berton C. Willard, *Russell W. Porter* (Freeport, Maine, 1976).

SCOPE OF THE COLLECTION

The drawings of Russell W. Porter in the Caltech Archives represent only a small portion of his output, but they range over a variety of subjects from his California period, beginning in 1928. The works have been divided into groups and series defined generally by subject (see Table of Contents); building designs for Caltech are further grouped as much as possible for individual structures. Highlights of the collection include original design proposals for the 200-inch telescope mount, in both schematic and three-dimensional/cutaway form, plus a series of drawings of Hale's spectrohelioscope. Some of Porter's military drawings are also represented, as well as miscellaneous drawings of Caltech engineering projects such as the Hydrodynamics Laboratory.

Most of the drawings in the Caltech collection are originals. However, some works are represented only by photographic reproductions. In each case, the best version of a drawing, whether original or reproduction, is listed in the catalog that follows. Duplicates and copies have been placed at the end of the collection in a separate box. (An exception has been allowed when copies are too large to fit in the duplicates section; this applies only to items 2.4-1 through 2.4-4.) In the catalog, the number at the left margin is a unique identification number for the item listed. Duplicates or copies have the same number as their original, but with an additional identifying element of A, B, C, etc. For example, in Group I, Series I, item number 10 has the ID number 1.1-10. A photographic copy of this drawing is assigned the ID number of 1.1-10A. The latter is boxed at the end of the collection with other duplicate copies. No attempt has been made to differentiate between varieties of copies; some are high-quality matte photos while others may be low-quality Photostats or Xeroxes.

The bulk of the Porter material in this collection was acquired from the Astronomy Department at Caltech in the 1980s. In 1993 the Archives received a small amount of material from the estate of Helen Holloway, which included Porter drawings. Miss Holloway had been secretary to

Robert A. Millikan during his later years as head of Caltech, and after his death in 1953 she moved to the Astronomy Department. Among her papers were fourteen original Russell Porter drawings and twenty-four photographic reproductions. One item, a drawing of the machine and optical shop for the 200-inch telescope (Group I, Series I, item 1.1-29), was added to the Porter collection in January 1999. The remaining pieces were integrated into the collection in the appropriate groups and series in July 2000. The notation [H. Holloway gift] identifies these supplementary items. See also: Helen Holloway, Historical Files.

In May 2003, Dorothea Harrington donated fourteen original Porter studies and sketches, along with twenty-two photographic reproductions. The materials were in the possession of her husband, R. T. Harrington, who was employed as photographer in the Astronomy Department at Caltech. Mrs. Harrington herself also worked for a few years as secretary in the department. The Harrington donation includes some architectural sketches, sketches of the 200-inch telescope (various parts), studies for a grinding and polishing machine for the 200-inch mirror, and studies for a two-mirror coelostat. These materials have been incorporated into the appropriate sections in the Porter drawings and have been identified by the notation [D. Harrington gift].

In March and April of 2005, additional copies and some new photos were moved into the Porter collection from the Caltech Photo Archives. Those photos have now been renumbered within the Porter collection. Finally, in April 2014, nine technical drawings were transferred to the Archives from Thomas Laboratory. These are classified under miscellaneous technical drawings, numbers 4.4-9 through -17.

Many of the drawings have been reproduced and scanned into the Caltech Archives' Image Archive, which is searchable from the Archives' website at http://caltech.discoverygarden.ca/islandora/search/mods_location_shelfLocator_mt%3A%28RWP%29?page=1

Charlotte E. Erwin
September 1998; Revised July 2004; April 2005; updated May 2014.

THE DRAWINGS OF RUSSELL W. PORTER

GROUP I: THE CALTECH CAMPUS

SERIES I: BUILDINGS AND PLANS

Box 1

1.1-1 Plan and section, "Small Instrument Shop for Astrophysics"
Floor plan and small section. Pencil and colored pencil on transparent paper, mounted on board, 11 x 14 inches. Unsigned, dated December 6, 1928.

1.1-2 Drawing, "Entrance to Optical and Machine Shops Astrophysical Group"
Perspective rendering looking northeast. Pencil and colored pencil on paper, 7.25 x 8 inches, mounted on board, 10 x 12.5 inches. Unsigned, undated.

1.1-3 Sketch [untitled]
Elevation of Caltech optical shop from south, with right-margin note: "80' to Dormitories." Pencil on paper, 12 x 8 inches. Unsigned, undated.

1.1-4 Sketch, "Preliminary Study #1 of the Optical & Machine Shops for the 200 Inch Telescope"
Perspective rendering of façade of Caltech optical shop. Pencil on transparent paper, 7.5 x 8.5 inches. Unsigned, undated.

1.1-5 Elevation/perspective rendering, "Preliminary Study No 1 of the Optical & Machine Shops for the 200 inch Telescope"
Elevation with perspective elements, south façade. Pencil on transparent paper, 7.75 x 8.5 inches, mounted on board, 11 x 14 inches. Signed R.W.P., dated 1928.

1.1-6 Drawing, "Perspective Looking Northeast"
Perspective rendering of Preliminary Study #1 of the Caltech optical and machine shops. Pencil and colored pencil on transparent paper, 8.25 x 10.25 inches. Signed R.W.P., undated.

1.1-7 Drawing, "Astrophysical Optical Shop from California Street Looking North"
Drawing, pencil and colored pencil on paper, 8 x 11 inches, mounted on board, 11 x 13 inches. Signed R.W.P. and dated 1929.

1.1-8 Drawing, "Astrophysics Machine Shop"
Perspective rendering looking north. Pencil on paper, 11.75 x 8 inches. Signed R.W.P., dated April 23, 1930.

1.1-9 Drawing [untitled]

Perspective rendering of Caltech optical shop looking northeast, continuing view of 1.1-8 above. Tower design shows prime and Cassegrain foci. Pencil on paper, 11.75 x 8 inches. Signed R.W.P., dated 1930.

1.1-10 Drawing, "An Open Air Rostrum, Suggested Treatment of the North End of the Optical Shop Over the Testing Tunnel, Looking Southwest"

Perspective rendering overdrawn with plan of optical and machine shops and aeronautics building. Pencil, colored pencil and ink on paper, 7.25 x 10.75 inches, mounted on board, 10 x 13.75 inches. Signed R.W.P., dated January 1930. Note: Duplicates in both color and b&w.

1.1-11 Drawing, "Study Astrophysics Optical Shop"

Perspective rendering with right-hand note: "Build First to Dotted Line." Pencil and colored pencil on transparent paper, mounted and taped on board, 9.75 x 8.5 inches. Signed R.W.P., dated April 22, 1930.

1.1-12 Drawing, "Entrance to Machine & Optical Shops, Astrophysics"

Drawing showing archway with fence and model of 200-inch telescope. Pencil, colored pencil and ink on paper, mounted on board, 12.5 x 7.75 inches. Signed R. W. Porter, undated.

1.1-13 Plan, "Layout of Plantings"

Plot plan for optical and machine shops, pencil and colored pencil on transparent paper, 7 x 9.25 inches folded. Signed R.W. Porter, dated 1932. [Fragile, torn at fold lines.]

1.1-14 Sketch [untitled]

Study for gateway with Robinson Astrophysical Laboratory [?] in background. Pencil on thin paper, 11.25 x 8 inches. Unsigned, undated. [Rusty paper clip damage.]

1.1-15 Drawing, "Entrance to Balcony, Astrophysics Building"

Perspective view of south side of building looking up at dome from balcony. Classical style doorway topped with armillary sphere. Pencil and colored pencil on paper, previously mounted [fragment of board still adheres], 8.5 x 13.5 inches. Signed R.W.P., dated 1929.

1.1-16 Sketch [untitled]

Rough sketch of unknown plaza-like space [or possibly Robinson balcony] with armillary sphere. Pencil on thin paper, 11 x 8.5 inches. Unsigned, undated.

1.1-17 Drawing [untitled]

Drawing showing west entrance to William G. Kerckhoff Laboratory of the Biological Sciences, viewed through foreground archway. Pencil on paper, mounted on soft board, 8.5 x 11 inches. Signed R.W.P., dated 1932.

1.1-18 Drawing [untitled]

Drawing of building with tall central hall with flanking arcaded wings [possibly a study for Caltech astrophysical optical and machine shop]. Pencil on heavy paper, 13 x 10 inches. Unsigned, undated. [Fold mark damage.]

