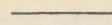


*With the compliments
of C. B. Frost*

622

REPORT
TO THE
American Astronomical Society
from the Director of the
Yerkes Observatory

For the year ending June 30, 1928



REPRINTED FROM POPULAR ASTRONOMY, VOL. XXXVII, NO. 3,
MARCH, 1929.

YERKES OBSERVATORY

UNIVERSITY OF CHICAGO

WILLIAMS BAY, WISCONSIN

Personnel. Mr. Ross returned in August, after an absence of about three months at Mount Wilson, during which he photographed Venus and Jupiter.

Professor F. E. Carr, of Oberlin, photographed the Kapteyn fields of declination 45° with the twin Ross objective, photographic and photovisual, during his stay at the Observatory in July and August.

Mr. Bobrovnikoff continued his studies of comets during the summer quarter and left for the Lick Observatory on September 9.

Miss Calvert returned from her summer vacation in Europe in October.

Mr. Otto Struve was absent from October 27 to December 19 for the further study at the Harvard Observatory of calcium in space.

Mr. Van Biesbroeck attended the meeting of the International Astronomical Union at Leiden.

Professor Georg Struve, of the University of Berlin and of the Observatory at Neubabelsberg, spent the summer as guest of the Observatory for micrometric observations, chiefly of the satellites of Saturn and Uranus.

Professor W. H. Garrett, of Baker University, was again assistant during the summer, working on his photometric problem at the 24-inch reflector.

Dr. Arthur S. Fairley joined the staff, June 18, 1928, and was assigned work with the U-V telescope in the determination of the photographic brightness of the brighter stars.

Equipment. The polar head and the new double tube for the twin 12-inch telescope came back from Fecker's shop on June 18, 1928, and work on the erection of the instrument was in progress at the end of the period of this report.

A new correcting lens of 6 inches aperture was designed by Mr. Ross and constructed by J. W. Fecker. It is a two-lens system, and is placed 250 cm in front of the slit of the Bruce spectrograph. A steel frame, swinging like a gate within the tube of the 40-inch telescope, was constructed by Mr. Ridell to carry this lens. Mr. Moffitt assisted in the design of this permanent attachment to the large telescope.

In order to secure more precision in the focusing of plates in the Bruce spectrograph, a set of 6 new plate holders was made of bronze castings by Mr. Ridell. They permit a focusing to about 0.03 mm. Four small plate holders of stainless steel were constructed by Mr. Ridell for use with the short-focus Moffitt lens of the spectrograph.

Reversible cages for fixing and washing 8x10 parallax plates were designed by Mr. Moffitt and built of Monel metal.

For the further protection of the interests of the Observatory, the University purchased an additional acre of ground, including a house and cottage, west of our present holdings on the State Highway.

Weather Conditions. Conditions for observing were much better than in the two preceding years, as indicated by the table of actual nocturnal observations with the 40-inch telescope, together with the departure from the monthly normals for the past 25 years. The increase of about 40% certainly represents an encouraging improvement.

1927	Hours	Dep.	1928	Hours	Dep.
July	96	-45	January	152	+20
August	148	-3	February	137	+17
September	138	-13	March	146	+19
October	187	+21	April	115	-3
November	69	-62	May	101	-14
December	145	+18	June	66	-54
				1500	-99

Solar Work. Observations with the Rumford spectroheliograph were made by Mr. Moffitt, assisted by Mr. Morgan, 188 spectroheliograms being obtained on 38 days; 33 direct photographs were made with the 40-inch telescope. Some advantage was found in increasing the width of the second slit, in securing increased exposure and for the avoidance of possible erroneous results from motions in the line of sight. It was found that fine details could be better recorded with Eastman Process plates than with the faster emulsion usually used, partly because of greater opportunity for development. Two hundred and two photographs were taken on 115 days, chiefly with the 5-inch telescope by Mr. Morgan or Mr. Hujer. Where possible the heliographic positions of the spots were sent to the Naval Observatory.

Observations with the 40-inch Telescope. Micrometric. Mr. Van Biesbroeck made 346 measures of double stars on parts of 26 nights. He obtained 51 observations for position, brightness, and physical appearance, of 6 different comets. He made 401 estimates of the brightness of variable stars, chiefly from the list of those discovered by Mr. Ross.

Professor Georg Struve began systematic observations of the satellites of Saturn on June 11.

Astrometric. Four hundred and twenty-three plates suitable for stellar parallax were obtained on parts of 85 nights, 311 by Mr. Moffitt, 105 by Mr. Morgan, and 7 by Mr. Van Biesbroeck. This number includes 18 plates taken for determination of proper motions. About 120 stars have been added to the observing program, chiefly from the list of proper motion stars discovered by Mr. Ross and having motions between 0".3 and 0".5 per annum. The plates for the first epoch have been taken for a number of these stars, while for a few the second epoch has been obtained. Four series of plates have been completed and the

plates measured by Mr. Moffitt. Investigation of the development for parallax plates has been continued by him with the result that the exposure time has been reduced to one-third of that used two years ago.

Spectrographic. The Bruce spectrograph was used on the whole or parts of 124 nights and 614 spectrograms were obtained, 337 by Mr. Struve, 152 by Mr. Barrett, 49 by Mr. Pogo, 44 by Mr. Hujer, and 32 by Mr. Morgan. Of these 163 had the dispersion of 3 prisms, the remainder that of one prism. 1970 spectrograms were measured as follows: 1668 by Mr. Struve, 122 by Mr. Pogo, 78 by Mr. Hujer, 56 by Mr. Chang, and 46 by Mr. Morgan.

Most of the measures by Mr. Struve were made in completion of the program on the radial velocities of 500-A stars, long under observation here. Mme. Elisabeth Struve worked throughout the year on the computations in this department. The reductions are completed and the early publication of this work is planned. Mr. Struve found remarkable variations in the spectrum of the A-star 17 Leporis, somewhat similar to those in α Canum Venaticorum, but more pronounced.

Orbits of the following spectroscopic binaries were computed:

4 β Trianguli	Struve and Pogo
30 τ Canis Majoris	Struve and Pogo
13 Ceti	Pogo new orbit
η Orionis	Pogo revision
31 Crateris	Struve new period from Ottawa observations
36 τ° Eridani	Hujer revision
ζ Herculis	Chang visual double
6 β Delphini	Chang visual double

Considerable time was given to the observations with 3 prisms of the standards for radial velocity which have been followed here for many years. Measures were completed for all unmeasured plates prior to 1928 and accurate wave-lengths were derived for all the stars on the list. Observations were also begun of the new list of standard velocity stars drawn up by the subcommittee of Commission 30 of the International Union. A study was made of possible sources of error in determination of radial velocity with high dispersion and improvements were made in the focusing of the instrument.

Mr. Struve continued his study of the remarkable 27 Canis Majoris. With the aid of data from the Chile station of the Lick Observatory, it was proven that the period cannot be one day, but must be 3 years or more. And it seems impossible to escape the conclusion that its mass is of the order of one thousand times that of the sun.

Mr. Pogo developed an improved form of the Laves hodographic method of determining the orbit of a spectroscopic binary and in his doctor's thesis made a new investigation of the spectroscopic orbit of 13 Ceti.

Mr. Hujer continued his studies of the silicon and strontium lines in stellar spectra. Some preliminary results were presented to the American Astronomical Society.

A new table for the reduction of one-prism spectrograms was computed by Mr. Struve and Miss Cable.

24-inch Reflector. The work on asteroids needing reobservation was continued by Messrs. Van Biesbroeck, Struve, and Chang and 149 plates of comets were taken together with 327 plates on asteroids. On parts of 108 nights, 99 positions were obtained for 53 asteroids. A new asteroid YO 26 was found by Mr. Van Biesbroeck and adequately observed.

Fifty-two plates for cometary positions were obtained by Mr. Van Biesbroeck yielding 5 positions of periodic comet Schaumasse and comet Encke in 1927, as well as the last positions of comet Pons-Winnecke and comet Schwassmann.

Bruce Photographic Telescope. Mr. Ross continued his survey for proper motion stars and published his sixth list of such stars in the *Astronomical Journal*, numbering 106 and bringing the total to 787. He also published the sixth list of 65 new variable stars discovered in the same surveys. The number of fields taken was 100. A beginning was made on photographing the Kapteyn areas from 15° south to the North Pole, using the twin cameras. At Mount Wilson, during July and August, several hundred exposures were made in various colors, of the planets Venus and Jupiter. Mr. Ross took time for a careful study of the photographs of Venus with an interpretation of the conditions in the atmosphere of that planet. This was published in the *Astrophysical Journal* for July, 1928.

General. For the safer preservation of our extensive collection of astronomical photographs, now numbering some 50,000, an attic room with brick walls in the center of the building was finished off by painting the walls and treating the cement floor to prevent dust and by providing an adequate system of lighting. A set of steel cabinets should next be provided for the filing of these negatives.

Volume 5 of the *Publications*, both parts by Mr. Van Biesbroeck, the first covering his observations of double stars for ten years, and the second, being the memoir on the definitive orbit of comet 1914 V (Delavan), was distributed.

The *Catalogue of 349 Dark Objects in the Sky*, which was published in the *Barnard Atlas of Selected Regions in the Milky Way*, was reprinted as a pamphlet of 12 pages for the convenience of workers in celestial photography.

Miss Calvert gave most of her time to the preparation for publication of Professor Barnard's micrometric measurements of the positions of selected stars in about 17 of the principal star clusters. She also prepared for Professor Aitken, for inclusion in the new extension of the β catalogue of double stars, Professor Barnard's measurements of such stars made in the seven years from 1915 until the time of his death. Miss Jorgensen assisted in both of these pieces of work.

Library. The capacity of the library was greatly increased by the opening of a second stack room in the attic, of size 80x18 feet. The room was plastered and ample electric illumination installed and was supplied with 30 steel stacks being released to us by changes at the University. The congestion caused by the accumulation of duplicates and reprints from the libraries of Professors Burnham and Barnard was relieved. The extensive work of transfer was carried out by Miss Van Biesbroeck, under the supervision of Mr. Barrett. There was the normal increase of bound books during the year.

The number of visitors during the year was 12,160.

The lavatories on the main floor were remodeled and new equipment installed. At this time a new dark room was added in the attic for the convenience of observers using the 24- and 12-inch telescopes.

EDWIN B. FROST, *Director.*

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May 5, 1926.

My dear Mr. Frost:

Thank you very much for your kindness in sending a bound copy of the Report of the work at Yerkes Observatory for use in this Office. I shall be glad to keep it where it is available, and also to bring it to President Mason's attention.

Very truly yours,

William E. Scott (signed)

Secretary to the President.

Professor Edwin B. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

WES:S

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WES:2

The University of Chicago

Yerkes Observatory
WILLIAMS BAY, WIS.

May 1, 1926

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Mr. William E. Scott, Secretary to the President
University of Chicago, Chicago

Dear Mr. Scott:

I am enclosing herewith a pamphlet in which have been combined succinct printed reports of the work at the Yerkes Observatory as prepared for the annual volume of the American Astronomical Society. I have thought that such a departmental report as this should be in the President's office, available for consultation. Will you therefore kindly bring this to his attention, if convenient, and have it placed on file? I shall expect to send other sheets of this sort from year to year as they are issued.

Very truly yours,

Edwin B. Frost

Edwin B. Frost
Director

Enc.

EBF λ

The University of Chicago

Director
WILLIAM BAY, WIS

May 1, 1938

Handwritten:
L.P.
A.V.I.I.
J. ...

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University of Chicago, Chicago

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Very truly yours,

Handwritten signature: Edwin F. Frost

Edwin F. Frost
Director

Enc.

MAY 1

Report
of
Yerkes Observatory
University of Chicago
Williams Bay, Wisc.

1922-23

1923-24

1924-25

Edwin B. Frost
Director

(prepared for American Astronomical Society)

Extract from Popular Astronomy
March 1924
February 1925
February 1926

Using a doublet camera of smaller field, Mr. Schlesinger completed at Allegheny Observatory the reobservation of 7229 Gesellschaft stars between -2° and $+2^\circ$ declination. This catalogue is now in press. A second series of plates covering the zone from 50° to 55° had been secured in 1915. The measurement of these plates has been completed by Miss Barney and Miss Booth and the reductions are well under way. They will yield positions for 8200 stars.

Celestial Mechanics. Professor Brown has completed the first part of a memoir entitled, "The Trojan Group of Asteroids." This has been distributed as Part 1, Volume 3, of the Transactions of the Observatory. He is now engaged on the continuation of this work.

Miscellaneous. Miss Palmer has assisted in the compilation of a Catalogue of Stellar Distances and a Catalogue of Bright Stars. She has also acted as librarian, superintending the work of bringing up the binding and the arrangement of the library. Mr. Oort has carried out an investigation on the relation between the masses and velocities of stars; and in connection with the Catalogue of Stellar Distances he has derived the systematic corrections to certain series of parallax determinations. Miss Booth has finished the measurement and computations on four series of plates of Selected Areas. These plates were secured at the Dearborn Observatory and the work is to appear as a joint publication of the two institutions.

The 26-inch Photographic Refractor. When the question arose in 1920 as to how the Yale Observatory could best contribute to the advancement of the science it was urged that a large photographic refractor erected in the Southern Hemisphere would prove much more useful than any similar telescope installed in the neighborhood of New Haven. The Corporation approved this recommendation and in February, 1923, awarded the contract for a 26-inch objective of 36 feet focal length to the J. B. McDowell Company of Pittsburgh. The glass disc for this telescope had been purchased in 1921 from Schott and Company. Mr. McDowell states that work on the objective is making good progress and that the glass is of unusual excellence.*

Quotations on the mounting for this southern telescope were invited from several firms both in this country and abroad. They all proved to be astonishingly high. The Observatory has therefore undertaken to build the mounting so far as possible in its own shop and to let contracts to outside firms for those parts that can not be handled in this way. The shop is now equipped with three lathes (up to forty inches swing), two drill presses, one milling machine (Brown and Sharp, Number 2), a small shaper, a grinder, and a good equipment of small tools. The work of making the assembly and the detailed drawings has been entrusted to Mr. R. W. Sellew, mechanical engineer, of Mid-

*This objective was finished by Mr. McDowell in October, 1923, a few weeks before his untimely death. His letters concerning it speak of it as the best objective that he has ever made.

dletown, Connecticut. The contract for the driving clock has been awarded to G. W. Klages and Sons of Pittsburgh.

The site for this telescope will be either in New Zealand or South Africa. A definite decision will be made next spring on the basis of the tests for seeing which are now in progress in both countries.

YERKES OBSERVATORY
UNIVERSITY OF CHICAGO
WILLIAMS BAY, WISCONSIN

EDWIN B. FROST, Professor of Astrophysics, and Director.
JOHN A. PARKHURST, Associate Professor of Practical Astronomy.
STORRS B. BARRETT, Associate Professor of Astrophysics, Secretary, Librarian.
GEORGE VAN BIESBROECK, Associate Professor of Practical Astronomy.
OLIVER J. LEE, Assistant Professor of Practical Astronomy.
OTTO STRUVE, Assistant in Stellar Spectroscopy.
MARY R. CALVERT, Computer.
FLORENCE B. LEE, Office Secretary.
MARGUERITE VAN BIESBROECK, Assistant in Library.
ELSIE JOHNSON, LELA CABLE, Temporary Computers.
GEORGE C. BLAKSLEE, Photographer.
FRANK R. SULLIVAN, Engineer in charge of 40-inch telescope.
CHARLES RIDELL, Instrument Maker.
HENRY M. FOOTE, Carpenter, and Supervisor of Building.

