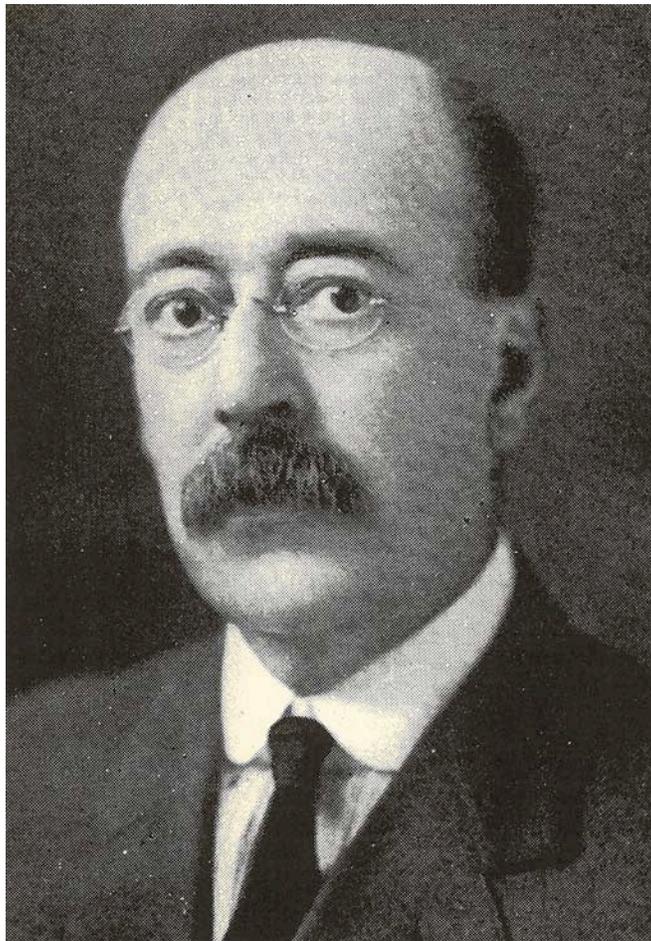


HISTORY  
*of the*  
RITTENHOUSE  
ASTRONOMICAL  
SOCIETY  
1888 – 1960



**Mr. Edmund Elliot Reed, Jr.**  
*Founder and First President*

THE  
RITTENHOUSE ASTRONOMICAL  
SOCIETY

Philadelphia – Pennsylvania

A History of the Society from  
1888 – 1960

*by*

Cecil M. Billings  
*President 1954 – 1955*

*“This being made, He yearned for worlds to make  
From other chaos out beyond our night –  
For to create is still God’s prime delight.  
The large moon, all alone, sailed her dark lake,  
And the first tides were moving to her might;  
Then Darkness trembled, and began to quake  
Big with the birth of stars, and when He spake  
A million worlds leapt into radiant light.”*

*Llyod Mifflin*

## ACKNOWLEDGMENTS

In the pages that follow, we present the History of the Rittenhouse Astronomical Society. The information recorded herein was obtained in part from the minutes of the Society dating back to 1915, old living members, relatives, and the intimate friends of those prominently identified with the important affairs of the Society

We wish especially to thank Mr. Edwin F. Bailey, Astronomy Department of the Franklin Institute, for his encouragement during the research period, and his valued suggestions in the preparation of the history, and to Miss Luba Shapiro, our Secretary who typed the entire history. Our thanks also to Mr. Newman S. Shirk and Miss Marian A. Russo for their cooperation in printing this history.

We are also deeply indebted to the following who cooperated so earnestly by loaning photographs, furnishing biographies, and other material, without which this history could not have been written:

Mrs. Alice D. Allen, Hollis, L.I., New York; Miss Helen H. Babb, Swarthmore, Pennsylvania; Mrs. William Barton, McConnellsburg, Pennsylvania; Mr. E. Warren Bowden, New York City; Miss Florence A. Hoadley, Swarthmore, Pennsylvania; Miss Mildred Dupuy Janke, Moorestown, New Jersey; Mr. Fred W. Knipe, State College, Pennsylvania; Mr. James L. Knipe, Lancaster, Pennsylvania; Professor Norman Margang, Baptist Seminary, Philadelphia, Pennsylvania; Miss Helen Norton, Bennington, Vermont; Mrs. Howard F. Pitman, Philadelphia, Pennsylvania; Mrs. John H Pitman, Swarthmore, Pennsylvania; Mr. Walter M. Read and Dr. Edmund J. Read of Camden, New Jersey; the Reverend Joseph C. Robbins, First Baptist Church, Bennington, Vermont; Mrs. Jonathon T. Rorer, Philadelphia, Pennsylvania; Mrs. George Rosengarten, Brookline, Pennsylvania; Miss Elizabeth Rumrill, Berwyn, Pennsylvania; Mrs. H. Ross Smith, Lansdowne, Pennsylvania; Mrs. Elsa Isabell Wardwell, Woodbury, New Jersey.

Camden Fire Insurance Association, Camden New Jersey; First Camden National Bank, Camden New Jersey; Esterbrook Pen Company, Camden, New Jersey.

Cecil M. Billings  
November 14, 1959

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## EARLY HISTORY

The Rittenhouse Astronomical Society with headquarters at The Franklin Institute, Philadelphia, Pennsylvania is one of the oldest amateur groups in America, devoted to the study and advancement of astronomy.

It had its beginning as the Camden Astronomical Society in Camden, New Jersey, where it was incorporated and registered with the County of Camden, State of New Jersey on April 3, 1888. A copy of the certificate of incorporation follows:

### THE CAMDEN ASTRONOMICAL SOCIETY

Know all men by these presents that we Edmund E. Read Jr., Augustus Dupuy, Charles Bowden all of the City and County of Camden, and the State of New Jersey and R. M. Luther and Oscar Knipe of the City of Philadelphia and State of Pennsylvania do hereby associate ourselves into a company or association or society to be known as "The Camden Astronomical Society" and to that end we do by this our certificate set forth:

First: That the name which we have assumed to designate such society is "The Camden Astronomical Society."

Second: That the place where the meetings of this society are to be held and all business in relation to it be transacted is in the City of Camden aforesaid and that the object for which this society is formed is to engage in Astronomical work, purchase the necessary instruments for the proper pursuit of astronomical studies shall require.

Third: That the total amount of the Capital Stock of the said Association is Fifteen Hundred Dollars the number of shares into which the same is divided is Fifteen and the par value of each share is One hundred dollars. The amount with which said Association will commence its work is the said sum of Fifteen hundred dollars.

Fourth: The names and residences of the Stockholders and the number of shares held by each are as follows:

Edmund E. Read, Jr.	Camden	New Jersey	Eight shares
Augustus Dupuy	Camden	New Jersey	Two shares
Charles Bowden	Camden	New Jersey	Two shares
R. M. Luther	Philadelphia	Pennsylvania	Two shares
Oscar Knipe	Philadelphia	Pennsylvania	One Share

Fifth: The period at which said association shall begin is the First day of April A.D. 1888.

Signed and Sealed in the presence of

T. F. Boardman	)	Edmund E. Read, Jr.	(L.S.)
As to Read, Dupuy	)	A. B. Dupuy	(L.S.)
And Bowden	)	Chas. Bowden	(L.S.)
Rene Guillou	)	R.M. Luther	(L.S.)
As to Luther and	)	O. Knipe	(L.S.)
Knipe	)		
State of New Jersey	)		
Camden County	) ss.		

Be it remembered that on this twenty third day of March, in the year of our Lord one thousand eight hundred and eighty-eight, before me the subscriber, a Commissioner of Deeds of New Jersey, personally appeared Edmund E. Read, Jr., Augustus Dupuy, and Charles Bowden three of the signers of the aforesaid certificate of organization who I am satisfied are the persons named therein and having been made acquainted with the contents of the said certificate acknowledged that they signed, sealed and delivered the same as their voluntary act and deed. All of which is hereby certified.

T.F. Boardman  
Commissioner

State of Pennsylvania)  
County of Philadelphia) <sup>ss.</sup>

Be it remembered that on this Twenty ninth day of March in the year of our Lord one thousand eight hundred and eighty-eight, before me the subscriber a Commissioner of Deeds for the State of New Jersey, personally appeared R. M. Luther and Oscar Knipe, who I am satisfied are the persons named in the foregoing certificate of organization and the contents thereof having been made known to them they acknowledged that they signed, sealed and delivered the same as their voluntary act and deed. All of which is hereby certified.

(L.S.)

Rene Guillou  
Commissioner of Deeds for  
New Jersey

Received and recorded  
April 3, 1888,

E. Burrough  
Clerk.

The certificate of incorporation shows that fifteen shares of capital stock were issued, with a par value of one hundred dollars a share. The five charter members bought the entire issue. The money was used to buy certain astronomical instrument sand equipment, some of which are mentioned in Mr. Dupuy's letter on pages *(see future release)*

The founder and moving spirit of the Camden Astronomical Society was Mr. Edmund Read, Jr., a prominent businessman and native of Camden, New Jersey. He was the first president of the Society, holding that office for thirty-five years, from January 9, 1889 to his death on August 7, 1923.

Regular meeting sin the early days of the Society were informal and were held only three or four times a year, and convened at the discretion of the President. Attendance averaged eight to ten members. What the membership and meetings lacked in the number was made up in quality, as the subjects discussed and biographies of these men testify.

For thirty-five years most meetings were held at the imposing three-story house of President Read at 604 Cooper Street, Camden, New Jersey shown in the photos on pages *(see future release)* In effect this house was the only home of the Society during Mr. Read's

lifetime. This historic headquarters was torn down in 1944 to make room for drive-in facilities of The First National Bank and Trust Company of Camden.



*Cooper St., Camden, N.J. about 1900 – Arrow indicates Mr. Reed's home.*



*First National Bank and Trust Company in course of construction year 1928.  
Arrow shows Mr. Reed's home at 604 Cooper St.*

When the business of the meetings had been transacted and the papers read and discussed, refreshments were served. Social and intellectual intercourse then prevailed for the remainder of the evening. In fact, the collations, the exchange of ideas, and the good fellowship experienced at these infrequent meetings were high on the agenda in importance. This type of meeting was continued during Mr. Read's presidency of thirty-five years and for a few years thereafter.

It is unfortunate that minutes of the meetings prior to October 13, 1915 were either lost or destroyed. ON that date a meeting was held at Mr. Read's residence at 604 Cooper Street, Camden, New Jersey. The following members were present: Messrs. Barton, Bryan, Collins, Dolman, C. L. Doolittle, Euberg d'Auria, Goldsmith, Hallett, Hoadley, Mason, Matos, Partridge, Shelley, Skidmore, Smith, Whitaker, and Williams.

The minutes of this meeting are significant in that discussion took place concerning the desirability of continuing the meetings. Fortunately the general sentiment to continue the meetings prevailed. Otherwise, The Camden Astronomical Society would possibly have closed its career then and there. All those that were present except three agreed to contribute papers from time to time.

Great credit is due Mr. Read for his inspiring leadership in keeping the Society active. He was a man of exceptional talents and culture. In addition to his lifelong interest in astronomy and science, he was an outstanding individual in his home community, both in business and financial circles. For more than twenty years he gave unstintingly of his time and energy to the advancement of educational and civic affairs of Camden and the State of New Jersey.

During Mr. Read's presidency most of the contemporary greats in American astronomy, many of who later became active members in the Society, lectured before his group. Mr. Read labored untiringly in his efforts to make The Camden Astronomical Society one of attainment and distinction.

One of our former distinguished presidents, the late H. B. Rumrill, found a letter from Augustus Dupuy printed in an old publication of the Astronomical Society of the Pacific and dated May 31, 1890. The letter was read by Mr. Rumrill at a meeting of the Rittenhouse Astronomical Society in the fall of 1933.

This most interesting and informative letter is not found in the minutes of that year, but a copy was made available to us by his daughter, Miss Elizabeth F. Rumrill of Berwyn, Pennsylvania, who found it in one of the astronomical journals kept by her father during his lifetime. We are grateful to Miss Rumrill for a copy of Mr. Dupuy's letter which we quote as follows:

In the fall of 1888, I was persuaded to purchase an old reflector. After setting it up in my backyard, I invited some of my friends to call and examine it. Among them were Mr. E. E. Read, Jr., our President, and Mr. Charles Bowden. Mr. Read was the possessor of a three-inch glass of French make, considered very fine, and Mr. Bowden of a four-inch, by Fitts. After seeing through my "cannon," as they were pleased to call it, Mr. Read became dissatisfied with his smaller glass, and determined to purchase a large one. It was subsequently proposed that we should form ourselves into a society, and that we should build and thoroughly equip an observatory for the use of the members.

On the 9<sup>th</sup> of January, 1889, we held our first meeting, with five members present. Mr. Read was elected President and myself Secretary. We appointed committees on the observations of the sun, moon, stars planets, and nebulae. These committees make reports (verbal) at each quarterly meeting, and a written report each year of the work done during that time.

Our instruments are as follows: The observatory, owned by Mr. Read containing a 5 1/2 – inch refractor, mounted on an equatorial stand, with driving clock and circles complete, by Cooke; sidereal clock; chronograph; two-inch transit; spectroscope; and electric illumination for circles. My own outfit consists of a 9 1/2 inch reflector; Dr. R. M. Luther, a three-inch refractor; Professor F. P. Leavenworth at Haverford, has a two-inch Clack refractor; H.H. Furness, Jr., has a complete observatory, covering 4 1/2 – inch refractor.

We now have fourteen members, most of whom have telescopes ranging from three to six inches aperture.

As to our work: Mr. Read makes regular observations of the sun, noting all spots, determining their position, and making drawings of all prominences. Mr. Furness is occupied with the same work. Professor Leavenworth devotes himself to double star measurements. Mr. Hewitt, one of our members living at Burlington, New Jersey, will shortly have mounted an excellent six-inch glass by Grubb. I am at work on the moon, and have made about two dozen negatives, which, although very inferior, are showing signs of improvement.

In conclusion, I will say that we are all being greatly benefited by our association; and although our growth is slow, compared with that of our friends of the Astronomical Society of the Pacific, we are gradually getting in a condition to do some real work in the future

Signed

A.B. Dupuy

(See Dupuy's letter to astronomer Elger on pages *(see future release)*)

Also of interest is an excerpt from a letter by Mr. Rumrill, dated March 5, 1938 to Dr. H. V. Gummere, former President of Rittenhouse which we quote below:

March 5, 1938

Dear Doctor Gummere:

In the old catalogues of James W. Queen and Co. there was a picture of the spectroscope which they furnished the Camden Astronomical Society. This was a source of enthusiasm to me when constructing my first refractor of 2 1/2 – inches aperture, with which I made some interesting observations. That was in 1889, following the reading of Langley's "The New Astronomy."

It would be interesting, incidentally, to learn something of what became of the old instruments mentioned by Mr. Dupuy. We do know that Mr. Read's telescope and spectroscope were badly injured by boyish thieves who broke into his observatory in order to steal the brass in the instruments. Mr. Quimby told me of this horrible escapade.

I will that our Society might follow up the idea of having committees on observation, although comparatively few of our members possess telescopes

Very sincerely yours,  
H. B. Rumrill

Early records of the Camden Astronomical Society show that members were asked to give lectures from time to time on subjects of their choosing. Usually of a scientific or philosophical character, many were not specifically related to astronomy. Here are a few taken from the minutes:

January 12, 1916	“Biological Evidence on the Cause of the Glacial Period” by James M Shelley
April 12, 1916	A – “Myths on the Personification of Natural Phenomena – Sampson, Johan, and Jephthah” B – “Religious Astronomical Conceptions” C – “The Desire of Man to Know More About Space and Time” all by Edmund E Read, Jr.
October 26, 1916	“The Astronomy of Shakespeare” by John M Enburg
January 25, 1917	“The Physical Theory of Relativity” by Dr. Edward A. Partridge
November 22, 1917	“Some Observations on Current Education” by Dr. Jonathan T. Rorer. “Hebrew Myths” by Dr. Herbert C Whitaker
January 22, 1918	“The Calendar” by Rev. Walter A Matos
May 15, 1918	“The Work of the Committee on Public Safety” by Prof. H. V. Gummere.
April 24, 1919	“The Atmosphere of the Earth” by Prof. G. A. Hoadley
November 13, 1919	“The Development of the science of Optics” by Dr. Edward A Partridge
January 14, 1920	“The Gyroscope Compass” by John F Roeske.
November 10, 1920	“Precision Measurements” by Max Levy
October 12, 1922	“Educational Policy” by Dr. H. Ross Smith “Conditions in France and Belgium – Summer of 1922” by Emil P. Albrecht

BEAUMONT HOUSE  
SHAKESPEARE ROAD  
BEDFORD.

1891 October 8.

Dear Sir,

In reply to your letter - I am  
unable to satisfactorily <sup>identify all</sup> the objects  
you observed, 1891, Sept. 20<sup>th</sup> 12<sup>h</sup>, with  
your  $9\frac{1}{2}$  in. Newtonian. The two  
objects casting long spires of shadow  
south of A occupy the position of  
Peirce, but you do not show this  
wing itself. Schmidt shows a crater  
& central mound in this, both of  
which I have seen with my

$8\frac{1}{2}$  in. Calver-Reflector & I doubt  
not that under good conditions  
they might be seen with smaller  
apertures - say a 5 in. Refractor.

I cannot speak with certainty  
as to the height of the objects in  
question (both of which seem to be  
Crater-cones) but <sup>they are</sup> certainly not less  
than 400 feet. While those in A  
are of course proportionately less.

If these pertain to Peirce A, they  
are new to me & must be peaks on

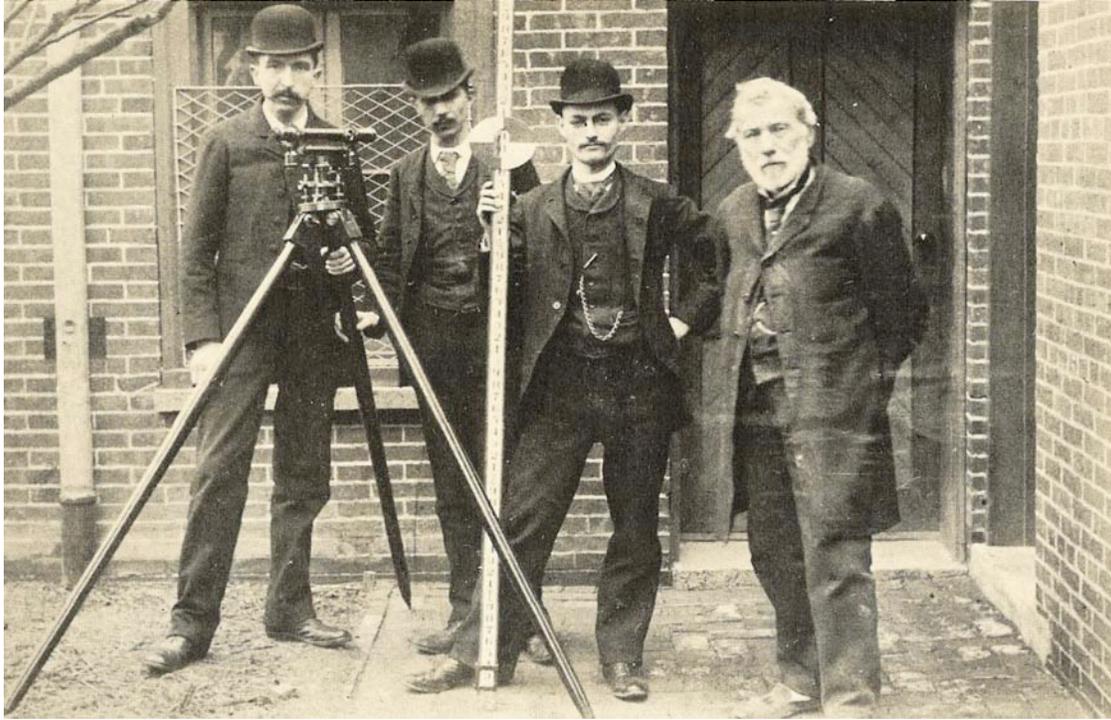
<sup>of Peirce A.</sup>  
the wall. Thinking that possibly  
you do not possess Schmidt's map  
I enclose a tracing from it of a  
portion of the Mr. Crisium which  
may help you to identify what you  
saw. The only sketch in  
my possession which bears any  
resemblance to yours is Schaefer's, made  
nearly a century ago - a rough copy of  
which I annex. I will  
take an early opportunity  
of endeavouring to verify  
your observation.



I remain  
Yrs very truly,  
Thomas Gwyn Elger

Mr A. B. Depuy  
Camden N. Jersey U.S.A

Letter to Augustus B. Depuy from Astronomer Thomas Gwyn Elger



*Augustus Depuy, two workmen and Depuy's Uncle Charles H. Brightly, the instrument maker in front of his shop on 16<sup>th</sup> Street, Philadelphia, Pa. In 1891.*

QUEEN & CO., INC., PHILADELPHIA

## SOLAR AND STELLAR SPECTROSCOPE



DIFFREACTION GRATING SPECTROSCOPE,  
AS MOUNTED FOR THE  
ASTRONOMICAL SOCIETY OF CAMDEN, N. J.



*Rev. Charles Bowden and his 4" Fitz Telescope in yard of home at Camden, New Jersey*

Dr. Jonathon T. Rorer one of the very early and prominent members of the Rittenhouse Society and its President in 1935, gave a paper before the old Camden Society on October 8, 1913, entitled, "The Beginnings of Astronomy in America" which, because of its historical value and interest, we reproduce for your information and pleasure.

## THE BEGINNINGS OF ASTRONOMY IN AMERICA

By J. T. Rorer, Philadelphia, Pa.

American astronomy as we have it today is a product of the nineteenth century, in fact of the latter half of that century. While England from the time of Newton, and France from the time of the Cassinis, were taking an active part in the development of the science, this country was in its infancy, and the stern duties that faced the colonists were not conducive to the investigations of the laws of nature. The foundations of the Republic were being laid and the genius and means of the country were almost exclusively occupied on questions of state.

It is the object of this paper to trace the development of astronomical interest in the colonies, to call to mind the pioneers of our craft, and to follow the rise of the older observatories down to the middle of the last century.

How interesting to read that astronomy was taught at Harvard, at Yale, at the College of Philadelphia, and at William and Mary, from the earliest days! Among the "first fruits of Harvard" was one "godly Mr. Samuel Danforth, who hath not only studied Divinity but also Astronomy." John Sherman and Uriah Oaks were also makers of almanacs. Gassendi's "Astronomy" was the text book used at Harvard even forty years after the publication of the "Principia." Gassendi's text contained strange theories of planetary motion, stating it to be due to certain fibers which acted like the muscles of animals.

In 1726 the Hollis Professorship of Mathematics and Natural Philosophy was founded at Harvard. Isaac Greenwood, John Winthrop, Samuel Williams, and Samuel Webber, who successively occupied this chair, all made astronomical contributions to the "Philosophical Transactions" and to the Memoirs of the American Academy. These papers consist principally of observations of lunar and solar eclipses, latitude and longitude calculations, and occasionally a transit. Greenwood is noteworthy as the author of the first American Arithmetic, but it is regrettable that this first professor of Mathematics and Astronomy in the oldest American college was dismissed for drunkenness in 1738.