1.1-19 Drawing, "Reading Room, Astrophysics Dept., Caltech"

Drawing showing interior of astrophysics library. Pencil and ink on board, 8.5 x 11 inches. Rough sketches on back. Signed R. W. Porter, dated 1929. [H. Holloway gift]

1.1-20 Drawing [untitled]

Drawing with dramatic perspective of Robinson Laboratory looking approximately northeast. Pencil on paper, 7 7/8 x 11 inches. Signed R. W. P., dated 1932. [Fragile] [H. Holloway gift]

1.1-21 Drawing, "Library"

Drawing of interior of astrophysics library. Pencil, 7 7/8 x 11 inches. Signed R. W. P., dated 1933. [Fragile] [H. Holloway gift]

1.1-22 Drawing, "Corner of Optical Shop & Entrance"

Drawing of exterior angle of shop and archway, with tree. Pencil on paper, 7 7/8 x 11 inches. Signed R. W. P., dated 1933. [Fragile, torn near right top corner] [H. Holloway gift]

1.1-23 Drawing, "Optical Shop, looking northwest"

Drawing of optical shop facing California Boulevard. Pencil on paper, 7 7/8 x 11 inches. Signed R. W. P., dated 1933. [Fragile] [H. Holloway gift]

1.1-24 Drawing [untitled]

Drawing of optical shop, companion piece to 1.1-23 above, facing more towards the west, showing east façade. With automobile parked at curb. Pencil on paper, 7 7/8 x 11 inches. Signed R. W. P., dated 1933. [Fragile] [H. Holloway gift]

1.1-25 Drawing [untitled]

Drawing of optical shop, companion to 1.1-23 and 1.1-24 above, east façade, facing southwest, approximately. Pencil on paper, 7 7/8 x 11 inches. Signed R. W. P., dated 1933. [Fragile, tear bottom left corner] [H. Holloway gift]

1.1-26 Sketch, "Solar Furnace Roof as seen 140 ft away on California St."

Sketch, unsigned and undated, possibly for Robinson Laboratory. Pencil on transparent paper, 8 x 5.5 inches. [H. Holloway gift]

1.1-27 Elevation, "This disposition places the solar furnace symmetrically over the N-S-axis of the building at a height giving the minimum clearance in the second story corridor/Looking south"

Rough elevation with description as above. Pencil on transparent paper, 10 x 8

inches. Signed R. W. P., dated Nov. 1930. [H. Holloway gift]

1.1-28 Drawing, cutaway [untitled]
Cutaway drawing of solar furnace showing multiple levels below ground; view probably facing northwest from California Boulevard. Pencil and ink on paper, mounted on board, 8 x 11 inches. Unsigned and undated. [H. Holloway gift]

1.1-29 Drawing, "Main Entrance to Machine & Optical Shops on California Street"
Drawing, looking north through archway at telescope model. Pencil, colored pencil and ink on paper, 8.5 x 6.75 inches, mounted on board, 9.5 x 8 inches. Signed RWP, dated 1929. [This drawing was transferred to the collection from the papers of Helen Holloway, 6 Jan 1999.]

1.1-30 Drawing, "Panel Treatment on South Wall of Optical Shop"
Sketch of ornamental detail for optical shop, south façade. Pencil on paper, 8 x 11.75 inches. Signed R. W. P., dated January 27, 1930. [D. Harrington gift]

Oversize box (Box 5):

1.1-31 Drawing, "Astrophysics Laboratory"
Perspective rendering showing Robinson Astrophysics Laboratory from the south. Pencil on transparent paper, 15.5 x 11.25 inches, mounted on board 16.5 x 12 inches. Signed R. W. P., undated. OVERSIZE.

1.1-32 Drawing [untitled]
Drawing of Robinson Astrophysics Laboratory. Erased title visible as "Perspective View of the Astrophysical Laboratory of the California Institute of Technology." Pencil and colored pencil on paper, 12.25 x 10.25 inches, mounted on board 16.25 x 14 inches. Signed R.W.P., undated. [Damaged.] OVERSIZE. Note: Small copies in Duplicates (Box 6) are better quality images; they are also titled and dated 1929.

1.1-33 Photographic print [untitled]
Photographic copy of drawing of entrance to Robinson Astrophysics Laboratory. With colored pencil enhancement, 9.25 x 10.75 inches, mounted on board 11.75 x 13.25 inches. Signed R.W.P. and dated December 1929. [Original in Public Relations?] OVERSIZE. Note: Small copies in Duplicates (Box 6) are better quality images.

Box 1 (cont'd):

1.1-34 Photographic print [untitled]
Photographic copy of perspective drawing of Robinson Astrophysics Laboratory from the south. Similar view to 1.1-31 and 1.1-32. Light gray semi-gloss finish; 7.75 x 8.5 inches. Signed RWP on foreground sidewalk and dated 1929.

GROUP II: PALOMAR OBSERVATORY AND MISC ASTRONOMY

Box 2

SERIES I: STUDIES OF VICTORIA-TYPE AND OTHER MOUNTS

2.1-1 Elevation [untitled]
Elevation of Victoria mount with spherical central bearing, side view. Pencil on paper, 11.25 x 8 inches. Initialed on back RWP, undated.

2.1-2 Elevation [untitled]
Detailed elevation of spherical central bearing of Victoria mount, partially cutaway, front and side views, scaled to ¼ inch equals 5 feet. Pencil on paper, 8 x 11.25 inches. Initialed on back RWP, undated.

2.1-3 Elevation, "Victoria Type, Study #5."
Complete elevation, partially cutaway, of Victoria mount, with detailed polar axis bearings and optical configurations, side and end views, scaled to 5 inches equals 40 feet. Pencil on transparent paper, 13 x 9.5 inches. Signed R.W.P. Pasadena, dated 1929. [Left top corner torn away.]

2.1-4 Diagrams [untitled]
Page with two diagrams comparing split ring and Victoria mounts, with notes on "relative merits" of the two, with two rough sketches on back. Pencil on paper, 7.75 x 11.25 inches. Signed R.W.P., dated January 21, 1929.

2.1-5 Elevations, "Optical Combinations, 200"."
Set of six miniature elevations of optical combinations for the 200-inch telescope. Pencil and ink on paper, 12 x 8 inches, mounted on board, 13 x 9 inches. Signed R.W. P., undated.

2.1-6 Photographic print [untitled]
Photographic copy of drawing for design, principally the mount, of the 200-inch telescope. 11 x 8 inches. Signed R. W. P., dated 1933. [3-hole punched.] [H. Holloway gift]

Oversize box (box 5):

2.1-7 Elevation [untitled]
Elevation of Victoria mount, side view, showing weight distribution. Pencil on transparent paper, 11.75 x 13 inches. Unsigned, undated. OVERSIZE.

2.1-8 Elevation [untitled]

Elevation of Victoria mount, side view, with cutaway of central bearing, plus detail inset of declination drive pinion. Pencil on transparent paper, 18 x 12.5 inches. Unsigned, undated. [Fold mark damage.] OVERSIZE.

2.1-9 Elevation [untitled]

Elevation of Victoria mount, side view, scaled to 5 inches equals 40 feet. Pencil on transparent paper, 21.5 x 13 inches. [Torn at fold line.] OVERSIZE.

See also: John A. Anderson papers, JAA7.5-1: "Study of an Equatorial Turret Mounting…"

Box 2, cont'd

SERIES II: 200-INCH MIRROR GRINDING AND POLISHING

2.2-1 Sketch [untitled]

Sketch of 200-inch mirror grinding machine, view from gallery looking down. Pencil on paper, 11.75 x 8 inches. Unsigned, undated. [Lower left side and corner torn.]

2.2-2 Drawing, "Grinding & Polishing Mach., 200 inch disc"

Perspective drawing of grinding and polishing machine with mirror disk, visitors' gallery in background. Pencil on paper, 11.75 x 8 inches. Signed RWP, dated May 1929.

2.2-3 Drawing [untitled]

Perspective drawing, polishing the telescope mirror. Pencil on board, 11.5 x 9.75 inches. Signed and dated in mirror-writing, R.W.P., May 16, 1929. Published in Astronomical Society of the Pacific leaflets and in G. E. Hale, "Signals from the Stars." [Somewhat damaged by smudging or transfer from another drawing.]

2.2-4 Photographic print of 2.2-3, above

Photographic print of 2.2-3, printed in reverse to read forwards. 9.25 x 8 inches. Note on back: Fig. 8.

