

**Walter Sydney Adams Papers**  
**1881-1939**  
**Mss.B.Ad19**

American Philosophical Society  
2003  
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## Summary Information

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|-------------------------|--|
| <b>Repository</b>       | American Philosophical Society   |
| <b>Creator</b>          | Adams, Walter S. (Walter Sydney), 1876-1956  |
| <b>Title</b>            | Walter Sydney Adams Papers   |
| <b>Date [inclusive]</b> | 1881-1939  |
| <b>Call number</b>      | Mss.B.Ad19   |
| <b>Extent</b>           | 0.25 Linear feet   |
| <b>Location</b>         | LH-MV-C-1  |
| <b>Language</b>         | English  |
| <b>Abstract</b>         | <p>An expert in stellar spectroscopy, Walter Sydney Adams (1876-1956, APS 1915) made important empirical contributions to the analysis of the physical conditions of stellar and planetary atmospheres, determining the distances to extragalactic objects, and understanding stellar evolution. Adams succeeded his mentor George Ellery Hale as director of the Mount Wilson Observatory, serving in that capacity from 1923 to 1946. The Adams Papers contains approximately 100 letters addressed to the astronomer Walter Sydney Adams, dating primarily from the period after his move to Mount Wilson Observatory in 1904. Much of the correspondence is relatively perfunctory, however a few letters include interesting scientific content, including Harlow Shapley discussing his photometric study of HV 3435 and interest in Alpha Circini, Arthur Compton's comments on Keener's photoelectric method, Svante Arrhenius on the possibilities of constructing a new observatory for the Swedish Academy of Sciences, and Arthur Eddington discussing the implications of the spectrum of the companion to Sirius. Among Adams' other</p> |

correspondents are J. C. Kapteyn, James H. Jeans, Henry Norris Russell, Elihu Thomson, and Willem de Sitter.

**Preferred Citation**

Cite as: Walter Sydney Adams Papers, American Philosophical Society.

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## Background note

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Walter Sydney Adams (1876-1956, APS 1915), astronomer, explored the uses of spectroscopy, investigated sunspots and the rotation of the Sun, the velocities and distances of thousands of stars, and planetary atmospheres. Adams served as acting director and director of Mount Wilson Observatory from 1909 until 1946.

Walter Adams was born in the village of Kessab near Antioch in Northern Syria in 1876. His parents Lucien Harper Adams and Nancy Dorrance Francis Adams were missionaries under the American Board of Commissioners for Foreign Missions. The boy received his earliest education, which focused on theology, geography, history and the classics, at home. In 1885 the family moved to Derry, New Hampshire. There Adams attended first the local public school and then Pinkerton Academy, a private high school. When his father was sent back to Syria in 1890, Walter enrolled at St. Johnsbury Academy in northern Vermont. Due largely to health reasons, he subsequently spent a year on a Massachusetts farm. He then studied at Phillips Academy, Andover, where he deepened his knowledge of mathematics, physics, and chemistry. Upon graduation in 1894 he enrolled at Dartmouth College where he studied under the astronomy professor Edwin B. Frost (1866-1935, APS 1909), graduating in 1898.

In 1898 Frost accepted an invitation by George Ellery Hale (1868-1938, APS 1902) to take charge of the department of stellar spectroscopy at Yerkes Observatory in Williams Bay, Wisconsin, which had a 40 inch refractor, the largest refracting telescope in the world. Adams accompanied Frost to Chicago in order to gain practical experience and attend graduate school at the University of Chicago, where he studied celestial mechanics and learned practical astrophysical technique at Yerkes. At Chicago he studied under the astronomers Forest R. Moulton (1872-1952, APS 1916) and Kurt Laves (1866-1944), and the mathematician Oskar Bolza (1857-1942). At the Yerkes Observatory he worked closely with Hale and also with Frost, with whom he collaborated in a radial velocity program for stars of early spectral type. They found that many of the stars were spectroscopic binaries with large ranges in velocity.

