

*Geo. Hale*

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

*My dear Mr. Woodford -  
Is this all in  
the budget?*

Nov. 21, 1896.

*See p. 4. T.M.*

President W. R. Harper,  
University of Chicago,  
Chicago.

Dear Sir,-

In accordance with your request I present herewith a statement regarding the needs of the Yerkes Observatory for the year commencing July 1, 1897. Although appropriations for the Observatory have been made in the budgets of the preceding three years, the fact that we have within the last few weeks actually entered upon our work at Lake Geneva now makes it necessary to give special consideration to three important questions:

- (1) Formation of a suitable Observatory staff.
- (2) Equipment with necessary instruments and books.
- (3) Publication of investigations.

(1) Through appropriations made for last year three regular members of the staff and one assistant were appointed. Mr. Burnham has also consented to give his services on two nights of the week to the Observatory, while continuing his duties in the U. S. Court at Chicago. I have pointed out in previous letters the necessity of adding other members to the staff in order that it may be comparable with those of less important Observatories. Such of the Trustees as have recently visited the Observatory must regard this request as a reasonable one.



Ms. A. 9. 2. 1. 1896.

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University of Chicago,  
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Pres. Harper, 2.

As I understand it to be the wish of the Trustees to make few additions to the staff at present, I merely repeat my request of last year that Professor J. E. Keeler, Director of the Allegheny Observatory, and one computer, be appointed. Our opportunity of securing the services of Professor Keeler, of whose qualifications it is unnecessary to speak, is shared by no other existing Observatory, as I have explained in conversation with you.

(2) As a result of Mr. Yerkes' refusal to supply the Observatory with an equipment of minor instruments, the Trustees last year appropriated certain sums for the purpose of purchasing the necessary tools and employing mechanics to construct instruments under the direction of Professor Wadsworth in the workshop of the Kenwood Observatory. The result of the year's work has been to amply confirm the predictions made in my letter, viz:- that instruments equal in every respect to the best obtainable can be constructed at a cost of from one fourth to one half that demanded by the regular instrument makers. With the two excellent mechanics whom, owing to certain circumstances, we have been able to secure at \$60 each per month (instead of \$80 and \$75, formerly paid), and the admirably equipped workshop of the Yerkes Observatory, we expect to make even better progress during the coming year.

As only about five hundred dollars has been available for the purchase of books it is evident that we are in urgent need of money for this purpose, particularly as we do not share the advantages of other



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Pres. Harper, 3.

Departments in having convenient access to General and Departmental libraries of the University and other reference libraries in the city.

(3) The Committee appointed by the Trustees last spring to consider the request of the Observatory for an appropriation to cover the cost of publishing Professor Burnham's Catalogue of Double Stars informed us that while nothing could be done at that time it might perhaps be possible to include the amount asked for (\$1,500) in the next budget. It seems unnecessary to repeat here the arguments advanced in our communication of April 8, 1896, to the Trustees, as the members of the Committee undoubtedly appreciated the importance of publishing the Catalogue as soon as possible. I will simply point out that as the Astrophysical Journal closed its first year without a deficit our request for an appropriation for publication is more reasonable than would otherwise be the case.

I give below a tabulated statement of the estimated expenses of the Observatory for the year beginning July 1, 1897.



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Pres. Harper, 4.

ESTIMATED EXPENSES OF THE YERKES OBSERVATORY

for the year beginning July 1, 1897<sup>X</sup>

Salaries.

Director (Hale) - - - - -	-\$2,500✓	
Astronomer (Barnard) - - - - -	3,000✓	
Astronomer (Keefer) - - - - -	3,000	Not in
Astrophysicist (Wadsworth) - - - - -	-2,000✓	
Assistant (Ellerman) - - - - -	900✓	
Computer (Bauer) <sup>†</sup> - - - - -	900	750.
Mechanicians (Lorenz and Blomstrom) - - - - -	1,440✓	
Engineers (Myers and _____) - - - - -	1,200	1500.
Janitor (Wilhoit) - - - - -	- 540	960.
	<u>\$15,480</u>	

Other Expenses.