2.2-5 Photographic print, "The Two Hundred Inch Machine Testing"

Photographic copy of drawing of telescope mirror on end against the grinding machine, side view. 11 x 8.5 inches. Signed R. W. P., and date "Anno dom. 1934."

2.2-6 Photographic print, "The Two Hundred Inch Grinding Machine"

Photographic copy of drawing of telescope mirror in grinding and polishing machine, side view. 10.75 x 8.5 inches. Signed R.W.P., dated "A.D. 1934."

2.2-7 Photographic print [untitled]
Photographic copy of cutaway drawing showing detail of telescope mirror support mechanism (labeled on back). 7 7/8 x 7 5/8 inches. With signature R. W. P., dated 1936. [H. Holloway gift]

2.2-8 Drawing, "The 200 inch mirror tipped up on its table…"
Drawing of mirror on tilt table, vertical. Pencil on paper, with Astrophysical Observatory stamp and ink caption with number "sk #12." 8 x 11.75 inches. Signed R. W. Porter, dated 1930. [D. Harrington gift]

2.2-9 Drawing [untitled]
Drawing of telescope mirror tilted vertical. Pencil and colored pencil on transparent paper, 10 7/8 x 12 ¼ inches. Unsigned, undated. [D. Harrington gift]

2.2-10 Drawing [untitled]
Drawing of telescope mirror on tilt table, horizontal. Pencil on paper, with Astrophysical Observatory stamp and ink caption with number "sk #11." 8 x 11.75 inches. Unsigned, undated. [D. Harrington gift]

2.2-11 Drawing, "A large Cantilever Grinding & Polishing Machine"
Study for design for telescope mirror grinding machine, mounted on circular platform. Pencil on paper, 11.75 x 8 inches. Astrophysical Observatory stamp and ink caption "sk.#9". Signed R. W. Porter, dated March 1930. [D. Harrington gift]

2.2-12 Drawing [untitled]
Study for design for telescope mirror grinding machine. Pencil on paper, 11.75 x 8 inches. Astrophysical Observatory stamp and ink caption, "200" glass grinding machine (study)/optical photo. sk. 1-7." Rough sketch of individual components on back. Signed RWP, dated March 1930. [D. Harrington gift]

2.2-13 Photographic print, "The Seventeen Foot Tilting Table and Carriage"
Photographic copy of drawing of 200-inch mirror on tilt table, horizontal position. Original unknown. 11 x 8.5 inches. Signed RWP, dated Dec 1929. [D. Harrington gift]

Oversize box (box 5):

2.2-14 Drawing, "120 Inch Grinding & Polishing Machine"
Perspective drawing of grinding and polishing machine with mirror, side view. Pencil and ink on paper, mounted on board, 15 x 13 inches. Signed and dated: "R. W. P. Del. 1932." OVERSIZE.

Box 2, cont'd

SERIES III: 200-INCH TELESCOPE

2.3-1 Drawing, "Looking South"
Detailed perspective drawing of fork mount with attached cylindrical outrigger trunnions, wishbone stairs around RA axis, and enclosed observer's cage. Only the cell holder and upper tube ring are actually as built; central tube section is composed of X braces. Pencil on paper, 8 x 12 inches, mounted on board, 9 x 13 inches. Signed R. W. P., dated 1934.

2.3-2 Drawing, "At the Prime Focus"
Perspective cutaway drawing of observer in capsule. Pencil on paper, 8 x 12 inches, mounted on board, 9 x 13 inches. Signed R.W.P., dated 1934.

2.3-3 Drawing, "Cassegrain focus"
Perspective drawing with observer on swivel swing behind mirror. Pencil on paper, 8 x 12 inches, mounted on board, 9 x 13 inches. Signed R.W.P., dated 1934.

2.3-4 Drawing, "At the Cassegrain Focus"
Perspective drawing with observer on elevator, aluminizing chamber below. Pencil on paper, 8 x 12 inches, mounted on board, 9 x 13 inches. Signed R.W.P., dated 1934.

2.3-5 Drawing, "The Cassegrain Coude [sic] Focus"
Perspective cutaway drawing of observing station built into outrigger trunnion attached to fork mount. Pencil on paper, 12 x 8 inches, mounted on board, 13 x 9 inches. Signed R.W.P., dated 1934.

2.3-6 Drawing, "The Cassegrain Coude [sic] Focus Alternative"
Perspective cutaway drawing of observing station built into trunnion. Pencil on paper, 12 x 9 inches, mounted on board, 13 x 9 inches. Signed R. W. P., dated 1934.

2.3-7 Drawing, "The Aluminizing Chamber"
Perspective drawing of aluminizing chamber with 200-inch mirror. Pencil on paper, 12 x 8 inches, mounted on board, 13 x 9 inches. Signed R. W. P., dated 1934.

2.3-8 Drawing, "Changing Observers at the Prime Focus, 200 inch Telescope"
Perspective drawing showing observers entering and leaving enclosed capsule on spherical truss mount. Pencil, ink and chalk[?] on board, 10.5 x 8.75 inches. Signed R. W. Porter, dated 1936.

2.3-9 Drawing, “Prime Focus – Three Hour Circle”
Drawing of observer sitting in capsule. Pencil on paper, 11 x 8 inches. Signed R.W. P., dated Sept. 1933. [Fragile] [H. Holloway gift]

2.3-10 Photographic print, titled on back “Phantom view of telescope”
Small photographic copy of drawing, partial cutaway style, showing and labeling different components of telescope. 5 x 4 inches. Signed R. W. P., dated 1936. [H. Holloway gift]

2.3-11 Photographic print, titled on back “Horseshoe bearing oil pads”
Small photographic copy of cutaway drawing showing specific detail. 5 x 4 inches. Signed R. W. P., dated 1936. [H. Holloway gift]

2.3-12 Photographic print, “Cutaway Drawing of Declination Trunnion, 200 Inch Telescope”
Small photographic copy of elaborate cutaway drawing, showing a lot of detail. 5 x 4 inches. Signed R. W. P., dated 1936. [H. Holloway gift]

2.3-13 Photographic print, titled on back “Tentative sketch of the 200-inch Telescope,” followed by long description of sketch, handwritten and signed by George E. Hale
Medium-sized photo of drawing showing whole telescope pointing out through dome slit. 7.5 x 7.75 inches. Signed R. W. Porter, dated 1936. Two copies, numbered 2.3-13 and 2.3-13A, both with original writing by Hale on reverse [text and layout differs very slightly]. [H. Holloway gift]

2.3-14 Photographic print, “The Prime Focus Housing and Pedestal, 200 Inch Telescope”
Photographic copy of drawing of observer in capsule, partial cutaway showing interior of prime focus. Small insert in right bottom corner shows larger context with detail identified in square. 8 x 10 inches. Very small signature R. W. Porter, dated 1940. [H. Holloway gift]

2.3-15 Drawing, “Working at the Prime Focus”
Drawing of (viewed from rear) observer crossing ramp to prime focus capsule. On right is cross section of capsule with handwritten description. Pencil on paper, 11.25 x 7 7/8 inches. Signed R. W. P., undated. [D. Harrington gift]

2.3-16 Drawing, “Changing Observers at the Prime Focus of the Two Hundred Inch”
Drawing of two observers passing on ramp to prime focus capsule. Pencil on paper, 7 7/8 x 11.25 inches. Signed R. W. P., undated. [D. Harrington gift]

Oversize box (box 5):

2.3-17 Drawing, “Six Control Stations”
Perspective drawing of complete telescope with six stations called out; showing horseshoe mount with double trunnions and bearing supports similar to those built; scaled to 1 inch equals 10 feet. Pencil on paper, 12 x 8 inches, mounted on board, 15.75 x 11.5 inches. Signed R. W. P., dated April 1935. OVERSIZE.

2.3-18 Drawing [untitled]

Perspective cutaway drawing of front half of telescope on fork mount with outrigger trunnion tubes. Pencil on paper, mounted on board, 12 x 16 inches. Signed R. W. P., dated 1934. OVERSIZE.

2.3-19 Drawing [Untitled]

Perspective cutaway drawing of detail of mirror support for 200-inch telescope. Pencil and ink on paper, 16 x 15 inches, mounted on board, 16 x 18.25, with paper overlay. Signed R. W. P., dated 1936. OVERSIZE.