The following persons were volunteer research assistants: Professor Harriet W. Bigelow, of Smith College, during the summer quarter of 1922, continuing her work from the spring quarter; Dr. Alice H. Farnsworth, of Mt. Holyoke College, summer quarter of 1922; Professor Issei Yamamoto, of the University of Kyoto, October 1922 through June 1923; and Professor Anne S. Young, of Mt. Holyoke College, spring quarter, 1923. Mr. C. T. Elvey, of the University of Kansas, spent the summer quarter of 1922 in graduate work in spectroscopy.

The Observatory suffered an irreparable loss in the death, on February 6, 1923, of Edward Emerson Barnard, who contributed greatly to the work of the Observatory from its foundation. He became acutely ill about December 27, 1922, and did not come to the Observatory after that date.

Equipment. The Zeiss U.-V. camera and its equatorial mounting were removed from Mr. Parkhurst's grounds to a permanent location in a simple dome of canvass and wood, on the north end of the Snow Building. Its elevation of 25 feet gives an excellent horizon.

The original boilers at the power house were replaced by new ones in the summer of 1922. It has been found more economical to buy electric current during the months when steam heat is not needed, and a motor generator at the power house converts the alternating current of the public service company into direct current at 110 volts.

Dr. George S. Isham, of Chicago, made and presented a new chronograph of the Hipp type for use with the 40-inch telescope.

A camera lens, designed by Dr. Frank E. Ross, of the Eastman Kodak Company, and having an aperture of 57 mm and a focal length of 60 cm, was made by McDowell in the spring of 1923, for use with the Bruce spectrograph. It gives much better definition at the ends of the spectrum and requires no curvature of the plate, with one prism.

Considerable work was done in preparation for the eclipse expedition to Santa Catalina Island.

Solar Work. On account of the very calm condition of the sun near minimum, the Rumford spectroheliograph was used rather infrequently by Mr. Lee, only 23 spectroheliograms being obtained. On suitable clear days, however, he examined the limb visually for prominences with the spectroscope known as the Scout, which is attached to the 40-inch telescope without requiring the removal of other apparatus which may be in place for night work.

Two hundred and fifty routine photographs of the sun were made with the 12-inch telescope by Miss Calvert, Miss Bigelow, or Mr. Yamamoto, on 132 days.

40-inch Telescope. The year was particularly unfavorable for observations, the record of hours of use of the 40-inch telescope at night being 244 less than the 20-year normal of 1677, a deficit of about 14 per cent. The general program continued as heretofore.

Mr. Barnard's observations from July 1 to December 22, on parts of 52 nights, included determinations of position of faint comets, of selected stars in globular clusters, of an asteroid, of a nebula, of numerous comparison stars, and of the satellites of Uranus, together with many estimates of the brightness of several faint novae and of eight variable stars. Five clusters were also photographed by him.

Mr. Van Biesbroeck continued the measurement of the Hussey double stars, of which he has now measured 1217, and of some rapid binaries. He followed faint comets and asteroids, using also the 24-inch reflector for this purpose. He later continued Mr. Barnard's observations of the satellites of Saturn.

Mr. Parkhurst continued his photometric work, during the middle part of 32 nights, on the Rumford and Orion fields and variable stars.

Stellar Parallax. Two hundred and sixty-four usable plates, generally with two exposures on each, were secured, 190 by Mr. Lee, 73 by Mr. Van Biesbroeck, and one by Mr. Sullivan. Measurements and reductions of 21 stars were completed but are as yet unpublished, the measurement of 13 of these being made by Mr. Lee, and 8 by Mr. Van Biesbroeck. Four of Kapteyn's Selected Areas were measured by Mr. Lee and reduced for parallax and proper motion, a grant of \$300 from the Gould Fund making it possible to continue the reduction of these measures during the last six months of the year.

Spectrographic Work. The Bruce spectrograph was used on 88

nights, 193 3-prism plates and 517 1-prism plates being secured, chiefly by Mr. Struve. Mr. Barrett shared in the observing during March and April, 1923. Special attention was given to spectroscopic binaries of very short period and 421 spectrograms were measured by Mr. Struve.

24-inch Reflector. Mr. Parkhurst secured on parts of 85 nights 95 plates of the North Polar Sequence, 29 of Rumford fields, and 11 of proper-motion fields. Seven exposures on single-layer plates were obtained for Dr. Silberstein. Miss Farnsworth participated in this work during the summer of 1922.

During the autumn of 1922, Messrs. Van Biesbroeck and Struve photographed systematically some of the asteroids fainter than $13^m.8$ on the lists of the Rechen-Institut. Two plates were taken in immediate succession, with an exposure of 20 minutes each, and the moving object was then located with the blink machine. Positions on two or more nights were obtained for 44 asteroids, chiefly by Mr. Van Biesbroeck. Mr. Yamamoto took some part in this work.

12-inch Refractor. The equalizing-wedge photometer was used on 12 nights by Mr. Parkhurst, in remeasuring certain of the Rumford fields included in the joint study of "Photometric Magnitudes of Faint Standard Stars" (*Memoirs of the American Academy of Arts and Sciences*, Vol. XIV, No. 4, 1923). Miss Anne S. Young took part in this work, measuring these fields on 9 nights.

The instrument was also employed for incidental observations and for the occasional use of academic visitors.

Bruce Photographic Telescope. In the last six months of 1922, this instrument was used by Mr. Barnard on 50 nights, 128 plates being obtained with the 10-inch and 6-inch lenses, chiefly of the Milky Way and comets, with some search plates.

Mr. Yamamoto later took 179 plates of various regions. He also made an interesting study of the comparative accuracy with which positions could be measured on plates obtained with the 24-inch reflector, 10-inch and 6-inch Bruce doublets, and the Sky Patrol, the last named having a focal length of only 315 mm. The mean errors were, respectively, $0''.26$, $0''.85$, $0''.96$ and $4''.9$.

6-inch Cometseeker. On July 19, 1922, Mr. Barnard used this instrument in a visual search for the cosmic clouds of Father Hagen, with negative results.

Mr. W. R. Paul, of Chicago, has used this instrument on his vacations in sweeping for comets, for a few years past. During the present period he spent 21 nights at the Observatory, of which only 6 were suitable for sweeping. No unknown cometary objects were recorded.

The Library. Three hundred and ninety-five bound and 78 unbound volumes were received, bringing the total number of 6827 bound and 2207 unbound volumes, besides 3860 pamphlets.

The American Astronomical Society met at the Observatory from September 5 to 8, 1922.

In commemoration of the 25 years of activity of the Observatory, the trustees of the University of Chicago were invited here on the evening of September 30, 1922, and a retrospect of the work done was given by the director.

The meteorological service was maintained as usual, the observations being chiefly made by Mr. Struve.

An illustrated catalogue of the astronomical negatives of which slides and prints could be supplied was carefully prepared by Mr. Barrett. A set of 24 spectrograms of different types and dispersions, with explanation of methods of reduction, was made up and sent to about 40 institutions.

11,929 visitors were admitted to the Observatory on the public afternoons during the year.

Volumes 56 and 57 of the *Astrophysical Journal* were issued.

THIRTY-FIRST MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY

The thirty-first meeting of the Society was held on the invitation of Miss Caroline E. Furness, at Vassar College, Poughkeepsie, New York, on December 27 and 28, 1923. The members were housed in the Main Building of Vassar; meals were served in the same building; and the sessions were held in the Sanders Laboratory of Chemistry only a short distance away. There were thus available the ideal arrangements whereby the meeting took the nature of a large house party for a couple of days, with members given every opportunity for constant visiting and cordial discussion. For a winter meeting, the attendance was very good, there being from fifty to sixty visitors.

In the absence of President W. W. Campbell, the sessions were presided over by Vice-Presidents Henry Norris Russell and Ernest W. Brown. The program was marked by an unusually short list of papers, which, however, simply gave increased time for discussion. Another change of significance was the placing of the afternoon sessions at a late hour, so that there was none of the rush which usually seems to come in getting back to papers after lunch.

A few of the members looked about Poughkeepsie for proposed sites for the observation of the 1925 eclipse. Also, under the leadership of Mr. Brown, there was a general discussion of eclipse plans at one of the sessions. The committee for the solar eclipse of January 24, 1925, was appointed by the Council as follows: S. A. Mitchell, Chairman; H. D. Curtis, W. J. Humphreys, J. A. Miller, Frederick Slocum, J. Stebbins, E. W. Brown, L. J. Comrie, W. S. Eichelberger, H. N. Russell.

On the first evening of the meeting, a number of the "young people"

gathered at the Observatory where, under the hospitality of Miss Furness, they did such things as make candy and play various intellectual games. One would suspect from the actions of those taking part that observatories are fountains of perpetual youth, for certainly there were no old folks to be seen.

On the second evening, there was a special eclipse hour with exhibits from the ill-fated Californian and Mexican eclipse of 1923. Motion pictures of the preparations of the Yerkes and other parties at Camp Wrigley, Catalina Island, were exhibited through the efforts and kindness of Director Frost and Mr. B. W. Harris; also a splendid exhibit of motion pictures and photographs of the corona by John A. Miller, leader of the Sproul Observatory expedition to Yerbanís, Mexico, where with an almost clear sky complete success was secured.

Although the regular program of papers was finished in two days, there was a hold-over gathering on Saturday morning, when those engaged in the teaching of astronomy got together in an experience meeting, and made plans for the better instruction of the astronomers of the future. In this connection, an interesting vote was taken in which it was found that a majority of those at this meeting had entered college with an interest in astronomy already developed. If those present formed a representative group, then it must be true that people who take up astronomy as a profession are usually inclined in that direction at a relatively early age.

New members of the Society were elected, bringing the total number up to 408.

John A. Aldrich, Washburn College, Topeka, Kansas.
 J. H. Darling, 532 W. Third St., Duluth, Minnesota.
 Helen E. Howarth, Smith College Observatory, Northampton, Mass.
 Jan H. Oort, Yale University Observatory, New Haven, Conn.
 David Rines, 99 State Street, Boston, Mass.
 Rufus O. Suter, Jr., Harvard College Observatory, Cambridge, Mass.
 Peter van de Kamp, Leander McCormick Observatory, University,
 Virginia.
 Alexander Vyssotsky, Leander McCormick Observatory, University,
 Virginia.

The following members were in attendance at the Vassar meeting:

Ackerman, Ethel S.	Hawes, M. Alberta	Schwan, Dorothy L.
Albrecht, S.	Howe, Mary	Shapley, H.
Allen, Leah B.	Green, W. K.	Sitterly, B. W.
Baker, R. H.	Lundin, C. A. R.	Slocum, F.
Barton, S. G.	Luyten, W. J.	Slocum, Lois T.
Barney, Ida	Marriott, R. W.	Stearns, C. L.
Bigelow, Harriet W.	Mauzy, Antonia C.	Stebbins, J.
Boss, B.	Menzel, D. H.	Stetson, H. T.
Brigham, L. A.	Miller, J. A.	Stewart, J. Q.
Brown, E. W.	Oort, J. H.	Stokley, J.
Comrie, L. J.	Palmer, Margaretta	Swartz, Helen M.
Curtiss, R. H.	Pawling, J.	Tatlock, J.
Dugan, R. S.	Peters, G. H.	Turner, A. B.
Eichelberger, W. S.	Phillips, E. C.	van de Kamp, P.
Fairfield, Priscilla	Pitman, J. H.	Warner, W. R.
Furness, Caroline E.	Poor, J. M.	Yamamoto, I.
Hall, Mrs. H. T.	Schlesinger, F.	

able to install several large machine tools to supplement the regular equipment of the Observatory shop; but even with these additions some of the larger parts could not be handled by us and have been assigned to outside firms. Most of the construction is now finished. (Actually completed in October, 1924.) It is planned to make a complete assembly of the telescope in the Mason Mechanical Laboratory of the University.

Very fortunately the Observatory entered an order for the 26-inch lens intended for this telescope some time before it was absolutely necessary to do so. The lens was finished by Mr. McDowell in September, 1923, a few weeks before his sudden death. It is the last work of this famous optician, and letters from him declare it to be his best. Tests made by the writer and others in the optical shop of the maker indicate very clearly that the glass is a good one; the exact degree of its excellence cannot be definitely ascertained until it is tested with actual star images, and no opportunity for doing this will be forthcoming until the telescope is mounted at its site in the southern hemisphere.

At its annual meeting, April 14, the Observatory Committee, acting upon the recommendation of the director, decided to accept one of several invitations extended to us by organizations in South Africa. Two of these, at Johannesburg and Bloemfontein respectively, are especially attractive and the astronomical conditions at both places are known to be exceptionally good. Indeed, several competent astronomers who have investigated the district at first hand have expressed the opinion that the astronomical conditions on the Veldt, upon which both of these cities are situate, are not excelled at any other known locality either north or south of the equator. It is not necessary to make a decision as to the exact location of the telescope until next winter. The director intends to sail for South Africa on December 13, taking with him the objective, the mounting to follow soon after. He expects to be able to recommend one or the other of these two sites after an inspection of at most two weeks, and to begin the erection of the telescope as soon thereafter as the circumstances permit.

FRANK SCHLESINGER, *Director*.

YERKES OBSERVATORY
 UNIVERSITY OF CHICAGO
 WILLIAMS BAY, WISCONSIN

Personnel. Changes in the permanent staff since the last report were as follows: Dr. Otto Struve was advanced from an assistantship to an instructorship from January 1, 1924. In June, 1924, Dr. Frank E. Ross, for the past nine years at the Eastman Research Laboratory, was appointed associate professor of practical astronomy, effective on October 1, 1924.

Equipment. During this fiscal year the University of Chicago came into possession of the valuable property bequeathed to it by Professor Barnard, as a memorial to his wife, Rhoda Calvert Barnard, consisting of his home and ample grounds, adjacent to the Observatory. The Barnard House will be occupied by Professor Ross and family.

Trouble had been developing in the roller bearings of the wheels carrying the great dome and during the winter each one of the twenty-six wheels was taken down by Messrs. Sullivan and Ridell, as circumstances permitted, and repaired. Plans have been adopted for the renewal of these bearings within the next year or two.

A new metallic exposing shutter and several aluminum plateholders were made by Mr. Ridell for the 12-inch telescope. He also overhauled some parts of the Rumford spectroheliograph, beside making many other repairs and betterments.

Weather Conditions. The year was a very poor one for night observing, as would appear from the following table:

HOURS OF OBSERVATION WITH 40-INCH TELESCOPE.

	20-Year Normal		Departure
	1923-24	1903-22	
July	119	151	-32
Aug.	122	156	-34
Sept.	130	159	-29
Oct.	175	170	+ 5
Nov.	101	140	-39
Dec.	102	132	-30
Jan.	130	140	-10
Feb.	75	129	-54
Mar.	107	133	-26
Apr.	113	120	- 7
May	74	120	-46
June	71	126	-55
	1319	1676	-357

We shall probably find the above normals too high in future as Professor Barnard was accustomed to observe even under conditions of poor seeing. It is not our present practice to take photographs or observe with the 40-inch telescope under unfavorable conditions, so that this will have a considerable effect on the hours of observation.

The main programs of work continued as during the previous year, except for the expedition for observing the total solar eclipse of September 10, 1923.

Solar Work. Fewer plates than usual were taken by Mr. Lee with the Rumford spectroheliograph, because of the feeble activity of the sun and the cloudy skies. He used the "Scout" spectrocope on suitable occasions for visual reconnaissance for prominences, but found none of special interest. Thirty-two plates of the disk and sixty-two of prominences were taken. Of these, thirteen and eighteen plates, respectively, were taken by Mr. Struve around the time of the solar eclipse, in Mr. Lee's absence.

With the 12-inch telescope, 111 direct photographs of the sun were taken on 51 days, chiefly by Miss Calvert.