Along with these New England worthies may be mentioned also Thomas Godfrey, of Philadelphia, a glazier by trade, who had the reputation of being a great mathematician. He read the "Principia" in Latin, and is noted for his improvement to the quadrant. Franklin describes him as "one of the first members of the famous Junto, a self-taught mathematician, great in his way, and afterward the inventor of what is not called Hadley's quadrant."

Then there was Benjamin Banneker, of Maryland, a self-taught Negro astronomer and philosopher. He used Tobias Mayer's "Tables," Ferguson's "Astronomy" (based on Newton's "Principia"), and Leadbetter's "Lunar Tables" to calculate almanacs which Thomas Jefferson and David Rittenhouse highly commended.

Other such men might be mentioned, but we will pass on to the giants of those time – Franklin, Winthrop, and Rittenhouse. Although even these men did not contribute to astronomical knowledge in the magnificent way that Newton, Halley, or Bradley did, yet their immediate influence upon their fellow countrymen was perhaps more stimulation than was that of those able foreign astronomers.

It seems unfortunate that Franklin did not give more attention to astronomy. While he solved many problems in physics, and gave them practical application, there seems to be no evidence of much interest in astronomy. "He drew the lightning from the clouded sky," but the clear heavens seem to have had little fascination for him. In his letters to various persons, however, there are passages relating to comets and sunspots, and to Hershel's recent discoveries, and on his voyages he helped the captain to find his position by lunar observations.

In a paper before the American Philosophical Society, September the twenty-second, seventeen hundred and eighty-two, Franklin expressed his views as to the origin of the globe. The particles of the earth were originally mixed in confusion, occupying a great space. A fiat of the Almighty ordained gravity, and all the particles sought a common center. Shells of matter of varying densities were formed, the lighter matter on the outside, the heavier on the inside. The motion toward the center produced a rotation on an axis.

Franklin investigated meteorological conditions to a great extent, and made several contributions to existing knowledge on these subjects.

In 1743, he formulated plans for the founding of the American Philosophical Society. Its meetings were discontinued after ten years of struggling existence. It was subsequently resuscitated (1767), and in 1769, the "American Society for Promoting Useful Knowledge" united with it, Franklin being chosen President, and remaining so until his death in 1791. This society deserves mention as the promoter and guardian of early American science. From the first it took a great interest in astronomy, and seems to have exerted a very stimulating influence upon its development during those early days.

The name of John Winthrop stands out as one of the three great scientists of colonial times. Born in 1714 of distinguished family, at the age of twenty-four he became Hollis Professor of Mathematics and Natural Philosophy at Harvard.

In 1740, he observed a transit of Mercury, sending a report to the Royal Society which was printed in their "Transactions." It was favorably commented on by the French Academy. Winthrop also was thanked by the Royal Society and asked to continue his contributions. He later contributed several papers and was elected a Fellow of that body in 1765 when he contributed a Latin dissertation on the Nature of Comets.

He observed the return of Halley's comet in 1759; the transits of 1769 and of 1770, "one remarkable for its brilliance and the other for the disturbances which Jupiter produce upon its orbit." Upon these phenomena he lectured in public, and wrote articles for the Boston papers. As he had done much to relieve the popular superstition in regard to earthquakes, by explaining their true nature, so his popular lectures at the return of Halley's comet did much to acquaint the public with the nature and laws of comets.

Professor Winthrop successful in interesting the Governor of Massachusetts in the transit of Venus of 1761, whose help induced the House of Representatives of the Province to furnish the means for its observation. The province sloop was used to convey the astronomer and his assistants and their instruments to Newfoundland. After considerable difficulty in setting up their instruments, they were fortunate in securing a favorable day for their observations. The sun rose with Venus on the disk. The time of passing off was noted – 5<sup>h</sup> 6<sup>m</sup>. Winthrop published an account of his observations on his return.

When the transit of June 3, 1769 was approaching, Dr. Maskelyne, then Astronomer Royal, asked Winthrop to go to the neighborhood of Lake Superior to observe it where the whole phenomenon would be visible. His health did not permit of the trip, so he was enabled at Cambridge to see only the beginning of the transit before the sun set.

His account of the transit of Mercury, January 20, 1763, is published in the first volume of the "Memoirs" of the American Academy of Sciences, of which society he was one of the founders. He was the ablest mathematician and astronomer of his time, and was as well an excellent linguist. Besides his membership in the Royal Society, he received an LL.D. from Edinburgh. Twice he declined the presidency of Harvard. His death occurred in 1779.

The third of the great colonial scientists was David Rittenhouse, who was born near Germantown, in 1732, and died at his home on the corner of Seventh and Arch Streets in 1796. Soon after his birth, the family removed to a farm in Norriton. David early showed great ingenuity in the construction of water-wheels and clocks. Mathematics and astronomy interested him greatly. In these subjects he was self-taught, and it is claimed that he independently developed the method of fluxions, not knowing of the work of Newton and Leibnitz. It is difficult to confirm or refute this story from the evidence obtainable, but it is probably an exaggeration.

In 1763, he was engaged to run the line between Pennsylvania and Maryland previous to the arrival of Mason and Dixon. Later he made several other important surveys of state lines, and of proposed canals. He acquired great fame by construction of orreries. The first was purchased by Princeton before it was finished; the second he made for the College of Philadelphia. This instrument is still preserved and may be seen in the University of Pennsylvania library. Provost Smith raised 200 pounds toward paying for this instrument by delivering a course of lectures on astronomy. Dr. John Peters, then rector of Christ Church, has this interesting comment upon these popular lectures: The doctor in his introductory lecture was honored with the principal men of all denominations, who swallowed every word he said with the pleasure that attends the eating of the choicest viands; and in the close, when he came to mention the orrery, he over-excelled his very self."

The state legislature after viewing the orrery voted Rittenhouse 300 pounds "as a testimony of the high sense which this House entertains of his mathematical genius and mechanical abilities in construction said orrery."

He removed to Philadelphia from Norriton in 1770 and occupied a number of public positions, among them being the treasurership of Pennsylvania and Director of the United States Mint (the first), and in them served with conspicuous fidelity and ability. The Revolutionary War came on before he could be appointed "public astronomical observer" by the Assembly, in response to the petition of the Philosophical Society. During the war he was a loyal and helpful citizen.

He occupied the chair of Astronomy in the College of Philadelphia from 1779 to 1782, and later became a trustee. He succeeded Franklin as President of the Philosophical Society, and was made an honorary Fellow of the Royal Society in 1795.

He contributed numerous papers to the Philosophical Society, which may be found in the early "Transactions." His death occurred in 1796. His remains were placed beneath the pavement in his little observatory which adjoined his house on the northwest corner of Seventh and Arch Streets. When the observatory was removed his remains were taken

to the cemetery adjoining the Presbyterian Church at Fourth and pine Streets, and his grave was marked by a lettered stone. Later, his remains and this flat stone were removed to laurel Hill cemetery on the brow of the hill overlooking the Schuylkill.

The first volume of the "Transactions" of the American philosophical Society is teeming with interest to the student of colonial Astronomy. It contains some nineteen papers on astronomical subjects. The most valuable of these are the descriptions of the local astronomers of the transit of Venus of 1769. Other papers are a description of an orrery by Rittenhouse on a new plan; a description of an improved form of Godfrey's quadrant; several papers on comets; Rittenhouse's observations of the transit of Mercury, November 9, 1769; and a paper on the sun's parallax as deduced from the transit of Venus.

In a paper read before the Society June 21<sup>st</sup>, 1768, Rittenhouse gave the data of the coming transit of Venus. He computed beginning of transit June 3<sup>rd</sup>, 2<sup>h</sup> 16<sup>m</sup>, end 8<sup>h</sup> 50<sup>m</sup>. Rev. John Ewing in a paper the same day announced the contact to be 2<sup>h</sup> 13<sup>m</sup> 49<sup>s</sup>.5, using as the longitude of Philadelphia, 5<sup>h</sup> 0<sup>m</sup> 32<sup>s</sup>. Mr. Ewing urged upon the Society the necessity for an observatory to obtain a more exact determination of the longitude. This was carried out in erecting an observatory in Independence Square. The Pennsylvania Legislature appropriated one hundred pounds toward the observatory, which was erected about fifty feet southwest of the rear door of the Philosophical Society in Independence Square. Franklin purchased the telescope in London. It was from the balcony, or steps, of this little circular observatory that the Declaration was first read to the American people, according to Watson, the annalist.

In January 1769, the Philosophical Society appointed a committee of thirteen to observe the transit of Venus. The observers were divided into three groups, the first of which was located in the State House, or Independence Square, under the direction of Dr. Ewing, an able mathematician and a good astronomer. The other members of this party were Joseph Shippen, Charles Thompson, and Thomas Prior. Their instruments consisted of a six-foot sector, an equal altitude and transit instrument, a reflector of seven-inch aperture and four-foot focus, fitted with a Dollond micrometer, a refracting telescope of twenty-four foot focus, two small reflecting telescopes, and a clock. The day before the transit, the instruments were carefully adjusted and the rate of the clock determined.

"The long expected day of the transit came, so favorable to our wishes," says Dr. Ewing, "that there was not the least appearance of a cloud in the whole horizon from morning till night and the sky was uncommonly serene." The telescopes were again carefully inspected, time keepers appointed, and one-half hour before the first contact each observer stationed himself at his instrument. Each observer expressed surprise at the nature of the beginning of the transit. They expected that the outline of the planet would be well defined from the first and they were surprised to observe a "jagged like appearance" and "an irregular notched edge, which at every second seemed to increase with a kind of wavy and tremulous motion." In a few seconds later the dent appeared and the image became well defined and they were convinced that the jagged appearance was in reality due to the atmosphere of Venus cutting off part of the rays of the sun.

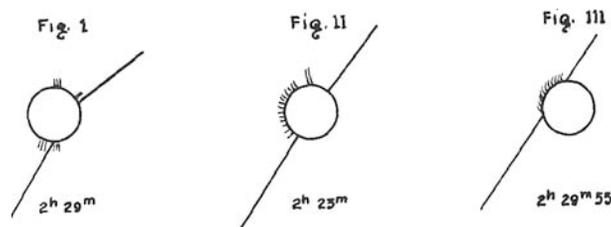
The times of the first contact varied eight seconds, from 2<sup>h</sup> 13<sup>m</sup> 42<sup>s</sup> to 2<sup>h</sup> 13<sup>m</sup> 50<sup>s</sup>; the mean of the five observers being 2<sup>h</sup> 13<sup>m</sup> 46<sup>s</sup>. Dr. Ewing's computed time was 2<sup>h</sup> 13<sup>m</sup> 49<sup>s</sup>.5. The latitude of the observatory was obtained from Mason & Dixon's observations of the latitude of the most southern point of the city, namely 39° 56' 29".2; adding to this

26".2, the latitude of the observatory is given as 39° 56' 55".4. The determined longitude was 5<sup>h</sup> 0<sup>m</sup> 35<sup>s</sup>. The parallax of the sun obtained from their observations is given as 8".6838, a value much more accurate than the values previously used. (The solar parallax given in the Nautical Almanac, that of the Paris Conference, is 8".80.)

The second of the Philosophical Society parties was under the leadership of David Rittenhouse at Norriton. In this group were Provost Smith of the College of Philadelphia, John Lukens, Surveyor General of Pennsylvania and John Sellers, member of the Assembly from Chester County. Rittenhouse, who had carefully supervised the preparations for the transit, used a thirty-six foot refractor, magnifying power, 144. Dr. Smith used a two-foot reflector equipped with a Dollond micrometer, made in London, and presented by Thomas Penn. Surveyor Lukens used a 42-foot refractor. An equal altitude instrument, a transit telescope, a quadrant, and a good clock, made by Rittenhouse himself, were other instruments at hand. Each observer worked quite independently of the others. Assistants were employed to count time and to record signals. Rittenhouse gave the signal of first contact at 2<sup>h</sup> 11<sup>m</sup> 39<sup>s</sup>. (Tradition has it that Rittenhouse fainted from excitement after he called first contact, but that he soon recovered and resumed his observations.)

“When the planet had advanced about one-third of its diameter on the sun,” says Rittenhouse, “as I was steadily viewing its progress, my sight was suddenly attracted by a beam of light situated at about forty or fifty degrees on the limb of Venus, from a line passing through her center and the sun’s and to the left of that line as seen through my inverting telescope.

About the same time the sun’s light began to spread round Venus on each side from the points where their limbs intersect each other.”



**COPIES OF DRAWINGS FROM RITENHOUSE’S SKETCHES**  
*(From report of Transit of Venus)*  
*(Vol. I., Transactions of the American Philosophical society.)*

Surveyor General Lukens, in his account of the phenomena, complains of the difficulty of using the 42-foot refractor. He gave the signal of contact 2<sup>h</sup> 12<sup>m</sup> 3<sup>s</sup>, which he supposed to be 15<sup>s</sup> too late. He also describes the beautiful border of light due to the atmosphere of Venus.

Dr. Smith’s reflector took in about half of the sun’s disk. He first noticed the tremulous motion of the sun’s limb, which he at first believed to be due to a cloud. In 5 or 6 seconds he was convinced that it was the beginning of the transit. He also speaks of the border of light and the “points and threads darting backward and forward into each other in a quivering manner for some space of time before they finally adhered. Dr. Smith discusses whether the jagged appearance is due to an atmosphere or merely to a

rough surface. He decides in favor of the former. The observers both in the State House Square and at Norriton took careful measurements of the diameters of Venus and the sun.

The complete observations with the computations of the latitudes and longitudes of the stations were immediately sent to the Astronomer Royal, Maskelyne, and were promptly acknowledged by him to be excellent and complete – an honor to the gentlemen who made them, and to those who promoted the undertaking.

The third party of the Philosophical Society was under the charge of Owen Biddle. Joel Bailey and Richard Thomas went with him to Cape Henlopen. The latitude and longitude of the station was obtained by running a line from a point on the Mason & Dixon line. Biddle's account is very similar to the other. He also remarks on the crescent of light.

After the Revolution, Nathaniel Bowditch is the first that claims attention. He was born of a family of shipmasters in 1773. He wrote the "Practical Navigator," from which he realized a modest fortune. He also translated and published at his own expense the "Mechanique Celeste."

Robert Treat Paine, another New Englander, carefully observed several eclipses and carefully determined the latitude and longitude of several Massachusetts towns.

We now turn from the consideration of individuals to tracing the rise of the earlier observatories.

In 1805, John Lowell, at that time residing in Paris, visited Delambre and obtained from him advice as to the building of an astronomical observatory, instruments, etc. This information was transmitted to Mr. Webber, Hollis professor of Mathematics and Natural philosophy, and it is inferred that the project of erecting an observatory was then being considered by the friends of Harvard College. Nothing was done officially at this time. Ten years later, May 10, 1815, at a meeting of the President and Fellows, Dr. Kirkland being President, it was "Voted, that the President, Treasurer, and Mr. Lowell, with Professor Farrar and Mr. Bowditch be a Committee to consider upon the subject of an observatory, and report to the corporation their opinion upon the most eligible plan for the same, and the site." This was probably the first corporate act within the United States concerning the establishment of an observatory.

Prof. Farrar and Dr. Bowditch as a sub-committee took the matter in hand and in June 1815 requested William C. Bond, afterward made Director, to visit the Observatory at Greenwich to obtain information in regard to the site, the buildings, and the instruments and their mountings. He was also to inquire of Troughton, the most celebrated instrument maker of the time, "The price of an eight-foot transit instrument of the best construction, the price of an eight-foot circular instrument like the one he lately furnished for Greenwich, and the price of a heliostat, and the price of the best clocks." In short the letter states that he obtain information "such as to enable you or some other person to superintend an direct in the erection of an observatory."

Mr. Bond immediately sailed for Europe and visited Greenwich, making careful observations and measurements of the different instruments and their mountings. He also visited the observatories of Glasgow, Edinburgh, John Bently's private observatory at Highbury, Milford-Haven, and others. Upon his return he, a model dome was constructed which was afterward copied in the one over the Equatorial. The committee also obtained much material and information from the observatories on the Continent. The investigations proved to the committee and friends of the project that, at that time,

there were not at hand sufficient funds to build and equip an observatory and to maintain it on a proper scale.

In October 1823, John Quincy Adams, then Secretary of State, urged in a private letter to a member of the Harvard Corporation that an open subscription be started. He subscribed \$1000, on condition that the sum be raised in two years and that his name be not publicly mentioned. The matter was not effectively consummated, however, at this time.

In 1839, William C. Bond was appointed Astronomical Observer to the University. Bond had made astronomical, meteorological, and magnetic observations at Dorchester, Mass., largely for the government. The consent of the government was obtained for the transfer of the entire equipment to Cambridge. The same year the Dana estate was secured for the use of the proposed observatory.

The American Academy of Arts and Sciences gave \$1000 towards the observatory, April 22, 1840. With this fund available, the instruments were immediately ordered. A cupola with a turning roof mounted on iron rollers was erected on top of the Dana house, within which the large reflector of the College, made by Short, or London, was mounted on a platform supported by the frame of the house. Besides this, in another room were barometers, and a Troughton and Simms transit instrument of two and three-quarters inch aperture and forty-six inch focus. The micrometer and the position circles were read by two verniers to ten seconds of arc. After the transit was placed in position, a meridian tower was built twelve miles to the south in the Blue Hills, and a meridian mark was also made on a brick house one mile to the north. In separate rooms were placed the magnetic instruments, consisting of several magnetometers for the determination of the components of terrestrial magnetism. It seems that more attention was given to the magnetic than to the astronomical work.

In 1843, there appeared a comet of surprising splendor. The observatory contained no instrument that would accurately give its position. An altitude and azimuth instrument was borrowed from the Massachusetts Survey to temporarily supply this want. The friends of the observatory had a practical lesson of the great need of a more modern and enlarged equipment to further enlarge the usefulness of the institution. Twenty thousand dollars was raised for the purchase of the best and most powerful telescope that could be obtained in Europe; Merz and Mahler, or Munich, the successors of the celebrated Fraunhofer, were asked to build a refractor, equatorially mounted. This firm, which had recently completed the Pulkowa instrument, contracted to furnish two object glasses of fifteen inches aperture, from which Harvard could select one, or reject both if unsatisfactory.

While the instrument was being made, the present site of the observatory was secured, and ground was broken for the central pier August 15, 1843. About one year later the old instruments were moved to their new home. During the next few years several instruments were added to the equipment, which permitted the position of the observatory to be accurately computed, and the observation of the solar eclipses of 1845 and 1846, the transit of Mercury of 1845, comets and sunspots.

The fifteen inch, after being tested by Simms, or London, was mounted in June 1847. Its nice adjustments and the ease with which it moved were the marvel of the time. Bond immediately started on the observation of the Andromeda and the Orion great nebulas, and the rings of Saturn. He discovered the inner, dusty ring, and the eighth satellite.

President Quincy called the latter the only addition to the solar system ever made on the continent of America. Had he been prophetic, he might have announced Bond's satellite as the first of the American additions to the solar system! In 1845, Mr. Bowditch presented the observatory with a comet seeker. In six years time, Bond discovered ten comets with this instrument.

By the time that Harvard had become possessed with its fifteen inch, many other observatories had sprung up in different parts of the country. Halley's comet was observed at Yale by Olmsted and Loomis in 1835, using a five-inch telescope, weeks before the news arrived of its having been seen in Europe. This instrument had been presented to Yale in 1828, but was so poorly mounted as to be of little use. The grand discovery of Halley's comet, says Prof. Loomis, "gave such an impetus to Astronomy that it helped to establish an observatory at Harvard and it kindled anew the astronomical spirit of Philadelphia and excited a desire for instruments superior to those which were then possessed."

There was also an observatory at Chapel Hill, North Carolina, in the years 1831-1832. Little work was accomplished. It was soon dismantled and afterwards destroyed by fire.

It is generally conceded that the first institution worth of the name observatory was that of Williams College, erected in 1836, by Prof. Albert Hopkins, brother of the celebrated mark Hopkins. It was a small building, 20 by 48 feet, surmounted by a revolving dome, containing a Herscheliam telescope, ten-foot focus, equatorially mounted. There was also a fair sized meridian circle.

In 1836, Loomis was called to Western Reserve University, Hudson, Ohio, as Professor of Mathematics and Astronomy. He visited Europe for books and instruments and returned with a four-inch equatorial, a transit, and a clock. At Western Reserve, in addition to his work as a college professor, and without an assistant, Loomis made a large number of observations, including comets, afterward computing their orbits.

Let us now return to Philadelphia and notice our astronomical development. The Philosophical Society still retained some of the spirit of the fathers and we find in their "Transactions," from time to time, papers on astronomical subjects.

In a paper published in 1841, Sears C. Walker speaks of the Friends' Academy on Fourth Street, near Chestnut, as having for many years maintained a small observatory. The fifteen-foot dome contained a five-inch telescope made by Henry Fitz, or New York, and mounted by Young, of Philadelphia. Other instruments were a smaller portable telescope, a transit instrument, a Gropengiesser clock, and a comet seeker. Here Joseph Roberts and Miers Fisher Longstrech, the latter of whom had some repute because of his new set of lunar tables, observed occultation's, eclipses, etc.

It seems also that Joseph Vaughan, Librarian of the Philosophical Society, allowed pupils of the Friends' Academy, under proper supervision, to use the instruments of Rittenhouse, which were mounted in the Society Hall, soon after the death of Rittenhouse, and which still remain there. President Patterson, or the Society, had adjusted the transit in the meridian and had placed a meridian mark on a building south of the Square.

The Central high School Observatory was founded in 1837, by ordering the instruments from Merz and Mahler on Munich. In 1840, the instruments arrived and were mounted in a tower in the rear of the school building on Juniper Street, where Wanamaker's now stands. The six-inch equatorial was the largest and best in America

until the erection of the fifteen-inch at Harvard. There was also a meridian circle by Ertel, a comet seeker, a chronometer, and a clock by Lukens. Loomis writes of the equipment, "The erection of the observatory formed an epoch in the history of American Astronomy in consequence of the introduction of a class of instruments superior to any which had hitherto been imported. It introduced the instruments of Munich favorably to the notice of the public."

Moon culminations, occultations, and comets were observed by Otis Kendall, afterward Professor of Mathematics and Astronomy at the University of Pennsylvania, and Sears C. Walter, later an observer at Washington. A notable event was the first interchange of star signals in this country, between the Washington Observatory and the High School Observatory, October 10, 1846. The apparatus was devised by Joseph Saxton; the signals were made by a tap of the finger on a key, as in telegraphing. Lieutenant Gilliss and Sears C. Walker operated the Washington end, and Professor Kendall the Philadelphia end. The difference of longitude between the stations by the night's work agreed within two-tenths of a second with the average of work done since. Several other mentions of Professor Kendall's name are found in connection with the development of telegraphy to astronomy. In January 1849, he connected his observatory with Cincinnati, and recorded his observations on Mitchell's chronograph.