Box 2, cont'd

2.3-20 Photographic print, "The Two Hundred Inch Telescope"

Photographic copy of cutaway drawing showing whole telescope inside dome; with phantom elements. This drawing served as the basis for the "Key Drawing" (see below, 2.3-21) published as #2 in *Giants of Palomar*. 8 x 10 inches. Signed R. W. Porter, dated 1938.

2.3-21 Photographic print, "The Two Hundred Inch Telescope" with marginal key

Photographic copy of same cutaway drawing as 2.3-20 above, but with handwritten explanatory key in margins. An abbreviated version of this keyed drawing was published as "Key Drawing" (#2) in *Giants of Palomar*. [Glue damage to back.] 8 x 10 inches. Signed R. W. Porter, dated 1938.

2.3-22 Photographic print, "The Two Hundred Inch Telescope Looking North"

Photographic copy of perspective drawing of complete telescope inside dome. 8 x 10 inches. Signed R. W. Porter, dated 1938.

2.3-23 Photographic print, "South Polar Axis Bearing, Yoke & Right Ascension Drive, Two Hundred Inch Telescope"

Photographic copy of cutaway drawing published as #5 in *Giants of Palomar*. 6.25 x 4.5 inches. Signed R. W. P., dated 1937.

2.3-24 Photographic print, "The Prime Focus, Two Hundred Inch Telescope"

Photographic copy of drawing with detailed view of prime focus capsule with observer, viewed through slit in dome; published as #14 in *Giants of Palomar*. 6 x 4.5 inches. Signed R. W. P., dated 1938.

2.3-25 Photographic print, "The Prime Focus. Cassegrain & Coude [sic] Mirrors. Two Hundred Inch Telescope"

Photographic print of detailed drawing with cutaway view; published as #16 in *Giants of Palomar*. 4.5 x 6.25 inches. Signed R.W. P., dated 1938.

2.3-26 Photographic print, "Two Hundred Inch Mirror, Cell Support & Cover"

Photographic print of detailed drawing with cutaway view; published as #9 in *Giants of Palomar*. 5.75 x 4.5 inches. Signed R. W. Porter, dated 1937.

2.3-27 Photographic print, “Mirror Supports, Two Hundred Inch Telescope”
Photographic print of detailed cutaway drawing; published as #10 in *Giants of Palomar*. 4 7/8 x 6.5 inches. Signed R. W. Porter, dated 1938.

2.3-28 Photographic print, “Two Hundred Inch Telescope Looking Northwest”
Photographic print of perspective drawing of complete telescope inside dome with slit open to night sky. Companion piece to RWP2.3-22. Published as #3 in *Giants of Palomar*. 8 x 10 inches. Signed R. W. Porter, dated 1939.

SERIES IV: OBSERVATORY BUILDING AND GROUNDS

2.4-1 Elevation, “Section Taken Thro[sic] E-F (Looking South)”
Photographic copy of section through center of Palomar dome. 11 x 10 inches. Unsigned, undated. Four copies total, one a negative image. [Two positives and one negative D. Harrington gift]

2.4-2 Elevation, “Meridian Section (Looking West)”
Photographic copy of section of proposed Palomar dome through polar axis based on Mt. Wilson design. 11 x 10 inches. Unsigned, undated. Three copies total, one a negative image. [One positive and one negative D. Harrington gift]

2.4-3 Plan, “Plan at A-B”
Photographic copy of floor plan of second, i.e., observing floor of Palomar observatory. 10 x 11 inches. Unsigned, undated. Four copies total, one a negative image. [Two positives and one negative D. Harrington gift]

2.4-4 Plan, “Plan at C-D”
Photographic copy of floor plan of first (ground) floor of Palomar observatory. 10.5 x 10 inches. Unsigned, dated December 7, 1932. Four copies total, one a negative image; negative is torn, right edge. [Two positives and one negative D. Harrington gift]

2.4-5 Drawing, “Vestibule 200 inch Tel”
Perspective drawing of entrance hall, with visitors reading a “Keep Out” sign at base of stairs. Pencil and colored pencil on paper, mounted on board, 14 x 10.5 inches. Signed R.W.P., dated 1937.

2.4-6 Photographic print, “Study of the 200 Inch Telescope, A.D. 1932”
Photographic copy of sketch of exterior main entrance to dome from central path, with top of dome cut off. 11 x 7.75 inches. Signed R. W. P. [H. Holloway gift]

2.4-7 Photographic print (color) of exterior dome framework [untitled]
Photographic copy of color sketch or painting of dome construction. 5 x 7 inches. Signed R. W. P., dated Nov. 1, 193[9]. [H. Holloway gift]

2.4-8 Photographic print (color) of exterior dome framework [untitled]
Photographic copy of same scene as 2.4-7 above, but different print with different color values. 4.5 x 5 inches. Signed R. W. P., dated Nov. 1, 193[9]. [H. Holloway gift]

Oversize box (box 5):

2.4-9 Plan, "Plot Plan, Study #7, Two Hundred Inch Telescope, Palomar Mountain"
Plan with topographic features, showing observatory, outbuildings and future landing strip; scaled to ½ inch equals 100 feet. 17.5 x 13 inches. Signed R. W. Porter, dated June 1935. OVERSIZE.

2.4-10 Plan with perspective rendering and photograph [untitled]
Plan with topographic features of Palomar observatory and grounds, with perspective rendering of observatory as seen from parking lot. Plan is overlaid on a panoramic photograph, showing Porter and a colleague standing on the unimproved site. Pencil on transparent paper, overlaid on board, 18 x 12.5 inch. Unsigned, undated. OVERSIZE.

2.4-11 Drawing [untitled]
Drawing of aerial view of Palomar observatory and grounds, lacking 48-inch Schmidt dome and museum. Pencil and colored pencil on heavy board, 19 x 11.75 inches. Signed R. W. P., dated 1937. OVERSIZE.

Box 2, cont'd

2.4-12 Photographic print, "The 200 Inch Dome"
Photographic copy of drawing (or possibly painting) of exterior of dome showing main entrance, with slit open, exposing the telescope. Similar to the front cover illustration of *Giants of Palomar,* but view is from different angle. 8 x 10 inches. Unsigned, undated [ca 1947?].

2.4-13 Photographic print [untitled]
Small print, negative polarity, of drawing of dome and grounds with runway in front, labeled in parallel "taxiway" and "runway." 5 x 3 inches. Signed R. W. P., dated 1936.

2.4-14 Print (color) from digital scan, "The Two Hundred Inch Dome," cover of *Giants of Palomar*
Copy of book cover, revised edition, published by Caltech, copyright 1983. Original artwork signed R. W. Porter and dated 1947. Book in Archives landmark collection, QB82 .U62 S36 1983. Whereabouts of original drawing or painting unknown.

SERIES V: PALOMAR MISCELLANEOUS

2.5-1 Drawing, "12 Inch Re[f]lecting Telescope (f/5) for use in connection with the seeing program of the two hundred inch…."

Perspective drawing of telescope from left rear angle. Title note continues: "Designed for portability & lightness. The Cassegrain focus is f/20." Pencil on board, 7.5 x 11.75 inches. Signed RWP, dated 1929.

2.5-2 Drawing, "Crossing the Desert, April 9, Anno Dom. 1936"

Perspective drawing looking up embankment of train transporting 200-inch mirror disc. Pencil on paper, 11.5 x 7.75 inches, mounted on board, 12.5 x 10.25 inches. Signed R.W.P., dated 1936.

2.5-3 Drawing, "Study for a Four Foot Schmidt"

Perspective drawing of telescope with horseshoe-type mount. Pencil, colored pencil and ink on paper, mounted on board, 11 x 8.5 inches. Signed R.W.P., dated 1937.

2.5-4 Photographic print [untitled]

Photographic copy of sketch of large open structure on a round base. Possibly related to Palomar telescope. 11 x 8.5 inches. Signed R. W. P., dated 1936. [Palomar office gift, Robert Brucato]

SERIES VI: MISCELLANEOUS ASTRONOMY

2.6-1 Drawing, "The Modern Archdome"

Perspective drawing of dome created from nested semi-cylinders in the style of art deco. Tony Cook comments: "As odd as this study looks, an echo of it survives in the 'nested panel' design in the actual 200" dome shutters." Pencil on paper, 8.25 x 6 inches, mounted on board, 10 x 7.75 inches. Signed R. W. P., dated 1933.