Observations with the 40-inch Telescope. Micrometric. Mr. Van Biesbroeck made 1234 measures of double stars, of the list discovered by Hussey (98 per cent of which have now been re-observed), of rapid binaries, or of neglected stars. He also made observations of faint comets for position, brightness and physical appearance, on fifteen nights; of asteroids, on eighteen; of comparison stars, on thirty-six, and of faint variable stars, on twenty-three. The satellites of Saturn, Uranus, and Neptune were measured on respectively six, four, and thirteen nights. The stellar interferometer was used occasionally to test a new device, built by Mr. H. H. Porter of Chicago, for eliminating the effect of atmospheric dispersion.

Astrometric. 243 plates for stellar parallax were obtained, 238 by Mr. Lee, assisted by Mr. Sullivan, and 5 by Mr. Van Biesbroeck; and seven determinations of parallax were completed by Mr. Lee.

Four Selected Areas have been measured by Mr. Lee, and reduced, completing the zone at 45 degrees of north declination, with its 24 Kapteyn Areas. This work has included more than 350,000 settings on stellar images and scale. The individual trigonometric parallaxes and the proper motions of 1041 stars have been derived by a general method. The tables, charts, and discussions are being prepared for publication.

Photometric. On parts of 39 nights, Mr. Parkhurst obtained with the objective-grating seven plates of Rumford fields for comparison of photo-visual with visual magnitudes from the equalizing-wedge photometer. He also took two plates of the suspected variable BM Orionis (Bond 624). He made 145 visual comparisons of 37 variable stars, usually between 14th and 17th magnitudes; and on one night used the equalizing-wedge photometer on the Polar Sequence and on the comparison stars for RR Virginis.

Spectrographic. The Bruce spectrograph was employed exclusively with one prism and with the new Ross camera lens, and chiefly for stars of classes A and B. 307 plates were obtained by Mr. Barrett and 351 by Mr. Struve, Mr. Sullivan generally assisting, bringing the total number of such plates to 7431. 357 spectrograms were measured by Mr. Struve, many of the results being included in his doctor's thesis, "A Study of Spectroscopic Binaries of Short Period," presented in December, 1923. The orbits of 61 μ Orionis, of 43 θ^2 Orionis, and of 2 Monocerotis were definitively completed. Numerous plates of three spectroscopic binaries were loaned for measurement to Dr. Otto Kohl of Goettingen, who published an orbit of 13 μ Sagittarii, confirming our early results from the same material and indicating a variable motion of the system from the recent spectrograms.

24-inch Reflector. On parts of 37 nights, Mr. Parkhurst obtained for photometric purposes 32 plates of Rumford fields, 19 of the Polar

Sequence, 3 of the Kapteyn Areas, and one of the Orion nebula.

Mr. Van Biesbroeck photographed 26 fields for the position and physical appearance of comets. With Mr. Struve, he continued observations on asteroids fainter than magnitude 13.8. Positions for 74 asteroids were published in the *Astronomical Journal*. Ten of these were followed for a considerable arc, to establish their identity. Eight of them appear to be new.

12-inch Refractor. On parts of fourteen nights, Mr. Parkhurst made two complete sets of measures, with the equalizing-wedge photometer, of ten Rumford fields, for the comparison of the standard stars of the 9th with those of the 12th magnitude.

The instrument was also employed for incidental observations with the solar spectroscope, and for academic visitors on numerous occasions.

The *Zeiss U.-V. Doublet* was taken to California for the eclipse, and re-installed later in the autumn.

The *Bruce Photographic Telescope* was only slightly used, due to lack of an observer, but in the coming year will be kept in regular operation by Mr. Ross.

Mr. W. R. Paul, of Chicago, swept with the *6-inch Comet-Seeker* on parts of 17 nights.

Eclipse Expedition. During the summer and autumn of 1923, several members of the staff were much occupied with preparations for the total solar-eclipse of September 10, entailing an absence from the Observatory of Mr. Lee from July 26 to September 30, of Mr. Parkhurst from August 9 to October 3, and of Mr. Frost from August 21 to September 22. An account of this expedition, which was generously financed by Mr. William Wrigley, Jr., of Chicago and Santa Catalina, was published by the writer in *Popular Astronomy* for April, 1924.

Miss Calvert continued work on the preparation of the late Professor Barnard's Atlas of the Milky Way, under the direct supervision of the writer. This is to be published by the Carnegie Institution at Washington, in 1925. She also was occupied in preparing Professor Barnard's bibliography for a biographical sketch by the writer, which will appear in the *Memoirs of the National Academy of Sciences*. She further continued the reduction of unpublished observations by Professor Barnard, which were requested by persons working in different fields.

The reduction of Professor Barnard's extensive observations of the clusters was continued by one computer under the supervision of Mr. Van Biesbroeck.

The Library. The Observatory received, by Mr. Barnard's bequest, 321 bound and 884 unbound volumes, besides many reprints and pamphlets. There were also added 233 bound and 36 unbound volumes, and many pamphlets, bringing the total up to 7149 bound and 2445 unbound volumes, and 4160 pamphlets (exclusive of those received from the Barnard Estate).

Visitors to the number of 13,124 were counted on the public Saturday afternoons. Their movement was much facilitated by an additional iron stairway in the great dome.

Volumes 58 and 59 of the *Astrophysical Journal* were issued.

EDWIN B. FROST, *Director.*

ORION.

What mighty force in thee doth cause
(At night when I am homeward bound)
My soul to thrill, my heart to pause?
Methinks wouldst have me leave the ground
To join thee at thy source of light—
So doth compel thy wondrous sight!

Thou hast of beauty goodly store,
Nor noble mien nor poise dost need;
Of order one could ill ask more,
Thou art delight to every creed.
Withal great charm to me dost send
In that thou art most faithful friend!

As men to men themselves unite
Now to condole, now to rejoice
With them whom Time doth lift or smite:—
Dost thou to me lend thy sweet voice
As need there be—regret or cheer—
Let no one say thou art not near!

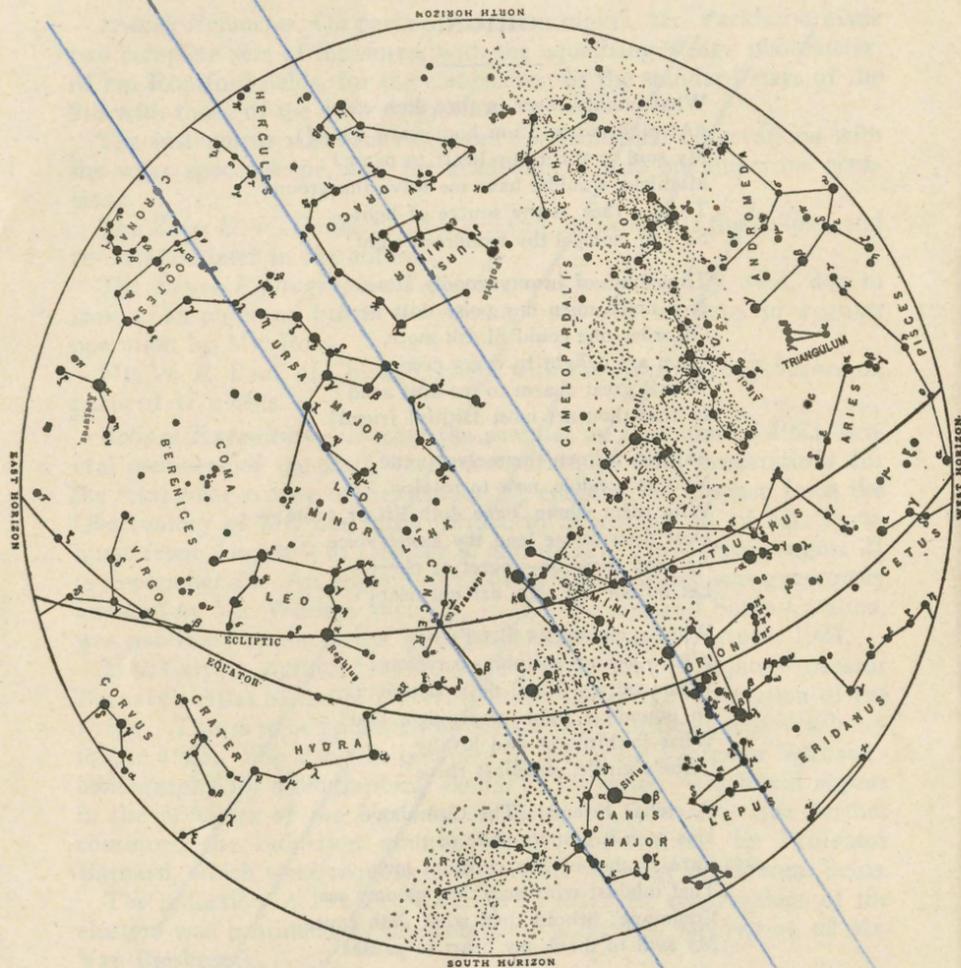
What sympathy in Betel's fire
With soothing softness so replete!
What courage Rigel doth inspire,
Of boundless light, resplendent seat!
What faithfulness and loyalty
Orion's girdle, steadfast three!

O, stellar Friend! The God above
Has seen it best to make of thee
Rare symbol of His constant love,
That mightst with man thru gloomy sea
Commune: behold then what doth cause
My soul to thrill, my heart to pause!

JOHN ALEXANDER PRETI.

PLANET NOTES FOR MARCH.

The Sun will continue its motion northeastward from $22^{\text{h}} 46^{\text{m}}, -7^{\circ} 51'$ on March 1 to $0^{\text{h}} 36^{\text{m}}, +3^{\circ} 52'$ on March 31. It will cross the equator about three A. M., Greenwich Civil Time, on March 21. This marks the moment of vernal equinox and the beginning of spring. On this date the day and night are equal at all places on the earth and after this date the days will be longer than the nights in the northern hemisphere.



THE CONSTELLATIONS AT 9:00 P. M. MARCH 1.

The phases of the Moon will occur as follows:

First Quarter	March 2	at 6 A.M. C.S.T.
Full Moon	10	" 2 P.M. "
Last Quarter	17	" 5 P.M. "
New Moon	24	" 2 P.M. "

Brown, as chairman of a committee of the American Astronomical Society, had charge of a nation-wide campaign for informing the public concerning the eclipse and how best to observe it, as well as for securing from the general public certain data that needed great numbers of observers. It is planned to describe in detail the results of this eclipse work in the *Transactions* of the Observatory.

The Southern Telescope. The construction of the mounting, carried out in our own shop, was completed in October, 1924. The whole telescope was then set up in the Mason Mechanical Laboratory, which is admirably equipped for such operations. The telescope was then dismantled and packed for shipment, finally leaving New York early in February on the steamer *Western Glen* sailing direct for Capetown, where she arrived, much delayed, at the end of March. In the meantime, Mr. Schlesinger had sailed from New York to South Africa via Southampton, on December 27, taking the great lens with him as baggage. He reached Johannesburg on February 8. After considering several sites, he accepted the very generous invitation of the new University of the Witwatersrand, within the city limits. A fine plot of ground was put at our disposal by the University, which also agreed to certain restrictions as to their future building operations with a view to protecting our observatory from possible encroachments that might hamper its work; and furthermore, the University has erected, free of expense to Yale, a suitable office building with residence quarters for the astronomer in charge and for one assistant.

Ground was broken for the Observatory building on February 18; the construction was finished early in June. The building is brick, faced by artificial grey stone that conforms in general appearance with the University buildings close by. Owing to many unforeseen delays, the telescope could not be erected in the manner or sequence originally planned. It was put completely together on the floor of the Observatory building while the workmen were still constructing the walls, and then was lifted into place upon its great piers as a unit. It was a great satisfaction to rest it in its final position and to find that its fit and operation were right. This was done in the last week in May. Mr. Schlesinger remained in Johannesburg a month longer before turning the telescope over to Mr. Alden, who had arrived May 29, and who remains permanently in charge. During that month the mechanical and optical performance of the instrument was tested in every essential respect and was found to be satisfactory. Mr. O'Connell, who has had so large a share in the construction and erection of the telescope, remains with Mr. Alden as observing assistant.

FRANK SCHLESINGER, *Director.*

YERKES OBSERVATORY

UNIVERSITY OF CHICAGO

WILLIAMS BAY, WISCONSIN

Personnel. The Observatory suffered a great loss in the sudden death, on March 1, 1925, of John Adelbert Parkhurst, associate professor of practical astronomy, for 25 years a member of the staff.

Associate Professor Frank E. Ross took up his residence here on October 1 and began work with the Bruce telescope; somewhat later he commenced observing with the 40-inch refractor and 24-inch reflector.

Additions to the list of temporary computers during parts of the year were Miss Mary Howe, Miss Margrethe Jorgensen, and Mme. Ludwig Struve.

Mr. H. L. Vanderlinden, of the staff of the Royal Observatory of Belgium, having a fellowship of the C. R. B., was a guest of the University of Chicago at the Observatory from October 2, 1924, to June 3, 1925. He devoted his time chiefly to stellar photometry.

The following graduate students worked at the Observatory during the year. Summer Quarter of 1924: W. H. Garrett, E. M. Justin, and W. A. Luby; from October 1, through the academic year, N. T. Bobrovnikoff, who came to us from the University of Prague; and Miss A. V. Douglas, of McGill University, who began her summer's work on May 15, 1925.

Equipment. No notable additions were made to the equipment during the year under review.

Weather Conditions. The conditions for observations at night were unfavorable for nine out of the twelve months, as indicated in the following table. The departure is from our twenty-year normal and this is subject to the same reservations as last year.

HOURS OF OBSERVATION WITH 40-INCH TELESCOPE AT NIGHT.

	1924-25	Departure
July	122	-29
August	133	-23
September	160	+1
October	194	+24
November	122	-18
December	82	-50
January	129	-11
February	72	-57
March	100	-53
April	140	+20
May	101	-19
June	84	-42
	1439	-257

Except for preparations made for observing the total eclipse, the program continued as in the previous year.

Solar Work. With the Rumford spectroheliograph, Mr. Lee secured 113 satisfactory plates with an average of two exposures to the plate. Of these, 51 were of the disk and 62 were of the limbs. During his absence at Iron Mountain, Mr. Struve obtained seven spectroheliograms. Active prominences of considerable size were photographed rather fully with the spectroheliograph on April 2 and May 11, 1925, by Mr. Lee. He also observed visually with the "Scout" on numerous days.

A plan which has been under consideration for some years past was put into partial effect in that we prepared for the attachment to the 40-inch telescope of a Universal movie camera, kindly loaned to us by Dr. George S. Isham. Preliminary attempts were made with this by Mr. Lee to photograph the granulations of the solar disk. Negatives on film were made both in the focus of the 40-inch objective and with an amplifying lens giving fourfold enlargement. These observations can be profitably attempted only when the seeing is very fine.

With the 12-inch equatorial, 266 direct photographs of the sun on 154 days were obtained by Messrs. E. M. Justin and N. T. Bobrovnikoff. After extended experimenting, which has been in progress for some years, we adopted the plan of using a strip of green gelatin filter on the slit of the exposing shutter, Eastman process plates being employed. In this way, we are able to use the full aperture.

After the eclipse, Mr. Bobrovnikoff made some photographs of the chromosphere and prominences on dicyanine plates with the solar spectrograph adapted for the infra-red region.

Observations with the 40-inch Telescope. Micrometric. Mr. Van Biesbroeck made 776 measures of double stars, chiefly of those discovered by Hussey, on parts of 51 nights. The manuscript of observations of double stars by Mr. Van Biesbroeck since 1915 awaits only funds for printing. Hussey 1067=XY Persei was examined on 27 nights for determining the character of the change in brightness.