Sharon Observatory may receive brief mention from the fact that it was located nearer Swarthmore than any of which we have record. Erected near Darby in 1845, by Mr. John Jackson, the little fifteen-foot dome surmounted a thirty-four foot tower. The equatorial, Merz and Mahler and was provided with a micrometer and a complete range of eyepieces. The mounting contained a driving clock, and the complete instrument cost \$1833. There was also a meridian circle, having a 3.25 - inch Merz lens, mounted by Young, of Philadelphia; a Gropengiesser sidereal clock; and other minor instruments. The total cost of the observatory was \$4000. Professor Loomis says in his account of this observatory, "The equatorial is employed in the observation of eclipses, occultations, and other celestial phenomena." It would be interesting to learn what has become of these instruments. (Perhaps some of you gentlemen can complete this bit of local history.)

During the period from 1840 to 1850 several other observatories were erected in different parts of the country: West Point, with a six-inch telescope, an Ertel transit etc.; Georgetown, in 1846, with a five-inch telescope Ertel transit, where Rev. James Curley did systematic work and later published a quarto volume of annals; and Amherst, established in 1847.

The Cincinnati Observatory, the cornerstone of which was laid by the venerable John Quincy Adams, in 1843, has an interesting early history. Professor O. M. Mitchel aroused a tremendous enthusiasm for astronomy by popular lecturing. He founded the Cincinnati Astronomical Society, which raised about \$11,000 by popular subscription to build the observatory. Professor Mitchel visited Europe and secured a twelve-inch glass from Munich, which was mounted in 1845. Mitchel began work on Struve's double stars and succeeded in separating many close stars that Struve had called "oblong." He also established the fact that electric connection of the clock with a chronograph could be accomplished without affecting the accuracy of the clock. In this he was wiser than our Bache and Walker, who feared that clock signals meant loss of accuracy.

The first proposal for a National Observatory is in the report of William Lambert, a Virginia surveyor, who was engaged by the government to establish the latitude and

longitude of the Capitol, in 1810. President Monroe, in a lengthy report to Congress, favored the project, but his suggestion was not acted upon. John Quincy Adams, in his first message, 1825, urged upon Congress the establishment of a national university and national observatory. He suggested the appointment of an astronomer who might be constantly at work and periodically publish his observations. He suggested the appointment of an astronomer who might be constantly at work and periodically publish his observations. He then refers to 130 observatories in Europe, while at that time there was not one in America. Congress, acting upon the message, appointed a committee, which prepared a bill to establish a national observatory at Washington. The bill went through first and second reading, but got no further. From time to time the effort was renewed, but nothing was done until 1830, when a first step was taken in the appointment of Lieutenant Goldsborough to care for the charts and maps and instruments for the naval service. He established the Depot of Charts and Instruments, in the western part of Washington, and rated the chronometers of the navy. Lieutenant Wilkes succeeded Goldsborough and erected at his expense a five-foot transit by Troughton, with which to get the time observations. He was followed by Hitchcock and Gilliss. The latter began observations of moon culminations, star places, and occultations. Gilliss was the first in the United States who conducted a working observatory, and the first who gave his entire time to astronomical work. He added to the instrumental equipment, published a volume of observations, and prepared a catalogue of stars. Repeatedly did Gilliss urge for money to enlarge the usefulness of his Bureau, but without much result until Encke's comet came along in 1842. The comet greatly interested William C. Preston, who fathered a bill through Congress appropriating \$25,000 to the Depot of Charts. This title seemed to be more attractive to the hard-headed congressmen of that day than did *National Observatory*, which John Quincy Adams used several times in his bills only to bring them to defeat.

Gilliss promptly consulted the leading astronomers in this country and abroad, and designed a new Depot of Charts that included an astronomical observatory. In 1845, Gilliss reported the erection of the building and its equipment consisting of an achromatic refractor, meridian transit, comet seeker, magnetic and meteorological instruments, and a library of about one thousand volumes.

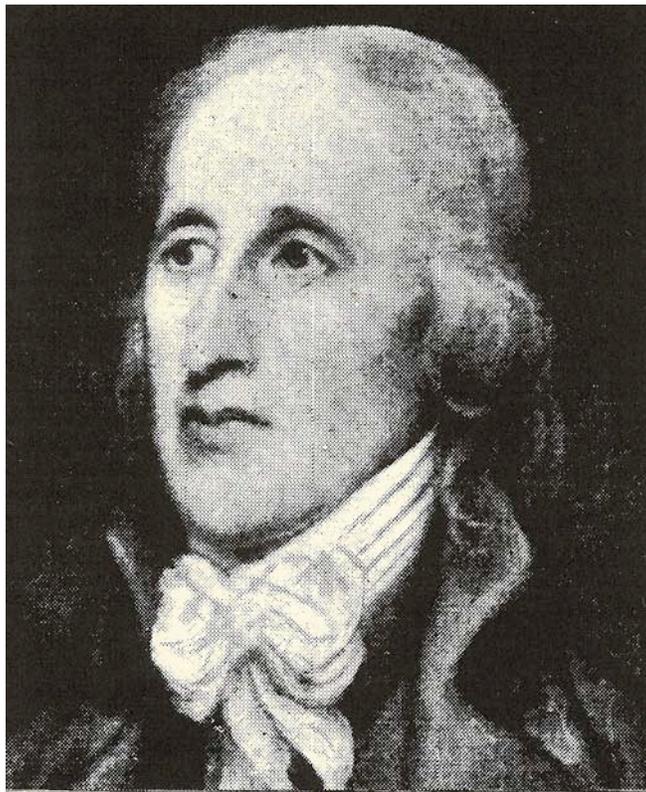
One of the first important discoveries in which the Naval observatory took pride was the identification of Neptune with a star of Lalande's Catalogue of 1795. This discovery was made by Professor Sears C. Walker, a Philadelphian, who was assigned by Superintendent Maury, then in charge of the Depot of Charts, to the tracing of observations of Neptune in the old star catalogues. To do this necessitated a careful study of Neptune's orbit. Walker's work is reported in Vol. II of the Smithsonian Reports. It led Lieutenant Davis to write to the secretary of the Navy, in 1849, "The theory of Neptune belongs by right of precedence to American science. In connection with its neighbor Uranus, it constitutes an open field of astronomical research into which the astronomers and mathematicians of the United States have been the first to enter and to occupy distinguished places." If this is too strong a statement at that early date, the subsequent researches of Newcomb certainly complete our claim.

The name "United States Naval Observatory" first appears in the volume of Observations issued in 1848.

There are many other interesting bits of astronomical information in the old reports of Scientific Societies and Historical Societies, as well as in the biographies of our chief men of science. The story of the upbuilding of American astronomy is one of which we can well be proud; most of these pioneers were forced to give their best energies to other necessary duties, their limited means often precluded adequate instrumental equipment – it was generally a continuous struggle and sacrifice impelled by the love of the science and the desire to penetrate further into its mysteries. This imperfect sketch takes us to the later half of the last century upon the threshold of the great fields of astronomical photography and spectroscopy, which our American astronomers have made so many distinguished contributions.

J.T. Rorer

Philadelphia, October 4, 1913



*David Rittenhouse*

*From the Trumbull Portrait  
Courtesy Pennsylvania Academy of Fine Arts*

CHANGE OF NAME

On Wednesday April 27, 1927 at a regular meeting held in the Central High School at Camden, New Jersey, a resolution was presented to consider the future welfare of the society. The principal recommendation contained was to change the name Camden Astronomical Society to a more appropriate one.

On October 12, 1927 the present name, Rittenhouse Astronomical Society, was unanimously adopted. The first meeting under the new name was held on December 14, 1927 at the Sproul Observatory in Swarthmore, Pennsylvania. Prior to the adoption of the present name, several others were considered and debated, but the proposal to honor the name of David Rittenhouse, pioneer American astronomer, finally won approval. On January 29, 1937 the change of name was officially recorded in Pennsylvania. Copy of the amendment is shown on pages .....

It is of interest to note in the minutes of a regular meeting of the Camden Astronomical Society held on November 13, 1919 at the residence of the President, Mr. Edmund E. Read, that an invitation was extended by The Franklin Institute to members of the Camden Society to attend the Institute meetings. This recognition by that venerable institution was the first recorded in C.A.S. minutes, and presaged the close relationship in the years that followed.

James Stokley, the first director of the Fels Planetarium of The Franklin Institute of Philadelphia, Pennsylvania, joined the Camden Astronomical Society in 1922, and for many years thereafter took a leading and active part in the Society's affairs.

CERTIFICATE OF AMENDMENT  
OF  
CERTIFICATE OF INCORPORATION OF  
THE CAMDEN ASTRONOMICAL SOCIETY

THE CAMDEN ASTRONOMICAL SOCIETY a corporation organized and existing by virtue of the provisions of the laws of the state of New Jersey, the Certificates of Incorporation of which was filed in the Office of the Clerk of Camden County in the State of New Jersey on April 3, 1888 in Book 3 of Corporations p. 983 &c.,

DOES HEREBY CERTIFY:

That at a regular meeting of The Camden Astronomical Society held the 12th day of October, 1927, a resolution was passed to amend the said charter by changing its name to The Rittenhouse Astronomical Society, notice of the Resolution being included in the notice of the meeting and passed by a two-thirds vote of the corporation, viz: unanimously; THEREFORE, it is hereby certified that the Charter of the said, The Camden Astronomical Society has been amended by changing its name to The Rittenhouse Astronomical Society.

IN WITNESS WHEREOF the said Camden Astronomical Society has hereunto affixed its corporate seal, duly attested by its President and Secretary this 11<sup>th</sup> day of December 1936.

The Camden Astronomical Society  
By *Henry V. Gummer*  
President

Attest  
*Charles Schrock*  
Secretary  
(Seal of Corporation)

State of *Penna* :  
: 188.  
County of *Pkta* :

Be it remembered that on this *32d* day of *Jan* 1937 before me, personally appeared A. C. Schook who being duly sworn on his oath saith, that he is Secretary of the Camden Astronomical Society above named, and that *Henry V. Gummer* is the President; that deponent knows the common or corporate seal of the said The Camden Astronomical Society and the seal annexed to this certificate, is such common or corporate seal; that the said Certificate of Amendment to the Charter was signed by the said President, and the seal of said Corporation affixed thereto in the presence of deponent; that said Certificate is the voluntary act and deed of said The Camden Astronomical Society for the uses and purposes therein expressed pursuant to a resolution of the Board of Governors of said corporation and at the execution thereof this deponent subscribed his name thereto as a witness.

Sworn and subscribed : *A. C. Schook*  
the day and ~~year~~ aforesaid:  
NOTARY PUBLIC

In the Courts of Common Pleas of Philadelphia County  
State of Pennsylvania

I, *John M. Scott*, Prothonotary of the Courts of Common Pleas of said County, which are Courts of Record having a common seal, being lawfully authorized by the laws of the State of Pennsylvania, to make the following Certificate, do hereby certify that the foregoing Certificate and the seal of the said Corporation, and the seal of the said Notary Public, are all in full and credit are and ought to be given, as well in Courts of Judicature as elsewhere; and that, as well accompanied with the subscribing of the said NOTARY PUBLIC, and the impression of the seal of the said Notary Public, and the seal of the said Corporation, to be taken in all respects as required by the laws of the State of Pennsylvania.  
The impression of the seal of the Notary Public is not required by law to be stated in this Certificate.  
I, *John M. Scott*, have hereunto set my hand and affixed the seal of said Court, this *29<sup>th</sup>* day of *JANUARY* ..... in the year of our Lord one thousand nine hundred *(1937)* *(1937)*.  
JOHN M. SCOTT, Prothonotary.  
By *Meredith Hauser* Principal Deputy Prothonotary.  
Dariusz Ahanski, Secondum Legem.

## THE DAVID RITTENHOUSE BI-CENTENARY

The bi-centenary of the birth of David Rittenhouse was coming up on April 8, 1932. The suggestion to celebrate this event was first made by the Rittenhouse Astronomical Society. At a regular meeting on February 11, 1931 held at the Lenape Club, Philadelphia, Pennsylvania, the president, Dr. George Rosengarten, appointed a committee to initiate the undertaking and to enlist the cooperation of other societies, newspapers, etc...

The chairmen were: Dr. John H. Pitman, Mr. James Stokley, Dr. Maurice J. Babb. It was not long before a citizens committee consisting of local, state, and national scientific and historical societies, as well as a number of leading citizens were enlisted in the enterprise. That the Rittenhouse Astronomical Society was well represented in the activities was demonstrated by the selection of its members to serve in the important posts of the General Committee. Dr. John H. Pitman was elected permanent chairman; Dr. Maurice J. Babb, Secretary; Dr. John A. Miller, chairman of sub-committee on program; Mr. James Stokley, chairman of sub-committee on publicity. The result was that forty-two societies joined in the celebration including those names below: Historical Society of Philadelphia, American Philosophical Society, The Franklin Institute, University of Pennsylvania, Rittenhouse Astronomical Society.

The Rittenhouse Bi-Centennial Celebration began at 3 P.M. on Friday, April 8, 1932, at the American Philosophical Society, 104 South 5<sup>th</sup> Street, Philadelphia, Pa. Mr. Alba B. Johnson presided.

“Rittenhouse and His Contemporaries” was discussed by Mr. Russell Duane, descendant of Benjamin Franklin.

“Rittenhouse the Scientist” was the subject of Dr. Annie J. Carson of Harvard College Observatory, foremost of then living woman astronomers.

“Rittenhouse and the Learned Societies” was given by Dr. Josiah H. Penniman, provost of the University of Pennsylvania where in the long ago David Rittenhouse was once professor of astronomy.

The birthday dinner was held at 7:00 P.M. at the Historical Society of Pennsylvania with John Frederick Lewis, President, presiding. Speakers were Dr. Howard McClenahan, Secretary of The Franklin Institute, and Judge Joseph Buffington of the United States Circuit Court of Appeals.

Next day, Saturday April 9<sup>th</sup>, in the morning, the delegates to the Bi-Centenary from learned societies, universities, and other institutions went on a pilgrimage to Independence Hall where David Rittenhouse once was active as a statesman of the Revolutionary War period and after. Carpenters Hall, Old Christ Church, 7<sup>th</sup> and Arch Streets, on opposite corners of which Rittenhouse had his home and observatory, his grave in Laurel Hill Cemetery, Philadelphia, and his birthplace on the upper end of Lincoln Drive in Philadelphia were visited. A wreath was placed on the grave.

The main or “General Anniversary Meeting” was held in Scottish Rite Temple, 3 P.M. on Saturday, April 9, 1932. Mayor Moore was honorary president.

The mayor introduced the chairman, Dr. W. W. Comfort, at that time President of Haverford College. The memorial address was delivered by Dr. Maurice J. Babb,

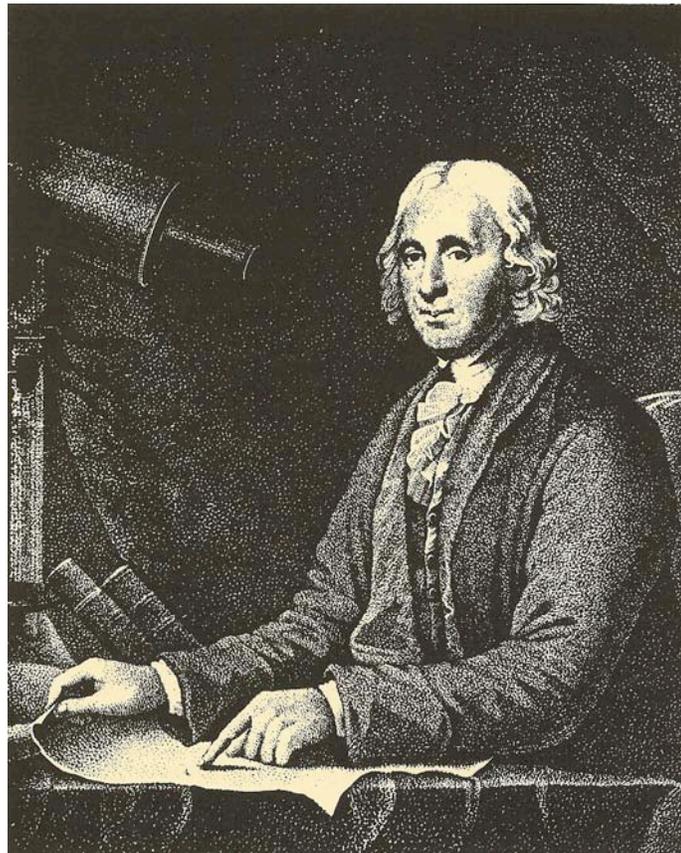
Professor of mathematics in the University of Pennsylvania, the foremost authority on the career of David Rittenhouse and long-time member of the Rittenhouse Astronomical Society.

The celebration closed on Saturday, April 9<sup>th</sup> at 8 P.M. in Houston Hall, university of Pennsylvania. The Rittenhouse Astronomical Society was host. Papers were given by the following distinguished gentlemen: Dr. Carl Rufus, University of Michigan; Dr. Frederick E. Brash, Library of Congress; Dr. Thomas Cope, University of Pennsylvania; Dr. Charles Olivier, University of Pennsylvania; Dr. John A. Pitman, Swarthmore College; and Mr. James Stokley, Franklin Institute.

Miss Caroline Stretch and George E. Eckhardt told of clockmaking before Rittenhouse and his own clockmaking. Dr. Babb described the famous Rittenhouse Orrery in detail. The visitors inspected the priceless Rittenhouse treasures housed at the Historical Society of Pennsylvania. They included portraits, autographed letters, coins struck while he was the director of the U.S. Mint in Philadelphia, some of his scientific papers, clocks, and surveying instruments of his own making.

The Rittenhouse Bi-Centenary Celebration marked a most successful milestone in the history of the Rittenhouse Astronomical Society.

The credit largely belongs to the fine administrative work of the committees which achieved an outstanding accomplishment in getting the cooperation of and coordinating the efforts of the various institutions, societies, and newspapers.



*David Rittenhouse*  
*Engraving from C.W. Peale Portrait*  
*Courtesy American Philosophical Society*

A radio talk on David Rittenhouse by Dr. John H. Pitman follows:

DAVID RITTENHOUSE

*By*

Dr. John H. Pitman

*Sproul Observatory, Swarthmore College  
Swarthmore, Pennsylvania*

A Radio Talk presented Friday, April 8, 1932 under the auspices of Science Service over the Columbia Broadcasting System.

On April 8, 1732, David Rittenhouse was born in the “New House” with the “coffin door” at the upper end of the Lincoln Drive in Philadelphia. This house was situated at the site of the first paper mill in American established by David’s great grandfather, William, a Dutch immigrant.

Two years after this, David’s father gave up the manufacture of paper and bought a farm along the Germantown Pike in Norriton, about twenty miles from Philadelphia. It was here that David grew up, much as the other boys in the neighborhood, doing the chores, helping with the plowing, the harrowing, the planting, and the harvesting. His early education was confined to the three R’s, but at the age of twelve he received a bequest which changed the course of his life. His uncle David left the boy a set of carpenter tools and a few books on arithmetic, geometry, and some mathematical calculations. Soon the fences on the farm and the plough handles became marked up with mathematical calculations as David would stop to check up on some problem. When he was seventeen, he built a wooden clock and shortly after, one of metal. His interest in this work was so great that he was able to persuade his father to purchase some tools in Philadelphia and set him up as a clock maker in a house erected along the highway.

Another fortunate incident happened. Thomas Barton, a graduate of trinity College, Dublin, and a tutor in the University of Pennsylvania, came into the neighborhood. Barton became fascinated with this brilliant youth, loaned him books, and helped him master Latin and Greek. Newton’s great Principia was studied in the original. This friendship lasted a life time for Barton married David’s sister, Esther.

David Rittenhouse’s skill as a clock maker became widely known. Many clocks of his handwork are even now ticking off the seconds. A number of theses are now on exhibit in the rooms of the Historical Society of Pennsylvania. Every one appreciates the delicacy of workmanship in a fine clock. It was this same skill that Rittenhouse brought into his observational work and the manufacture of surveying instruments and telescopes. It was this skill that enabled him to build the famous Orrery.

Rittenhouse writes “I did not build a machine, which should give the ignorant in astronomy a just view of the Solar System, but rather astonish the skillful and curious examiner, by a most accurate correspondence between the situation and motions of our little representatives of the heavenly bodies, and the situations and motions of these bodies themselves. I would have my Orrery really useful, by making it capable of informing us, truly, of the astronomical phenomena for any particular point of time; which, I do not find that any Orrery yet made, can do.” Here was an instrument capable of accurately showing the times and paths of totality for eclipses of the sun for five

thousand years before and five thousand years after 1770. This most excellent piece of mechanism cased in the finest cabinet work of that period is also on exhibit.

Rittenhouse contributed many scientific papers on various subjects, but his most famous work in astronomy was the transit of Venus. This planet, now shining brilliantly in the western sky at dark, occasionally passes directly between the earth and the sun, and from favorable sites can be seen projected on the face of the sun. One such transit was due on June 3, 1769, the next, in 1874. This furnished the most accurate way then known to determine the distance between the earth and the sun. Here was a chance that would not be repeated for more than a century. Rittenhouse planned for it for a year in advance. His was one of three parties in the neighborhood of Philadelphia and this party was left to its own devices. But writes Dr. Smith, Provost of the University of Pennsylvania, "Our other engagements did not permit Mr. Lukens or myself to pay much attention to the necessary preparations; but we knew that we had entrusted them to gentlemen on the spot, who had joined to complete skill in mechanics, so extensive an astronomical and mathematical knowledge, that the use, management and even the construction of the necessary apparatus, was perfectly familiar to him." Rittenhouse labored for months constructing his clock, telescopes, and observatory, and accurately determining the latitude and longitude of his station. The day was clear. Stretched out on the ground with his head pillowed in the lap of Thomas Barton, Rittenhouse made the exacting observations and then fainted when the nervous strain was over. As a result of this work, Rittenhouse ranked with the most skillful astronomers in the world.

In 1770, Rittenhouse moved to Philadelphia at the southeast corner of Seventh and Arch Streets. On a lot diagonally across the street, he soon erected an octagonal observatory. Here he independently discovered the use of spider threads in the eyepiece of the telescope and in order to adjust his transit instrument, he invented the collimating telescope. This discovery alone would have given him a permanent place in the history of astronomy. Dr. S. A. Mitchell, of the University of Virginia, says, "The first eclipse of the sun to be carefully observed in the British Colonies of America was that of June 24, 1778, which was observed by the astronomer David Rittenhouse of Philadelphia." This was only one week after the British troops had withdrawn from the city. Here in the time of great stress he maintained his mental balance.

Even then he was working for the success of the Revolution. He had become vice-president of the Committee of Safety and president of the New Council of Safety, military executive of the state. Here is a proclamation issued by him in his official capacity. "We, therefore, entreat you by the most sacred of all bonds, the love of virtue, of liberty, of your country, to forget every distinction, and unite as one man." And a second – "this glorious opportunity of signaling himself in defense of our country, and securing the right of America forever, will be seized by every man who has a spark of patriotism in his bosom."

An engineer of the Committee of Safety, he substituted iron for lead clock-weights in order that the lead might be used for ammunition. He superintended the manufacture of saltpeter, the casting of iron and brass cannon, and prepared the defenses of the Delaware. This is only a partial list.