2.6-2 Drawing, "Perspective View of the Hall of Astronomy…[Griffith Observatory]"

Perspective study for central lobby and west wing of Griffith Observatory. Pencil and colored pencil on paper, 11 x 7.5 inches, mounted on board, 11.75 x 8.25 inches. Signed R. W. Porter, dated "A.D. 1931." With slide negative.

2.6-3 Photographic print (red on white), "Coelostats"

Photographic copy of drawing of Griffith Observatory 3-beam coelostat, printed red. 8.5 x 11 inches. Signed R.W.P., dated 1931. [Donated by James W. Hanner via Helen Knudsen, 9-11-95]

2.6-4 Drawing, "Study #1, A Dialing Instrument for sitting [sic] the circles of the Coelostat mirrors of the solar Telescope" [Circle Setting Machine]

Perspective drawing, pencil on paper, 12 x 8.25 inches. Signed R.W.P., dated March 20, 1928. Note at top left: "This design is not as good as Study #II."

2.6-5 Drawing, “Circle Setting Machine for Solar Telescope Coelostat. Study #II”
Perspective drawing, pencil on paper, 11.25 x 8 inches. Signed R.W. Porter, dated March 1929. Note at bottom right: “See detailed drawings--.”

2.6-6 Drawing, “House at Big Bear Lake Region, Site Investigation, Altitude – 7500 ft”
Drawing of cabin-like structure with dog. Pencil on board, 11 x 8 inches. Signed R. W. P., dated Nov. 1929. [H. Holloway gift]

2.6-7 Drawing, “Two Mirror Coelostat, Astrophysical Laboratory…”
Sketch, with phantom elements, of two-mirror coelostat. Pencil on paper, 11.75 x 8 inches. Signed RWP, dated February 1930. [D. Harrington gift]

2.6-8 Drawing, “Model of Two Mirror Coelostat, Astrophysics Lab…”
Sketch of two-mirror coelostat. Pencil on paper, 11.75 x 8 inches. Signed R. W. P., dated February 1930. [D. Harrington gift]

2.6-9 Drawing, “A Two Mirror Coelostat”
Drawing of two-mirror coelostat inside dome. Pencil on paper, 11.75 x 8 inches. Signed R. W. P., dated 1930. [D. Harrington gift]

2.6-10 Drawing, “Looking down and southwest”
Sketch of two-mirror coelostat, partial view inside dome. Pencil on paper, 11.75 x 8 inches. Unsigned, undated. [D. Harrington gift]

2.6-11 Drawing, “Seven ways of transferring the first mirror of a coelostat…”
Sketch of seven partial views of coelostat components, with handwritten description. Pencil on paper, 11.75 x 8 inches. Signed R. W. P., dated February 1930. [D. Harrington gift]

2.6-12 Drawing [untitled]
Sketch of observer in a chair observing at medium-sized, stationary telescope in dome. Pencil on transparent paper, 8.75 x 9 inches. Signed R.W. P., dated [19]29. [Torn, bottom left corner.] [D. Harrington gift]

2.6-13 Photographic print, “Plate Loading Assembly, 48 Inch Schmidt Photographic Telescope”
Photographic copy of detailed cutaway drawing; published as #22 in *Giants of Palomar*. 8 x 10 inches. Signed R. W. P., dated 1947.

GROUP III: SOLAR ASTRONOMY

Box 3

SERIES I: SPECTROHELIOSCOPE SERIES
Note: The first 13 of the following 18 illustrations were published in George E. Hale, "The Spectrohelioscope and its Work, Part I: History, Instruments, Adjustments, and Methods of Observation, *The Astrophysical Journal* 70 (December 1929): 265-311 [referred to below as GEH]. The article was reprinted in *Contributions from the Mount Wilson Observatory* 17 no. 388 (1928-1929): 407-453.

3.1-1 Drawing [untitled]
Perspective drawing of coelostat, second mirror and telescope lens of spectrohelioscope. Pencil and ink on paper, backed with graph paper, 10.75 x 8.5 inches. Signed R. W. P., dated 1929. [Published as Plate VIII in GEH.]

3.1-2 Drawing [untitled]
Schematic drawing of complete spectrohelioscope setup with observer. Ink on card stock, 13.25 x 8 inches. Signed R. W. P., undated. [Has glue damage. Published as Figure 1 in GEH.]

3.1-3 Photographic print related to 3.1-2 above.
Schematic drawing of complete spectrohelioscope setup with observer, with detail inserts showing eyepiece and optical train (varies from 3.1-2 above). Ink drawing printed on card stock, 4.25 x 3.25 inches. Signed R.W. P., dated 1928. [This version published in *Amateur Telescope Making*, Book 1, p. 193.]

3.1-4 Drawing [untitled]
Schematic elevation of spectrohelioscope components. Ink on gray paper, 9.75 x 7.75 inches. Unsigned, undated. [Published as Figure 2 in GEH.]

3.1-5 Drawing [untitled]
Perspective drawing of oscillating slits and eyepiece of spectrohelioscope. Pencil and ink on paper, backed with graph paper, 8.5 x 11 inches. Signed R. W. P., dated 1929. Pencil note at bottom: Fig. 10 [crossed out], Plate III. [Published as Plate IX in GEH.]

3.1-6 Drawing [untitled]
Perspective drawing of two spectrohelioscope mirrors, vertical arrangement. Pencil and ink on Mt. Wilson Observatory letterhead stationery, backed with graph paper, 8.5 x 11 inches. Unsigned and undated. Pencil note at bottom: Fig.11 [crossed out] Plate IV. [Published as Plate X in GEH.]

3.1-7 Drawing [untitled]

Perspective close-up of grating support and line-shifter of spectrohelioscope. Pencil on board, 10 x 12 inches. Signed R. W. P., undated. [Published as Plate XI in GEH.]

3.1-8 Drawing [untitled]

Perspective cutaway drawing of spectrohelioscope second slit, driving mechanism and line shifter. Pencil on card stock, 10 x 12 inches. Unsigned, undated. [Published as Plate XII of GEH.]

3.1-9 Drawing [untitled]

Schematic cutaway drawing of spectrohelioscope, driving mechanism or oscillating slits. Ink on card stock, with penciled notes, 10 x 7.75 inches. Unsigned and undated. [Published as Figure 3 in GEH, p. 282.]

3.1-10 Drawing [untitled]

Perspective close-up of spinning disk with radial slits for spectrohelioscope. Pencil on board, 10 x 12 inches. Signed R. W. P., undated. [Published as Plate XIII in GEH.]

3.1-11 Drawing [untitled]

Perspective drawing of Anderson's rotating prisms, for use with fixed slits, for spectrohelioscope. Pencil and ink on paper, backed with graph paper, 8.5 x 11 inches. Signed R. W. P., dated 1929. [Published as Plate XIV in GEH.] [Note: drawing is marked Plate VIII.]

3.1-12 Drawing [untitled]

Perspective drawing of combined spectrograph, spectroheliograph and spectrohelioscope. Pencil and ink on board, 11.5 x 8.75 inches. Unsigned, undated. [Published as Plate XX from GEH.]

3.1-13 Drawing [untitled]

Perspective drawing of slits, gratings and skeleton tube of combined instruments seen from below, for spectrohelioscope assembly. Pencil and ink on board, 11.25 x 10 inches. Signed R. W. P., dated 1929. [Published as Plate XXI in GEH.]

3.1-14 Drawing [untitled]

Perspective close-up of concave mirrors of the spectroheliograph and spectrohelioscope. Pencil and ink on board, 9 x 11.5 inches. Unsigned, undated. [Published as Plate XXII of GEH.]

3.1-15 Drawing [untitled]

Perspective drawing of spectrohelioscope eyepiece and rotating prism assembly. Pencil and ink on paper, 8 x 11 inches. Signed R. W. P., undated.

3.1-16 Drawing [untitled]

Perspective drawing of spectrohelioscope grating box and line shifter. Pencil and ink on Mt. Wilson letterhead stationery, backed with graph paper, 11 x 8.5 inches. Unsigned and undated.

3.1-17 Drawing [untitled]

Perspective drawing of spectrohelioscope vibrating bar. Pencil and ink on Mt. Wilson letterhead stationery, backed with graph paper, 11 x 8.5 inches. Unsigned and undated.