Faint comets were observed as follows, by Mr. Van Biesbroeck: 1924 *b*, Encke, 14 nights; 1924 *c*, Finsler, 2 n.; 1925 *a*, Shajn, 10 n.; 1925 *b*, Reid, 7 n.; 1925 *c*, Orkisz, 12 n.; and 1925 *d*, Tempel II, 4 n. Among observations of faint asteroids on parts of 27 other nights, may be mentioned those of Ganymede (1924 TD) on 18 nights, ending April 5. The satellite of Neptune was observed on 4 nights and those of Uranus on 3 nights. Mars was visually observed on favorable occasions and the south polar cap was measured on 20 nights. A bright extension to the terminator was followed for several hours on October 27.

Astrometric. Usable plates of 198 fields for parallax and proper motion have been taken with the 40-inch on parts of 51 nights by Mr. Lee, assisted by Mr. Sullivan. Twenty-two ordinary parallaxes have been derived by Mr. Lee, which are not yet published. A list of 33 parallaxes were given jointly by Mr. Van Biesbroeck and Mr. Lee in the *Astronomical Journal*, No. 840. Mr. Lee has published an inter-

pretation of trigonometric parallaxes derived in the mass, in *Astronomical Journal*, Nos. 847-848.

Photometric. The following observations were made by Mr. Parkhurst up to February 20, 1925, on parts of 21 nights. Seven plates were taken with the grating over the 40-inch objective, of which three were for photovisual magnitudes in the Rumford fields, one for polar sequence, and three for the star Bond 624 Orionis. The stellar photometer was used on four nights. One hundred thirteen visual observations of 32 variable stars were made on 13 nights.

Photographic. Experiments were made by Mr. Ross in photographing planets and double stars on Eastman kryptocyanine plates sensitive to wave-length 7600 Å. He observed that the moon, Saturn, and Jupiter, show smaller diameters in the infra-red, as was found by Wright for Mars. Mr. Ross is carefully considering the photographic theory involved. Direct photographs of Mars with the enlarging lens employed by Mr. Barnard were occasionally made by Mr. Sullivan during the summer of 1924, but owing to the low altitude of the planet and poor weather conditions, these did not attain the excellence of the photographs secured in 1909 by Mr. Barnard.

Spectrographic. The Bruce spectrograph was used by Messrs. Barrett and Struve on 104 nights, the autocollimating spectrograph on one night. Mr. Sullivan assisted as usual. With a dispersion of one prism, 347 spectrograms were obtained, chiefly in completing the program on the B stars, with some A stars. With three prisms, 81 spectrograms were taken, some of them of the standard velocity stars, but the greater number were under a new program of repeating the observations of the twenty stars of the Orion type, observed and published over twenty years ago.

1034 plates were measured by Mr. Struve during the year, in completing the program of the B stars. In so doing, he found ten new spectroscopic binaries, and also found bright lines in certain stars, besides making a special study of a dark line near $\lambda 4470$. The orbits of 66 Eridani, by Messrs. Frost and Struve, and of 16 Lacertae, by Messrs. Struve and Bobrovnikoff, were published.

A model using threads was designed by Mr. Van Biesbroeck for computing the reduction to the sun and was found very satisfactory for checking computations to an accuracy of 0.1 km/sec.

Data for 14 unpublished spectroscopic binaries, discovered with the Bruce spectrograph by different workers, were communicated to the *Astrophysical Journal* by the director.

24-inch Reflector. On parts of 46 nights, 86 plates were secured for photometric purposes, including exposure ratio, polar sequence, and effective wave-lengths, 67 by Mr. Parkhurst, 14 by Miss Farnsworth, and 5 by Mr. Vanderlinden.

With this instrument faint comets were photographed for position and at times for physical appearance by Mr. Van Biesbroeck, who recovered Encke's comet and followed it through a rise from the 17th

to the 7th magnitude. Comets Finsler and Wolf were also photographed, the latter being one of the faintest ever observed. Asteroids of magnitude 13.8 and fainter continued to be observed by Messrs. Van Biesbroeck and Struve. Positions were obtained for 42 of these, and 3 new ones were discovered. Exposures made at the places predicted for 40 others failed to show them. Y. O. 21 proved to be (520) Franziska and Y. O. 23 to be (982) Franklina. The astrometric plates totaled 519.

The 12-inch Telescope was used chiefly for daily photographs of the sun, for the visual observation of prominences, and for general educational purposes.

The Bruce Photographic Telescope has been used by Mr. Ross since October 23, 1924. 45 fields were photographed with both the 10-inch and 6¼-inch lenses, with an average exposure of 2 hours. Mr. Ross devised a new procedure for avoiding error in focus due to variations in curvature of the plates as they came from the maker. The thickness of each plate is measured in the darkroom and a micrometer screw attached to the metallic plateholder forces the film into the correct plane. The plates were made for comparison under the blink-comparator, with plates taken by Mr. Barnard from 15 to 20 years earlier. Mr. Ross thus discovered 147 stars having proper motions greater than 0".10 per year. For 57 of these, the proper motion exceeded 0".50, and for 9, 1".00. The largest found was 2".55, the star being of about magnitude 10. The fields already covered by Max Wolf were avoided as far as known. From the data thus obtained, Mr. Ross estimates that there are 2,000 faint stars having an annual proper motion of 0".50.

In the search for proper motions, 44 new variable stars were noted, 20 of them on one plate in a region in Sagittarius rich in variables. The minimum of light is in general below magnitude 15, so that the 40-inch telescope is required for following the variation visually.

The Zeiss U.-V. Doublet was used on 27 nights during the summer of 1924, by Mr. Garrett, for determining the color of planetary nebulae, with and without a color-filter, by the method of exposure ratio. With the objective-prism, Mr. Parkhurst obtained two plates of Comet Finsler, and Mr. Bobrovnikoff secured 13 of Comet Orkisz and 3 of Comet Tempel II.

Miss Douglas made experiments, with the objective-prism over the Tessar lens of the Sky Patrol, in an attempt to secure comparison lines from absorption spectra, but nothing was found equal to neodymium for this purpose.

With the Comet-Seeker, Mr. W. R. Paul, of Chicago, observed on ten clear, and seven partly clear nights, making eleven trips to the Observatory. He swept the entire heavens visible in this latitude.

Plans had been made for observing the solar eclipse of January 24, 1925, by a small expedition to Iron Mountain, Michigan, by Messrs. Ross and Lee, with whom were associated Mr. F. D. Urie of the Elgin Observatory and Director S. A. Barrett of the Milwaukee Public

Museum. The sky was entirely cloudy there. Mr. Parkhurst took the Hartmann surface photometer, suitably adapted for the purpose, to Ithaca, New York, where he successfully observed the intensity of the total light of the corona. Mr. Blakslee used a Universal moving camera at Binghamton, New York, but did not obtain a successful film. Plans had been made to observe the red and infra-red flash spectrum on kryptocyanine plates with the Bruce spectrograph attached to the 40-inch telescope, with the solar spectrograph on the 12-inch telescope, and with a small concave grating on the mounting of the 24-inch reflector. Had the sky been clear, we should have had a much longer time for the observation of the flash spectrum than would have been possible in the track of totality.

Part IV of Volume III of the *Publications of the Yerkes Observatory*, containing Mr. Pettit's paper on the solar prominences and completing the volume, was issued and distributed during the year. Progress was made in the preparation for publication of Mr. Barnard's *Atlas of Selected Regions of the Milky Way*, by Miss Calvert, under the supervision of the director; and in the reduction of Mr. Barnard's observations of the globular clusters by the Misses Calvert and Jorgensen, with the oversight of Mr. Van Biesbroeck.

The Library. 249 bound and 24 unbound books were added to the library, as well as 300 pamphlets. Reprints of many of Mr. Barnard's papers are available for distribution to workers who may wish them.

Visitors to the number of 13,565 were recorded, chiefly on the public Saturday afternoons.

EDWIN B. FROST, *Director.*

PLANET NOTES FOR MARCH.

The *Sun's* path for the month of March will lie in a northeasterly direction from the constellation Aquarius into the constellation Pisces. It will be in a region of the sky in which there are no conspicuous bright stars. Its position on March 1 will be in right ascension $22^{\text{h}} 45^{\text{m}}$; in declination $-7^{\circ} 57'$; on March 31 in right ascension $0^{\text{h}} 35^{\text{m}}$; in declination $+3^{\circ} 47'$. It will cross the equator on March 21, at 3:00 A. M. C. S. T. This event marks the time of the vernal equinox, and is the calendar date for the beginning of spring. The distance between the sun and the earth will be increasing during this month, and at the end it will be practically the average for the year.

The phases of the *Moon* will occur as follows:

Last Quarter	March 11 at 6 A. M.	C. S. T.
New Moon	13 " 10 P. M.	"
First Quarter	20 " 11 P. M.	"
Full Moon	29 " 4 A. M.	"

The moon will be farthest from the earth on March 25, and nearest the earth on March 13.

Mercury will be at a point of greatest elongation east of the sun on March 14. This will be a favorable time to watch for the appearance of this planet in the evening sky. It will be about 7° north of the sun and will set more than an hour



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Perkes Observatory
WILLIAMS BAY, WIS.

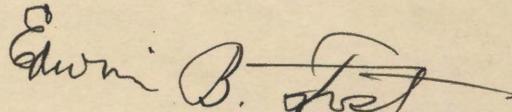
April 17, 1923

My dear Mr. Dickerson:

I have recently heard from Professor George E. Hale, and he concurs heartily with the idea that his historical comments on the early days of the Observatory should be preserved as a matter of record in your office, but that they should not be published. This is in accordance with the letter which I wrote you in December, and I enclose herewith the copy, for your files, of Professor Hale's manuscript.

With the kindest regards,

Very truly yours,


Edwin B. Frost
Director

Mr. J. S. Dickerson, Secretary
University of Chicago, Chicago.

Enc.

EBF λ

*Early History of Perkes
Observatory
E. Hale's Ms.*

Office of the Librarian

Room 503 Adams

The University of Chicago

April 17, 1933

George F. Rife

My dear Mr. Dickerson:

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With the kindest regards,

Very truly yours,



Edwin S. Foster
Director

Mr. J. B. Dickerson, Secretary
University of Chicago, Chicago.

Enc.

Enc. 2

Approved by
The Librarian
April 17, 1933

SCHLOSS LENZBURG
AARGU SWITZERLAND

THE BEGINNINGS OF THE YERKES OBSERVATORY *

I write from the ancient Castle of Lenzburg, surrounded by reminders ~~where every object speaks~~ of the past. ~~Here in the dungeons,~~ where the headman's axe and the instruments of torture still hang on the walls, Abbot Bernhart of Marseilles was imprisoned for months in the eleventh century. A hundred years later the Emperor Frederick Barbarossa held court in the great hall. After another hundred years Rudolph of Hapsburg planned on the ramparts the fortunes of the ill-fated house of ~~Aspasia.~~

Thus I find myself ~~therefore~~ looking backward, and ^{may not be} inclined toward the reminiscent mood which, after all, is wholly out of keeping with the purposes of this twenty fifth anniversary meeting. ~~---an indulgence of infirm grandfathers.~~ If I could offer a more worthy contribution

~~---a better contribution to this anniversary meeting,~~ it would surely be sent, but some of you may really be interested to know how the Yerkes Observatory originated, and others, who know already, will forgive me for telling the tale ~~(which is not for publication)~~ in the intimate form of a personal narrative.

I cannot claim to have begun my astrophysical work with a far-reaching plan. On the contrary, I had one simple, but strong ambition - I must find a way to photograph the solar prominences without an eclipse. When this had ^{accomplished} been ~~done~~ at Kenwood in the autumn and winter of 1891-92, and

* Letter read at the twenty-fifth anniversary meeting of the American Astronomical Society, Yerkes Observatory, Sept. 7, 1922. [This was not intended for publication, but at the request of one of the Trustees of the University, it is given here in slightly revised form.] ^{omit brackets if published}

SCHLOSS LENZBURG
AARGAU SWITZERLAND

* THE BEGINNING OF THE YERKES OBSERVATORY

I write from the ancient Castle of Lenzburg, surrounded
by reminders
of the past. Heretofore
the history of the observatory
has been a story of
struggle and
perseverance. It is
a story of the
early days of
the observatory
and the
work of the
observers.

inclined toward the reminiscent mood which, after all,
wholly out of keeping with the purpose of this twenty fifth Anniversary
meeting, cannot be regarded as fitting. If I could offer
a more worthy contribution
to the celebration of this anniversary meeting, it
would surely be said, for some of you may really be inter-
ested to know how the Yerkes Observatory originated, and
others, who know already, will forgive me for telling the
tale (perhaps a little) in the intimate form of
a personal narrative.

I cannot claim to have begun my astrophysical
work with a far-reaching plan. On the contrary, I had one
simple, but strong ambition - I must find a way to photograph
the solar prominences without an eclipse. When this had
been accomplished
at Kenwood in the autumn and winter of 1891-92, and

* This is a copy of the original
manuscript of the history of the
Yerkes Observatory, written by
Dr. Charles Doolittle Walcott,
and published in the
Yerkes Observatory Bulletin,
Vol. 1, No. 1, 1922.

when it appeared that a promising opportunity for progress lay in the study of the flocculi which I had found and photographed on the face of the sun, ^{I determined} ~~I determined~~ ~~it became clear~~ that I must have a larger telescope - one that would carry powerful spectroscopes and spectroheliographs, and give a large image of the sun suitable for the ^{investigation of the} ~~study of the structure~~ ~~of spots, flocculi, and prominences.~~ ^{It must also collect enough light to serve effectively for the study of stellar spectra.} But how could ^{such a telescope} ~~it~~ be obtained? Appointment to a position in the nascent University of Chicago brought ~~with it~~ no instrumental means, but it did afford the possibility of seeking in the name of the University a really adequate observatory. But to whom could an appeal be made?

I had not successfully answered this question in the summer of 1892, and ~~as I cast my fly for trout from an Adirondack canoe I fear that my mind sometimes wandered from the attractions of the sport to the still greater charms of solar research.~~ ^{and when I went to Rochester} ~~At any rate, when I left the mountains for a week to attend the meeting of the American Association at Rochester,~~ ^{for the Advancement of Science,} the much-desired observatory was dominant in my thoughts. There I met Frost, ^{just returned from study abroad,} ~~who was just losing a German accent,~~ Eliakim Moore, coming to Chicago from Yale, and other close friends of later years. And there I found the clue to my problem.

One hot evening we were sitting in front of the hotel, trying to keep cool. I was in a receptive mood, and my ears readily caught a tale that Alvan G. Clark, ^{the well-known maker of telescopes,}

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was telling to a group about him. ^{He said} ~~It seems~~ that in 1889, when the Lick Observatory was beginning to create its world-wide reputation, the people of Southern California, then in the ^{midst} ~~uprise~~ of a land boom, felt that their fair territory might advantageously profit by the example of James Lick. So a worthy citizen offered to a local educational institution ^{land} then valued at fifty thousand dollars. This was ample warrant, in the judgment of the hour, for ordering a pair of 40 inch glass disks, which in the course of three years had been successfully made by Mantois in Paris. But unfortunately the land-bubble had meanwhile burst, ^{no money was available,} ~~the gift was worthless,~~ and Mantois was vainly seeking payment of the sixteen thousand dollars at which the disks were valued. Here was a great opportunity, said Clark, for someone to get a large telescope without loss of time. ^{The glass was in his shop, it} ~~He had tested the glass~~ and found it perfect, and nothing would please him more than to figure a 40 inch objective.