Task after task he completed with accuracy and thoroughness. At the request of Penn, he surveyed with instruments of his own construction, the circle of twelve miles radius with Newcastle as center, which forms the boundary between Pennsylvania and

Delaware. Mason and Dixon with the finest equipment Europe could produce took his results without question and ran the line 160 miles towards the west. With the exception of this portion, Rittenhouse was responsible for the remainder of the boundary of Pennsylvania. Delaware, Maryland, West Virginia, Ohio, New York, New Jersey, and Massachusetts are each indebted to the astronomical skill and mechanical genius of this great citizen.

Upon the outbreak of the Revolution, Benjamin Franklin was needed elsewhere. His friend, David Rittenhouse, was elected to succeed him in the State Assembly. The formation of a State Constitution was necessary. Rittenhouse was a member of the Constitutional Convention. A State Treasurer was needed, and for twelve successive trying years he was chosen for this task. The national government was finally erected. A mint was necessary. Who had the mechanical skill and scientific knowledge to build the machinery and initiate the work? Upon the urgent request of both Jefferson and Hamilton, Rittenhouse became the first director of the United States Mint.

All of these affairs of State deprived him of considerable time from his scientific and intellectual pursuits. Jefferson wrote him, "Nobody can conceive that nature ever intended to throw away Newton upon the occupations of a crown." For twenty-five years he was connected with the University of Pennsylvania, first as Professor of Astronomy, then as Vice-Provost, and for the greatest period as a Trustee. For a quarter of a century he was active in the affairs of the American Philosophical Society as secretary, librarian, vice-president, and president, succeeding Benjamin Franklin in that honorable office, and in turn being succeeded by Thomas Jefferson. He was elected Foreign Member of the Royal Society, which was the highest scientific honor of this day. Honorary degrees were bestowed upon him by Princeton, William and Mary, and the University of Pennsylvania.

David Rittenhouse died June 26, 1796 and was first buried under his observatory at Seventh and Arch Streets. He now rests in North Laurel Hill Cemetery overlooking the Schuylkill River. The greatest tribute of his generation came six months after his death. In December 1796, the President of the United States, both Houses of Congress, both Houses of Legislature, the Diplomatic Corps and various honorable bodies of the city of Philadelphia proceeded to the First Presbyterian Church where he was eulogized by Dr. Benjamin Rush. Jefferson on that occasion said, "Genius, science, modesty, purity of morals, simplicity of manners, marked him as one of nature's best sample of the perfection she can cover under human form."

On the initiative of the Rittenhouse Astronomical Society and with the active cooperation of the American Philosophical Society, The Franklin Institute, the Historical Society of Pennsylvania, and the University of Pennsylvania, more than fifty scientific and historical societies are holding a series of meetings today and tomorrow as a tribute of this generation to the memory of this great pioneer American astronomer, scientist, patriot, statesman, and public servant, David Rittenhouse.

Harvey M. Watts composed a beautiful sonnet to him.

DAVID RITTENHOUSE – ASTRONOMER – 1732 – 1796

Born where the woodland brook goes rushing by  
Pulsing with song, as if in full attune  
With household murmers and the cradle's croon,  
Here one lay dreaming as the hours fly;  
Yet Genius watchful, 'neath the turning sky  
Gave opportunity and, lo, the boon  
Of wisdom as, entranced, at night's high noon,  
He marveled o'er the dazzling panoply  
Heir to the great tradition and the name  
Of those whose quest no human folly bars,  
Seeking the inner veil of Final Cause  
Ruling supreme in universal laws,  
The years but add fresh luster to his fame, -  
The New World's Pioneer among the stars!

Harvey M Watts

The American Philosophical Society,  
The Franklin Institute,  
The Pennsylvania Historical Society,  
The Rittenhouse Astronomical Society,  
The University of Pennsylvania,  
combined committees invite

Prof. J. Pittman

to serve as a member of  
The Rittenhouse Bicentenary Citizens Committee

These committees together with those of some fifteen National Scientific and Historical Societies, city, county, state and National Governments are trying to locate all Rittenhouse clocks, instruments, letters, papers, documents and portraits.

A dinner is proposed Friday evening April 8, 1932, together with other appropriate ceremonies and memorials. We need your counsel as to the character and extent of the tribute to be paid to this the greatest native Philadelphian.

Loyally yours,

*M. J. Babb*

M. J. Babb, Temporary Secretary  
Box 12 Bennett Hall  
University of Pennsylvania

Philadelphia  
May 26, 1931

RITTENHOUSE BICENTENARY COMMITTEE  
(PRELIMINARY LIST)

- |   |   |
|---|---|
| Mr. GEORGE M. ABBOTT  | Mr. ALBA B. JOHNSON   |
| Prof. MAURICE J. BABB<br><i>Rittenhouse Astronomical Society</i>                                | Mr. C. N. JOHNSON<br><i>American Institute of Electrical Engineers</i>                    |
| Mr. FRANKLIN BACHE  | Mr. S. W. JOHNSON   |
| Prof. SAMUEL G. BAYTON<br><i>American Astronomical Society</i>                                  | Prof. JOHN C. JOHNSON<br><i>Pennsylvania Academy of Sciences</i>                          |
| Hon. RICHARD J. BRAMER<br><i>Department of State, Harrisburg</i>                                | Prof. A. E. KIRKVELLY   |
| Prof. H. C. BERRY<br><i>Section of American Association for the Advancement of Science</i>      | Dr. FRED KIRKELL  |
| Mrs. RUDOLPH BLANKENBURG  | Mr. CONRAD N. LAUER<br><i>American Society of Mechanical Engineers</i>                    |
| Mr. JAMES G. BIDDLE   | Mr. MORRIS E. LAIRD   |
| Mrs. FRANK B. BLACK   | Dr. JOHN FREDERICK LAWE<br><i>Historical Society of Pennsylvania</i>                      |
| Mr. FREDERICK E. BRADCH<br><i>History of Science Society</i>                                    | Mrs. ANNA L. LINGLEBACH   |
| Mr. HENRY S. BRIDGEMAN<br><i>Pennsylvania German Society</i>                                    | Rev. DR. ALEXANDER MACCOLL  |
| Dr. ALBERT P. BRUBAKER<br><i>American Philosophical Society</i>                                 | Mr. PERCY C. MADHRA, JR.  |
| Dr. EDWIN C. BRIDGES  | Mrs. J. WILLIS MERTIN   |
| Dr. CHARLES W. BURR   | Mr. WILLIAM W. MITOS  |
| Dr. OTIS W. CALDWELL<br><i>College of Arts and Sciences, University of Pennsylvania</i>         | Dr. GEORGE W. MCCLELLAND  |
| Prof. E. F. CHERRY  | Dr. HOWARD MCCLELLAN<br><i>The Franklin Institute</i>                                     |
| Dr. S. SOLIS COHEN  | Dr. JOHN A. MILLER<br><i>American Philosophical Society; American medical Association</i> |
| Mr. GHELLETT COLLINS<br><i>American Paper and Pulp Association</i>                              | Prof. HOWARD H. MITCHELL<br><i>University of Pennsylvania</i>                             |
| Dr. W. W. COMFORT   | Mr. WILLIAM B. MONTAGUE<br><i>Montgomery County Historical Society</i>                    |
| Mr. GUSTAVUS WYVENS CONK  | Hon. J. HAMPDEN MOORE   |
| Dr. THOMAS D. COPE  | Mr. H. S. PRINCE NICHOLS  |
| Mr. WILLIAM DICK  | Mr. ANDREW P. NOE<br><i>American Numismatic Society</i>                                   |
| Dr. A. G. DOUGHTY<br><i>Dominion Archives, Canada</i>   | Prof. CHARLES P. OLIVER<br><i>University of Pennsylvania</i>                              |
| Mr. JAMES A. EWING  | Dr. J. H. PENNINGTON<br><i>University of Pennsylvania</i>                                 |
| Major THOMAS F. FARRELL<br><i>Chief Engineer, Department of Public Works, State of New York</i> | Prof. JOHN H. PITTMAN<br><i>Rittenhouse Astronomical Society</i>                          |
| BARB Wm. H. FISHERBIRCH   | Mr. ELI KIRK PRICE  |
| Mr. WALTON FORSTALL   | Mr. CALVIN M. RICE<br><i>American Society of Mechanical Engineers</i>                     |
| Mr. BENJAMIN FROHMAN  | Mr. HOWARD RICHARDS<br><i>Metric Association</i>  |
| Mr. WILFRED W. FRY  | Dr. GEORGE ROSENQARTIN  |
| Prof. LEWIS FURBER<br><i>American Institute of Electrical Engineers</i>                         | Dr. W. CARL RUPPEL<br><i>History of Science Society</i>                                   |
| Mr. HENRY C. GIBSON<br><i>Historical Society of Pennsylvania</i>                                | Prof. HENRY NORRIS RUSSELL<br><i>American Physical Society</i>                            |
| Mr. HOWARD GILLINGHAM<br><i>American Numismatic Society</i>                                     | Dr. H. H. SHERRILL  |
| Dr. ARTHUR W. GOODFRED<br><i>American Philosophical Society</i>                                 | Dr. H. H. SHERRILL<br><i>Prussia, Federation of Historical Societies</i>                  |
| Dr. HENRY V. GUNNBERG   | Mrs. CAROLINE W. SMEDLEY<br><i>Historical Society of Franklin</i>                         |
| Hon. A. BOYD HAMILTON<br><i>Prussia, Federation of Historical Societies</i>                     | Mr. J. WILLIAM SMITH  |
| Rev. J. HENRY HARMES  | Mr. JOHN B. STEPHENSON, JR.   |
| Mr. W. HALL HARRIS<br><i>Maryland Historical Society</i>  | Mr. JAMES STODOLY<br><i>Rittenhouse Astronomical Society</i>                              |
| Mr. NATHAN HEAVARD<br><i>The Franklin Institute</i>   | Dr. WALTER T. TADGANT   |
| Capt. N. H. HACK<br><i>U. S. Coast and Geodetic Survey</i>                                      | Mr. ARTHUR H. THOMAS<br><i>Scientific Equipment Makers of America</i>                     |
| Mr. VICTOR HENDERSON  | Mr. CHRISTOPHER WARD<br><i>Historical Society of Delaware</i>                             |
| Dr. A. CHESTERMAN HERBICK   | Mrs. BARCLAY WARBURTON  |
| Mr. EDWARD HOOKER<br><i>Germanian Historical Society</i>  | Mr. HARVEY M. WATTS   |
| Mr. A. IDLES<br><i>American Society of Mechanical Engineers</i>                                 | Mr. W. CHATFIELD WETHERILL  |
|   | Mr. D. ROBERT YARNALL<br><i>Engineering Foundation</i>                                    |

## The David Rittenhouse Bicentennial

### The David Rittenhouse Bicentennial

Saturday, April 9, 1932  
Eight-fifteen o'clock

HOUSTON HALL, UNIVERSITY OF PENNSYLVANIA  
Thirty-fourth and Spruce Streets

*Special Meeting of the Rittenhouse Astronomical Society for  
Scientific and Historical Papers*

Chairman.....	MR. HARRY B. RUMRELL President, Rittenhouse Astronomical Society
Presiding Officer.....	MR. JOHN K. RITTENHOUSE
Paper Making at Time of Rittenhouse Paper Mill.....	MR. GRELLET COLLINS American Pulp and Paper Association
The Astronomical Work of Rittenhouse.....	PROF. W. CARL RUFUS University of Michigan
The Rittenhouse Diffraction Grating.....	DR. THOMAS D. COPE University of Pennsylvania
A Fire Ball Observation.....	DR. CHARLES P. OLIVIER Director, Flower Observatory
Rittenhouse Clocks.....	MR. GEORGE ECKHARDT
The Transit of Venus.....	MR. JAMES STOKLEY Associate Director, The Franklin Institute Museum
The Latitude Work of Rittenhouse.....	PROF. JOHN H. PITTMAN Swarthmore College
The Orrery.....	DR. MAURICE J. BABE University of Pennsylvania
Rittenhouse and His Contemporaries in the Royal Society.....	MR. FREDERICK E. BRASCH Secretary, History of Science Society

Under the Auspices of The American Philosophical Society, The Franklin  
Institute, The Historical Society of Pennsylvania, The Rittenhouse  
Astronomical Society and the University of Pennsylvania

Friday, April 8, 1932

Three o'clock

THE AMERICAN PHILOSOPHICAL SOCIETY

104 South Fifth Street

### Honorary Chairman

HONORABLE J. HAMPTON MOORE..... Mayor of Philadelphia

### The Presiding Officer

MR. ALBA B. JOHNSON..... The American Philosophical Society

### Addresses

#### Rittenhouse and His Contemporaries

Franklin, Washington, Jefferson and others. His  
place in the thought and life of his period.  
RUSSELL DUANE, Esq.

Rittenhouse, The Scientist..... DR. ANNIE J. CANNON  
Harvard College Observatory

#### Rittenhouse

His Relations to Institutions of Learning and Learned Societies  
DR. JOSIAH H. PENNIMAN  
Provost, University of Pennsylvania

Under the Auspices of The American Philosophical Society, The Franklin  
Institute, The Historical Society of Pennsylvania, The Rittenhouse  
Astronomical Society and the University of Pennsylvania

## THE FIFTIETH ANNIVERSARY DINNER

Another high point in the history of the Rittenhouse Astronomical Society was reached on April 8, 1938 when the members celebrated its fiftieth anniversary. Ninety-six ladies and gentlemen attended the gala affair held at the Robert Morris Hotel, 17<sup>th</sup> and Arch Streets, Philadelphia, Pennsylvania.

The Society had come a long way in the intervening years since its founding by those dedicated men on that April 3<sup>rd</sup> in 1888. They charted a true and accurate course for us to follow down the years. To them and those who later took over the helm, can be credited the Society's prestige and importance today as an astronomical group.

Dr. Jonathan T. Rorer, Head, Department of Mathematics, William Penn High School and former President of the Rittenhouse Astronomical Society, was the gracious and witty toastmaster.

Dr. Henry V. Gummere, Director of the Strawbridge Memorial Observatory of Haverford College, Haverford, Pa., spoke on the "Early Days of the Society."

Dr. Harlow Shapley, then Director of the Harvard College Observatory, was the principal speaker for the evening. He was introduced by former President of Rittenhouse, Dr. John A. Miller, then Director Emeritus of the Sproul Observatory, Swarthmore College. Dr. Shapley's subject was "Fifty Years of American Astronomy."

As we write this record, we speculate that some of the older members attending the celebration must have recalled in fond memory those gallant and talented members of an earlier day (mentioned by Dr. Gummere in his talk) whom we like to believe now dwell

happily somewhere in the realm of the stars they loved so well: Read, Dupuy, Bowden, Luther, Matos, the Doolittles et al.

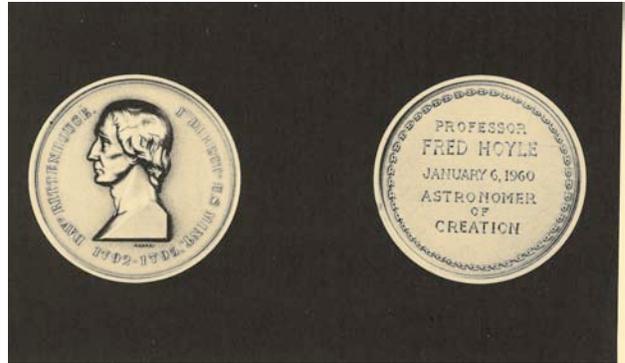
## SYMPOSIUM ON LIFE OF SIR WILLIAM HERSCHEL

November 11, 1938 marked the two hundredth anniversary of the birth of Sir William Herschel, world famous astronomer. The Rittenhouse Astronomical Society and The Franklin Institute met in the Lecture Hall of The Franklin Institute to commemorate the occasion. Dr. Henry V. Gummere, Director of the Strawbridge Memorial Observatory, Haverford College, and Mr. Frederick E. Brash, Secretary of the History of Science Society and Librarian of the Smithsonian Division of the Library of Congress, recalled some of the many accomplishments of this great man during his crowded lifetime of astronomical research. Dr. Samuel G. Barton, Associate Professor of Astronomy at the University of Pennsylvania, described Herschel's profound work on double stars. Mr. Edwin F. Bailey of The Franklin Institute staff explained how Herschel made his telescopes and displayed several mirrors of speculum metal which he (Bailey) had ground and figured after the fashion of Herschel.

THE PRESIDENT AND THE BOARD OF GOVERNORS OF  
*The Rittenhouse Astronomical Society*  
of Philadelphia  
REQUEST THE PLEASURE OF YOUR COMPANY AT A  
SUBSCRIPTION DINNER  
ON FRIDAY EVENING, APRIL 8TH, 1938  
AT SEVEN O'CLOCK  
IN CELEBRATION OF THE  
*Fiftieth Anniversary*  
OF ITS FOUNDING AS  
*The Camden Astronomical Society*  
AT  
THE ROBERT MORRIS HOTEL  
ARCH STREET AT SEVENTEENTH  
PHILADELPHIA  
★  
DOCTOR HARLOW SHAPLEY  
DIRECTOR OF THE HARVARD COLLEGE OBSERVATORY  
WILL SPEAK ON  
FIFTY YEARS OF AMERICAN ASTRONOMY  
AND SOME OF THE OLDER MEMBERS OF THE  
ORIGINAL SOCIETY  
WILL GIVE INTERESTING REMINISCENCES

PLEASE REPLY TO THE SECRETARY  
RITTENHOUSE ASTRONOMICAL SOCIETY  
THE FRANKLIN INSTITUTE, PHILADELPHIA  
NOT LATER THAN TUESDAY, APRIL 5TH

SUBSCRIPTION \$1.50  
MEMBERS MAY INVITE GUESTS



*The Rittenhouse Silver Medal*

## THE RITTENHOUSE MEDAL

The Rittenhouse Medal is awarded for outstanding achievement in the science of Astronomy.

Dr. Frank Schlessinger, then Director of the Yale Observatory, was the first person to be awarded a Certificate of Honorary Membership and a souvenir David Rittenhouse Medal. The medal was one of those originally minted to commemorate the Bi-Centenary of the birth of David Rittenhouse on April 8, 1932. It was thought fitting by the members to include one of the medals as a souvenir along with the Certificate of Honorary Membership.

The ten who received an Honorary Membership and the Souvenir Medal are shown in the accompanying table.

<u>RECIPIENT</u>	<u>DATE</u>	<u>AFFILIATION</u>
Dr. Frank Schlessinger	October 17, 1933	Director Yale Observatory - Originally from Yerkes Observatory, he was also president of the American Astronomical society. His main research interest was the improvement of parallax measurements. Results of his investigations are world-renowned and he is considered the leading authority in that area of research.
Dr. Robert G. Aitken	Oct. 16, 1934	Director Lick Observatory - He made systematic surveys of binary stars, discovering thousands, measuring their positions visually and calculating orbits for many. His works allowed orbit determinations which increased astronomer's knowledge of stellar masses.
Dr. Harlow Shapley	Oct. 19, 1935	Mount Wilson Observatory - Calibrated Henrietta S. Leavitt's period-luminosity relation for Cepheid variable stars and used it to determine distances to globular clusters. He boldly and correctly proclaimed that globulars outline the Milky Way and the galaxy's center was thousands of light years away in the direction of Sagittarius.
Dr. Robert McMath	Dec. 11, 1936	Director McMath-Hulbert Observatory - Served as chairman of the association of Universities for Research in Astronomy. The National Solar Observatory is the crowning

		achievement of Dr. McMath who was known for his expertise in solar physics and building solar telescopes. The observatory is co-named along with Dr. Pierce.
Dr. Armin O. Leuschner	Apr. 22, 1937	Berkley Astronomical Department - Director University of California - His research was in orbit theory, and he determined or refined the orbits of numerous asteroids and comets, but his most important contribution to astronomy was as an educator.
Dr. Knut Lundmark	Mar. 24, 1938	Professor of Astronomy, University of Lund, Sweden - Plotted the radial velocity galaxies against their estimated distances. He made rough determinations of the distances to other galaxies by comparing their sizes and brightness to that of M31. Lundmark concluded that there may be a relationship between galactic red-shift and distance, but "not a very definite one." 1924
Dr. Gustavus Wynne Cook	Mar. 6, 1940	Director Cook Observatory Investigator in Astronomical Science, The observatory named for Dr. Cook; now named the Flower and Cook Observatory, is one of the oldest astronomical research institutions in America: Founded in 1895. Originally in Malverne PA, and now relocated on the University of Pennsylvania Campus atop the David Rittenhouse Laboratory.
Dr. John A. Miller	May 10, 1940	Director Emeritus, Sproul Observatory
Dr. Forest Ray Moulton	Mar. 3, 1943	Secretary, American Association for the Advancement of Science
Mr. Samuel Fels	Nov. 9, 1943	Philanthropist and Donor of Fels Planetarium - One of Philadelphia's most prominent philanthropists. He took an active interest in, and gave generous support to, civic, scientific, cultural, and educational causes.

There is no record in the Rittenhouse minutes of further awards of Honorary Memberships and/or souvenir Rittenhouse Medals.

In 1952 the Society decided to establish a sliver medal (see page ####) to be awarded

from time to time to astronomers for noteworthy achievement in astronomical science. The silver medal is cast from the die (obverse) used for the Bi-Centennial Rittenhouse Medal.

The astronomers listed in the table below have received the Silver Medal.