In 1899 Adams published his first research contribution on "The polar compression of Jupiter." The following year he departed for Munich, Germany, to complete a Ph.D. under the astronomers Hugo von Seeliger (1849-1924) and Karl Schwarzschild (1873-1916), returning to Chicago in 1901 to become computer and general assistant at Yerkes and also taught astrophysics at Chicago.

In 1904 Hale invited Ferdinand Ellerman (1869-1940), George Willis Ritchey (1864-1945) and Adams to join him in the task of establishing a new observatory on Mt. Wilson in the hills above Pasadena in California, with funding from the Carnegie Institution. Adams accepted, and from 1904 to 1909, he served as Assistant Astronomer. He subsequently was acting director from 1909 to 1923, and director from 1923 to 1946. Adams worked closely with Hale in the planning and building of the observatory situated on the then barely accessible Mount Wilson, where equipment had to be carried up by burro. Construction of the 60-ft. solar tower telescope and 60-inch stellar telescope took nearly two years. Adams subsequently oversaw the completion of the 100-inch reflecting telescope and, late in his career, the 200-inch telescope at Mt. Palomar.

In addition to substantial administrative work, Adams continued to carry out studies on radial velocities. He made fundamental empirical contributions to understanding how and why spectra could be used to reveal the conditions of stellar atmospheres, helping to establish the means by which spectra could be used to discern the temperature, pressure, and density of stars. His spectroscopic observations also helped to confirm the presence of two fundamental classes of stars, giants and dwarfs. Furthermore, he and his colleague Arnold Kohlschütter (1883-1969) discovered the use of spectral parallax (a comparison of the intrinsic versus observed brightness of stars) in determining the distance to stars. Adams and Kohlschütter published their first joint paper on the spectroscopic method of determining a star's parallax in 1914, shortly before Kohlschütter had to return to Germany. In a number of papers written with other researchers, including Alfred H. Joy (1882-1973), Milton La Salle Humason (1891-1972), and Ada M. Brayton, Adams developed this method more fully. In recognition of his efforts, Adams was elected to the American Philosophical Society in 1915. In addition, he was awarded the Gold Medal of the Royal Astronomical Society in 1917, and the Draper Medal of the National Academy of Sciences in 1918.

In 1925, Adams reached the peak of public acclaim when his observation of the gravitational field around Sirius corroborated Albert Einstein's theory of relativity. In 1928 the Astronomical Society of the Pacific awarded Adams the Bruce Medal. Later in his career, he devoted his attention to the analysis of planetary atmospheres, reporting the presence of carbon dioxide on Venus in 1932 and trace amounts of oxygen on Mars in 1934. Furthermore, he used Doppler displacement to study the rotation of the sun.

After his retirement from Mt. Wilson in 1946, Adams worked as a research associate of the Carnegie Institute of Washington (1946-1948), and of the California Institute of Technology (1947-1948). He thus maintained a close working relationship with the observatory from its founding in 1904 to its merger with the Mt. Palomar Observatory in 1947.

Adams was the recipient of many awards and honors. In addition to the Gold, Bruce, and Draper Medals, he was awarded the Prix Janssen of the Société Astronomique de France (1926), and the Janssen Medal of the French Academy of Sciences (1935). In 1947 he was the Henry Norris Russell Lecturer of the American Astronomical Society. He received honorary degrees from Chicago, Columbia, Dartmouth, Pomona, Princeton, and Southern California. He was a Foreign Associate or Member of the Royal Astronomical Society (1914), the Royal Swedish Academy (1935), the Institut de France (1945), and the Royal Society (1950). In addition to the APS he was also a member of the National Academy of Sciences and served as president of the Astronomical Society of the Pacific (1923), of the American Astronomical Society (1931-1934), and of the Pacific Division of the American Association for the Advancement of Science (1929). He was Vice-President of the International Astronomical Union (1935-1948) and also acted as its General Secretary (1940-1945). A crater on Mars and minor planet #3145 were named after him.