I may add parenthetically that the 40 inch telescope was to have been erected on Mount Wilson. ^{our The} ~~subsequent~~ occupation of this site ^{by the Carnegie Institution of Washington,} ~~after~~ Professor Hussey's telescopic tests had shown it to be more favorable than any other place he ^{had} visited, was a pure coincidence.

It goes without saying that Clark's story gave me food for thought. I ~~returned to the Adirondacks,~~ ~~packed my fishing tackle,~~ and hastened to Chicago ^{where,} ~~after~~ consulting my father, whose interest in ^{the} ~~my~~ project was very keen, I visited several men who might conceivably be willing to provide for the telescope. But no one had the

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money to spare. A few days later I made another fruitless round of visits in the city. At noon, somewhat discouraged, I called at the Corn Exchange Bank to see Mr. Charles Hutchinson, then, as now, the enthusiastic friend and supporter of every such effort. After explaining my object, I asked for suggestions. "Why don't you try Mr. Yerkes?", he replied. "He has talked of the possibility of making some gift to the University and might be attracted by this scheme." So I went ~~at once~~ ^{that afternoon} to President Harper, then at the threshold of his tremendous task of building the University of Chicago. After a few questions he heartily approved of the attempt, asked me to write out a statement of the plan, and sent it to Mr. Yerkes. A reply came back asking us to call on him. We did so, and before the interview was over Mr. Yerkes asked us to telegraph for Clark, with whom he made a contract for the 40 inch objective. I remember with pleasure Dr. Harper's enthusiasm as we left the office. "I'd like to go ~~on~~ ^{to the} top of a hill and ~~yell~~ ^{cheer}!" he cried. And in spite of the financial limitations of later years, he always remained a firm friend of the Yerkes Observatory.

This was early in September, 1892. The University, initiated chiefly as an undergraduate school, was beginning to feel the influence of Harper's large and scholarly ambitions. The doors of its single building were about to open to those who boldly negotiated the generous mud of the "campus", but its problems were many and various. Where could be found the immense sums needed for buildings and endowment? Could ^{a sufficient number of} leading scholars and investigators be induced to join its faculty, assuming the financial

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needs overcome? Would advanced students actually prefer Chicago to the great universities of the east? To Harper's optimism such questions brought ^{only} ~~but~~ one answer, but the educational and scientific world, though aware of the remarkable development of the Graduate School, knows little of the difficulties it cost him. As one who had an opportunity to observe at close range his incessant struggles, up to the day of his death, against both internal and external obstacles, I wish to pay a tribute of respect to the memory of a great and inspiring leader.

It was natural that the embryo Observatory, consisting of a 40 inch objective in the process of figuring, should share in these difficulties. Indeed, as I look back on President Harper's strenuous task, I realize that nothing short of his overwhelming optimism could have induced him to favor an undertaking which could play but little part in his educational scheme. With limitless plans for a great university, but without the lecture halls, dormitories, libraries, laboratories, and museums needed for the thousands of students that peopled his dreams; without the large faculty required for instruction and research; and without the many millions essential to meet current bills, it is no wonder, ~~however~~, that he could not see, except in Mr. Yerkes, any source of funds for a large and expensive Observatory, situated far from the University campus and devoted almost solely to research. Mr. Yerkes, on the contrary, not appreciating the general problem, thought that Mr. Rockefeller's millions should immediately build,

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equip, and maintain the Observatory he had initiated. After some persuasion, ~~however,~~ ^{nevertheless} he ordered the 40-inch ~~telescope~~ ^{telescope} mounting from Warner & Swasey and a stellar spectrograph from Brashear, but there he stopped and refused absolutely to do more.

Many vigorous efforts failed to break the deadlock, and I decided to go abroad for some months, partly for study ~~at the University of Berlin~~ and partly for an attempt to photograph the corona without an eclipse from some high mountain. Before leaving I requested the then University architect, Henry Ives Cobb, who was ~~in close touch with~~ ^{in close touch with} ~~close to~~ Mr. Yerkes, to let me know if he saw the least hopeful sign. While in Berlin, in December 1893, I received a letter from Cobb saying he thought that an interesting design might make some appeal. We had entertained not even a distant hope of securing a complete observatory building from Mr. Yerkes: a tower and dome for the 40 inch were all he would even talk of. But I determined to make a bold stroke for an adequate building, and accordingly prepared a comprehensive plan. Of this I heard nothing until the following spring, when one fine day in Florence I received from Cobb a large roll of blue prints, showing my plan worked out as it now appears in brick and mortar. My delight was so great that I could hardly leave the blue-prints behind me, even when visiting picture galleries!

But our troubles were not over, as Mr. Yerkes was not yet ready to proceed with the work. After attempting - of course without success - to photograph the corona

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with a special spectroheliograph from the summit of Mount Etna in July 1894, I returned to Chicago, only to find that Mr. Yerkes was unwilling to build until the University would guarantee to maintain the Observatory on an adequate scale. We had been overwhelmed by enterprising real estate dealers, ^{and others} with offers of tracts of land in various parts of Illinois and Wisconsin, and even the site finally selected, ^{presented by Mr. John Johnston, involved considerable supplemental expenses,} ~~had to be freed from encumbrance.~~ I called for aid ~~from the~~ ^{from} three good friends of the Observatory, ^{*} who promptly responded. But the perplexities of the University, hard pressed for funds ^{at} ~~in~~ this period of serious financial depression, were not so easily overcome. Finally I guaranteed that the operating expenses would not exceed a very small sum during the first year, which meant that I must raise in addition money to pay salaries and to meet other expenses. At last the work of construction was begun in 1895.

I wish your time and endurance would permit me to dwell upon some of the incidents of this period: the active interest and enthusiasm of Burnham, who began observing at the earliest possible moment and served several years without any financial remuneration; the kindly patience of Barnard, called from Mount Hamilton too soon, and forced to content himself for many weary months without a telescope; the memorable expedition with Barrett to fix the orientation of the 40-inch pier; the faithful work of Ellerman in our oft-repeated attempts to detect the corona with a bolometer while the Observatory was slowly rising near us; the arrival of the object-
* Martin A. Ryerson, Edward E. Ayer, and William E. Hale.

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* Letter A. R. Rogers, March 5, Apr., and William S. Miller

glass and the first tests of the telescope - made on hot nights, before the motors were ready, when we had to rotate the dome by hand, in scant attire; and finally, after we had seemingly exhausted all the delays in the calendar, the heart-breaking fall of the rising-floor, - most fortunately without personal injury to anyone - just as we had begun observational work. But the summer passed, the rising-floor was promptly ^{and generously} replaced by Warner & Swasey, and the dedication exercises (~~beyond which I must not extend this lengthy narrative~~) served as the occasion for a large meeting of astronomers, subsequently repeated annually ^{many} at other observatories under the auspices of the American Astronomical Society.

~~A perverse fate, which seemed to require me to devote my efforts outside the Observatory toward the unpopular task of promoting the general interests of science and research, rather than to the more attractive possibility of following the progress of my favorite subject at your meetings, has deprived me in recent years of the advantages of active participation in the work of the Astronomical Society. Once more I am kept away, on an occasion that interests me most keenly, but I certainly hope to have the pleasure of greeting you at Mount Wilson next summer. It is a satisfaction to think that you have been welcomed at Lake Geneva by some of my former associates, and especially by my old friend and colleague Frost, who has directed the Yerkes Observatory during almost all of its organized existence. He has also set us a superb example,~~

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Of this first meeting, and of the later developments of the Observatory I must not speak, though it would be a pleasant task to do so. I should like to refer to the atmospheric conditions, which have proved to be exceptionally favorable for solar work, and to review the long series of important researches, stellar, solar, and planetary, made with the 40-inch telescope. This splendid instrument, so admirably mounted and easily controlled, has been constantly directed toward the heavens, despite temperatures sometimes falling below -20° Fahrenheit in the open dome, for a full quarter of a century. The rich harvest includes numerous and important results in stellar spectroscopy, especially those relating to the B stars; micrometric measures of close binaries, crowded globular clusters, barely visible satellites like Jupiter's fifth, and other difficult objects; photographic parallax determinations, initiating a new and successful American school of parallax measurers; stellar photometric observations; solar investigations of various kinds; excellent photographs of the moon, planets, and nebulae; and many other observations. I should also like to mention the work done with the other telescopes, especially the revelation by the Bruce telescope of the vast network of dark nebulae that crowd the Milky Way. The initiation of new instruments, in which Miss Bruce, the Rumford and Draper Funds, Miss Snow, and particularly Dr. George Isham gave so

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much help, and the parts played by the physical laboratory and instrument shop, would also be congenial themes. But I have already described some of this work in "The Study of Stellar Evolution", and my old friend and colleague Frost, who has so ably directed the Observatory during almost all of its organized existence, will doubtless survey for you its whole range of operations. His skillful management of the Astrophysical Journal, and his wise policy in drawing to the Observatory astronomers from all parts of the world for study and research, deserve more than passing mention. Since the partial loss of his sight, which I earnestly hope may soon be restored, he has set a superb example of the finest qualities of a true philosopher. I join you in hearty congratulations and best wishes to him and to all the staff of the Yerkes Observatory, and in cordial hopes for the ever increasing success of your own researches and the prosperity of the American Astronomical Society. It has splendidly accomplished its purpose of advancing astronomy both at home and abroad, and it deserves every advantage that the future may bring.

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George F. Hale

The University of Chicago

The Board of Trustees

BOARD OF TRUSTEES

October 11, 1928

Mrs. Jackson
CVV

October 1, 1928

OFFICE OF THE SECRETARY OF THE BOARD
ELLIS AVENUE AND 54TH STREET

Contributions & Grants:

From Mrs. Edward E. Ayer, in memory of her husband,
Edward Everett Ayer, a five-inch telescope for use
at Yerkes Observatory. The telescope has been in
use at the Observatory for some years as a loan from
Mrs. Ayer, and is valued by Dr. Frost at about \$600.

Mr. Frost
Family
Dear Sir
... and enclosing the receipt copies of correspondence relating to
Mrs. Edward E. Ayer's gift of the five-inch telescope to Yerkes Observatory.
No doubt you will want to include this gift in your material to be presented
at the next meeting of the Board of Trustees.

Yours very truly,

John H. Murphy

HS

Copy to Mr. Stearns.

Mr. Johnson
G-4

BOARD OF TRUSTEES

October 11, 1928

The Board, Lake Geneva
September 27, 1928

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Edward E. Ayer - \$600

Yerkes Observatory, Oct. 11, 1928

The University of Chicago

The Board of Trustees

October 1, 1928.

Act Board

OFFICE OF THE SECRETARY OF THE BOARD
ELLIS AVENUE AND FIFTY-EIGHTH STREET

October One
1 9 2 8

Mr. Frederic Woodward,
Faculty Exchange.

Dear Mr. Woodward:

I am enclosing herewith copies of correspondence relating to Mrs. Edward E. Ayer's gift of the five-inch telescope to Yerkes Observatory. No doubt you will want to include this gift in your material to be presented at the next meeting of the Board of Trustees.

Yours very truly,

Johns. Mearns

HS

Copy to Mr. Steere.

Cordially yours,

L. R. Steere

Dr. E. E. Frost
Yerkes Observatory
William Bay, Wisconsin

BYB
CC Mr. Woodward
CC Mr. Board

Oct 1928

The University of Chicago

The Board of Trustees

October 1, 1928

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5112 AVENUE AND FIFTY-EIGHT STREET

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Yours very truly,

Frederic Woodard

FS

Copy to Mr. Steere.

The University of Chicago

October One
1 9 2 8

My dear Dr. Frost:

This will acknowledge receipt with your letter of September 28 of Mrs. Edward B. Ayer's formal statement of gift to the University for Yerkes Observatory of the five-inch Brashear telescope, mounting and accessories. It must be a source of real pleasure to you to have the University receive this gift after so many years' use of the instrument by the Observatory.

The matter will be presented to the Board of Trustees at its next meeting and, as is the custom in such cases, formal acknowledgment will be sent to Mrs. Ayer by the Secretary of the Board.

Mrs. Ayer's original statement of gift is to be placed in our safety deposit box.

Cordially yours,

L. R. Steere

Dr. E. B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

EVB:HWB
CC Mr. Woodward
CC Mr. Moulds

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is to be placed in our safety deposit box.

Cordially yours,

L. R. Steere

Dr. E. B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

EVB:WVB
CC Mr. Woodward
CC Mr. Moulton

October 1, 1926.

Dr. E. B. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

This will acknowledge the receipt of your letter of September 29 enclosing copy of letter which you received from Mrs. Edward E. Ayer, of 2 Banks Street, Chicago, in which she gives to the University the five-inch telescope which has been in use during the past years at Yerkes Observatory.

The certified copy of the letter of gift will be held on file and Mrs. Ayer's action will be reported to the Board of Trustees at its next meeting, when in accordance with the usual custom, formal thanks will be sent to her on behalf of the Board.

Yours very truly,

Secretary.

H3

Copy to Mr. Steere.
" " Mr. Woodward.

October 1, 1928.

Dr. E. B. Frost,
Lick Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

This will acknowledge the receipt of your letter of September 28 enclosing copy of letter which you received from Mrs. Edward E. Ayer, of 2 Bank Street, Chicago, in which she gives to the University the five-inch telescope which has been in use during the past years at Lick Observatory. The certified copy of the letter of gift will be held on file and Mrs. Ayer's action will be reported to the Board of Trustees at its next meeting, when in accordance with the usual custom, formal thanks will be sent to her on behalf of the Board.

Yours very truly,

Secretary.

HS

Copy to Mr. Stearns.
" " Mr. Woodward.

ROOM
TELE

October 1, 1926.

Mr. Steere:

I am enclosing herewith copy of Dr. Frost's letter to me dated September 29 transmitting copy of Mrs. Edward E. Ayer's letter of gift of the five-inch telescope, and also copy of my reply to Dr. Frost.

Copies of this correspondence are also being sent to Mr. Woodward for presentation to the Board of Trustees at the October meeting.

HS

Copy to Mr. Woodward.

October 1, 1928.

Mr. Stearns:

I am enclosing herewith copy of Dr. Frost's letter to me dated
September 29 transmitting copy of Mrs. Edward E. Ayer's letter of gift of
the five-inch telescope, and also copy of my reply to Dr. Frost.
Copies of this correspondence are also being sent to Mr. Woodward
for presentation to the Board of Trustees at the October meeting.

HS

Copy to Mr. Woodward.

The University of Chicago

Office of the Vice-President and Business Manager

ROOM 1300, 189 W. MADISON ST.
TELEPHONE FRANKLIN 1034

October One
1 9 2 8

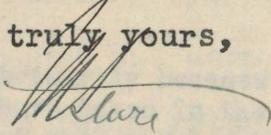
GIFT OF TELESCOPE
BY MRS. EDWARD E. AYER

Dear Mr. Woodward:

I enclose a copy of a letter of September 28 and enclosure from Dr. Frost, together with copy of my reply. The original statement by Mrs. Ayer has been deposited in our safety deposit box.

I assume you will wish to report this to the Board at the October meeting.

Very truly yours,


L. R. Steere

Mr. Frederic Woodward
The University of Chicago

EVB - Enclosure
CC Mr. Moulds

The University of Chicago

Office of the Vice-President and Business Manager

FROM 1200 125 W. MADISON ST.
CHICAGO, ILLINOIS 60607

October One
1938

LIST OF TELECOPIES
BY MRS. EDWARD E. AYER

Dear Mr. Woodward:

I enclose a copy of a letter of September 28 and enclosure from Dr. Frost together with copy of my reply. The original statement by Mrs. Ayer has been deposited in our safety deposit box.

I assume you will wish to report this to the Board at the October meeting.