Dr. Gerard P. Kuiper	April 16,1952	Director Yerkes Observatory April 16, 1952 Kuiper discovered two moons of planets: Uranus's moon Miranda in 1948 and Neptune's moon Nereid in 1949. In 1944 he discovered that Saturn's moon Titan had an atmosphere of methane. He is considered the father of modern planetary science. He was chief scientist for the Ranger lunar-probe program and identified landing sites for the Apollo moon missions. His greatest contribution was the prediction in 1951 that a belt of minor planets existed outside Neptune's orbit that was the source of short-period comets. This belt, now called the Kuiper Belt is also the location of possible other planets.
Dr. Harlow Shapley	March 18,1953	Director Harvard Observatory - There he studied the Magellanic clouds and made catalogs of galaxies. He wrote many books and was an important popularizer of science. He founded and developed an outstanding graduate school. Cofounder of UNESCO, he played a major role in national and international affairs.
Dr. Otto Struve	April 23, 1954	President International Astronomical Union - He made detailed spectroscopic investigations of stars. He directed four observatories including McDonald which he founded and where a telescope is named for him.
Sir Harold Spencer Jones	April 22, 1955	Astronomer Royal of England Apr. 22, 1955 From 1933 to 1955 Spencer Jones was the tenth Astronomer Royal. He determined the distance from Earth to the sun by triangulating the distance to the asteroid Eros, refining the near accurate

Dr. Lyman Spitzer, Jr.	May 19, 1958	<p>measurement made by David Rittenhouse in 1769. He published a paper in 1939 showing that the Earth's rotation was not uniform and could no longer be used as an accurate clock. He worked at the Royal Observatory in Greenwich and supervised its move to Herstmonceux Castle in Sussex.</p> <p>Director Princeton University Observatory</p>
Dr. Bengt Stromgren	April 1, 1959	<p>He was the first to propose putting a large telescope in space. The Hubble Space Telescope was based on his concepts. The Infrared Spitzer Space Telescope was named for him.</p> <p>Professor; Institute for Advanced Study, Princeton - Known for his theory of the ionized gas clouds around hot stars. He calculated the relative abundances of the elements in the sun and other stars.</p>
Dr. Fred Hoyle	January 6, 1960	<p>Plumian Professor of Astronomy, Cambridge University - He coined the term Big Bang but never accepted that theory for the origin of the universe. Hoyle believed in the steady-state theory. He advanced a theory that infections on Earth resulted from microorganisms arriving from distant places in the universe.</p>
Cecelia Payne Gaposchkin	1961	<p>Professor Harvard University: - The first woman to become a full professor at Harvard University. Her dissertation was said to be the best one in 20th century astronomy. She was ahead of her time showing that hydrogen and helium were a major constituent of stars.</p>
Peter Van De Kamp	1965	<p>Director Sproul Observatory, Swarthmore College - He studied nearby stars measuring their movements. He started a search for planets orbiting other stars. He was the president of the Rittenhouse Astronomical Society in 1944.</p>

Martin Schwarzschild	1966	Professor; Princeton University - His book, "Structure and Evolution of the Stars," was used by astrophysicists to apply computers to the computation of stellar models. His Stratosphere project sent balloons with instruments to obtain data of the sun, other stars and planets of our solar system in the 1950s and 1960s.
Helen Sawyer Hogg	1967	Harvard Observatory Encouraged women to study and enter the science profession. She developed techniques for measuring the distance to galaxies beyond the Milky Way. Her research was on variable stars in globular clusters. She was program director for the National Science Foundation, first female president of the Royal Canadian Institute and founded the Canadian Astronomical Society. In 1976 she became a Companion of the Order of Canada-one of the highest honors in the nation.
Allan Sandage	1968	He found the first optical counterpart to a radio source that would be identified as a quasar. His research has been in stellar astronomy and observational cosmology. He was involved in determining the ages of the oldest objects known.
Carl Sagan	1980	
Carolyn and Eugene Shoemaker	1988	
Clyde Tombaugh	1990	



*Sir Harold Spencer Jones, Astronomer Royal, (center) receiving the Rittenhouse Medal for 1955 from Pres. C. M. Billings (left) with Pres. S. W. Rolph of The Franklin Institute looking on.*

*Dr. Fred Hoyle (right) receiving the Rittenhouse Medal from President James Conklin - 1960*

## MEETING A CHALLENGE

The Rittenhouse Astronomical Society throughout its long history has demonstrated its usefulness in promoting the science of astronomy. In addition, the Society has been thoroughly conscious of its civic duties and quick to challenge erroneous statements or information that might lead to decisions prejudicial to the best interests of astronomical progress.

Such action was taken at a regular meeting of the Society, held Tuesday evening, March 14, 1933 at The Franklin Institute.

It was brought to the attention of the membership by a letter from a friend of the Naval Observatory pointing out some glaring inaccuracies regarding the observatory that appeared in the March 11, 1933 issue of "Colliers' Magazine."

A committee was immediately appointed to draft a protesting answer to the article. The result was the following letter containing the facts about the Naval Observatory which was sent to all interested parties. Many replies were received lauding our initiative in preventing a curtailment of the highly necessary work of the Naval Observatory.

## THE RITTENHOUSE ASTRONOMICAL SOCIETY

Philadelphia, Pa.

March 25, 1933

WHEREAS reports have reached the Rittenhouse Astronomical Society that the U. S. Naval Observatory stands in serious danger of undue curtailment in its essential functions, the following resolution has been passed by a special committee of the Society empowered to act:

Though it fully understands that substantial reductions must be made in the national budget, the Rittenhouse Astronomical Society requests that any reduction in the appropriations for the Naval Observatory be made with full knowledge of the facts and that no reduction be made which will curtail its every-day and fundamental usefulness. The many reasons for this request are given at length in the appended statement.

JAME STOKLEY

President, Rittenhouse Astronomical Society  
Associate Director, Franklin Institute Museum

A. CLYDE SCHOCK

Secretary, Rittenhouse Astronomical Society  
Professor in Mathematics, Central High School, Phila.

WILLIAM H. BARTON JR.

Vice-President, Rittenhouse Astronomical Society  
Directory of Observatory, Pennsylvania Military College

CHARLES P. OLIVIER

Director of Flower Observatory, University of Pennsylvania

LEONARD ORMEROD

The Bell Telephone Company of Pennsylvania

JOHN H. PITMAN

Chairman, Special Committee, Rittenhouse Astronomical Society  
Professor in Mathematics and Astronomy, Swarthmore College.

## OUR NAVAL OBSERVATORY

No living person is familiar with all technical subjects and few technically trained men have definite information on many scientific topics. When a person purchases a magazine of national circulation he is entitled to an honest statement of facts. Whether the conclusion the writer presents is false, true or partially true, the reader can decide for himself if the facts are truly and completely stated.

The following is quoted from a recent article. (George Creel. "What Roosevelt Intends to Do." "Colliers", "March 11, p. 34 foot Col. 2.") "The Naval Observatory, a moss-grown institution that costs \$300,000 a year exclusive of an admiral, his aides and other navy personnel ..... At the Observatory they study the stars with a telescope made in 1840, and the two major duties are to set a clock each day and get out the Naval Almanac, a task which is the last word in perfunctoriness."

Our Naval Observatory is not a moss-grown institution, but, on the contrary, the work of its scientific staff is a credit to the nation and is as modern and accurate as the work of any national observatory in the world.

The annual cost of operating the Observatory is about \$193,000 – not \$300,000. Of this about \$135,000 is for the Observational Department, about \$43,000 for the Nautical Almanac and about \$15,000 for the Nautical Department. This was before the 8 1/3% reduction for legislative furlough.

The superintendent is usually a captain in the Navy. About one in three is an admiral or becomes one during his tour of duty. The last time an admiral was superintendent was in 1923. There have been no admiral's aides at the observatory having specific duties, most of which are in connection with the work of the Nautical Department, and the salaries of these would continue whether they performed duties at the Naval observatory or elsewhere.

The duties of the superintendent are administrative and executive. The astronomical work is planned by the scientific members of the staff, and is decided by the Council whose membership comprises the superintendent, the assistant superintendent and the principal members of the scientific staff.

At the Observatory they study the stars, also the sun and moon and other heavenly bodies. The 'they' means the scientific staff. These observations are for the purpose of determining the positions of these bodies in the sky and predicting their positions for future dates.

Of what practical value are these data? Look at your map of the United States. See how many state boundaries are meridians of longitude or parallels of latitude. Look at the long boundary separating the United States and Canada from Minnesota westward following the 49<sup>th</sup> degree of latitude. Not one of these boundaries could be accurately laid out without an accurate knowledge of the positions of the stars as furnished by the Naval Observatory.

All the work of the Coast and Geodetic Survey depends on information constantly supplied by the Naval Observatory, and only by this means can the accurate maps and charts be made.

What time is it? Look at your watch, clock or electric clock. If your time is correct you mean that you have directly or indirectly compared your time with that furnished by our Naval Observatory, a service which costs you one cent in six years. That is the standard by which all business is conducted in the United States. Time is determined by observations of the stars. Sun dial days are not the same length during different parts of the year.

The Bureau of Standards, through its Radio Laboratory, sends a standard wave length signal on which the various radio stations turn their transmitters. The control of these standard radio frequency oscillators depend on the daily time signals sent from the Naval Observatory. If this control were eliminated in a very short while chaos would prevail in the entire radio broadcasting world, with resulting interference that would destroy its usefulness in this country and consequent international complications would ensue.

By 1935, perhaps new standards for electrical units will probably be adopted all over the scientific world. At the present time, our Bureau of Standards is cooperating with outer countries in research work leading to this. This work is very definitely and closely tied in with the daily time signals sent from the Naval Observatory. The cooperative solar study in which the Naval Observatory is engaged is studying sun spots and solar radiation in connection with weather study. Any contributions to the knowledge of the weather will exert great influence on business and even our daily life.

These scientists of ours study the stars not with a telescope made in 1840, but with the following instruments:

	Installed	Reconstructed
26-inch Equatorial	1873	1893
12-inch Equatorial	1893	
9-inch Transit Circle	1865	1894
6-inch Transit Circle	1897	
10-inch Photo-equatorial	1911	
3-inch Transits (2)	1913	

8-inch Photo-Zenith Tube  
Shortt Clocks (3)

1915  
1930-1933

The following instruments are under construction:

40-inch Reflector Telescope and 15-inch Photographic Refractor (Triplet)

After the astronomer makes his observations and the necessary calculations are completed he knows the error of his standard clock and sets the broadcasting clock in accordance with the correct time. This clock sends out signals which are available to every citizen who wishes to tune in at noon or 10:00 P.M., or on a short wave set, at four other times during the day and night. From these signals, the clocks of our railroads are regulated, and electric companies regulate their generators, making possible the usefulness of the electric clock and thus enabling a new industry to give employment to our citizens. The navigators in our Navy and Merchant Marine check their chronometers wherever they may be.

The Naval Observatory Nautical Almanac Office publishes the "American Ephemeris and Nautical Almanac," "The American Nautical Almanac," the "Lunar Ephemeris for use of Aviators" and "The Astronomical Papers of the Nautical Almanac." It does not publish the "Naval Almanac," if such a title exists. The "Nautical Almanac" is not the last word in perfunctoriness, but the most useful book in the navigator's cabin.

If such a book were not available "The Navy would quit sailing," as one navigator put it. We would be back to the time of Christopher Columbus. With such a record of the positions of the sun, moon and stars as found in the "Nautical Almanac" and with a chronometer whose accuracy is checked by radio time signals, the navigator makes his observations and calculation and finds his position at sea. He locates drifting icebergs and notifies shipping of the latitude and longitude of these menaces so that other ships knowing their positions may avoid them. We do not want another "Titanic" disaster.

Without the "Nautical Almanac," our Merchant Marine would have to remain in port. In 1931, the total value of our foreign and domestic sea-borne commerce was approximately seven billion dollars. The pay of the employees of the Nautical Almanac Office and Observatory staff was \$178,258.00. Where can you buy insurance anywhere for less than 3/1000ths of 1% of the value of the property insured? No value is included to cover the lives of the passengers and crews, nor is any value of shipping and equipment included. One cup of tea each year pays your share in this protection, given not only to the shop which brought your tea to these shores, but also to other ships as well, thanks to our Naval Observatory.

This book is not entirely the work of our Nautical Almanac Office, but part of it is furnished by the corresponding offices of other countries to avoid unnecessary duplication of work though our office holds itself in readiness to prepare the entire portion used by navigators in case of emergency. The cooperating offices are The British Nautical Almanac, the Berliner Jahrbuch, the Connaissance des Temps, the Almanaque Nautico and our own office.

Such data, time and positions, furnished by the work of the Naval observatory are absolutely essential to modern business, our Merchant Marine and or Navy. It should be made available by our national government. In emergencies we cannot depend on data

furnished by other countries. No country in the world, in spite of the grave financial difficulties which each is facing, has abandoned or seriously curtailed the work of its National Observatory.

In view, of the unfortunate misstatement of fact, and our President's knowledge of the work of the Navy Department and of Navigation in general, we cannot believe that such an idea originated with the President. We do not believe that our President intends to disrupt business and put in jeopardy those upon the seas by such a curtailment of the budget.

THE RITTENHOUSE ASTRONOMICAL SOCIETY  
Philadelphia, Pennsylvania

March 25, 1933

THE FRANKLIN INSTITUTE and  
THE RITTENHOUSE ASTRONOMICAL SOCIETY

*By Dr. I. M. Levitt*

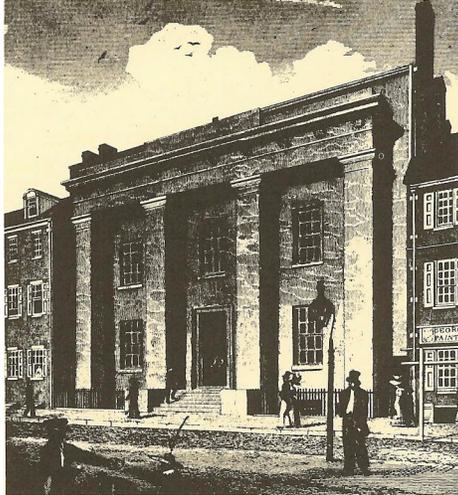
The close relationship between The Franklin Institute and the Rittenhouse Astronomical Society goes back more than forty years. It was on November 13, 1919 that The Franklin Institute invited the then Camden Astronomical Society to attend its meetings, at which the Institute presented the world famous figures of science.

In 1927, because most of the members of the Camden Astronomical Society were residents of Philadelphia, it was decided to change the name of the Society. The name of the Philadelphia Astronomical Society was voted down and the name of the Rittenhouse Astronomical Society adopted.

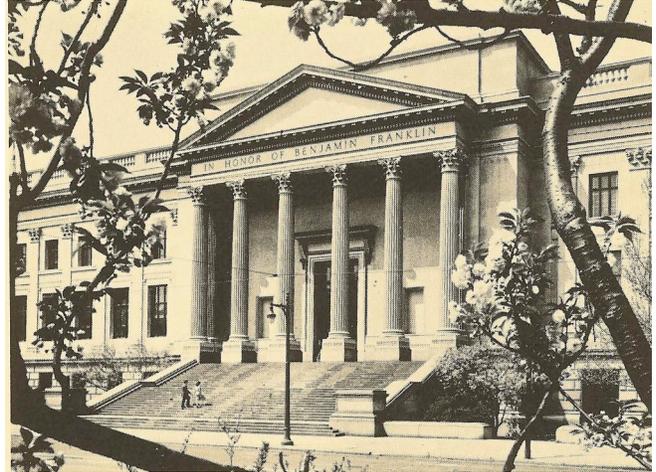
By May 6, 1931, at the suggestion of Dr. James Stokley, Associate Director of The Franklin Institute Museum on the Parkway in 1934, the Society transferred its activities to the new building. Except for a short period in the early 1940's when World War II was disrupting all activities, the meetings have been held in The Franklin Institute.

The Rittenhouse Astronomical Society, along with The Franklin Institute, has been hose to the American Astronomical Society twice during this period. Outstanding speakers in the field of astronomy and astrophysics have been invited to lecture at both the Institute and the Rittenhouse Astronomical Society and members of both organizations benefited from this joint venture.

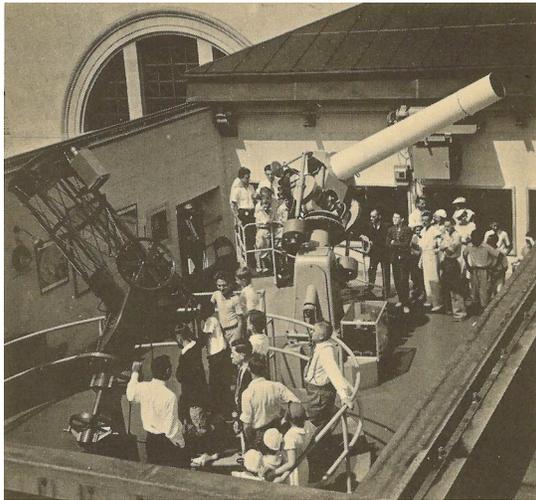
Astronomers like George Ellery Hale, Henry Norris Russell, Edwin Hubble and Harlow Shapley have been awarded Franklin medals by The Franklin Institute. With the inauguration of the Rittenhouse medal, a joint meeting has been held every year.



*Franklin Institute's home from 1825 to 1934 on South Seventh Street, Philadelphia, Penna.*



*The Institute's present home at 20<sup>th</sup> & Benjamin Franklin Parkway, Philadelphia, Penna.*



*The Franklin Institute Observatory*



*The Lecture Hall of The Franklin Institute and meeting place of the Rittenhouse Astronomical Society.*

## THE OBSERVATORIES

No history of the Rittenhouse Astronomical Society would be complete without mention of the nearby college and university observatories and their association.

Over the years to the present time, most of the Directors and professional astronomers of the Cook, Flower, Sproul and Strawbridge Observatories have been, or are now, members of The Rittenhouse Astronomical Society.

Many have been the principal officers or have headed important committees of the Society. They have, on many occasions, opened the observatories for our instruction and enjoyment of their observing facilities.

We are, therefore, most happy in the several pages that follow to acquaint you with some interesting facts concerning the aforementioned observatories.

## THE SPROUL OBSERVATORY OF SWARTHMORE COLLEGE

At Swarthmore, Pennsylvania

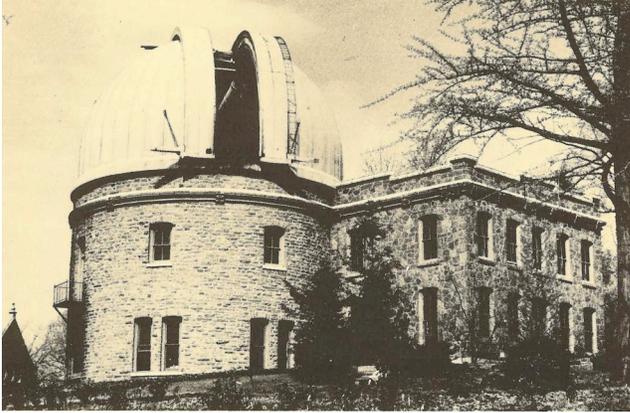
*By Sarah Lee Lippincott*

Teaching astronomy at Swarthmore was started by Dr. Susan J. Cunningham, who was connected with the college from 1869-1906. Through her efforts a small Observatory was erected in 1887, containing a three-inch transit instrument, a six-inch equatorial telescope, and other equipment.

The founding of the Sproul Observatory followed the appointment of John A. Miller in 1906 to succeed Miss Cunningham. Dr. Miller's requirement of a telescope was fulfilled by a gift made in 1907 by William Cameron Sproul, Swarthmore College '91, and later governor of Pennsylvania.

The Sproul telescope, a large visual refractor with an objective 24-inches in diameter and a focal length of 36 feet is used primarily as a camera with properly chosen panchromatic photographic plates combined with a yellow filter at the focus. Pinpoint images of stars are faithfully recorded from a useful star field a little larger than the apparent size of the moon. Minute changes in stellar positions can be detected by repeated photographs of the same fields. In this manner the telescope was used, from the beginning, by Dr. Miller to determine parallaxes and proper motions of stars. A later development was the determination of stellar masses from his studies of orbital motion in double stars.

In 1937 the Directorship was assumed by Peter van de Kamp, who adjusted the original research program of the 24-inch telescope to follow up the assumption that many stars appear single only because their possible companion stars – or planets – are too faint or too close to their primaries to be observed directly. Such an unseen object would reveal itself through irregularities in the visible star's motion across the sky. With this in mind, nearby stars are photographed regularly. Several companion objects have been detected so far. One of these objects was subsequently seen with the 200-inch Hale reflector on Mt. Palomar at the position angle computed from the Sproul photographs. This star, Ross 614B and its primary along with a double star L726-8 AB, were found from analyses of Sproul photographs to be the least massive stars yet determined.



*The Sproul Observatory*



*John Anthony Miller, Ph. D.  
1859-1946*

#### HAVERFORD COLLEGE At Haverford, Pennsylvania

Astronomy, at Haverford College, began with the founding of the college in 1833. The main building was capped by a cupola intended as the location for an observatory but there are no records showing that it was put to this use. A small telescope was available which was set up on a window sill. However, by 1839 a wooden building 15' square was erected to house a 2' transit instrument – John Gummere was the observer.

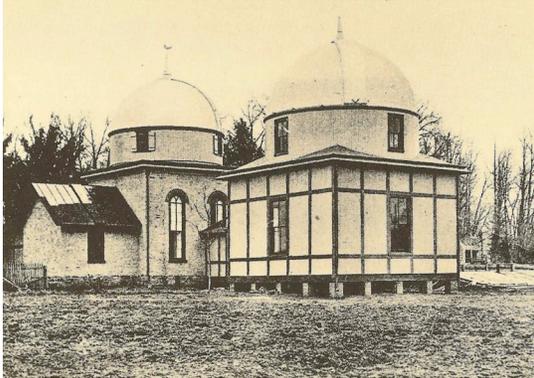
In 1852, the department really came into its own with the purchase of an 8" refractor by Fitz of New York. It was equatorially mounted and a building was constructed on the present site to house it. The objective was not quite satisfactory and was refigured by Alvin G. Clark. A driving clock and a micrometer were added to the telescope. A sidereal clock and a 4" meridian circle completed the observatory equipment. Professor Joseph G. Harlon was director. The next addition was an eight inch diameter speculum mirror by Brashear. The mounting was made by Levi T. Edward, or the class of 1881. He discovered comet 1881B with this portable telescope.

In 1883, Isaac Sharpless obtained the money for a larger telescope. The new equipment was in operation by the end of 1884. The 10" Clark refractor was installed in a new stone building. Complete with heliometer, spectroscope and chronograph. Two refractors, a 4.5" and 4.0", were later given to the College.

Through the generosity of the Strawbridge family, the old observatory building was replaced in 1933 by the present stone structure. Complete with classroom, darkroom and a library containing several thousand volumes and periodicals. Two four-inch cameras and a spectrohelioscope completed the instrumentation.

Three of the staff have been members of The Rittenhouse Astronomical Society. F. B. Leavenworth just missed being a founding member of the Camden Society. Henry V. Gummere was a long time member serving once as president. Dr. Louis C. Green, the present director, served once as president and has lectured many times to the Society.

Prof. E. W. Brown who spent 16 years at the College was perhaps the most widely known astronomer ever to be on the staff.



*The old Haverford College Observatory.*



*The present observatory nearing completion in 1933.*

## THE COOK OBSERVATORY

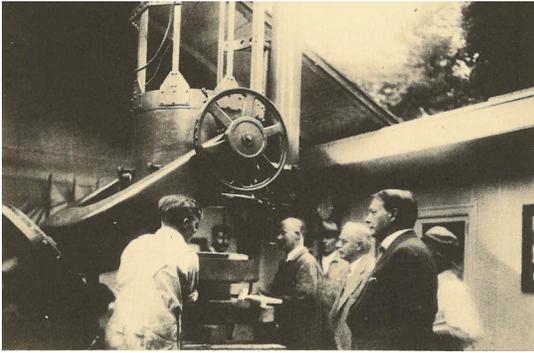
(formerly at Wynnewood, Pennsylvania)

Cook Observatory was the private property of the late Dr. Gustavus Wynne Cook, 1867-1940, who was a native Philadelphian. Before moving to Wynnewood, PA., he had acquired an 8-inch refractor and become greatly interested in astronomy. After moving to his new estate, Roslyn House, he determined to found a regular observatory and secure a staff of young men capable of professional work.

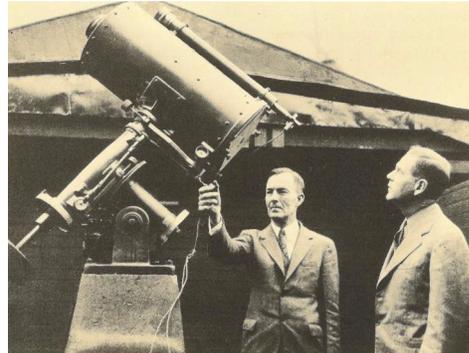
The various buildings eventually contained a 28 1/2 - inch reflector, a 15-inch horizontal refractor, a combination astrographic mounting of three Ross-Fecker cameras of 10 1/4 - inch, 5-inch, and 4-inch aperture, a 3-inch elbow-type transit instrument (built by himself), and a combined spectroheliograph and spectrohelioscope used for daily observations of the sun. Superb photographs of celestial objects were obtained with the larger instruments, and considerable spectroscopic work was done. His most ambitious plan was for a complete Milky Way atlas on 24 x 20 inch plates, showing stars to at least 16 magnitude. This was only partly completed at his lamented death in 1940.