In 1956 Adams died of cerebral thrombosis in Pasadena. He was twice married. His first wife Lilian M. Wickham died in 1922. He was survived by his second wife, Adeline Miller, and two children.

## Scope & content

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The Adams Papers contains approximately 100 letters addressed to the astronomer Walter Sydney Adams, dating primarily from the period after his move to Mount Wilson Observatory in 1904. Much of the correspondence is relatively perfunctory, however a few letters include interesting scientific content, including Harlow Shapley discussing his photometric study of HV 3435 and interest in Alpha Circini, Arthur Compton's comments on Keener's photoelectric method, Svante Arrhenius on the possibilities of constructing a new observatory for the Swedish Academy of Sciences, and Arthur Eddington discussing the implications of the spectrum of the companion to Sirius. Among Adams' other correspondents are J. C. Kapteyn, James H. Jeans, Henry Norris Russell, Elihu Thomson, and Willem de Sitter.

Two letters in the collection deal specifically with instrumentation: H. Spencer Jones complains of the problems in the manufacture of optical glass in the post-World War I period, and Elihu Thomson writes about his manufacture of quartz disks and tubes. Typically, a few of the letters include interesting personal details. In addition to Edwin B. Frost's recommendation for a fellowship at the University of Chicago when Adams was a graduate student there, the collection includes a fine, long letter from Russell describing his trip in the Middle East, and Adams' correspondence with English colleagues during the First World War provides a glimpse of the stress on astronomical research in England and on Anglo-American relations.

## Administrative Information

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### Publication Information

American Philosophical Society 2003

## Provenance

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### Acquisition Information

Acquired from Mary Benjamin, April 1966 (accn. no. 1966-545ms).

### Processing Information

Recatalogued by rsc, 2004.

## Related Materials

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### Related Material

The largest collection of the papers of Walter Sydney Adams is housed at the Huntington Library, San Marino, Calif., which also holds a substantial archive of material relating to the Mount Wilson Observatory. Hale is a major correspondent in the papers of Edwin Frost (Yerkes Observatory) and Henry Norris Russell (Princeton).

The Niels Bohr Library at the American Institute of Physics has 10 pages of autobiographical notes by Adams, 1954, an oral history with him regarding the early days at Mount Wilson Observatory, and a tape recording of the Fiftieth Anniversary dinner for Adams at Mount Wilson, 1954.

The Printed Materials Department houses several works by Adams, including: Frost, Edwin Brant and Walter Sydney Adams. *Radial Velocities of Twenty Stars Having Spectra of the Orion Type* (Chicago: University of Chicago, 1903). **Call no.:** 378.773 C43M.Adams, Walter Sydney. *An Investigation of the Rotation Period of the Sun by Spectroscopic Methods* (Washington: Carnegie Institution, 1911).

**Call no.:** 506.73 C21p no.138.Adams, Walter Sydney. *The Sun's Place Among the Stars* (Washington: Smithsonian, 1936). **Call no.:** 506.73 Sm6an 1935.Adams, Walter Sydney. *What Lies Between the Stars* (Washington: Smithsonian, 1942). **Call no.:** 506.73 Sm6an 1941.

## Indexing Terms

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## Corporate Name(s)

- Mount Wilson Observatory.

## Personal Name(s)

- Arrhenius, Svante, 1859-1927
- Bush, Vannevar, 1890-1974
- Compton, Arthur Holly, 1892-1962
- Dyson, Frank Watson, 1868-1939
- Eddington, Arthur Stanley, Sir, 1882-1944
- Frost, Edwin Brant, 1866-1935
- Hale, George Ellery, 1868-1938
- Jeans, James Hopwood, Sir, 1877-1946
- Jones, H. Spencer, (Harold Spencer), 1890-
- Kapteyn, J. C. (Jacobus Cornelius), 1851-1922
- Newall, Hugh Frank, 1871-
- Russell, Henry Norris, 1877-1957
- Shapley, Harlow, 1885-1972
- Slipher, V. M.
- St. John, Charles Edward, 1857-1935
- Thomson, Elihu, 1853-1937
- Turner, H. H. (Herbert Hall), 1861-1930

## Subject(s)

- Astronomical spectroscopy.
- Astronomy
- World War, 1914-1918

## Bibliography

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Joy, A. H. "Walter Sydney Adams," *Biographical Memoirs of the National Academy of Sciences* 31 (1958): 1-31.