3.1-18 Drawing [untitled]

Perspective drawing of first and second spectrohelioscope mirrors, horizontal arrangement. Pencil and ink on Mt. Wilson Observatory letterhead stationery, backed with graph paper, 11 x 8.5 inches, brown stain. Unsigned and undated.

3.1-19 Drawing [untitled]

Perspective drawing of observer using the spectrohelioscope with horizontal mirror arrangement. Pencil and ink on paper, 11.75 x 8 inches. Signed R. W. P., dated 1929.

SERIES II: SOLAR TELESCOPE STUDIES

Note: According to Anthony Cook, the following are part of a series of 60" solar telescope studies, of which Willard B-552, 553, 554, 555, 556 and 557 are also a part. The Caltech set is accompanied by a letter to G. E. Hale from J. A. Anderson, which says, in part: "Here is a bunch of sketches by Porter, showing various possible forms for the 60 inch sun telescope. I am especially intrigued by the Bascule shutter!! …All this is, of course, chiefly for amusement." Also according to Cook, there is a letter in the Hale Papers from Hale to Porter commenting on these drawings.

3.2-1 Letter, J. A. A. [John A. Anderson] to Hale. Pencil on paper, 8 x 11 inches. Signed J. A. A, undated. [See note above.]

3.2-2 Sketch, "5 ft Solar Telescope"

Perspective drawing, side view, showing telescope on inverted fork mount inside Bascule shutter. Pencil on paper, 11.75 x 8 inches. Signed R.W.P., dated June 1, 1932. [Small tear, right margin].

3.2-3 Sketch, "Solar Telescope, Bascule Shutter"

Perspective drawing, view from left front angle, showing Bascule shutter (i.e., telescope housing). Pencil on paper, 8 x 6 inches. Signed R. W. Porter, dated June 4, 1932.

3.2-4 Drawing, "Solar Telescope, Inverted Fork"

Perspective drawing showing inverted fork mount and supports. Pencil on paper, 8.25 x 8 inches. Signed R.W.P., dated June 4, 1932.

Oversize box (box 5):

3.2-5 Elevation, "First Optical Payout, June 1, 1932, RWP"
Schematic cutaway drawing showing polar axis focus and mirror elevator, housed in traditional dome. Scaled to 2 ½ inches equals 5 feet. Pencil and colored pencil on transparent paper, 13 x 13 inches. Signed RWP, dated May 30, 1932. [Damaged at edges, taped at fold line.] OVERSIZE.

3.2-6 Elevation, "Solar Telescope with Inverted Fork Mounting & Dome Housing"
Schematic cutaway drawing. Scaled ½ inch equals 1 foot. Pencil and colored pencil on transparent paper, 17 x 12.25 inches. Signed RWP, dated June 4, 1932. [Slightly damaged edges, taped at fold line.] OVERSIZE.

3.2-7 Elevation, "Solar Telescope Showing Sliding House on Trucks"
Schematic cutaway drawing. Pencil and colored pencil on transparent paper, 17 x 12.25 inches, damaged at fold line, taped. Signed R. W. P., dated June 4, 1932. OVERSIZE.

GROUP IV: MILITARY AND TECHNICAL DRAWINGS

Box 4

SERIES I: ROCKET LAUNCHER DRAWINGS

Note: These are all photographic prints of original perspective drawings (probably in pencil and ink on paper). According to archivist's note dated 2/24/87, Prof. Willy Fowler indicated that these were prototypes and the beachhead settings were imaginary. Six in the group of thirteen are stamped "Secret."

4.1-1 Drawing [untitled]
Side view of truck with launcher and stowed rockets. 11 x 8.5 inches. Signed R. W. Porter, dated 1942.

4.1-2 Drawing [untitled]
Rear view of truck with launcher and stowed rockets, with dimensions. 8.5 x 11 inches. Signed R. W. P., dated 1942.

4.1-3 Drawing [untitled]
View from above left rear, operator loading the launcher. 11 x 8.5 inches. Signed R. W. P., dated 1942.

4.1-4 Drawing [untitled]
Side view of truck (from left, with cutaway element and dimensions), with operators loading launcher, which is positioned at about 45 degrees. 11 x 8.5 inches. Signed R. W. P., dated 1942.

4.1-5 Drawing [untitled]
Rear angled view of truck, showing launch of rocket. 11 x 8.5 inches. Signed R. W. P., dated 1942.

4.1-6 Drawing [untitled]
View from above rear of truck, showing firing into invaders offshore, with inset of view from invaders' perspective. 9.75 x 8.5 inches. Unsigned, undated.

4.1-7 Drawing, "Chemical Warfare Defense of California Coast"
Perspective drawing of invaders in landing craft being hit by chemical gas rockets. 11 x 8.5 inches. Signed R. W. P., dated 1942.

[The next six all stamped SECRET.]

4.1-8 Drawing [untitled]
Perspective drawing of launcher from left rear mounted on trailer, raised to about 45 degrees. 9.75 x 7.75 inches. Unsigned, undated.

4.1-9 Drawing [untitled]
Perspective drawing of launcher from left rear mounted on trailer, with operator. 10 x 8 inches. Unsigned, undated.

4.1-10 Drawing [untitled]
Perspective drawing of launcher aiming into distance, with remote operator and observers. 9.75 x 8 inches. Signed R. W. P., dated 1942.

4.1-11 Drawing, "Recharging with dolly"
Perspective drawing from right rear of launcher, with operator positioning launcher rack. 9.75 x 8 inches. Unsigned, undated.

4.1-12 Drawing [untitled]
Perspective drawing of launcher from rear, aimed almost vertically, with operator. 8 x 10 inches. Signed R. W. P., dated 1942.

4.1-13 Drawing [untitled]
Perspective phantom close-up of operator reading elevation on launcher rack. 9.75 x 8 inches. Signed R. W. P., dated 1942.

SERIES II: MISCELLANEOUS MILITARY

Note: These are all photographic prints of original perspective drawings.

4.2-1 Drawing, "Night Binocular Installation in P-61 Aircraft"
Photographic print of perspective drawing, exterior view looking into cockpit. 11 x 6.75 inches. Signed R. W. P., dated 1945.

4.2-2 Drawing [untitled]
Photographic print of perspective drawing of night binocular in P-61 aircraft, from pilot's perspective. 11 x 7 inches. Signed R. W. P., dated July 21, 1945.

4.2-3 Drawing, "Model Catapult and Entry Cameras"
Photographic print of perspective drawing, with phantom elements. 10 x 8 inches. Signed R. W. P., dated October 1945.

4.2-4 Drawing, "Model Test Tank and Catapult"
Photographic print of perspective drawing. 10.25 x 8 inches. Signed R. W. P., dated October 1945.

Oversize box (box 5):

4.2-5 Drawing, "Japanese Balloon Ballasting Control"
Photographic print of perspective drawing, with wiring diagram overlaid. 11 x 17 inches. Signed R. W. Porter, dated 1945. OVERSIZE.

Box 4, cont'd

SERIES III: HYDRODYNAMICS LABORATORY

Note: These are all photographic prints of original perspective drawings.

4.3-1 Drawing, "Controlled Atmosphere Launching Tank, Hydrodynamics Laboratory"
Photographic print of perspective drawing with cutaway elements. 12.75 x 9.5 inches. Signed R. W. Porter, dated 1945.

4.3-2 Drawing [untitled]
Photographic print of detailed perspective drawing with cutaway elements of controlled atmosphere launching tank, Hydrodynamics Laboratory, Caltech. 13 x 9.75 inches. Signed R. W. Porter, dated 1945.

4.3-3 Drawing, "Free Surface Water Tunnel, Hydrodynamics Laboratory"
Photographic print of perspective drawing with cutaway elements. 12.5 x 8.75 inches. Signed R. W. P., dated 1945.

4.3-4 Drawing, "High Speed Water Tunnel, Hydrodynamics Laboratory"
Photographic print of perspective drawing with cutaway elements. 13.25 x 9.75 inches. Signed R. W. P., dated 1945.

Oversize box (box 5):

4.3-5 Drawing, "High Speed Water Tunnel, Hydrodynamics Laboratory"
Photographic print of perspective drawing with cutaway elements of upper assembly. 13.75 x 19.25 inches. Signed R. W. Porter, dated 1947. OVERSIZE.

Box 4, cont'd

SERIES IV: MISCELLANEOUS TECHNICAL

4.4-1 Photographic print [untitled]
Photographic copy of cutaway drawing of streamlined train showing passenger cabin and shock absorbers. 10 x 6.5 inches. Signed R. W. Porter, dated 1938. Stamp on back: Pacific Railway Equipment Co., C-34.