By his will, the observatory was left to the University of Pennsylvania and dr. C. P. Olivier automatically became director, and so continued until 1954. The various types of work, begun before 1940 were continued and somewhat expanded until the breaking out of World War II when the entire staff went into various services. After peace came, the work was again started with a reduced staff. Due to the expanding suburbs, the location became very unfavorable for astronomical work, so the instruments were moved later to the new Flower and Cook observatory at Malvern, Pennsylvania some 14 miles to the west. They are, for the time being, the principal instruments in use there. Several of the smaller instruments from both former sites are now in a Students Observatory on the

campus of University of Pennsylvania. Dr. F. B. Wood became director of the combined Flower and Cook Observatory in 1954.



*The 28 1/2 " Reflector at Cook Observatory, Mr. Harry Rumrill and Dr. Cook third and fourth figures from left.*



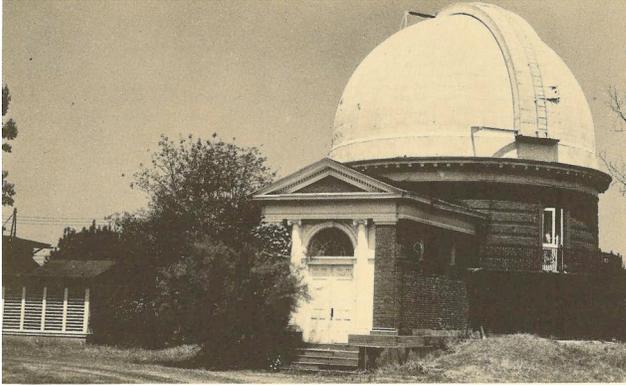
*The 4" Astrographic Camera, Dr. Charles Olivier at control, with William Barton looking on.*

### THE FLOWER OBSERVATORY (formerly at Upper Darby, Pennsylvania)

The founding of Flower Observatory, Upper Darby, Pennsylvania, was made possible by the will of Reese Wall Flower of Delaware County, Pennsylvania. Observational work was begun there in 1897. The grounds covered over 7 acres and the situation at that date was considered quite far from the city. There was a large brick dome housing the 18-inch Brashear refractor, and a transit house containing an 8-inch photographic zenith telescope, a 5-inch visual zenith telescope, a 4 1/2-inch meridian circle, and a 3-inch elbow-type transit instrument. A smaller building contained a 5-inch refractor. About 1937 Dr. G. W. Cook presented a 4-inch Ross-Fecker photographic telescope.

A large residence had living quarters for the director and in a wing, offices for the staff. The directors were: Dr. Charles Doolittle, 1895 – 1912, Dr. Eric Doolittle, 1912 to 1920, Dr. S. G. Barton, acting director, 1920 to 1928, and Dr. Charles P. Olivier, director, 1928 to 1954. At the latter date the land was sold, building demolished, and instruments moved to the new site.

Before 1928, the work was mostly on double stars, and fundamental work with the zenith telescopes. After 1928, double star work was continued vigorously, but photometric work on variable stars and their comparison stars was inaugurated. Also the headquarters of the American Meteor Society moved to Flower Observatory, which from then on became the center of amateur, as well as considerable professional work on meteors, for the country. The results of the telescopic work were published in eight volumes of Proceedings and in some of the over one hundred reprints, the meteor results were published. The staff also published numerous other shorter or popular articles in journals.



*The old Flower Observatory of Upper Darby, Pa.*



*Dr. Charles Olivier at eyepiece of the 18”  
Brashear.*

### OBSERVING AND COMPUTING SECTION OF THE RITTENHOUSE ASTRONOMICAL SOCIETY

At the October 1957 meeting of the Society, following a presentation of a proposal by Mr. James H. Conklin, the Observing and Computing Section of the Rittenhouse Astronomical Society was officially approved. The by-laws of the section state, “the object of the O.C.S. shall be to contribute to the advancement of the science of astronomy by performing the observational and computational programs of the Rittenhouse Astronomical Society.”

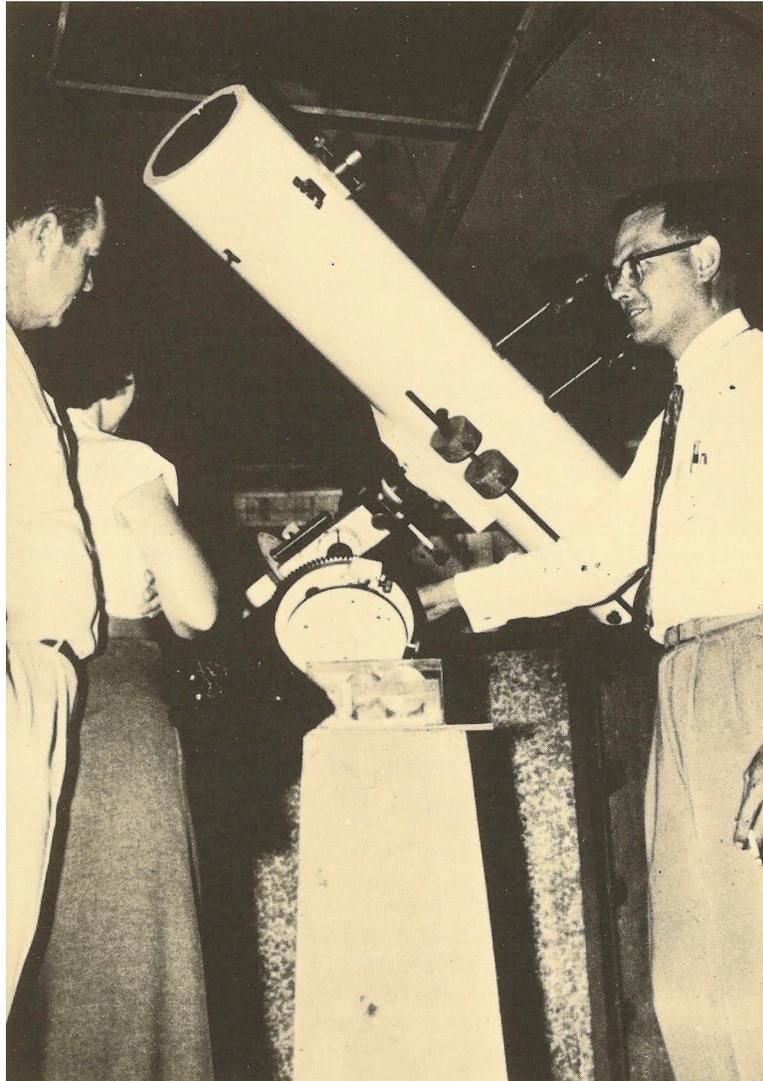
James Conklin was elected Section Head at the first organizational meeting. A Principal Observer, Principal Recorder, and Principal Computer are the other officers of the program staff. These officers, with the Secretary-Treasurer and Assistant Section Head, make up the Astronomical Council. The Council manages the affairs of the Section. The activities of the Section are further organized by standing committees on Variable Star Observations, Minor Planet Positions, Occultations, Meteor Counts, and Computations.

Membership in the Observing and Computing Section is open to any member of the Society who desires to do serious work in astronomy. Most of the current members own their own telescopes or other astronomical equipment. They have found increased satisfaction and technical use for their instruments through their association with the O.C.S. A continuing program of the O.C.S. is the one hour instruction period Practical Astronomy presented at each monthly meeting. The monthly meetings were held at Woodbury, New Jersey during the first year. In the fall of 1959 the meeting place was changed to the school at Mullica Hill, New Jersey, so as to be nearer the O.C.S. observatory.

The O.C.S. has been an annual member of the American Association of Variable star Observers since June of 1958. During 1959, 174 observations of 63 variable stars were officially reported to AAVSO.

In early 1960 the members constructed a 12” focal length, 305 mm, f 2.5 astronomical camera which when mounted in the observatory will provide an expanded

program for the Section. Members of the Section have attended most of the National Astronomical Meetings and Conventions.



*Inside the Observatory of the Observing and Computing Section of Rittenhouse Astronomical Society at Mullica Hill, N.J.*

## BIOGRAPHICAL SECTION

In the section immediately following, and beginning with the five charter members, are shown the photographs and biographies of the Presidents, Secretaries, and Treasurers who held office in the Rittenhouse Astronomical Society, and its predecessor the Camden Astronomical Society, from 1889-1960.

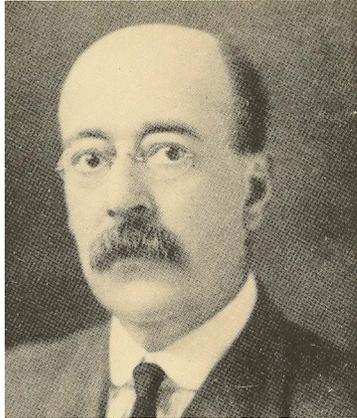
In addition to the principal officers, are shown some of the members who were not officers, but prominent on committees and other important activities of the Society.

Please note that all the biographies shown are condensed versions necessary in the interest of space requirements. Those members who are interested in a more detailed biography are referred to the Rittenhouse Astronomical Society Scrap-Book which is

available in the Society's archives, Astronomy Department of The Franklin Institute, Philadelphia, Pennsylvania.

## OFFICERS OF THE RITTENHOUSE ASTRONOMICAL SOCIETY

### PRESIDENTS



Edmund E. Read, Jr.  
1889-1923

Edmund Elliot Read, Jr. was born in Camden, N.J. August 7, 1859. He graduated from the University of Pennsylvania in 1879 with a degree of A.B. He was a man of exceptional talents and culture. In addition to his outstanding work in education, business and the financial affairs of his community, he maintained a lifelong interest in astronomy and science. Occasionally he lectured at the Wagner Institute of Philadelphia. He was a director of the Camden Trust Co. and Director and President of the Camden Fire Insurance Association from 1899 to 1923.

Mr. Reed built a small brick observatory on his property at 6<sup>th</sup> and Cooper Sts. He was the founder, charter member, and first president of the Camden Astronomical Society. He died August 7, 1923.



Dr. John A. Miller  
1924-1926

John Anthony Miller was born in Greensburg, Ind., December 16, 1859. Following his early education, he taught in public schools. Subsequently he entered Indiana University where he completed his graduate studies.

In 1891 he taught mathematics at Leland Stanford University. Three years later, he returned to Indiana University as Professor of Mechanics and Astronomy. In 1906 Dr. Miller became director of the Sproul Observatory at Swarthmore College. He was Vice-President of Swarthmore College for fifteen years, during which period his time was devoted to administration and teaching.

In 1929 Indiana University honored Dr. Miller with the degree of LLD. He was the second president of the Camden Astronomical Society serving from 1924 to 1926. He died on June 15, 1946.



Dr. Samuel G. Barton  
1927

Samuel Goodwin Barton was born in Ivyland, Pa., January 1, 1882. He graduated from Temple University with an A.B. degree in 1903 and received a Ph D. from the University of Pennsylvania in 1906. His teaching career included: Professor of Mathematics Clarkson Tech, 1907 – 1911; Assistant Professor of Mathematics, Swarthmore College, 1911-1913; Astronomy Instructor, University of Pennsylvania, 1913-1914, and Associate Professor, 1931-1951.

Dr. Barton was Director of the Flower Observatory from 1921-1928. He is author of many papers and several books on astronomical subjects, notably his "Guide to the Constellations."

He directed the U.S. Shipping Board's Navigation School from 1917-1919. He died on January 3, 1958.



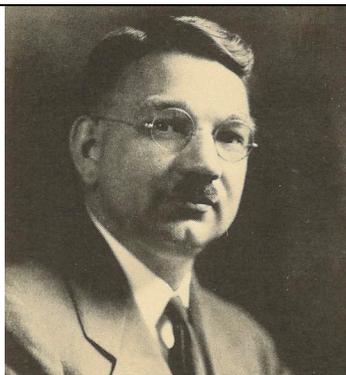
Prof. A. Clyde Schock  
1928 & 1945

A. Clyde Schock was born in Philadelphia, Pa., May 25, 1892. He is a graduate of Central High School of Philadelphia and the University of Pennsylvania.

From 1915 to 1936 he taught mathematics and astronomy at Central High School, and since 1937 to the present (1959) heads the Department of Mathematics.

He is co-author of several books on secondary school mathematics. His new book is titled, "Analytic Geometry and Calculus for the High School."

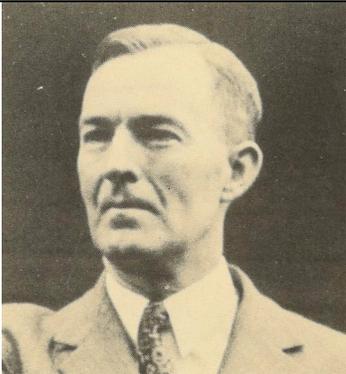
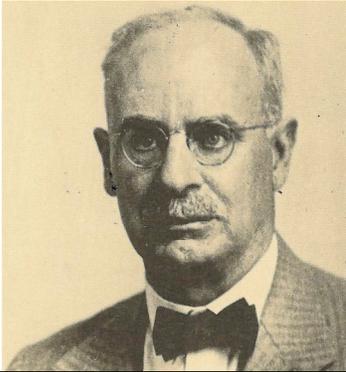
Mr. Schock was elected a member of the Camden Astronomical Society in 1922, and from 1929 to 1942 was Secretary of The Rittenhouse Astronomical Society. He was also its President twice, once in 1928 and again in 1945. Mr. Schock was a member of the staff of the Fels Planetarium of The Franklin Institute from 1932 to 1936.



Dr. John H. Pitman  
1929 & 1938

John H. Pitman was born at Conshohocken, Pa., April 7, 1890. He graduated from Swarthmore College in 1910, and received a master's degree in 1911. He spent two years at the University of California for graduate study. He returned to Swarthmore in 1913 and was successively Instructor of Mathematics and Astronomy, Assistant Professor in 1918 and Associate Professor from 1928. He was also active in politics, and served as Burgess of Swarthmore, Pa. From 1934 to 1947.

He was a member of the American Astronomical Society, and The Rittenhouse Astronomical, serving twice as the latter's president, in 1929 and in 1938. He joined the old Camden Astronomical Society prior to

	<p>1915 and suggested in 1927 the change in name to The Rittenhouse Astronomical Society. He died at Swarthmore, Pa. in 1952.</p>
 <p data-bbox="300 680 581 747">Dr. Charles P. Olivier 1930 &amp; 1942</p>	<p>Charles Pollard Olivier was born in Charlottesville, Pa., April 10, 1884. He graduated from the University of Virginia with an A.B. degree in 1905 and received an A.M. in 1908 and his Ph. D. in 1911.</p> <p>Hi career began as Professor of Astronomy and Physics in Agnes Scott College, Decatur, Ga. From 1911 to 1914. He was Assistant professor of Astronomy at the University of Virginia from 1914 to 1923, and Associate Professor from 1923 to 1928.</p> <p>He became Director of Flower Observatory in 1928, and in 1940 also Director of Cook Observatory. He is an international authority on meteors and comets. He founded the American Meteor Society in 1911.</p> <p>Dr. Olivier has authored over 200 articles and two books, "Meteors" and "Comets." <b>He died on August 14, 1975.</b></p>
 <p data-bbox="284 1268 597 1335">Dr. George Rosengarten 1931 &amp; 1941</p>	<p>George Rosengarten was born in Philadelphia, Pa., October 6, 1887. He was a graduate of the University of Pennsylvania, receiving an A.B. degree in 1908, a C.E. in 1911, and a Ph. D. in 1920.</p> <p>He began his career in 1908 as an engineer with the Bethlehem Steel Company. Returning to his Alma Mater in 1909, he taught Civil Engineering for two years.</p> <p>In 1913 he was named Professor of Physics at the West Philadelphia High School and served in that capacity until his retirement in 1950. From 1922 he also was Professor of Physics and Mathematics at Philadelphia College of Pharmacy and Science.</p> <p>A member of many scientific societies, he served as President of The Rittenhouse Astronomical Society in 1931 and in 1941.</p> <p>He died November 23, 1953.</p>
	<p>Harry Barlow Rumrill was born in Philadelphia, Pa., May 13, 1867. He spent forty-nine years with the Pennsylvania Railroad, retiring in 1932.</p> <p>Having mastered the piano and organ in his spare time, he had considered a professional career as a musician, but owing to a threatened paralysis of his fingers, could not continue.</p> <p>Since 1882 he had been interested in the stars, and after retirement, turned to astronomy in earnest. He confined his work principally to sunspot observation.</p>

<p>Harry B. Rumrill 1932</p>	<p>He wrote many articles on astronomy which were published in this country and Europe. His membership included the leading U.S. astronomical societies. He was also a Fellow of the Royal Astronomical Society of Great Britain. He died January 22, 1951.</p>
 <p>Dr. James Stokley 1933</p>	<p>James Stokley was born in Philadelphia, Pa., May 16, 1900. He received a B.S. degree in 1922 and an M.A. in 1924 from the University of Pennsylvania. Wagner College of New York honored him in 1949 with a degree of Sc. D.</p> <p>He teaches science writing in the School of Journalism at Michigan State University. Before his present post, he was publicist for General Electric Co., 1941-1956; Director, Buhl Planetarium, 1939-1940; Director, Fels Planetarium, 1931-1939; staff writer, "Science Service," 1925-1931, and 1940-1941; science teacher, Central High School of Philadelphia, 1923-1925.</p> <p>He is a Fellow of the American Association for the Advancement of Science, the Royal Astronomical Society, the British Interplanetary Society, and leading societies.</p> <p>James Stokley, native of Philadelphia, died December 29, 1989, at age 89.</p>
 <p>Prof. William H. Barton 1934</p>	<p>William H. Barton, Jr. was born in Baltimore, Md., July 7, 1893. He graduated with honors from Baltimore City College in 1911. He received a B.S. degree in 1917, a C.E. degree in 1921, and his M.S. from the University of Pennsylvania. He taught Civil Engineering at the University of Pennsylvania from 1920 to 1930. He headed the Department of Civil Engineering, Pennsylvania Military College from 1930 to 1935.</p> <p>He was appointed in 1938 as executive curator of the Hayden Planetarium, having lectured there since its opening day in 1935. He had charge of several eclipse expeditions. He was a Fellow of the Royal Astronomical Society and the New York Academy of Sciences and other leading bodies. He died July 7, 1944 and was buried at Arlington Cemetery with full Military Honors.</p>



Dr. Jonathan T. Rorer  
1935

Jonathan Taylor Rorer was born in West Chester, Pa., August 21, 1871. He received an A.B. degree from Columbia College in 1895 and his Ph. D. in 1901 from the University of Pennsylvania.

He was a fellow of the A.A.A.S. and a member of the American Mathematical Society, American Astronomical Society, Council of Teachers of Mathematics, and National Educational Association. He wrote numerous papers on scientific subjects, which were published in leading journals.

Some posts he held were: Professor of Mathematics, Central High School, Philadelphia, 1895-1909; Head, Departments of Mathematics, William Penn High School; Visiting Professor and Lecturer, Temple University, 1942-1948; Educational Corps, U.S.A., 1918-1919; Education Director, 2<sup>nd</sup> Div. A.E.F., 1919.

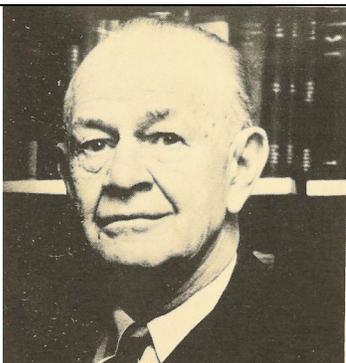


Dr. Henry V. Gummere  
1936

Henry Volkmar Gummere was born March 20, 1870 in Philadelphia, Pa. He graduated from Penn Charter School in 1885 and from Haverford College in 1888. He received M.A. degrees from Haverford and Harvard. From 1893 to 1897 he taught mathematics at Swarthmore College. Returning to Harvard in 1898 he completed a year of graduate study.

From 1899 to 1904 he was professor of Mathematics, Physics, and Astronomy at Ursinus College, and for fourteen years thereafter, headed the Department of Mathematics at Drexel Institute.

After a special assignment by the Federal Government in 1918, he returned to Haverford as Professor of Mathematics and Astronomy, and Director of the Strawbridge observatory. Retiring in 1942, Haverford gave him an honorary degree of Sc. D.

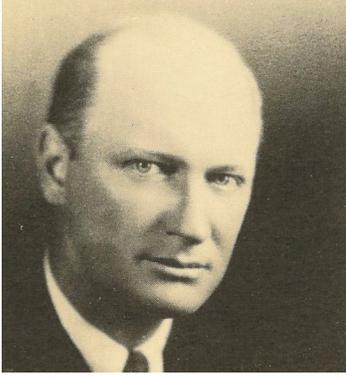


Walter H. Fulweiler  
1937

Walter Herbert Fulweiler was born in Philadelphia, Pa. In 1880. He graduated from the University of Pennsylvania 1901, with a B.S. degree in chemistry. From 1901 to 1907, he was employed by the Philadelphia Gas Works, West Chester Gas Co., and Kansas City, Mo. Gas Co.

He joined the United Gas improvement Co., Philadelphia, in 1907, where he was Chief Chemist, Chemical Engineer, and Consulting Chemist from 1926 to 1936. From 1936 to 1958 he had a consulting practice in Philadelphia.

Mr. Fulweiler was a member of many scientific societies in the United States and Europe. During World War I he served as consultant on explosives.

	<p>The American Gas Institute gave him the Beale Medal in 1908 and 1934. The Society of the Chemical Industry awarded the Grasseilli medal in 1922. He died December 20, 1958.</p>
 <p>Dr. Henry E. Hathaway 1939</p>	<p>Henry Ernest Hathaway was born in Corning, N.Y., January 19, 1886. He received his early schooling in Scranton, Pa. Shortly after graduation fro high school, he entered the Federal Weather Bureau Service. His first assignment was in Boston, Mass. Where he studied at Harvard for one year.</p> <p>During World War I he served overseas with the 4<sup>th</sup> Corps Artillery as Sergeant-Major. Reentering the Weather Bureau after the war, he was stationed from time to time at Nantucket, Mass.; Sandy Hook, N.J.; Wythville, Va.; New Haven Conn.; Block Island, R.I.; Reading Pa., and, at his retirement, Excanaba, Mich.</p> <p>He was a student of astronomy and interested in its influence on weather prediction. He lectured frequently on both subjects. His death occurred November 29, 1953.</p>
 <p>Dr. Arthur E. Bassett D.D.S. 1940</p>	<p>Arthur Edward Bassett was born in Philadelphia, Pa., November 3, 1886. He graduated from the Swarthmore Preparatory school and from the University of Pennsylvania Dental School in 1908. He practiced dentistry with his father in Philadelphia and later, after his father's death, in Swarthmore, Pa.</p> <p>Dr. Bassett gave many years of service to his community; Board of Health 1920-1925; Borough Council, 1926-1929; Swarthmore School Board 1930-1935, serving as President, 1931-19035. In Philadelphia, to which he commuted daily, he was President of the Academy of Stomatoloty, 1935 and a member of the Union League.</p> <p>He was interested in science, and in 1938, was asked to fill an unexpired term on the Board of Governors of The Rittenhouse Astronomical Society. He died January 26, 1951.</p>



Dr. Armand Spitz  
1943

Armand N. Spitz was born in Philadelphia, Pa., July 7, 1904. He attended the University of Pennsylvania from 1922 to 1924 and the University of Cincinnati from 1924 to 1925. He spent Three years with Philadelphia newspapers, and was editor and publisher of the Haverford Township News from 1928 to 1936. He was most active in community affairs.