## Walter Sydney Adams Papers

## Collection Inventory

| Walter Sydney Adams Papers  |              | Box 1         |
|---|--------------|---------------|
| Breakfast complimentary to Prof. Richard A. Procter   | 1881 April 9 | Pr. Menu, 1p. |
| Autographs of attendees on verso.   |              |               |
| <b>Frost, Edwin Brant, 1866-1935</b><br>To W. R. Harper   | 1899 Feb. 24 | ALS, 3p.      |
| Recommending Adams for fellowship.  |              |               |
| <b>Newcomb, Simon</b><br>To Walter Sydney Adams   | 1901 June 18 | ALS, 1p.      |
| <b>Hale , George Ellery, 1868-1938</b><br>ALS to Walter Sydney Adams  | 1908 Mar. 12 | ALS, 1p.      |
| Includes card from James A. Ward, sculptor, glued to verso.   |              |               |
| <b>Kapteyn, J. C. (Jacobus Cornelius), 1851-1922</b><br>To Walter Sydney Adams  | 1911 June 28 | ALS, 3p.      |
| <b>Kapteyn, J. C. (Jacobus Cornelius), 1851-1922</b><br>To Walter Sydney Adams  | 1911 Dec. 6  | ALS, 3p.      |
| Thanks for the radial velocities; I anxious for better information on A stars. Sends list of all stars to magnitude 9 <sup>0</sup> within 15 to the pole. |              |               |
| <b>Gates, Henry C.</b><br>To Ferdinand Ellerman   | 1913 Mar. 25 | TLS, 1p.      |
| <b>Julien, W. H.</b>  | 1914 July 21 | ALS, 4p.      |

## Walter Sydney Adams Papers

To Charles E. St. John

Re: spectroscopic observations and theory.

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|                        |               |          |
|------------------------|---------------|----------|
| <b>Plummer, H. S.</b>  | 1914 Sept. 23 | ALS, 1p. |
| To Walter Sydney Adams |               |          |

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|                        |              |          |
|------------------------|--------------|----------|
| <b>Turner, H. H.</b>   | 1917 Jan. 12 | ALS, 2p. |
| To Walter Sydney Adams |              |          |

Congratulations on receiving the Gold Medal.

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|                                  |              |          |
|----------------------------------|--------------|----------|
| <b>Newall, Hugh Frank, 1871-</b> | 1917 Jan. 14 | ALS, 1p. |
| To Walter Sydney Adams           |              |          |

Congratulations on receiving the Gold Medal.

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|  |             |          |
|--|-------------|----------|
| <b>Dyson , Frank Watson, 1868-1939</b> | 1917 Feb. 8 | ALS, 2p. |
| To Walter Sydney Adams                 |             |          |

Congratulations on receiving the Gold Medal.

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|                          |              |          |
|--------------------------|--------------|----------|
| <b>Aitken, Robert G.</b> | 1917 Feb. 15 | ALS, 1p. |
| To Walter Sydney Adams   |              |          |

Congratulations on receiving the Gold Medal.

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|                        |              |          |
|------------------------|--------------|----------|
| <b>Turner, H. H.</b>   | 1917 Feb. 27 | ALS, 2p. |
| To Walter Sydney Adams |              |          |

"The distraction of the war is serious... It is overdue that our cousins over the water should join us in stamping on this mad dog -- terribly strong & terribly mad."