4.4-2 Photographic print, "5 Million Volt Electrostatic Generator, Kellogg Radiation Laboratory"
Photographic copy of cutaway drawing of generator. 5 x 7 inches. Signed R. W. Porter, dated 1947. [Original in Kellogg Laboratory]

Oversize Box (box 5):

4.4-2 Photographic print (duplicate copy), "5 Million Volt Electrostatic Generator, Kellogg Radiation Laboratory"
Photographic copy (duplicate) of cutaway drawing of generator. 16 x 20 inches. Signed R. W. Porter, dated 1947. [Original in Kellogg Laboratory] OVERSIZE.

Box 4 (cont'd):

4.4-3 Drawing [untitled]
Drawing of sundial, with dial set into flower-shaped holder, mounted on circular base. Pencil and colored pencil on paper, mounted on board; drawing 8.25 x 7 inches, mount 10 1/8 x 7 ¼ inches. Signed R. W. P., dated 1929. [H. Holloway gift]

4.4-4 Photographic print [untitled]
Glossy photographic copy of drawing, partial cutaway style, of unidentified large apparatus, with male figure to right. Possibly Palomar-related. 7.25 x 10 inches. Unsigned and undated. [H. Holloway gift]

Extra-Oversize (vertical files EO03)

4.4-5 Drawing, [Rapid Load Testing Machine]
Untitled concept study for rapid load testing machine; designed and constructed for studies of the effect of rapid loading on the tensile characteristics of metals; designed by David S. Wood, rendering by R. W. Porter. Pencil and ink on board, 17 x 22.25 inches. Signed R. W. Porter, dated 1944. EXTRA-OVERSIZE.

4.4-6 Drawing, "Rapid Load Testing Machine, Impact Laboratory CIT"
Final version of rapid load testing machine. Designed and constructed for studies of the effect of rapid loading on the tensile characteristics of metals; designed by David S. Wood, rendering by R. W. Porter. Pencil and ink on board, 19 x 30.5 inches. Signed by R. W. Porter, dated 1947. EXTRA-OVERSIZE.

Box 4 (cont'd):

4.4-7 Photographic print, "Southern California Cooperative Wind Tunnel…"
Photographic copy of birds-eye view cutaway drawing of whole wind tunnel and adjacent control room and workrooms. Title of drawing is in balloon bubble, upper right. 11 x 8 5/8 inches. Signed R. W. Porter, undated.

4.4-8 Photographic print, "600 MEV Synchrotron"
Photographic copy of perspective cutaway drawing of Caltech synchrotron. 10 x 8 inches. Signed R. W. Porter, dated 1949.

Oversize Box (box 5):

4.4-9 Drawing, "Approximate Scale – Half Size" [Rapid Load Testing Machine]
Cutaway drawing. Pencil on paper, 19.25 x 24.5 inches. Unsigned, undated. Identification from accompanying anonymous description, typescript. Fair condition, with tears and losses at edges; tape and thumb-tack holes at corners. OVERSIZE.

4.4-10 Drawing, untitled [Rapid Load Testing Machine?]
Cutaway drawing in cross-section. Pencil on paper cut to 5-sided polygon, squared 13 3/8 x 15 3/8 inches. Unsigned, undated. Fair condition, with thumb-tack holes in corners. Not oversize, but stored with 4.4.-9 (above) for possible association with that drawing.

4.4-11 Drawing, untitled [Synchrotron]
Perspective view with cutaway elements, plus cross-section view. Pencil on paper, 38 x 31 5/8 inches. Unsigned, undated. Scale indicated ¾ inch= 1 foot (1/16 scale). Additional notation, right edge: "Passed by/Lauritsen/Langmuir." Fair condition, creased and damaged along double-fold lines with tear at fold intersection, loss at edges; tape and thumb-tack holes on corners and center. OVERSIZE.

4.4-12 Drawing, Capital & Pilaster – N^{o} [blank]
Elevation view of sculpted or molded capital. Pencil and graphite on tissue paper, 19 x 13 7/8 inches. Unsigned, undated.

4.4-13 Drawing, N^{o} 100 [study for capital]
Two views, elevation and partial cross-section titled "Reflected half plan – full size detail." Pencil and graphite on tissue paper, 12 1/8 x 17 inches. Unsigned, undated.

Box 4 (cont'd):

4.4-14 Drawing, untitled [study for capital]
Three views: top plan, elevation finished three sides, bottom plan. Pencil and graphite on tissue paper, 9 1/8 x 12 1/8 inches. Unsigned, undated.

4.4-15 Drawing, Italian Well Curb
Two views: full curved elevation and top view. Scale 1 ½ inches equals 1 foot. Pencil and graphite on tissue paper, 8 7/8 x 12 inches. Unsigned, undated.

4.4-16 Drawing, 18th Century Town Pump
Two elevation views of water pump with female figure pumping water. Minor cutaway detail on one pump. Scale ¾-inch equals 1 foot. Pencil and graphite on tissue paper, 12 ¼ x 9 inches. Unsigned, undated.

4.4-17 Drawing, English Cottage Well Winch
Three views: side, front, and plan of construction of superstructure of water well, with frame, winch, rope and chain, bucket and lid. Scale ¾ inch equals 1 foot. Unsigned, undated.

DUPLICATES AND NEGATIVES

Box 6

Photographic duplicates or reproductions, arranged in numerical order corresponding to group, series and item numbers above, with additional A, B, C etc. identifiers. A set of sundial photos (on Caltech campus) is included [gift of H. Holloway].

1.1-7A Photographic print
Glossy photographic copy of 1.1-7. 7 x 9.5 inches.

1.1-8A Photographic print
Small glossy photographic copy of 1.1-8. 7 x 5 inches.

1.1-10A Photographic print (negative)

Photographic copy (white on black) of 1.1-10. 8 x 11 inches. [D. Harrington gift]

1.1-10B Photographic print
Small glossy color print of 1.1-10. 4 7/8 x 7 inches.

1.1-10C Photographic print
Small glossy b&w print of 1.1-10. 5 x 7 inches.

1.1-12A Photographic print
Glossy print of 1.1-12. 9 1/8 x 5.75 inches.

1.1-23A Photographic print
Matte print of 1.1-23. 9.75 x 6 7/8 inches.

1.1-31A Photographic print (oversize original)
Small glossy photographic copy of 1.1-31. 7 x 5 inches.

1.1-32A Photographic print
Small glossy color print of 1.1-32 (oversize original). 6 7/8 x 5 inches.

1.1-32B Photographic print
Small glossy b&w print of 1.1-32 (oversize original). 7 x 5 inches.

1.1-33A Photographic print
Small glossy color print of 1.1-33 (oversize original). 4 7/8 x 7 inches.

1.1-33B Photographic print
Small glossy b&w print of 1.1-33 (oversize original). 5 x 7 inches.

2.1-1A Photographic print
Photographic copy of 2.1-1. Glossy, 8 x 10 inches.

2.1-2A Photographic print
Photographic copy of 2.1-2. Glossy, 8 x 10 inches.

2.1-3A Photographic print
Photographic copy of 2.1-3. Glossy, 8 x 10 inches.

2.1-4A Photographic print
Photographic copy of 2.1-4. Glossy, 8 x 10 inches.

2.1-5A Photographic print
Photographic copy of 2.1-5. Glossy, 8 x 10 inches.

2.1-6A-B Photographic prints
Photographic copies [2 identical] of 2.1-6. [D. Harrington gift]

2.2-4A Photographic print
Photographic copy of 2.2-4. 9.25 x 8 inches. [H. Holloway gift]

2.2-5A Photographic print, "The Two Hundred Inch Machine Testing"
Small photographic copy of 2.2-5, with bottom cropped. 5 x 4 inches. With handwritten title, initials and date on back.

2.2-6A Photographic print, "The Two Hundred Inch Grinding Machine"
Small photographic copy of 2.2-6, with title cropped off bottom. 5 x 4 inches. With handwritten title, initials and date on back.