From 1937 to 1941, he was an instructor in astronomy at Friends Central school. His work at the Franklin Institute from 1935 to 1947 is impressive: he was radio lecturer; editor, "The Institute News"; Assistant Director of Public Relations; Director, Museum Education; Lecturer, Fels Planetarium; and head of the Department of Meteorology.

He invented the Spitz Planetarium, organized the worldwide Moonwatch Program for the Smithsonian.

**He died April 14, 1971.**



Peter van de Kamp  
1944

Peter van de Kamp was born in Kampen, Netherlands, December 26, 1901. He graduated from the university of Utrecht in 1922 as Doctorandus. He started his career in Astronomy as an assistant at Keptenn Astronomical laboratory, Groningen. He came to the united States as research director of McCormick observatory, University of Virginia. The University of California, in 1925, and the University of Groningen, in 1926, conferred the Ph. D. degree upon him.

He has served as Director of Sproul Observatory from 1927 to the present. He received a Fulbright Award from France in 1949.

At Sproul, he has concentrated on the study of nearby stars and measurement from photographs taken through the 24", 36' F.L. Refractor. He is a member of leading astronomical societies. **He died on May 18, 1995.**



Dr. Louis C. Green

Louis Craig Green, educator and astrophysicist, was born in Macon, Ga., February 2, 1911. He graduated from Princeton University with an A.B. in 1932, an M.A. in 1933, and a Ph. D. in 1937. From 1937 to 1941, he taught mathematics and astronomy at Allegheny College. In 1941, he went to Haverford College and since 1953 has been Professor of Astronomy there. He is Director of the Strawbridge Memorial Observatory. He also taught at Swarthmore and Bryn Mawr Colleges.

Dr. Green was a Guggenheim Fellow in 1955-1956

<p>1946</p>	<p>and is a Fellow of the American Physics Society. He has contributed many articles to professional journals.</p> <p>He is a member of the American Astronomical Association and The Rittenhouse Astronomical Society. <b>Died 1999.</b></p>
 <p>Arthur S. Burgess 1947</p>	<p>Arthur S. Burgess was born in Philadelphia, Pa., October 19, 1884. He attended Central High School and Palmers Business College. He worked for Townsend, Whelen &amp; Company from 1901 to 1934 when he became a partner in the newly formed firm of Biddle, Whelen and Company. On January 1, 1954 this company was dissolved and Mr. Burgess became a partner of W. N. Newbold's Son and Company, of Philadelphia.</p> <p>He was the first Governor from Pennsylvania and Delaware when the National Association of Security Dealers was founded in 1940 by Congress.</p> <p>When studying Greek Mythology in High School in 1902, Mr. Burgess first became interested in Astronomy and built a telescope. He joined the Rittenhouse Astronomical Society in 1933 and as elected President in 1947.</p>
 <p>Edwin F. Bailey 1948</p>	<p>Edwin F. Bailey was born in Philadelphia, Pa., October 28, 1907 and educated in the Philadelphia public schools. Early experiments with optics stimulated his interest in astronomy. He helped organize the Amateur Telescope Makers section of The Franklin Institute in 1936, and was its first instructor.</p> <p>In 1937, he became a part-time assistant in The Franklin Institute Observatory. From 1940 to 1945, he was employed in the optical department of Frankford Arsenal.</p> <p>From 1945 to the present writing he has been a staff member of The Franklin Institute. He was appointed Assistant Director, Department of Astronomy, in 1958.</p> <p>He joined The Rittenhouse Astronomical Society in 1934 and largely through his efforts the society has been kept a "going concern."</p>



Dr. Raymond H. Wilson Jr.  
1949

Raymond Hiram Wilson was born in Gap, Pa., February 14, 1911. He received an A.B. from Swarthmore College in 1931, and an A.M. in 1933. In 1935 the University of Pennsylvania conferred a Ph. D. in astronomy, mathematics, and physics. He also took special courses at Harvard and the University of California.

He taught at the U.S. Naval Academy, Temple and Louisville Universities. One of Dr. Wilson's interests was interferometry, which he had pursued at old Flower Observatory, then in Upper Darby, Pa. His research work also included high temperature flames, high resolving interferometers for measuring double stars, and orbit calculations.

At this writing he is with the National Aeronautics and Space Administration, Washington, D.C.



Dr. I. M. Levitt  
1950-1951

I. M. Levitt was born in Philadelphia, Pa., December 19, 1908. A graduate of Central High School, he received a B.S. degree in Mechanical Engineering from Drexel Institute, and his Ph. D. in Astronomy from the University of Pennsylvania. He holds D. Sc. Degrees from Temple University and Drexel Institute.

He was appointed Director of The Fels Planetarium of The Franklin Institute in 1949 where, over the years, his colorful and effective shows are outstanding.

Dr. Levitt holds patents on a number of scientific devices. In 1953 he designed the Mars Space Clock which was built by the Hamilton Watch Co. and is now on exhibit at The Franklin Institute. He is known internationally for his syndicated newspaper and journal articles, and the numerous radio and T.V. lectures on science and space travel.

**Died January 2004.**



Dr. Frank Wood

Frank Bradshaw Wood was born in Jackson, Tenn., and December 21, 1915. He attended the University of Florida, earning a B.S. in Physics in 1936; he received an M.S. in Astronomy from Princeton University in 1940 and a Ph. D. in Astronomy from Princeton in 1941. He was a Research Asst. at Northwestern University in the summers of 1938 and 1939. He was in the U.S. Naval Reserve from 1941 to 1946, retiring as Commander.

He was a Research Associate at Princeton in 1946; a National Research Fellow, steward and Lick observatory 1947-50; Professor and Director 1954;

<p>1952</p>	<p>Astronomical observatories and flower Professor of Astronomy 1958 University of Pennsylvania, Fulbright Fellow, Mt. Stromlo Observatory, Australia 1957-58. <b>He died in 1997.</b></p>
<div data-bbox="261 344 618 730" data-label="Image"> </div> <div data-bbox="331 737 548 800" data-label="Caption"> <p>John W. Streeter 1953</p> </div>	<p>John Williams Streeter, historian of science, was born at Manchester, Mass. Sept. 9 1908. He graduated from Yale University in 1931, and received master Degrees from university of Arizona and Harvard College. He taught astronomy at Brown University and Vassar College. He is a member of the American Astronomical Society, and has been active in the History of Science Society, and Research Society of America. He is Secretary of Section L on The History and Philosophy of Science of the American Association for the Advancement of science. He served with the Air Force in World war II, and holds the rank of Lt. Colonel in the Reserves.</p> <p>His special interests are rockets and earth satellites, and he pioneered a symposium on Earth Satellites and Research Vehicles at The Franklin Institute in 1956.</p>
<div data-bbox="261 932 618 1318" data-label="Image"> </div> <div data-bbox="331 1325 548 1388" data-label="Caption"> <p>Cecil M. Billings 1954-1955</p> </div>	<p>Cecil M. Billings was born at Glen Cove, L.I., N.Y., August 4, 1885. After a public school education, he attended Cooper Institute, N.Y. night classes in mechanical engineering from 1901 to 1905. In 1909-10, he designed electric tower clocks and a bell-striking mechanism fro the Metropolitan Life Insurance Tower, New York City. From April 1917 to March 1918, he served as First Lieutenant, Ordnance Dept. U.S.A.</p> <p>For the next thirty-one years, he was engineer and sales executive for three major oil companies, retiring in December 1954. He is a member of the Astronomy Department of The Franklin Institute and designed several special satellite tracking telescopes, the Moonwatch Station, and mounting for the Observatory monochromator.</p>
<div data-bbox="261 1484 618 1871" data-label="Image"> </div>	<p>Charles J. Schaefflein was born in Philadelphia, Pa., September 27, 1919. He attended St. Stephen's Parochial school and graduated from Roman Catholic High School in 1937. He entered St. Charles Seminary in 1940.</p> <p>He was ordained a priest, May 26, 1949 by Bishop Hugh L. Lamb. A short stay at Holy Trinity Church, Morrisville, Pa. and St. Anne's at Phoenixville, Pa. Preceded his present assignment as teacher of Biology and General Science at Roman Catholic High school and Chairman of the Science Dept. He is also on the</p>

<p>Rev. Charles J. Schaefflein 1956-1957</p>	<p>faculty of Cabrini College for Girls, Radnor, Pa. Where he teaches Theology.</p> <p>He is co-ordinator of Diocesan education programs of radio and television, and for the past five years, has taught astronomy at St. John's Evening School for Adults.</p>
 <p>Emil Klein 1958-1959</p>	<p>Emil Klein was born in Philadelphia, Pa., August 6, 1909, and graduated from Frankford high School. Early thereafter he became interested in science and astronomy. He joined The Franklin institute in 1936 when the Amateur Telescope Makers Section was started and proceeded to grind a 6" mirror and make a telescope. He also made a 6" refractor telescope.</p> <p>At the time this history is being compiled, Mr. Klein is completing a 16" Newtonian-Gregorian Telescope. He has studied geology at the Wagner Institute and art at the Graphic sketch Club and Pennsylvania Academy of Fine arts.</p> <p>Mr. Klein served successively, as Secretary, Treasurer, Vice-President, and President of the Amateur Astronomers of Franklin Institute, and was Treasurer of the Middle East Region of the Astronomical League.</p>
 <p>James H. Conklin 1960 -</p>	<p>James H. Conklin was born in Brooklawn, N.J., May 31, 1921 and grew up in Pennsauken Township. He has a B.S. degree in Chemical Engineering from the Drexel Institute of Technology, Philadelphia, Pa. He is superintendent of the Ammonia Production Area of DuPont-Repauno Works at Gibbstown, New Jersey.</p> <p>He served four years in the U.S. Infantry, World War II, first as a private, later as a Major, and saw action in the European Theater of operations, and the Southwest Pacific area.</p> <p>His primary hobby is astronomy. At the age of sixteen he built his first telescope.</p> <p>His memberships include the American Institute of Engineers, the Royal Astronomical Society of Canada, and the Rittenhouse Astronomical Society. He is President of the latter society.</p>



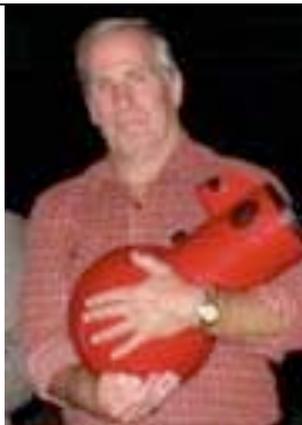
**Dr. Milton Friedman**  
197? -

**VICE PRESIDENTS**



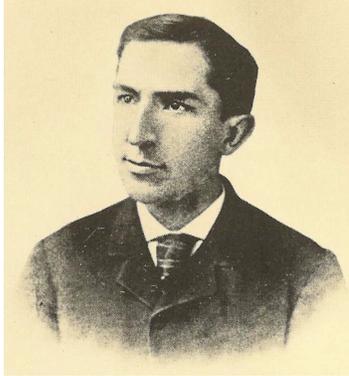
**Donald D. Davis**  
1960

Donald D. Davis was born in Bennington, Vermont, on June 18, 1935. His high school education took place at La Salle Academy in Providence, R.I., from which he was graduated in 1953. After spending one year at Providence College, he transferred to the University of Pittsburg for two years. While attending that university, he joined the staff of the Buhl Planetarium and gave lectures. In 1956, he became Assistant Curator of Education and Planetarium Lecturer at the Nashville Children's Museum in Nashville, Tenn. In 1957, he resumed his education at Vanderbilt University, from which he was graduated in 1958 with a B.A. degree in mathematics. At present, he is Lecturer in The Fels Planetarium and Vice President of the Rittenhouse Astronomical Society.



**Alan Daroff**  
19??

**SECRETARIES**



Augustus Dupuy  
1889 - \*

Augustus Brightly Dupuy was born in Philadelphia, Pa., September 13, 1859. He was descended from an old Huguenot family. Mr. Dupuy was educated in Camden, N.J. schools, having moved there in 1869. Employed by the Bell Telephone Company as a technician from 1887 to 1903, he designed and developed several important electrical devices for controlling lightning discharges.

He resided in Collingswood, N.J. from 1906 to 1917. While there he was employed as a mechanic by Young and Brightly, the instrument makers of Philadelphia, Pa.

Mr. Dupuy was an amateur astronomer and owned a 9 1/2" reflector. He also collected minerals, and in 1912 gave his valuable collection to the Collingswood Library. Charter member and first Secretary of the Camden Astronomical Society.



Dr. Herbert C. Whitaker  
Prior to 1915 - 1920

Herbert Coleman Whitaker was born at Cape May Point, N.J., October 31, 1862. He prepared for college at Fewsmith School, Philadelphia. He graduated from the University of Pennsylvania in 1886 with degrees of B.S. & M.E. and received a Ph. D. in 1896. Dr. Whitaker started his teaching career at central Manual school, Philadelphia, where he served from 1887 till 1907. He then transferred to South Philadelphia high School as Professor of Mathematics. He joined the Camden Astronomical Society prior to 1915 and was Secretary and Treasurer up to 1920.

Dr. Whitaker was a brilliant mathematician and inventor of a new form of numbers by means of which the otherwise impossible roots of irrational algebraic equations may be found. He died November 17, 1921.



Prof. James M. Shelley  
1921 - 1923

James M. Shelley was born at Boyertown, Pa. in 1878. He received an A.B. degree from Lafayette College in 1903. Before coming to Philadelphia, he was Head of the Science Department, Perth Amboy, N.J. High School; Principal of Doylestown, Pa. High School; and Superintendent of Schools in Bucks County, Pa. From 1908 to 1931, he taught in the Southern Manual Training School, and also taught biology, geography, and general science at the South Philadelphia High School. When the Olney High School was opened, he transferred there, and finished teaching in 1940 when he retired.

Professor Shelley joined the Camden Astronomical Society sometime prior to 1915 and served as Secretary

	and Treasurer from 1921-1923. He died in Ocean City, N.J., December 11, 1955.	
 <p>Rev. Walter A. Matos 1924-1929</p>	<p>Walter Antonio Matos was born in Philadelphia, Pa., October 31, 1874. He is a graduate of the Central High School in Philadelphia. In 1893 he received a B.A. degree from the Philadelphia Divinity school and was ordained a full minister in 1899.</p> <p>He as missionary in charge of the Episcopal parish of Swarthmore, Pa. From 1898 to 1920. This parish became the Trinity Episcopal Church in 1920 and he was its first rector, serving until 1929. The Rev. Matos was an astronomer and a volunteer observer at the Sproul Observatory of Swarthmore College from 1915 to 1928, working for the most part on the Observatory's stellar parallax program.</p> <p>He joined The Rittenhouse Astronomical Society some time prior to 1915 and served as its Secretary and Treasurer from 1924 to 1929.</p>	
Prof. A. Clyde Schock	Oct. 1925 - 1942	See President Entry
Dr. Louis C. Green	1943 - 1945	See President Entry
 <p>Miss Sarah Lippincott 1946-1948</p>	<p>Sarah Lee Lippincott was born in Philadelphia, Pa., October 26, 1920 and educated in the Philadelphia public schools. She attended Swarthmore College, and received a B.A. degree from the University of Pennsylvania in 1942. Swarthmore conferred an M.S. Degree in 1950.</p> <p>Since 1951 Miss Lippincott has been Research Associate at the Sproul Observatory, Swarthmore College. She has also done astronomical research at the Lick Observatory the Harvard College Observatory, and the Upper Air Research Observatory in New Mexico. Miss Lippincott went to the Paris Observatory in 1953 and 1954 on a Fulbright Fellowship. She was a member of the French Solar Eclipse Expedition to Oland, Sweden, June 1954. Her astronomical research papers have been published in American, French Canadian, and Dutch journals.</p>	



George Evalt  
1949

George J. Evalt was born in the dual monarchy of Austria-Hungary, April 17, 1905. His parents brought him to the United States in 1913 and settled in Reading, Pa., where they remained as a family group until 1922. In 1922 his parents returned to Europe and Mr. Evalt moved to Philadelphia to continue his education in the public schools.

He took a night job in a hotel and for the next thirty years came up through the various stages of hotel operation and finally became a partner in two small hotel chains.

He is no longer connected with hotel operation but is actively engaged in the wholesale furniture field.

Mr. Evalt's interest in science and astronomy urged him to join The Rittenhouse Astronomical Society in 1945. He was elected Secretary in 1949.



Mrs. Robert M. Cole  
1950-1951

Wertha Pendelton Cole was born at Bryn Athyn, Pa., in 1892. She was a teacher and astronomer and a 1910 graduate of the Academy of the New Church, Bryn Athyn, Pa., where for fifteen years she was Dean of Women, until her retirement in 1958. She held a B.A. degree from Columbia University and did graduate work in Astronomy and the University of Virginia. During World War I, Mrs. Cole was connected with the Observatory of the University of Virginia.

In 1957, Mrs. Cole organized and headed the now famous Bryn Athyn Moonwatch group for satellite spotting. This station won high praise from the Smithsonian Astrophysical Observatory. Mrs. Cole joined the Rittenhouse Astronomical Society in 1935 and served as Secretary from 1950 to 1951. She died January 8, 1959.



Mrs. Robert Owen Gorson  
1952-1955

Lois Smith Gorson was born in Milton, Pa., and educated in the Milton public schools, and Bucknell University.

She joined The Franklin Institute's Amateur Telescope Makers' section in 1940 and ground a 6" telescope mirror. She served as Secretary of A.T.M. and later became Editor of its publication "The Observer."

Mrs. Gorson joined The Rittenhouse Astronomical Society in 1937. She was active in meteor observation groups and served on several committees of the Society. She is also a member of the Moonwatch Team of The Franklin Institute.

	Mrs. Gorson was Secretary of The Rittenhouse Astronomical Society from 1952 to 1955.	
	<p>Jane Kauffman was born in Philadelphia, Pa., march 12, 1930, and educated in the public schools. Employed by The Franklin Institute in the Astronomy Department for nine years, she became interested in science and studied in The Franklin Institute Library. Her lay knowledge of astronomy resulted in handling the public information services of the Astronomy Department. In September 1956, she married and soon after went to Buffalo, New York. While there, Mrs. Friedberg became General Science Teacher in the Junior Education Department of the Buffalo Museum of Science and she was a frequent lecturer in the Planetarium.</p> <p>In 1957, she returned to the Astronomy Department of The Franklin Institute and remained until 1959.</p>	
Mrs. Jane Kauffman Friedberg 1956-1958		
	<p>Luba Shapiro was born in Philadelphia, Pa., October 28, 1942. She is now a senior at the Philadelphia High School and plans a college education in the physical sciences. She is keenly interested in astronomy and at this time is making her own telescope. Miss Shapiro is a member of The Franklin Institute. She is the very efficient Secretary of The Rittenhouse Astronomical Society and is a member of its computing section.</p> <p>She is also a member of the Moonwatch Team of The Franklin Institute and since October 1958 has been helping in the junior workshop of The Franklin Institute.</p>	
Miss Luba Shapiro 1959-		
Robert Fellwock		
		
Theodore T. Williams 2005 -		
<b>TREASURERS</b>		
Augustus Depuy	1889 -	See Secretaries Above
Dr. Herbert C. Whitaker	* - 1920	See Secretaries Above
Rev. Walter A. Matos	1924 - 1929	See Secretaries Above



S. Walter Johnson  
12/1929 – 3/1951

S.W. Johnson was born in Rockford, Ill., May 17, 1887. He came east at an early age and in 1902 started his business career with the Turner Construction Company. He remained with them for over fifty-one years, retiring in 1953.

From 1922 to 1942, he taught accounting on a part-time basis at Swarthmore College.

A keen interest in astronomy, dating from 1912 when he purchased a 3” Bardon Refractor, prompted him in 1919 to join the former Camden Astronomical Society. He became Treasurer of its successor, the present Rittenhouse Astronomical Society December 13, 1929, and served with distinction until June 1, 1951. He is retired and lives in Swarthmore, Penna.



Mrs. Thomas L. Scatchard  
3/1951-6/1953

Ruth Francis Scatchard was born at Chester, Pa., July 17, 1923. She was a graduate of the Germantown High School, Class of 1939. She married Thomas L. Scatchard in 1941. Both were interested in astronomy and optics. They organized the optical Film Engineering Company of Philadelphia for the purpose of coating lenses and mirrors for the trade.

Mrs. Scatchard became a member of The Rittenhouse Astronomical Society in 1948 and served as its Treasurer from March 15, 1951 until her untimely death in 1953. She was also a member of the Amateur Astronomers of The Franklin Institute and an ardent boating and autoracing enthusiast.

Ruth will long be remembered by Rittenhouse associates for her fine personality.



Miss Eleanor Vadala  
6/1953 -

Eleanor Th. Vadala was born at National Park, N.J., September 8, 1923. Her early schooling was obtained in Atlantic City, Cardiff, N.J. and Philadelphia. She graduated from Juniata College, Huntington, Pa. in 1947 with a B.S. degree. She is a demonstrator and lecturer at The Franklin Institute and a member of the Moonwatch Team. Her interest in astronomy resulted in building a 6” telescope a few years ago.

Miss Vadala has been the Treasurer of The Rittenhouse Astronomical Society since 1953. She has been active in the Astronomical League, having served two terms as Secretary of the Middle East region. She is a balloon enthusiast, a member of the Balloon Club of America, and has made numerous flights both in this country and abroad.

 <p>Ruth M List 2005 -</p>	
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**Members of Note**

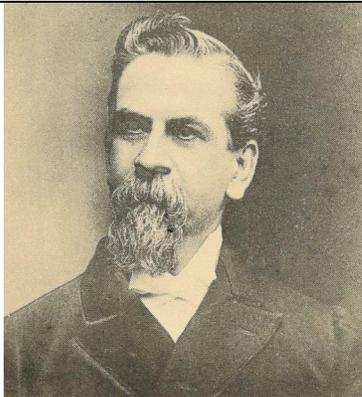


Robert Morris Luther, D.D.  
Charter Member

Robert Morris Luther was born in Philadelphia, Pa. In 1842. He graduated from Princeton Seminary in 1864. Immediately after graduation he and his wife went to Burma as missionaries. He had also studied medicine in the States, which greatly helped in his work with the native Karens.

Returning from Burma in 1872, Dr. Luther went to Bennington, Vt. And became pastor of the First Baptist Church. He remained nine years as pastor, and then returned to Philadelphia. In 1881 he was appointed secretary of the American Baptist Missionary Union fro the Southern District of the United States, a post he retained until his retirement in 1891.