Very truly yours,

J. B. Stearns

Mr. Frederic Woodward
The University of Chicago

EWB - Enclosure
CC Mr. Novits

COPY.

September 29, 1928.

Mr. John M. Moulds
Secretary of the Board of Trustees
University of Chicago
Chicago, Illinois

Dear Mr. Moulds:-

I enclose herewith an attested copy of a letter which I have just received from Mrs. Edward E. Ayer of 2 Banks Street, Chicago. At my request, Mrs. Ayer has made the gift to the University for use at the Yerkes Observatory of the 5" Brashear refractor which she has loaned to us for the past dozen years and which we have found very useful. I should conservatively place the value of the telescope and eye pieces at \$600.00.

I have sent the original letter of the gift to Mr. Steere. I have added the attested copy of her letter of gift because there may be a possibility that some other disposition of the telescope may have been contemplated in Mrs. Ayer's will.

We are very glad to receive this gift primarily because of the friendly interest which both Mr. and Mrs. Ayers have taken in the Observatory since its first beginning, and secondly because of the useful service which it has given us in the past and will continue to give us in the future.

I presume that a formal acknowledgement will be made by you in behalf of the Board at its next meeting.

Very truly yours,

(Signed) Edwin B. Frost

EBF:GE

September 29, 1928.

COPY

Mr. John M. Morinda
Secretary of the Board of Trustees
University of Chicago
Chicago, Illinois

Dear Mr. Morinda:-

I enclose herewith an attested copy of a letter which I have just received from Mrs. Edward E. Ayer of 2 Banks Street, Chicago. At my request, Mrs. Ayer has made the gift to the University for use at the Yerkes Observatory of the 5" Brashear reflector which she has loaned to us for the past dozen years and which we have found very useful. I should conservatively place the value of the telescope and eye pieces at \$800.00.

I have sent the original letter of the gift to Mr. Stearns. I have added the attested copy of her letter of gift because there may be a possibility that some other disposition of the telescope may have been contemplated in Mrs. Ayer's will.

We are very glad to receive this gift primarily because of the friendly interest which both Mr. and Mrs. Ayer have taken in the Observatory since its first beginning, and secondly because of the useful service which it has given us in the past and will continue to give us in the future.

I presume that a formal acknowledgment will be made by you in behalf of the Board at its next meeting.

Very truly yours,

(Signed) Edwin B. Frost

EBF:GE

The University of Chicago

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

September 28, 1928

Mr. Lloyd R. Steere
189 West Madison Street
Chicago, Illinois

My dear Mr. Steere:

I enclose herewith a formal statement from Mrs. Edward E. Ayer in which she presents to the University of Chicago, for the Yerkes Observatory, a five inch Brashear refracting telescope with accessory eye pieces and mounted on a tripod. This telescope has been loaned to the Observatory by Mrs. Ayer for a dozen or more years and I am very much pleased that she has presented it to us. Its present estimated value is approximately \$600.

Since some other disposition of this telescope may have been contemplated in the ultimate settlement of her estate, I would suggest that this original be preserved with that in view.

I presume that you will make a formal acknowledgment of this gift. Her address is: 2 Banks Street, Chicago.

I am also notifying Mr. Moulds of this gift.

Very truly yours,

(Signed) Edwin B. Frost, Director

EBF:GE

The University of Chicago

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

September 28, 1928

Mr. Lloyd R. Steere
189 West Madison Street
Chicago, Illinois

My dear Mr. Steere:

I enclose herewith a formal statement from Mrs. Edward H. Ayer in which she presents to the University of Chicago, for the Yerkes Observatory, a five inch Brashear refracting telescope with accessory eye pieces and mounted on a tripod. This telescope has been loaned to the Observatory by Mrs. Ayer for a dozen or more years and I am very much pleased that she has presented it to us. Its present estimated value is approximately \$600.

Since some other disposition of this telescope may have been contemplated in the ultimate settlement of her estate, I would suggest that this original be preserved with that in view.

I presume that you will make a formal acknowledgment of this gift. Her address is: 2 Banks Street, Chicago. I am also notifying Mr. Moulde of this gift.

Very truly yours,

(Signed) Edwin B. Frost, Director

EBF:GE

C O P Y

DUPLICATE

The Oaks, Lake Geneva

September 27th, 1928

Mrs. Edward E. Ayer is happy to present in honor of her late husband - Edward Everett Ayer - the five-inch telescope which she owns - (now there) - to the Yerkes Observatory of the University of Chicago.

Williams Bay, Wis.

Walworth County

September 28,

I hereby certify that the above is a true and correct copy of the original in the handwriting of Mrs. Edward E. Ayer

(Signed) Storrs B. Barrett
Notary Public

My commission expires Oct. 11, 1931.

(SEAL)

COPY

DUPLICATE

The Oaks, Lake Geneva

September 27th, 1928

Yerkes Observatory of the University of Chicago.
Everett Ayer - the five-inch telescope which she owns - (now there) - to the
Mrs. Edward E. Ayer is happy to present in honor of her late husband - Edward

September 28,
Walworth County
Williams Bay, Wis.

I hereby certify that the above is a true and correct copy of the original
in the handwriting of Mrs. Edward E. Ayer.

(Signed) Stuart B. Barrett
Notary Public

My commission expires Oct. 11, 1931.

(SEAL)

The University of Chicago

The Board of Trustees

OFFICE OF THE SECRETARY OF THE BOARD
ELLIS AVENUE AND FIFTY-EIGHTH STREET

Board
G 22

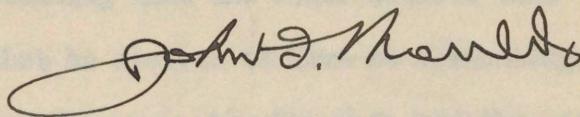
July 24, 1928.

Mr. F. C. Woodward,
Faculty Exchange.

Dear Mr. Woodward:

Enclosed is a copy of a letter received from
Dr. Frost together with a copy of my reply. I assume that
you will wish to report this gift at the next meeting of the
Board of Trustees as from an anonymous donor.

Yours very truly,



Secretary.

JFM:ED

Enclosures - 2.

The University of Chicago
The Board of Trustees

SECRETARY OF THE BOARD
OF TRUSTEES

100
100

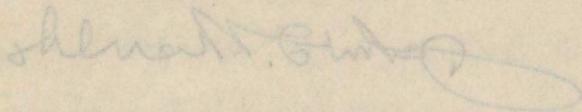
July 24, 1928.

Mr. F. W. Woodward,
Faculty Exchange.

Dear Mr. Woodward:

Inclosed is a copy of a letter received from
Mr. Grant together with a copy of my reply. I assume that
you will wish to report this gift at the next meeting of the
Board of Trustees as from an anonymous donor.

Yours very truly,



Secretary.

TH:ED

Enclosures - 2.

July 24, 1928.

Dr. Edwin B. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

This will acknowledge receipt of your letter of July 23 enclosing check for \$100 representing the contribution from an anonymous donor to be expended at your discretion as Director of the Observatory. In accordance with your request this amount will be credited to the "Astranon Fund" with the expectation that additional amounts will later be received from the same donor for this fund.

It is my understanding that the donor desires this gift to remain anonymous and that he desires to have no acknowledgment sent to him. His desires will, of course, be observed, and the gift will be reported to the Board of Trustees as from an anonymous donor.

Yours very truly,

JOHN F. MOULDS

Secretary.

JFM:ED

C.C. to Mr. Woodward.

July 24, 1928.

Dr. Edwin B. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

This will acknowledge receipt of your letter of
July 23 enclosing check for \$100 representing the contribution
from an anonymous donor to be expended at your discretion
as Director of the Observatory. In accordance with your request
this amount will be credited to the "Astronomical Fund" with the
expectation that additional amounts will later be received from
the same donor for this fund.

It is my understanding that the donor desires this
gift to remain anonymous and that he desires to have no acknowledgment
sent to him. His desires will, of course, be observed, and the gift
will be reported to the Board of Trustees as from an anonymous
donor.

Yours very truly,

JOHN F. MOULDS

Secretary.

THW:ED
C.C. to Mr. Woodward.

C
O
P
Y

July 23, 1928.

Mr. John F. Moulds, Secretary
58th and Ellis Avenue
Chicago, Illinois

My dear Mr. Moulds:

I enclose herewith a check for \$100 which I have just received from a friend of the Observatory. It is to be expended at my disgression as Director and the donor expects to make additional drafts within the present fiscal year to a total of about \$1,000. He desires to remain anonymous and at his request no acknowledgment is to be made. I would ask that this be called the Astranon fund. This would seem to be the correct way for handling this, but if you prefer, I could keep such fund in the First National Bank at Lake Geneva.

For your own information I give confidentially the name of the donor, viz. John C. Deagan. He has a business in Chicago, the manufacture of very precise accoustical instruments and bells (J. C. Deagan, Inc, 1770 Berteau Ave, Chicago, Ill.), but he lives chiefly in California when he is not traveling for pleasure. Mr. Deagan called upon me at the Observatory on Saturday last and offered this gift to the University. I wish that he had felt disposed to giving us the whole amount at this time, but he preferred to send the balance at intervals.

Yours very truly,

(Signed) Edwin B. Frost

Edwin B. Frost, Director

EBF:GE

COPY

July 22, 1928.

Mr. John F. Woods, Secretary
424 and 426
Chicago, Illinois

My dear Mr. Woods:

I enclose herewith a check for \$100 which I have just received from
a friend of the Observatory. It is to be expended at my discretion as
Director and the donor expects to make additional gifts within the
present fiscal year to a total of about \$1,000. He desires to remain
anonymous and at his request no acknowledgment is to be made. I would
ask that this be called the Astor fund. This would seem to be the
correct way for handling this, but if you prefer, I could keep such fund
in the First National Bank at Lake Geneva.

Mr. John C. Beagan. He has a business in Chicago, the manufacture of very
precise astronomical instruments and sells (J. C. Beagan, Inc., 1770 Berteau
Ave., Chicago, Ill.), but he lives chiefly in California where he is not
traveling for pleasure. Mr. Beagan called upon me at the Observatory on
Saturday last and offered this gift to the University. I wish that he had
felt disposed to give us the whole amount at this time, but he preferred
to send the balance at intervals.

Yours very truly,

(Signed) Edwin B. Frost

Edwin B. Frost, Director

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

922

April 10th 1928.

President Max Mason,
University of Chicago,
Chicago, Ill.

Dear Mr. President:

Thank you for your letter of April 7th.

From private advices which I have from Schenectady I believe that the General Electric Company is making real progress toward the production of quartz discs of considerable size. The matter is a little delicate, I believe, in that they are having better success by a method they have developed which is superior to that suggested by Elihu Thompson. Since he is one of the founders of their industry much consideration has to be given to his view. However, I have written direct to Schenectady for estimates. Hale and I have often discussed this quartz question and we are in regular correspondence on this and other subjects.

With thanks for your continued interest and assistance, I am

Very truly yours,

Edwin B. Frost

EBF.M

EDWIN B. FROST.

The University of Chicago

Verkes Observatory
WILLIAMS BAY, WIS.

April 5th 1928.

922

President Max Mason,
University of Chicago,
Chicago, Ill.

Dear Mr. President:

In order to meet the essential requirements of preparedness I have thought it best to make a model in clay to indicate how an additional dome, about sixty feet in diameter, could be attached to our building for our proposed quartz reflector. I had previously entertained the idea that the dome for a reflector would be placed in the northwest portion of our grounds some six or eight hundred feet away from the present building and a thousand feet or more distant from our power house. One of my friends, who is an architect in Chicago, had emphasized to me the great advantage of attaching the new dome to the present building and it was his impression that the architectural effect could be improved rather than injured by such an addition. It is obvious that there would be great economy in operation as well as much greater convenience for the observers as compared with working in a separate building at a considerable distance, which might be snow bound during five months in the year. Professor

The University of Chicago

Physics Department
WILLIAMS HALL, WIS.

April 25th 1928

President Max Mason,
University of Chicago,
Chicago, Ill.

Dear Mr. President:

In order to meet the essential requirements of preparedness I have thought it best to make a model in clay to indicate how an additional dome, about sixty feet in diameter, could be attached to our building for our proposed quartz reflector. I had previously entertained the idea that the dome for a reflector would be placed in the northwest portion of our grounds some six or eight hundred feet away from the present building and a thousand feet or more distant from our power house. One of my friends, who is an architect in Chicago, had emphasized to me the great advantage of attaching the new dome to the present building and it was his impression that the architectural effect could be improved rather than injured by such an addition. It is obvious that there would be great economy in operation as well as much greater convenience for the observers as compared with working in a separate building at a considerable distance, which might be snow bound during five months in the year. Professor

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

President Max Mason

April 5th 1928.

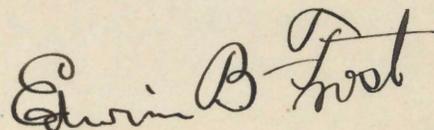
-2-

Van Biesbroeck kindly made a rough model in clay and we experimented with the distance at which the new dome should be attached at the east end of the present building. I enclose for your use two prints, one showing the model of the building as it is and the other of the model as it would be with the sixty foot dome added on the east end. Everyone who has seen it, including the architect, regarded it as improving the appearance of the present building.

I am also making preliminary inquiries of some of the optical concerns regarding the possibility of supplying a disc of 60" or 72" diameter in quartz or pyrex glass and I presume that I shall have some interesting data available in the near future as to possibilities and costs.