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|  |              |          |
|--|--------------|----------|
| <b>Kapteyn, J. C. (Jacobus Cornelius),<br/>1851-1922</b> | 1917 Mar. 26 | ALS, 2p. |
| To Walter Sydney Adams                                   |              |          |

Congratulations on receiving the Gold Medal.

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|  |              |          |
|--|--------------|----------|
| <b>Dyson , Frank Watson, 1868-1939</b> | 1917 Dec. 28 | ALS, 4p. |
| To Walter Sydney Adams                 |              |          |

## Walter Sydney Adams Papers

"If this war induces the same friendly feelings between Americans & Englishmen generally as exist and have existed over now for some time between the Astronomers of the two countries it will not have been altogether in vain. However, we hope for more than that. I am convinced that if only a democratic government could arise in Germany there would before many years be an era of goodwill. Unfortunately the prospect does not seem very near..."

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**Jeans, James Hopwood, Sir, 1877-1946**      1918 Jan. 1      ALS, 4p.  
To Walter Sydney Adams

Certainly is rotation in Andromeda, "am inclined to think the numbers probably represent a linear law corresponding to a rigid body rotation."

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**Turner, H. H.**      1918 Jan. 1      ALS, 3p.  
To Walter Sydney Adams

Foresees tough year with the war, Germany having the advantage, but "the U.S. are very, very welcome now."

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**Campbell, W. W.**      1918 Apr. 10      TLS, 1p.  
To Walter Sydney Adams

Seeking lantern slide of the Andromeda nebula showing the new stars discovered at Mount Wilson.

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**Pickering, William H.**      1919 Mar. 22      ALS, 1p.  
To Walter Sydney Adams

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**Kapteyn, J. C. (Jacobus Cornelius),**      1919 July 25      ALS, 1p.  
**1851-1922**  
To Walter Sydney Adams

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**Turner, H. H.**      1919 Aug. 1      ALS, 2p.  
To Walter Sydney Adams

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**Jones, H. Spencer, (Harold Spencer),**      1919 Aug. 7      ALS, 4p.  
**1890-**  
To Walter Sydney Adams

Problems in obtaining optical glass since the war; flint glass (re: firms Wood and Derby, Chance).

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## Walter Sydney Adams Papers

|  |              |          |
|--|--------------|----------|
| <b>Newall, Hugh Frank, 1871-</b><br>To Walter Sydney Adams   | 1919 Aug. 12 | ALS, 1p. |
| <b>Wood, R. W.</b><br>To Ferdinand Ellerman  | 1919 Nov. 10 | PC, 1p.  |
| <b>Hale, George Ellery, 1868-1938</b><br>Address at the retirement of Dr. Woodward   | 1920         | TMS, 2p. |
| <b>Sliphen, V. M.</b><br>To Charles E. St. John<br><br>Re: high dispersion spectra and the atmosphere of Venus.  | 1921 July 15 | TLS, 1p. |
| <b>Arrhenius, Svante, 1859-1927</b><br>To George E. Hale<br><br>Possibilities for building a new observatory for the Swedish Academy of Sciences.  | 1922 July 9  | ALS, 1p. |
| <b>Thomson, Elihu</b><br>To Walter Sydney Adams<br><br>Re: production of quartz disks and quartz tubing.   | 1922 Aug. 3  | TLS, 2p. |
| <b>Gregory, R. A.</b><br>To Walter Sydney Adams<br><br>Editorial duties at <i>Nature</i> prevent him from concentrating exclusively on any one science.  | 1922 Dec. 3  | ALS, 2p. |
| <b>Shapley, Harlow, 1885-1972</b><br>To Walter Sydney Adams<br><br>Will soon complete photometric study of HV 3435 and are now interested in Alpha Circini and similar objects because of the ionized strontium lines and low temperature calcium lines. | 1924 Feb. 4  | TLS, 1p. |
| <b>Schlesinger, Frank</b><br>To Walter Sydney Adams<br><br>Regarding his publication of spectroscopic parallaxes.  | 1924 Feb. 5  | TLS, 1p. |