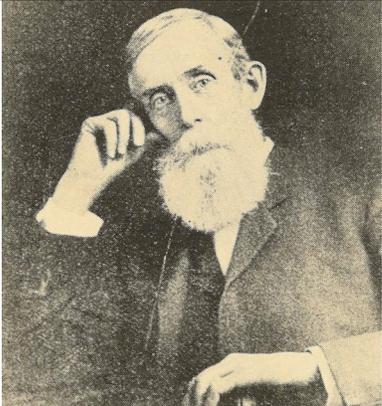
Dr. Luther's hobby was astronomy. He was one of the five charter members of the Camden Astronomical Society. He died on September 28, 1903.



Charles Bowden

Charles Bowden, born in Liskeard, England, November 10, 1843, attended Sidcot School and Eaton College. Leaving England in 1861 he spent three years in Queensland and New South Wales, thence back to England. IN 1867 he came to the United States to visit his uncle, Richard Esterbrook, founder of the Esterbrook Pen Company of Camden, N.J. After living for ten years in New York, he joined the Esterbrook Pen Company in 1877 and remained until his death on October 27, 1931.

He was an ordained minister of the Methodist Episcopal Church for over fifty years, a Master

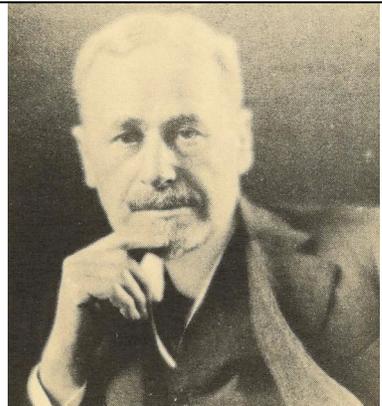
<p>Charter Member</p>	<p>Mason, and Grand Chaplain of the State of New Jersey for twenty-five years. He was expert in astronomy and botany. He was a charter member of the Camden Astronomical Society.</p>
 <p>Oscar Knipe Charter Member</p>	<p>Frederick Augustus Oscar Kneipp was born in Dresden, Germany on June 25, 1819. Between the years 1845 and 1846, he came to the United States. For convenience, he shortened his name to Oscar Knipe. He was a man of wide learning and accomplishments. He spoke eight languages fluently and considered astronomy and the sciences his hobbies.</p> <p>He was employed for many years by Queen &amp; Company, Inc. of Philadelphia and New York, famous at the time for their fine scientific instruments. He first worked in their Astronomical Department as an expert lens grinder. Later he traveled to foreign countries as an agent for Queen &amp; Co.</p> <p>Mr. Knipe was the eldest of the original five charter members of the Camden Astronomical Society. He died on June 11, 1904.</p>
 <p>Charles Leander Doolittle, LLD. Astronomer</p>	<p>Charles Leander Doolittle was born in Ontario, Ind., November 12, 1843. He graduated from the University of Michigan in 1874 with the degree of C.E. From 1875 to 1895, he was Professor of Mathematics at Lehigh University and was professionally known for research on variation of latitude. When Flower Observatory was founded as part of the University of Pennsylvania in 1885, he became Director. He was a member of the American Philosophical and Astronomical Society of America and Treasurer of the latter from 1899 to 1911. In 1912, Lehigh University conferred an honorary degree of LLD. On Dr. Doolittle. He is author of "Practical Astronomy as Applied to Geodesy and Navigation" and "Results of Observation with Zenith Telescope, Sayre Observatory 1876-1895 and at Flower Observatory 1894-1911."</p>



Eric Doolittle  
Astronomer

Eric Doolittle was born in Ontario Ind., July 26, 1869. He graduated from Lehigh University in 1887 and received his C.D. degree in 1892. He was instructor of Astronomy at Lehigh from 1891 to 1892 and at the State University of laws from 1892 to 1893. He came to the University of Pennsylvania in 1896 and was Assistant Professor of Astronomy from 1904 to 1912 and Professor of Astronomy and Director of The Flower Observatory from 1912 to his death in 1920. He was a Fellow of the Royal Astronomical Society and member of the old Camden Astronomical Society.

Professor Doolittle, like his famous father, was a prolific writer and famous for his observations on double stars. From 1901 to 1914 he published measurements of over 3900 Double and Multiple Stars.

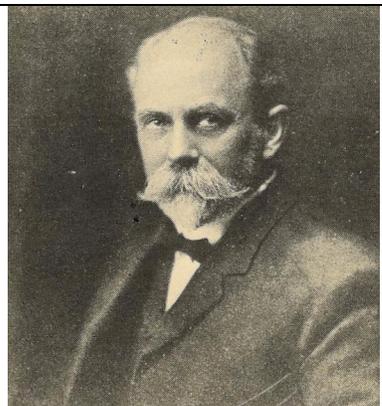


Max Levy  
Inventor

Max Levy was born in Detroit, Mich. March 9, 1857. He was educated in the Detroit schools and studied architecture in 1875. Until 1890 he was engaged in photo-engraving during which period he introduced the modern screen and half-tone engraving process.

He was awarded the John Scott and Edward Longstreth Medals by The Franklin Institute. He was also the recipient of The Royal Cornwall Polytechnic Silver Medal and the gold medals at the Chicago World Fair in 1893, at Paris, France in 1900, at Buffalo, N.Y. in 1901, and at St. Louis, Mo. In 1904.

On January 30, 1917, he was granted a patent on a counting chamber of advanced design for the haemocytometer, adopted by the Army and by leading medical institutions. He died in 1925.



George A. Hoadley, Sc. D.  
Educator and Scientist

George A. Hoadley was born in Sheffield, Mass., December 2, 1848. He graduated from Union College, Schenectady, N.Y., in 1874 with A.B. and C.E. degrees. Union gave him an A.M. degree in 1877 and, in 1907, an honorary Sc. D. In 1888 he was appointed Professor of Physics at Swarthmore College where he taught for twenty-five years, retiring in 1914. In 1892, he became Vice President.

He is the author of several textbooks on physics and electricity and was a Charter Member and fellow of the American Physics Society. During World War I he was Secretary of The Franklin Institute and in 1925 Secretary of the Committee on Science and

	<p>Arts. Dr. Hoadley was an active member of the Camden Astronomical Society and frequently lectured before that group. He died in 1936.</p>
 <p data-bbox="363 709 542 781">John Dolman Lawyer</p>	<p data-bbox="691 306 1386 487">John Dolman was born in Philadelphia, Pa., June 12, 1857. He was educated in Philadelphia schools and studied law and started in the office of his father's law firm. He practiced law until his death at the age of 80 years.</p> <p data-bbox="691 487 1386 886">His leisure time was devoted to science and astronomy. Mr. Dolman was also an expert photographer and won many prizes for his exhibits in this country and abroad. He gave much time to the study of high-dilution homeopathy in the field of medicine. Keenly interested in astronomy, he joined the old Camden Astronomical Society around 1900 and was a regular contributor of technical papers before that group on subjects relating to geophysics and cosmology. He died December 11, 1937 at Swarthmore, Pa.</p>
 <p data-bbox="308 1297 594 1369">H. Ross Smith, Ph. D. Educator</p>	<p data-bbox="691 894 1386 1146">H. Ross Smith was born at Media, Pa., September 6, 1884. He was educated in the Media Public Schools. In 1903, he was graduated from the West Chester State Teachers' College and, in 1906, received an A.B. degree from Lafayette College. The University of Pennsylvania conferred an A.M. degree in 1911 and a Ph. D. in 1913.</p> <p data-bbox="691 1146 1386 1514">He taught mathematics in the High Schools of Camden, N.J. and Philadelphia, Pa. And in Pennsylvania State College. Dr. Smith was head of the Mathematics Department of the South Philadelphia High School and one time Principal of both Vare Junior and Overbrook Senior High Schools. He was interested in astronomy and joined the Camden Astronomical Society early in the 1990's and lectured from time to time before that group. He died in 1937.</p>



Maurice Jefferis Babb, Ph. D.  
Educator

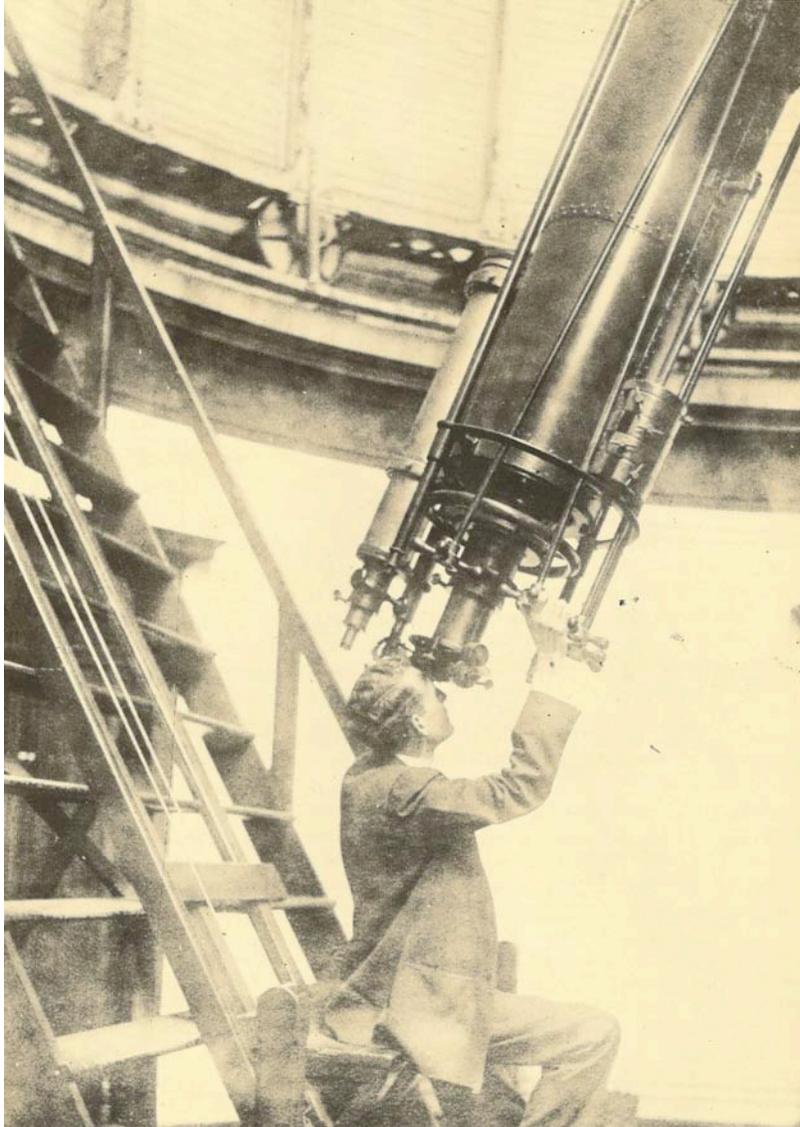
Maurice Jefferis Babb was born at Marshalton, Pa., October 20, 1870. He was professor of Mathematics at Dickinson Seminary from 1896 to 1900. He taught at Bellefonte Academy in 1900-1901, and was Instructor of Mathematics, Pennsylvania State College from 1901 to 1905. Haverford College bestowed a degree of B.S. in 1905.

Dr. Babb went to the University of Pennsylvania as Instructor in Mathematics in 1905 and earned his Ph. D. in 1910. He was Assistant Professor from 1910 to 1924 and full Professor from 1924 to 1940, when he retired as Professor Emeritus. Author of several text books and numerous papers on mathematics, he was probably the foremost authority on the life of David Rittenhouse. He died October 27, 1945.



Donald D. Davis  
Vice-President  
1960

Donald D. Davis was born in Bennington, Vermont, on June 18, 1935. His high school education took place at La Salle Academy in Providence, R.I., from which he was graduated in 1953. After spending one year at Providence College, he transferred to the University of Pittsburg for two years. While attending that university, he joined the staff of the Buhl Planetarium and gave lectures. In 1956, he became Assistant Curator of Education and Planetarium Lecturer at the Nashville Children's Museum in Nashville, Tenn. In 1957, he resumed his education at Vanderbilt University, from which he was graduated in 1958 with a B.A. degree in mathematics. At present, he is Lecturer in The Fels Planetarium and Vice President of the Rittenhouse Astronomical Society.



*Prof. Eric Doolittle at the eyepiece of the 18" Brashear Refractor at Flower Observatory in 1914.*

JOHN M. ENBURG  
*Amateur Astronomer and Lecturer*

On the opposite page is shown a snapshot of John Enburg, the oldest living member of the Rittenhouse Astronomical Society and his valuable collection of rare coins, ivories, minerals, and stamps.

Mr. Enburg is 86 years of age, having been born on November 16, 1873 in Philadelphia. He has been a member of The Rittenhouse Astronomical Society for over 50 years, joining shortly after 1900. He lives alone in his apartment at 5141 Baltimore Avenue, Philadelphia, Pennsylvania.

Mr. Enburg is also a member of many other societies, some of which are the Philadelphia Coin Club, American Numismatic Association, and The American

Association for the Advancement of Science. He has been honored on frequent occasions by the first two names. In his younger days, Mr. Enburg was a realtor and builder. With his brother, James, he built over 500 homes in West Philadelphia.

His principal lifetime avocation has been astronomy. He gave many papers and lectures on the subject to various organizations throughout America. Mr. Enburg knew all five of the charter members of the Camden Astronomical Society and attended meetings with them at Mr. Reed's home for many years. At one of the meetings, October 26, 1916, he gave a talk titled "The Astronomy of Shakespeare." One of his favorite lectures, illustrated with photographic slides of pictures taken by the Mt. Wilson and Yerkes Observatories, was titled "Beyond the Clouds." (Slides were donated by his daughter, Mrs. John J. Pitman of Philadelphia, to The Rittenhouse Astronomical Society in 1959.)

Mr. Enburg owned a 3 1/2" refractor which was mounted on a specially constructed observation platform on the roof of his former home on Catherine Street in Philadelphia.



*John Enburg standing beside his showcase of rare coins and medallions*

### HARRY BARLOW RUMRILL

President

1932

Harry Barlow Rumrill, 1867 – 1951, President of The Rittenhouse Astronomical Society in 1932, was an accomplished amateur astronomer.

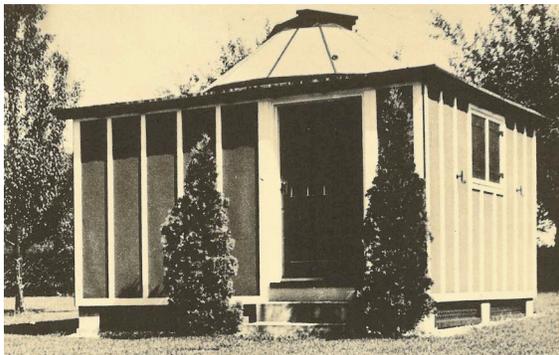
The Tredyffrin observatory at Berwyn, Pennsylvania shown on the opposite page was completed by Mr. Rumrill in 1933, and was the culmination of an ambition he had entertained for many years. Long hours at a window on the south side of his Berwyn,

Pennsylvania home proved the need for better observing facilities to utilize his telescope's capacity to the fullest.

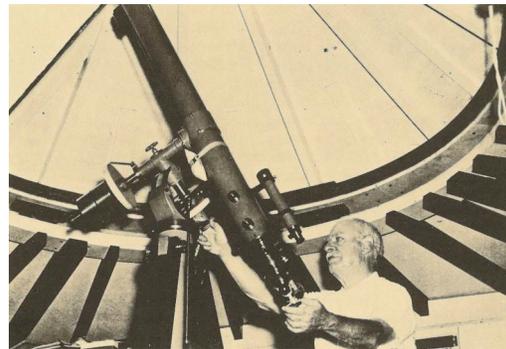
In addition to being a fine amateur astronomer and author of articles on astronomy and science, Mr. Rumrill was a superb designer and craftsman. He drew all the plans, and built the observatory himself, except for the pouring of the four-ton central concrete telescope pier and the foundation pillars.

The building of wood stands back of the home on Conestoga Road at Berwyn, Pennsylvania now occupied by his daughter, Elizabeth. It is 16' square with a 10' diameter twelve-sided dome 4' high. The dome weighs 500 pounds and is mounted on six flanged wheels of bronze. It is rotated by a yacht steering wheel coupled to a system of chain and sprocket wheels. A 10" diameter rubber tired wheel fastened to the sprocket shaft bears tightly against the base rim of the dome furnishing the friction torque for rotation. A 2' slit in the dome is covered by an adjustable weatherproof canvas shade. Tredyffrin with its instruments and records stands today in mute testimony to a great amateur astronomer.

The other photograph shows Mr. Rumrill in the observatory with his 4" Brashear telescope.



*The Tredyffrin Observatory*



*Mr. Rumrill in his observatory at Berwyn, Pa.  
Adjusting the 4" Brashear Refractor.*

## HENRY C. GIBSON

Henry C. Gibson was born in Philadelphia, PA., on November 14, 1885. His inborn interest in astronomy was undoubtedly inherited from his father, an amateur astronomer, who owned a 6" French made Bardou telescope. However, his imagination was really fired when at the tender age of 8 years, he first saw the planet Saturn thru a "10¢ per look" telescope, set up in City Hall Plaza, in Philadelphia.

Shortly after that, his grandmother, returning from a visit to Paris, brought him a small Bardou refractor for his exclusive use. Down through the years to the present, Henry Gibson has systematically studied the stars and planets, with a number of telescopes of various makes, types and sizes.

About 1915, Warner and Swasey built a 12" refractor for him which he used continuously for ten years. In 1925 he had Fecker of Pittsburgh build a 30" "Cassegrainian" reflector with a 30' effective focal length which served him for another

ten years. His present telescopes include an 8" f-8 reflector, a 2 1/2" – 6' F.L. reflector, the magnificent 10" – 150" focal length refractor, and a new 18" F.8 Newtonian reflector by the Cave Optical Company of Long Beach, California. Of special interest is the superb three element apochromatic objective of the 10" refractor. It was figured by the Perkins & Elmer Co. This flawless apochromat is the only one of its size in America. Housed in an air cell it is protected from moisture by a tube capsule containing a desiccator.

All the telescopes, excepting the 8" reflector, are mounted in separate observatories, built on his properties about 10 miles west of his winter home at Palm Beach, Florida.

Mr. Gibson's library of over 200 books on the science of astronomy is impressive.

He has been a member of the Rittenhouse Astronomical Society since 1932 and in past years served on several important committees.



*Henry C. Gibson and his 10" - .150" F.L. Refractor Telescope, Inset – snapshot taken of Mr. Gibson at West palm Beach, Fla., in 1956.*

#### D. ROBERT YARNALL, D. Sc.

D. Robert Yarnall born June 28, 1878, is Co-Founder and Chairman of the Board of Yarnell-Waring Company of Chestnut Hill, Pennsylvania, manufacturers of steam plant equipment.

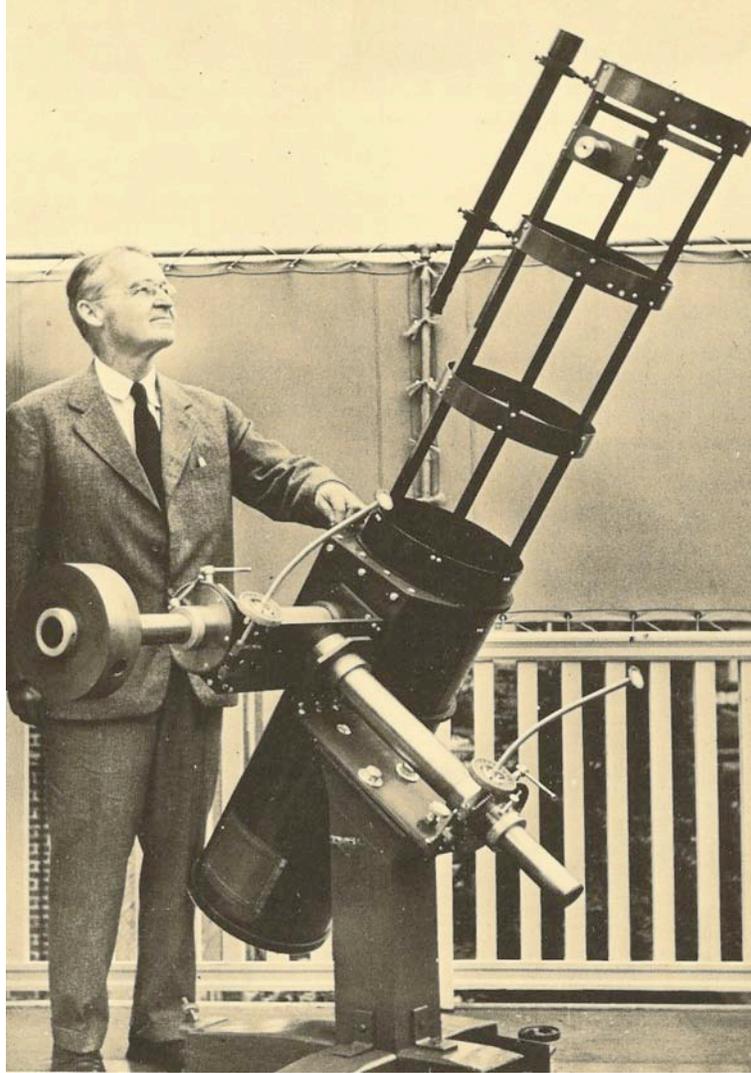
He is a graduate of Westtown School and received a B. S. degree from the University of Pennsylvania in 1901 and a Technical degree in Mechanical Engineering in 1905. He holds honorary degrees from Lehigh University, D. Eng. In 1942, and D. Sc. From Haverford College in 1947.

He is a Fellow, Past President and honorary Member of the American Society of Mechanical Engineers. He is also Past President and Honorary Member of the Engineers Club of Philadelphia. From 1942 to 1947 he served on the Board of Managers of The Franklin Institute and is a recipient of the Hoover Medal of American Engineering Societies.

Mr. Yarnall holds patents on many valves and steam specialties and is the author of a number of engineering papers. He has been very active in civic affairs as a member of the Business Advisory Council, U.S. Dept. of Commerce and The Philadelphia City Planning Commission from 1942 to 1955, serving as its Vice-Chairman from 1945 to 1955. Working with the American Friends Service Committee, he was director and Vice-Chairman of four commissions sent to Europe in connection with war relief work.

In 1936 Mr. Yarnall organized the Amateur Telescope Makers Section of The Franklin Institute. The photograph on the opposite page shows him alongside his 10" reflector telescope, mounted in the observatory on his estate in Chestnut Hill, Pennsylvania. He completed this fine telescope in 1938.

Mr. Yarnall joined The Rittenhouse Astronomical Society in 1935 and is an enthusiastic supporter of the Society's activities.



*Mr. D. Robert Yarnall and his 10" reflector telescope in observatory at Chestnut Hill, Pa.*

## ROSTER OF MEMBERS

This section that follows comprises a carefully prepared alphabetical list of all members of record from 1889 to 1960 that are now members, or were members at one time of the Rittenhouse Astronomical Society or its predecessor, the Camden Astronomical Society.