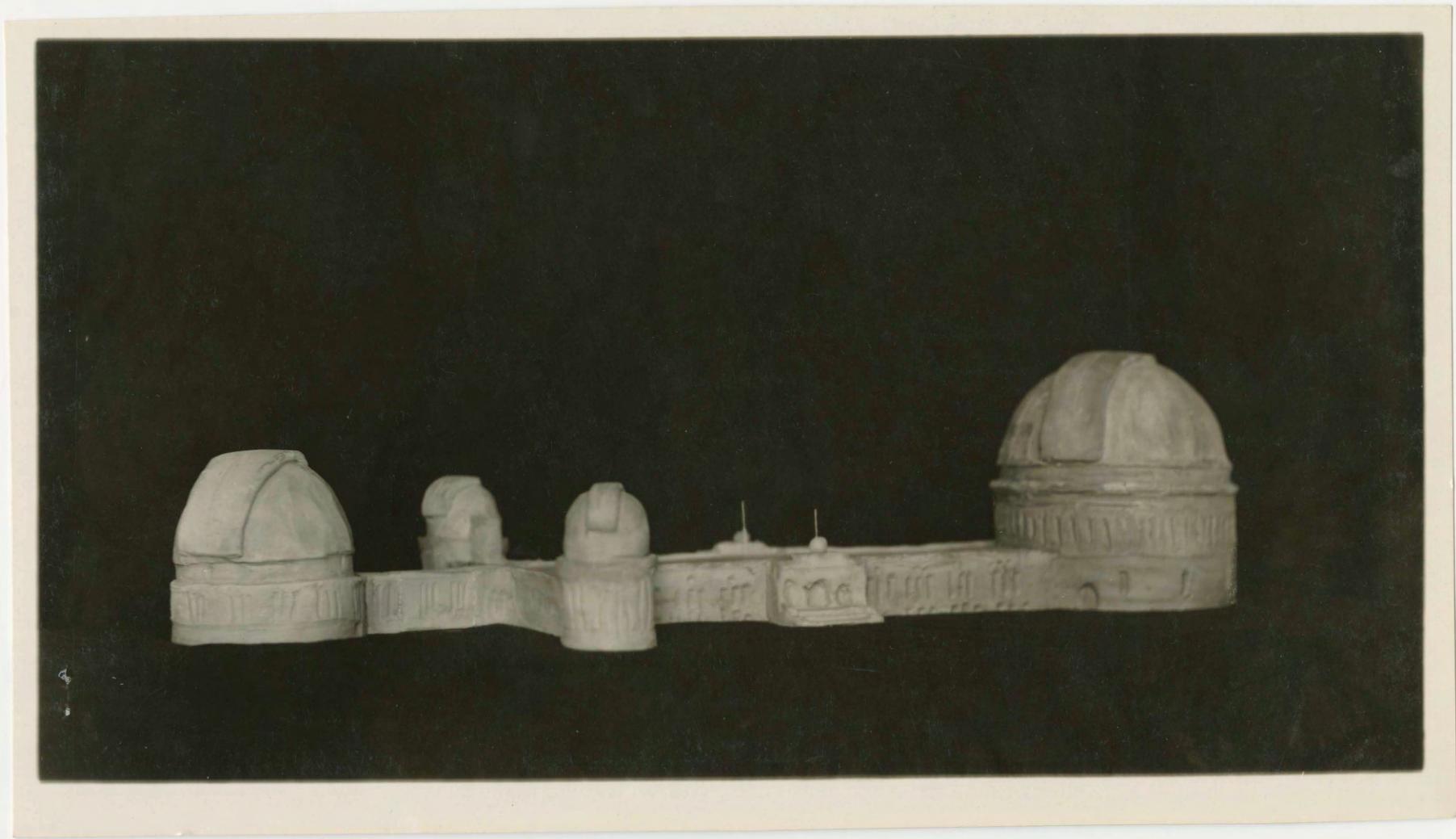
Thanking you for your interest and assistance in this matter, I am

Very truly yours,

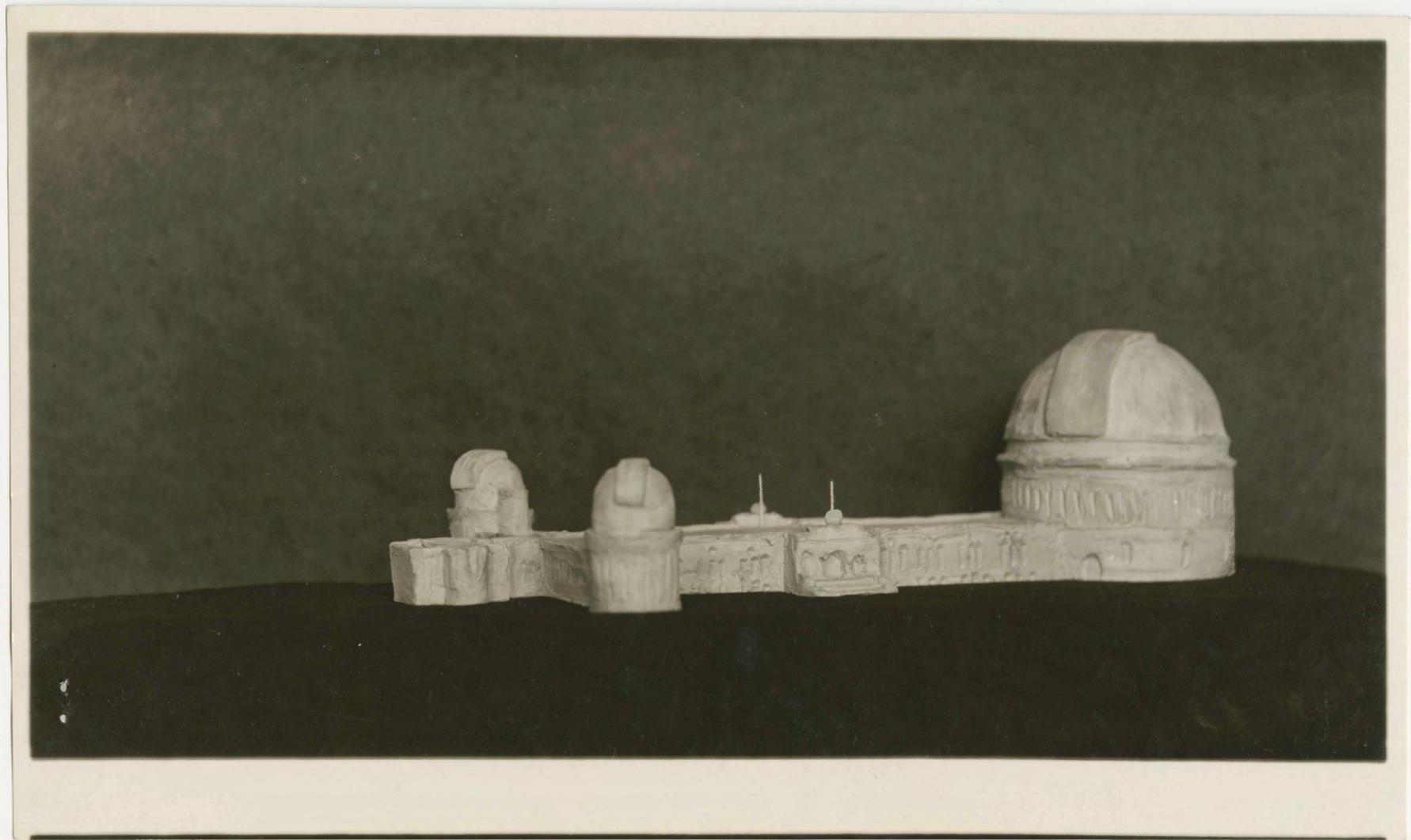


Edwin B. Frost.

EBF.M



The Yerkes Observatory
from a rough model
showing the appearance
of the sixty foot dome
for a large reflector
attached at the east
end of the building.



The Yerkes Observatory
from a rough model
showing its present
appearance.

March 5, 1928.

My dear President Mason:

In completing the accessories for the twelve-inch twin telescope which is being carried on under the appropriation from the Rosenwald Fund, I would ask that formal authorization for the third \$5,000. be made at this time. The reconstruction of the telescope has not been completed by the maker in Pittsburgh, but we are now beginning the design of the accessories, and it appears that with another \$5,000. we can complete the work in an appropriate manner. This last \$5,000. need not be available before the new fiscal year beginning July 1st, but we should be assured of it so that we can make our designs accordingly.

Thanking you for early action, if possible, upon this request, I am

Very sincerely yours,
James B. Frost

President Max Mason,
Harper Library.

March 5, 1928

My dear President Mason:

In completing the accessories for the twelve-inch twin telescope which is being carried on under the appropriation from the Rosenwald Fund, I would ask that formal authorization for the third \$5,000 be made at this time. The reconstruction of the telescope has not been completed by the maker in Pittsburgh, but we are now beginning the design of the accessories, and it appears that with another \$5,000 we can complete the work in an appropriate manner. This last \$5,000 need not be available before the new fiscal year beginning July 1st, but we should be assured of it so that we can make our designs accordingly.

Thanking you for early action, if possible, upon

this request, I am

Very respectfully yours,
Robert S. Stebbins

President Max Mason,

Harvard University.

March 30, 1928

922

Dear Professor Frost:

We shall recommend at the April meeting of the trustees, appropriation of the third \$5,000 for the completion of the accessories for the twelve-inch twin telescope. I believe that you may go ahead with arrangements safely with the thought that this \$5,000 will be available in the next fiscal year as required.

Sincerely yours,

Max Mason

President

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay
Wisconsin

Q. 2. 5

March 30, 1928

Dear Professor Frost:

We shall recommend at the April meeting of the trustees, appropriation of the third \$25,000 for the completion of the accessories for the twelve-inch twin telescope. I believe that you may go ahead with arrangements safely with the thought that this \$25,000 will be available in the next fiscal year as required.

Sincerely yours,

Max Mason

President

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay
Massachusetts

C
O
P
Y

January 18, 1928

Edwin B. Frost
Feb-9

Mr. John F. Moulds
The University of Chicago
58th and Ellis
Chicago, Illinois

My dear Mr. Moulds:

Henry H. Porter of Chicago, whose summer home has been at Lake Geneva since his boyhood, has recently presented to the Observatory (which is to say the University) two very beautiful specimens of his handiwork, which he has constructed, in accordance with specifications, which we furnished to him in advance, at his request. These are (1) The Porter Astrogon, which is a sort of armillary sphere, by which the transformations from one system of spherical coordinates to another can readily be made, without computation, by direct reading of the circles. This was completed early in 1927.

(2) A celestial globe made of thick brass turned to a precision of perhaps $2/1000$ of an inch, and provided with very accurate graduations. By the aid of this, many computations may be avoided, and distances and angles be directly read from the globe.

I enclose a photograph of the globe, which has a diameter of 9.50 inches.

I estimate that the astrogon could not have been made to order for less than \$1,000, while the globe of this precision made to order would cost not less than \$1,500.

I am arranging for some silver plates duly inscribed to be attached to the bases of the two instruments.

I have thought that perhaps the trustees might like to send Mr. Porter some words of appreciation of these gifts. He is now at work on a chronograph for use in one of our domes. Like his brother-in-law, the late Dr. George S. Isham, he likes to undertake tasks of this sort for the Observatory, and visits us frequently.

May I here express my thanks for the courtesies shown me at the recent faculty dinner and the provision made for my comfort in a University room at the Quadrangle Club.

Very truly yours,

(Signed) Edwin B. Frost.

EBF:BH

January 18, 1937

Mr. John F. Phillips
The University of Chicago
508 East 57th St.
Chicago, Illinois

Dear Mr. Phillips:

Very many thanks for the letter of Chicago, which number have been sent to me. I have since the receipt, has recently presented to the University (which is to say the University) the very beautiful specimen of the manuscript which has been contained in the envelope. The specimen is (1) the former letter, which is a copy of the original copy, by which the manuscript was first written of original conditions as another copy, which is a copy of the original copy, by direct reading of the original. This was done early in 1937.

(2) A specimen of the kind of which I have turned to a specimen of the kind of an inch, and provided with very accurate measurements. By the way of this, many computations may be made, and the results may be directly read from the table.

I enclose a copy of the table, which has a diameter of 9.50 inches.

I estimate that the weight would not have been made in order for the kind of this specimen and in order to avoid any loss of \$1,500.

I am extending for some time after being instructed to be attended to the case of the two instruments.

I have thought that perhaps the trustees might like to see the original and a copy of the original of the original. This is very on a photograph for use in one of our books. This is a photograph of the late Dr. George B. Johnson, as likely under the name of this sort for the University, and visits in the University.

My I have expressed my thanks for the certificate shown me at the recent meeting dinner and the provision made for my comfort in a University of the University.

Very truly yours,

(Signed) Edwin B. Frost

EWBFM

C
O
P
Y

January 19, 1928.

Dr. E. B. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

I am delighted to learn from your letter of January 18 about the two gifts from Mr. Henry H. Porter. It seems to me they are a very fine addition to your equipment and a splendid contribution by Mr. Porter. I will show your letter and the photograph to President Mason, with the expectation that the gifts will be reported to the Trustees at the next meeting of the Board.

On behalf of the committee in charge of arrangements for the recent faculty dinner, I wish to thank you most sincerely for your address. It was inspiring and my only regret is that you did not have about three or four times the amount of time which was allotted to you so that you could have continued on with the "Song of the Stars".

Yours very truly,

JFM:HS

Secretary.

Very truly yours,

(Signed) Edwin S. Frost.

COPY

January 19, 1928

Dr. E. Frost,
Yerkes Observatory,
Williams Bay, Wisconsin.

Dear Dr. Frost:

I am delighted to learn from your letter of
January 18 about the two gifts from Mr. Henry H. Porter. It
seems to me that you are very kind in making such a
and a splendid contribution by Mr. Porter. I will show your
letter and the photographs to President Mason, with the
expectation that the gifts will be reported to the Trustees
at the next meeting of the Board.
On behalf of the committee in charge of arrange-
ments for the recent faculty dinner, I wish to thank you most
sincerely for your address. It was inspiring and my only regret
is that you did not have about three or four times the amount of
time which was allotted to you so that you could have continued
on with the "Song of the Stars".

Yours very truly,

Secretary

JTH:ES

922

November 25, 1927

Dear Mr. Frost:

We are glad to accept your suggestion that Miss Calvert of your staff be permitted to carry and safeguard during the meeting of the American Academy of Sciences the medals awarded to the late Professor E. E. Barnard. President Mason is glad that you reported this to us and thanks you for your personal interest in caring for these valuable evidences of Mr. Barnard's scientific recognition.

Very truly yours,

David H. Stevens

Assistant to the President

Mr. Edwin Brant Frost
Yerkes Observatory
Williams Bay
Wisconsin

22

November 25, 1927

Dear Mr. Frost:

We are glad to accept your suggestion that Miss Calvert of your staff be permitted to carry and safeguard during the meeting of the American Academy of Sciences the medals awarded to the late Professor E. E. Barnard. President Harter is glad that you reported this to us and thanks you for your personal interest in seeing for these valuable evidences of Mr. Barnard's scientific recognition.

Very truly yours,

David H. Stevens

Assistant to the President

Mr. Edwin Grant Frost
Yerkes Observatory
Williams Bay
Wisconsin

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

November 23, 1927

President Max Mason
The University of Chicago
Chicago, Illinois

My dear Mr. President:

In connection with the meeting of the A.A.A.S. at Nashville, the Tennessee Academy of Sciences is planning special exercises in honor of their most distinguished scientist, our late colleague, Professor E. E. Barnard. Dr. Aitken of the Lick Observatory, will devote his address, as retiring chairman, chiefly to the great scientific work of Mr. Barnard.

They have written here to obtain the loan for exhibition of the medals received by Mr. Barnard, which, in his will, were left to the University for preservation at the Observatory. There are six gold medals from different learned societies, and three bronze. It would be necessary to stipulate that every necessary precaution should be taken for the safekeeping of these while they are on exhibit.

However, I should not wish to loan these without full authority from you or from the appropriate committee of trustees. If it should not seem to yourself or to them wise to accede to this request, I should bear this decision with

The University of Chicago

Lick Observatory
Williams Bay, Wis.

November 23, 1927

President Max Mason
The University of Chicago
Chicago, Illinois

My dear Mr. President:

In connection with the meeting of the
A.A.A.S. at Nashville, the Tennessee Academy
of Science is planning special exercises in
honor of their most distinguished scientist,
our late colleague, Professor E. E. Barnard.
Dr. Wicker of the Lick Observatory, will devote
his address, as retiring chairman, chiefly to
the great scientific work of Mr. Barnard.
They have written here to obtain the loan
for exhibition of the medals received by
Mr. Barnard, which, in his will, were left to
the University for preservation at the Observatory.
There are six gold medals from different learned
societies, and three bronze. It would be necessary
to stipulate that every necessary precaution
should be taken for the safekeeping of these
while they are on exhibit.

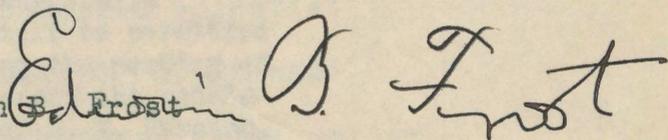
However, I should not wish to loan these
without full authority from you or from the ap-
propriate committee of trustees. If it should
not seem to yourself or to them wise to accede
to this request, I should bear this decision with

resignation; but, if we could be sure of the safe guarding of the medals, it would be greatly appreciated by the many admirers of Professor Barnard in Tennessee. Miss Calvert of our staff (Mrs. Barnard's neice) would take the medals with her and care for them except while being exhibited.

Yours very truly,

EBF:BH

Edwin B. Frost



resignation; but, if we could be sure of the safe guarding of the medals, it would be greatly appreciated by the many admirers of Professor Bernard in Tennessee. Miss Calvert of our staff (Mrs. Bernard's niece) would take the medals with her and care for them except while being exhibited.