2.2-7A Photographic print
Small glossy photographic copy of 2.2-7. 5 x 4 inches. With handwritten title on back. [H. Holloway gift]

2.2-8A Photographic print (negative)
Photographic copy (white on black) of 2.2-8. 8 3/8 x 12 inches. Astrophysical Observatory stamp on front and back, ink captions in margins. [D. Harrington gift]

2.2-10A Photographic print (negative)
Photographic copy (white on black) of 2.2-10. 8 1/8 x 11 7/8 inches. Astrophysical Observatory stamp on back, ink captions in margins. [D. Harrington gift]

2.2-11A Photographic print (negative)
Photographic copy (white on black) of 2.2-11. 12 x 8.25 inches. Astrophysical Observatory stamp on back, ink captions in margins. [D. Harrington gift]

2.2-12A Photographic print (negative)
Photographic copy (white on black) of 2.2-12. 11.75 x 8.25 inches. Astrophysical Observatory stamp on front and back, ink captions in margins. [D. Harrington gift]

2.2-13A Photographic print
Photographic copy identical to 2.2-13. [D. Harrington gift]

2.2-14A Photographic print
Small glossy b&w print of 2.2-14 (oversize original). 7 x 5 inches.

2.3-1A-B Photographic prints, "Looking South"
Photographic copies of 2.3-1. 6 5/8 x 9 1/2 inches (A); 8 x 10 inches (B).

2.3-2A Photographic print
Photographic copy of 2.3-2. Glossy, 8 x 10 inches.

2.3-3A Photographic print
Photographic copy of 2.3-3. Glossy, 8 x 10 inches.

2.3-4A Photographic print
Photographic copy of 2.3-4. Glossy, 8 x 10 inches.

2.3-5A Photographic print
Photographic copy of 2.3-5. Glossy, 10 x 8 inches.

2.3-6A Photographic print
Photographic copy of 2.3-6. Glossy, 10 x 8 inches.

2.3-7A Photographic print
Photographic copy of 2.3-7. Glossy, 10 x 8 inches.

2.3-8A Photographic print
Photographic copy of 2.3-8. Glossy, 10 x 8 inches.

2.3-8B-C Photographic prints
Photographic copies [2] (almost identical) of 2.3-8. Glossy, 7 x 5 inches.

2.3-12A-B Photographic prints
Photographic copies [2] of 2.3-12. Copy A identical to "original" but somewhat larger. Copy B is same drawing but retitled and redated R. W. P. 1937 [original 1936]. Glossy, 6.5 x 4 5/8 inches.

2.3-13B-E Photographic prints
Photographic copies [4] of 2.3-13 and 2.3-13A but lacking inscriptions on reverse. B-C are matte, D is glossy, 7 5/8 x 7 7/8. E is glossy, 8 x 10 inches.

2.3-15A Photographic print (negative)
Photographic copy (white on black) of 2.3-15. 11 7/8 x 8.5 inches. [D. Harrington gift]

2.3-15B Photographic print (positive)
Photographic copy (black on white) of 2.3-15. 11 x 7 ¾ inches. [H. Holloway gift]

2.3-16A Photographic print (negative)
Photographic copy (white on black) of 2.3-16. 8.25 x 11 inches. [D. Harrington gift]

2.3-16B Photographic print (positive)
Photographic copy (black on white) of 2.3-16. 8.5 x 11 inches. [3-hole punched] [H. Holloway gift]

2.3-17A-C Photographic prints (oversize original)
Photographic copies [3] of 2.3-17. 13.25 x 9.5 inches (A-B); 10 x 8 inches, glossy (C).

2.3-18A-B Photographic prints (oversize original)
Photographic copies [2] of 2.3-18. A is glossy, 10 x 8 inches. B is matte, 7 3/8 x 9.75 inches.

2.3-20A-B Photographic prints
Photographic copies [2] (duplicates) of 2.3-20. A is 8 x 10 inches. B is 4.5 x 6 inches.

2.3-21A Photographic print
Copy of 2.3-21 reduced on large page, possibly intended as proof. 8 x 10.5 inches.

2.3-22A Photographic print
Photographic copy (duplicate) of 2.3-22. 4.75 x 6.5 inches.

2.3-26A Photographic print
Photographic copy (duplicate) of 2.3-26. 6.25 x 5 inches.

2.4-1A-C Photographic prints
Photographic copies [3] of 2.4-1, positive and negative. 11 x 10 inches.
[IN BOX 2 WITH ORIGINAL BECAUSE OF SIZE.]

2.4-2A-B Photographic prints
Photographic copies [2] of 2.4-2, positive and negative. 11 x 10 inches.
[IN BOX 2 WITH ORIGINAL BECAUSE OF SIZE.]

2.4-3A-C Photographic prints
Photographic copies [3] of 2.4-3, positive and negative. 10 x 11 inches.
[IN BOX 2 WITH ORIGINAL BECAUSE OF SIZE.]

2.4-4A-C Photographic prints
Photographic copies [3] of 2.4-4, positive and negative. 10.5 x 10 inches.
[IN BOX 2 WITH ORIGINAL BECAUSE OF SIZE.]

2.4-6A Photographic print (negative)
Photographic copy (white on black) of 2.4-6. 11 7/8 x 8.25 inches. [D. Harrington gift]

2.4-8A Photographic print
Identical photographic copy of 2.4-8. Color, glossy, 4.5 x 5 inches.

2.4-13A Photographic print

Photographic copy (duplicate) of 2.4-13. 5 x 3 inches.

2.5-2A Photographic print
Photographic copy of 2.5-2. Glossy, 10 x 8 inches.

2.6-6A Photographic print
Photographic copy of 2.6-6. Glossy, 10 x 8 inches.

3.1-1A Photographic print
Photographic copy of 3.1-1. 9.5 x 7.5 inches, with handwritten note: Fig. 8. Coelostat and Telescope Lens.

3.1-4A-D Photographic prints
Photographic copies [4] of 3.1-4. 10 x 6.5 inches (A-C) and 10.25 x 7 inches (D).

3.1-5A-B Photographic prints
Photographic copies [2] of 3.1-5. 7.5 x 9.25 inches. B has handwritten note: Fig. 9, Oscillating Slits of Spectrohelioscope.

3.1-6A Photographic print
Photographic copy of 3.1-6. 7.25 x 8.5 inches. Note on back: Fig. 24.

3.1-11A Photographic print
Photographic copy of 3.1-11. 7.5 x 9.25 inches.

3.1-12A Photographic print
Photographic copy of 3.1-12. 9.5 x 7.5 inches.

3.1-13A Photographic print
Photographic copy of 3.1-13. 8.25 x 7.5 inches.

3.1-14A Photographic print
Photographic copy of 3.1-14. 7.5 x 9 inches.

3.1-15A Photographic print
Photographic copy of 3.1-15 with added spectrum. 5.5 x 12 inches.

4.1-1A Photographic print
Photographic copy of 4.1-1. Glossy, 7 x 5 inches.

4.1-2A Photographic print
Photographic copy of 4.1-2. Glossy, 7 x 5 inches.

4.1-3A Photographic print
Photographic copy of 4.1-3. Glossy, 7 x 5 inches.

4.1-4A Photographic print
Photographic copy of 4.1-4. Glossy, 7 x 5 inches.

4.1-5A Photographic print
Photographic copy of 4.1-5. Glossy, 7 x 5 inches.

4.1-6A Photographic print
Photographic copy of 4.1-6. Glossy, 7 x 5 inches.

4.1-7A Photographic print
Photographic copy of 4.1-7. Glossy, 7 x 5 inches.

4.3-1A-E Photographic prints
Photographic copies [5] of 4.3-1. Glossy, 11 x 8.75 inches.

4.3-2A-D Photographic prints
Photographic copies [4] of 4.3-2. Glossy, 11 x 8.75 inches.

4.3-3A-D Photographic prints
Photographic copies [4] of 4.3-3. Glossy, 11 x 8.75 inches.

4.3-5A-E Photographic prints
Photographic copies [5] of 4.3-5 (oversize). Glossy, 8.75 x 11 inches.

4.4-2A Photographic print
Photographic copy of 4.4-2. Glossy, 8 x 10 inches.

4.4-7A Photographic print
Photographic copy (duplicate) of 4.4-7. Glossy, 11 x 8 5/8 inches.

MISCELLANEOUS PAPERS

Folder 1 Biographical material (including photo)

Folder 2 Notes and calculations, astronomical (by RWP)

Folder 3 Garden telescope (including photos)

Related collections:

Giants of Palomar Collection of Russell W. Porter Drawings of the 200-Inch Palomar Telescope; Russell W. Porter, Historical Files