## Walter Sydney Adams Papers

|   |              |          |
|---|--------------|----------|
| <b>Eddington, Arthur Stanley, Sir,<br/>1882-1944</b>  | 1924 Feb. 6  | ALS, 2p. |
| To Walter Sydney Adams  |              |          |
| Regarding implications of the spectrum of the companion of Sirius.  |              |          |
| <b>Jeans, James Hopwood, Sir, 1877-1946</b>   | 1924 May 29  | TLS, 1p. |
| To Walter Sydney Adams  |              |          |
| Will visit in early September at Hubble's invitation. Jeans will have wife and child with him, "but they will not interfere in any way with astronomical activities." |              |          |
| <b>Pritchett, Henry S., (Henry Smith),<br/>1857-1939</b>  | 1924 July 7  | ALS, 2p. |
| To Walter Sydney Adams  |              |          |
| <b>Birkhoff, George David, 1884-1944</b>  | 1924 Oct. 4  | ALS, 2p. |
| To Walter Sydney Adams  |              |          |
| <b>Day, Arthur L.</b>   | 1924 Oct. 13 | TLS, 1p. |
| To Walter Sydney Adams  |              |          |
| <b>Sitter, Willem de</b>  | 1925 Jan. 24 | ALS, 1p. |
| To Walter Sydney Adams  |              |          |
| The lecture he gave at Princeton on the size of the universe will be published in the publications of the Astronomical Society of the Pacific.                        |              |          |
| <b>Abbot, C. G.</b>   | 1925 Jan. 26 | TLS, 1p. |
| To Walter Sydney Adams  |              |          |
| Smithsonian engaged in million dollar endowment drive.  |              |          |
| <b>Hale , George Ellery, 1868-1938</b>  | 1927 Sept. 8 | ALS, 1p. |
| To Walter Sydney Adams  |              |          |
| Frost wants 12 inch Kenwood reflective retruned.  |              |          |
| <b>Hale , George Ellery, 1868-1938</b>  | ca.1927      | LS, 1p.  |

## Walter Sydney Adams Papers

To Walter Sydney Adams

Congratulations on birth of their child.

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**Russell, Henry Norris, 1877-1957** 1930 Mar. 21 ALS, 4p.

To Walter Sydney Adams

Good news about Mount Wilson. Account of trip to Middle East.

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**Hale, George Ellery, 1868-1938** 1930 Oct. 24 PC, 1p.

To Walter Sydney Adams

Thanks for the roses.

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**Newall, Hugh Frank, 1871-** 1935 June 5 ALS, 1p.

To Walter Sydney Adams

Invitation to dinner.

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**Jeans, James Hopwood, Sir, 1877-1946** 1937 Nov. 11 TLS, 1p.

To T. Spicer-Simson

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**Escanglon, S. (Observatoire de Paris)** 1938 Jan. 8 ALS, 1p.

To Walter Sydney Adams

In French. Thanks for the letter of Mrs. Adams.

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**Compton, Arthur Holly, 1892-1962** 1938 Feb. 28 ALS, 3p.

To Walter Sydney Adams

Doubts about whether Keener's photoelectric method will supplant the photographic method, but it has the merit of quantifying intensity.

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**Newall, Hugh Frank, 1871-** 1938 May 19 ALS, 2p.

To Walter Sydney Adams

Death of George E. Hale.

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**Eddington, Arthur Stanley, Sir, 1882-1944** [1938] AMs, 2p.

**Walter Sydney Adams Papers**

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Address to the members of the International  
Astronomical Union

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**Bush, Vannevar, 1890-1974**

1939 Oct. 12

TLS, 1p.

To Walter Sydney Adams

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**Milne, E. A.**

ALS, n.d.

1p. (inc.)

To unidentified recipient

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