Yours very truly,

Edwin F. Rissac
D. F. Rissac

REP:RH

The University of Chicago

Verkes Observatory
WILLIAMS BAY, WIS.

G-22
Braid
July 14
att

July 2, 1927.

President Max Mason,
University of Chicago,
Chicago, Illinois.

My Dear Dr. Mason:

On June 7th I wrote in considerable detail to Dean Gale regarding the reconstruction of the 26-foot dome housing our 12-inch telescope, preparatory to adapting this telescope for use as a twin with two 12-inch objectives, one visual and the other photographic. We have owned these two objectives for thirty years but have not been able to use but one because of the lack of the proper mounting. With the \$5000.00 granted for use before July 1st we have completed the work on the dome at a cost of about \$3000.00 plus \$500.00 for re-wiring and motorizing that dome. In order to make the absolutely necessary repairs of the slow motions and axes of the telescope, the essential parts of the mounting were sent to Pittsburgh for study by J. W. Fecker (successor to Brashear) and work has been in progress on these repairs for which about \$1500.00 was left out of the \$5000.00 appropriation. The expense will probably not exceed \$2000.00.

I have now received a figure from Fecker for the cost of providing twin tubes which will carry the two objectives. The figure is \$2275.00 f.o.b. Pittsburgh. In as much as ten weeks will be required for doing this work it is urgent that we should have a further appropriation from the Rosenwald fund immediately available for this purpose so that a definite order can be given. As stated in my letter of June 7th to Dean Gale, which I trust has now reached your desk, I asked for the addition of \$5000.00 by July 1st. This will provide the balance needed for the repairs to the mounting now in progress and for the transportation and erection of the telescope. There might be a small balance left to make a start on some of the accessories needed for the double telescope, in particular the plate holders for simultaneous photographic operations with the two objectives. To complete the accessories, additional appropriations would be necessary during the year but a second \$5000.00 would not be necessary until January 1st, 1928 instead of November 1st, 1927.

We greatly miss the 12-inch telescope while the repairs are in progress and therefore trust it will be possible for the appropriation to be made so that the instrument can be re-erected by October 1st. When we can complete the design and construction

The University of Chicago

WILLIAM DAVIS WALKER
WALTER DICKSON

July 2, 1927

President Max Mason
University of Chicago
Chicago, Illinois

My Dear Dr. Mason:

On June 7th I wrote in considerable detail to Dean Gale regarding the reconstruction of the 18-inch dome housing our 18-inch telescope, preparatory to adapting this telescope for use as a twin with two 18-inch objectives, one visual and the other photographic. We have owned these two objectives for thirty years but have not been able to use them because of the lack of the proper mounting. With the \$5000.00 granted for one before July we have completed the work on the dome at a cost of about \$3000.00 and the \$2000.00 for re-wiring and mounting that dome. In order to make the telescope, the essential parts of the mounting were sent to Pittsburg for repair by W. W. Walker (successor to Walker) and work has been in progress on these repairs for some time. The \$1500.00 we left out of the \$5000.00 appropriation. The expense will probably not exceed \$3000.00.

I have now received a figure from Walker for the cost of providing twin tubes which will carry the two objectives. The figure is \$1750.00. Inasmuch as the work will be repaired for doing this work it is argued that we should have a further appropriation from the Rosenwald fund immediately available for this purpose so that a definite order can be given as stated in my letter of June 7th to Dean Gale, which I first has now reached your desk. I asked for the addition of \$3000.00 by July 1st. This will provide the balance needed for the repairs to the mounting now in progress and for the transportation and erection of the telescope. There might be a small balance left to make a start on some of the accessories needed for the double telescope, in particular the plate holders for simultaneous photographic operations with the two objectives. To complete the accessories additional appropriations would be necessary during the year, but a second \$5000.00 would not be necessary until January 1st, 1928 instead of November 1st, 1927.

We greatly miss the 18-inch telescope while the repairs are in progress and therefore trust it will be possible for the appropriation to be made so that the instrument can be re-erected by October 1st. When we can complete the design and construction

President Max Mason, July 2, 1927, 2.

of the accessories intended for this instrument we shall have a telescope of great value for research.

I hope you will find it possible to visit the Observatory during the summer.

Very respectfully yours,

Edwin B. Frost
Edwin B. Frost

EBF:ES

President Van Ness, July 2, 1927, S.

of the accessories intended for this instrument we shall
have a telescope of great value for research.
I hope you will find it possible to visit the Observatory
during the summer.

Very respectfully yours,

Edwin P. Hubble

EM:BB

M-M

June 17, 1927

My dear Mr. Gale:

The receipt of your letter of June 10, inclosing a letter from Mr. Frost, and relating to a further appropriation from the Rosenwald Fund, is acknowledged.

There are so many requests for assistance from the Rosenwald Fund during the coming year that I foresee some difficulty in satisfying everyone. The President is out of town for a week and I shall take the matter up with him immediately upon his return.

Yours sincerely,

Frederic C. Woodward

Dean H. G. Gale
Faculty Exchange

W*1

W. W.

June 14, 1937

My dear Mr. Gais:

The receipt of your letter of June 10, enclosing a letter from Mr. Press, and relating to a further appropriation from the Rosenwald Fund, is acknowledged.

There are so many requests for assistance from the Rosenwald Fund during the coming year that I foresee some difficulty in assisting everyone. The President is out of town for a week and I shall take the matter up with him immediately upon his return.

Yours sincerely,

Frederic C. Woodward

Dean H. G. Gais
Rec'd by Exchange

WJ

The University of Chicago
The Ogden Graduate School of Science

June 10, 1927

OFFICE OF THE DEAN

Dear Mr. Gale,
Ogden Graduate School of Science
The University of Chicago
Chicago, Illinois

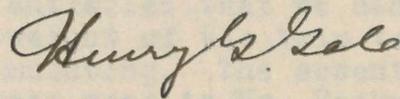
Dear Mr. Gale:

Mr. F. C. Woodward
Faculty Exchange

Dear Mr. Woodward:

I do not suppose you have taken up yet the question of the expenditure of the Rosenwald money for next year. I am sending you Mr. Frost's letter of which I have a carbon. You will note that Mr. Frost would like between \$12,000 and \$15,000 next year to complete the rehabilitation of the twelve-inch telescope and accessories. I think that these improvements should be allowed if there is no urgent need for the money for other purposes.

Very truly yours,



Henry G. Gale
Dean.

HGG:M

Further study of the telescope should be made, and out of the available Rosenwald money designs are being worked out in Pittsburgh for the new mounting, I wish to have them extended to cover the necessary accessories of that will practically be a new telescope, viz., (1) a double slide plateholder operating simultaneously with either or both objectives, (2) Spectroheliograph to be used, with the visual objective, simultaneously with a spectrograph, for the photographic objective, (3) A small spectroheliograph for the routine daily observations, to avoid the heavy job and danger attendant upon the use of the big Mumford spectroheliograph on the 40-inch telescope, (4) take nearly one and one-half hours per day to put on and take off the Mumford instrument, shifting the heavy weights, with a great loss of time and always some risk of accident. I believe that with Dr. Moffitt's skill in optical and mechanical design, we can plan a spectroheliograph that can be operated easily by

The University of Chicago
The Open Market School of Science

June 10, 1927

Mr. F. C. Woodward
Faculty Exchange

Mr. F. C. Woodward

I do not suppose you have seen my yet

the question of the magnitude of the Howard's money

for past year. I am writing you Mr. Frost's letter

of which I have a carbon. You will note that Mr. Frost

wants the balance \$10,000 and \$10,000 next year to

maintain the reputation of the faculty club buildings

and accessories. I think that these improvements

should be allowed if there is no urgent need for the

money for other purposes.

Very truly yours,



Henry G. Wells
Dean

HGS:W

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

June 7, 1927

Mr Woodward

Dear Henry G. Gale
Ogden Graduate School of Science
The University of Chicago
Chicago, Illinois

Dear Mr. Gale:

In respect to the special grant of \$5000.00 made from the Rosenwald fund in March and to be spent by June 30, I beg to report as follows:

1. The work of cutting open the 26-foot dome to increase the width of the opening to 60 inches, so that the twin telescope can be used, is progressing under contract with the American Architectural Iron Works, Inc. It will be completed before the end of the month unless unforeseen difficulties occur.
2. The alterations in the electric wiring necessary to furnish electricity for this job and for the motor hereafter to operate the dome have been installed. The contract for the mechanism, including worm gear which is to operate the dome, has been given to J. W. Fecker, successor to John A. Brashear, at Pittsburgh and will be completed as far as possible this month. (Mr. Fecker has just installed a precisely similar apparatus on two 24-foot domes at the University of Michigan.)
3. Mr. Fecker spent May 16th and 17th here in order to study the question of a new mounting for the telescope. We have decided that we can save the University some \$10,000.00 by rehabilitating the present mounting, using all parts that can be retained, including the present pier and driving clock. By employing duralumin for the new twin tubes, we are satisfied that we can use the present axes and circles, since the weight of the twin telescopes will not exceed that of the present mounting. The essential parts of the present mounting have been sent to Mr. Fecker for further study and for the installation of new slow motions, a considerable part of which can be done during the present month and out of the available Rosenwald fund. While designs are being worked out in Pittsburgh for the twin mounting, I wish to have them extended to cover the necessary accessories of what will practically be a new telescope, viz., (1) A double slide plateholder operating simultaneously with either or both objectives. (2) Spectrohelioscope to be used, with the visual objective, simultaneously with a spectrograph, for the photographic objective. (3) A small spectroheliograph for the routine daily observations, to avoid the heavy job and danger attendant upon the use of the big Rumford spectroheliograph on the 40-inch telescope. (It takes nearly one and one-half hours per day to put on and take off the Rumford instrument, shifting the heavy weights, with a great loss of time and always some risk of accident.) I believe that with Dr. Moffitt's skill in optical and mechanical design, we can plan a spectroheliograph that can be operated readily by

The University of Chicago

Office of the Director
WILLIAMS HALL, 518
June 7, 1927

Dear Mr. Gale:
The University of Chicago
Graduate School of Science
Chicago, Illinois

Dear Mr. Gale:

In respect to the special grant of \$5000.00 made from the Rosenwald fund in March and to be spent by June 30, I beg to report as follows:

1. The work of cutting open the 26-foot dome to increase the width of the opening to 60 inches, so that the twin telescope can be used, is progressing under contract with the American Architectural Iron Works, Inc. It will be completed before the end of the month unless unforeseen difficulties occur.

2. The alterations in the electric wiring necessary to furnish electricity for this job and for the motor hoist to operate the dome have been installed. The contract for the mechanism including worm gear which is to operate the dome, has been given to J. W. Becker, successor to John A. Bissel, at Pittsburg and will be completed as far as possible this month. (Mr. Becker has just installed a practically similar apparatus on the 24-foot dome at the University of Michigan.)

3. Mr. Becker spent May 16th and 17th here in order to study the question of a new mounting for the telescope. We have decided that we can save the University some \$10,000.00 by rehabilitating the present mounting, using all parts that can be retained, including the present pier and driving clock. By employing dwarf-iron for the new twin tubes, we are satisfied that we can use the present axes and circles, since the weight of the twin telescopes will not exceed that of the present mounting. The essential parts of the present mounting have been sent to Mr. Becker for further study and for the installation of new slow motions, a considerable part of which can be done during the present month and out of the available Rosenwald fund. While designs are being worked out in Pittsburg for the twin mounting, I wish to have them extended to cover the necessary accessories of what will practically be a new telescope, viz. (1) A double slide plateholder operating simultaneously with either or both objectives. (2) Spectroheliograph to be used with the visual objective simultaneously with a spectrograph for the photographic objective. (3) A small spectroheliograph for the routine daily observations to avoid the heavy job and danger attendant upon the use of the big Rumford spectroheliograph on the 40-inch telescope. (4) It takes nearly one and one-half hours per day to put on and take off the Rumford instrument, shifting the heavy weights, with a great loss of time and always some risk of accident. I believe that with Dr. Moffitt's skill in optical and mechanical design we can plan a spectroheliograph that can be operated readily by

Mr. Gale. June 7, 1927

one man, without such loss of time and risk. We should then use the big Rumford only when there were phenomena of special interest on the disk or limb of the sun as indicated by the spectrohelioscope and small spectroheliograph on the new 12-inch mounting.

While the designs have not yet been worked out, I believe that we can make all of these improvements of this equipment for an additional expenditure not to exceed \$15,000.00, and perhaps for \$12,000.00. I will therefore request you to consider this matter and present my recommendations, with your support, as far as it seems justified, to President Mason, asking him that a further grant of \$5000.00 be made from the Rosenwald fund, available on July 1st, with the understanding that another \$5000.00 would be needed by November 1st, for the accessories, with a maximum of a third \$5000.00 if necessary, by June 1st, 1928.

Mr. Fecker's original estimate of a wholly new mounting, as reported to you last winter, was \$20,500.00, not including the alterations of the dome, etc., or the accessory spectroscopic and photographic equipment.

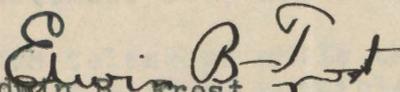
You will readily see that the present project thus constitutes a saving of at least \$10,000.00 and should provide full equipment necessary for a first-class instrument for research and graduate instruction.

You will also appreciate that while the telescope is necessarily dismantled for a study of the alterations at Pittsburgh, it is the logical time to receive authorization for the new twin tubes and all necessary connections which could be made with the \$5000.00 asked to be available on July 1st. I should hope to have the telescope thus ready for work by September 1st, but the new accessories, spectroscopic and photographic, could only be completed during the year as the designs could be thoroughly worked out and the apparatus constructed.

For your convenience, a carbon copy of this letter is enclosed.

Trusting that you will be able to have this important improvement receive early consideration and approval, if possible, I am,

Very truly yours,


Edwin B. Frost

EBF:BH

Mr. Gale, June 7, 1937

one man, without such loss of time and risk. We should then use the big camera only when there were phenomena of special interest on the disk or limb of the sun as indicated by the spectroheliograph and small spectroheliograph on the new 18-inch mounting.

While the designs have not yet been worked out, I believe that we can make all of these improvements of this equipment for an additional expenditure not to exceed \$15,000.00, and perhaps for \$12,000.00. I will therefore request you to consider this matter and present my recommendations with your support, as far as it seems justified, to President Mason, asking him that a further grant of \$5000.00 be made from the Rosenthal fund, available on July 1st, with the understanding that another \$5000.00 would be needed by November 1st, for the accessories, with a maximum of a third \$5000.00 if necessary, by July 1st, 1938.

Mr. Becker's original estimate of a wholly new mounting, as reported to you last winter, was \$30,500.00, not including the alterations of the dome, etc., or the necessary spectroscopic and photographic equipment.

You will readily see that the present project does constitute a saving of at least \$18,000.00 and should provide full equipment necessary for a first-class instrument for research and graduate instruction.

You will also appreciate that while the telescope is necessarily dismantled for a study of the alterations at Pittsburgh, it is the logical time to receive authorization for the new twin tubes and all necessary connections which could be made with the \$5000.00 asked to be available on July 1st. I should hope to have the telescope thus ready for work by September 1st, but the new accessories, spectroscopic and photographic, could only be completed during the year as the designs could be thoroughly worked out and the apparatus constructed.

For your convenience, a carbon copy of this letter is enclosed. Trusting that you will be able to have this important improvement receive early consideration and approval, if possible, I am,

Very truly yours,

Edwin P. Frost
Edwin P. Frost

EPF:BN