Photographic and shop supplies, stationery, etc., -	-\$2,400	2,000.
Equipment - - - - -	1,000	900.
Books and journals - - - - -	-1,000	420.
Publication (Burnham's Catalogue) - - - - -	1,500	Not in
Fuel - - - - -	- - - - -	1200.
	<u>\$5,900</u>	

(Mr. Myers, the engineer, informs me that he cannot make a reliable estimate of the amount of coal required until the power house has been running for a month and the large telescope and electric lights are in use.)

X Compare this statement with the estimate presented Oct. 23, 1894.

† It is greatly to be desired that Dr. L. A. Bauer shall enter upon his duties at the Observatory as soon as possible. He is willing to undertake the work of a computer in addition to his other duties.

*Where are Laves & Moulton?  
Mr. Hale does not seem to want them.*



ESTIMATED EXPENSES OF THE YERKES OBSERVATORY

for the year beginning July 1, 1897.

Salaries.

Director (Salis)	-----	\$2,800
Astronomer (Harvard)	-----	5,000
Astronomer (Kearny)	-----	5,000
Astronomer (Wadsworth)	-----	5,000
Assistant (Ellerman)	-----	900
Computer (Bauer)	-----	900
Mechanicians (Lorenz and Blomstrom)	-----	1,440
Engineers (Myers and _____)	-----	1,200
Janitor (Wilhoit)	-----	640
		<u>\$18,480</u>

Other Expenses.

Photographic and shop supplies, stationery, etc.	-----	\$2,400
Equipment	-----	1,000
Books and Journals	-----	1,000
Publication (Dunham's Catalogue)	-----	1,800
Fuel	-----	1,000
		<u>\$5,900</u>

(Mr. Myers, the engineer, informs me that he cannot make a reliable estimate of the amount of coal required until the power house has been running for a month and the large telescope and electric lights are in use.)

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4. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



Pres. Harper, 5.

In conclusion, I wish to refer once more to the very great importance of securing the services of Professor Keeler. It is evident to all, and was particularly commented upon by English astronomers who recently visited the Observatory, that the completion of the staff is a matter which demands the immediate consideration of the Trustees. I believe that the first step in this direction,-- one which would receive universal commendation,-- would be taken by appointing Professor Keeler without delay.

Trusting that you will present this letter to the Board of Trustees, I am,

Yours very respectfully,

*George E. Hale*

*Hale*

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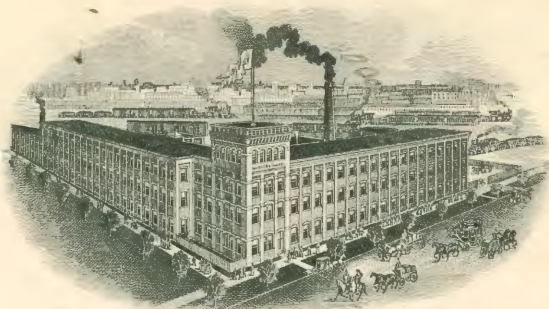
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Trustees, I am,

Yours very respectfully,

Thompson





# WARNER & SWASEY

CLEVELAND, OHIO, U.S.A.

W. R. WARNER.

CABLE ADDRESS: SWASEY CLEVELAND. (A. B. C. CODE.)

AMBROSE SWASEY.

*Prof. Hale*

November 24, 1898.

W. R. Harper,

Pres't Chicago University,

Chicago, Ills.

(35)

Dear Sir:--

We have received very urgent letters from Professor Hale in regard to the completion of the great telescope, and we have from time to time assured him that our interests in the matter were identical with his and yours. We are using our best endeavors to advance the completion of the work, but it is impossible to meet Professor Hale's wishes in the matter, as his desire is to make some observations in December. We have written to him that it would be very risky to have the objective in position while work is being done on the instrument; much also remains to be done on the Dome and Elevating Floor. From our most careful examination of the facts, we have written Professor Hale that it will be at least two or three months before the Objective can safely be placed in the instrument. We realize, also that the condition of the weather at the Observatory may seriously interfere with our work. The delay in the advancement of the work in the past three years has been a great disappointment to us, for we had assurance that the building would be ready at the close of the Exposition in 1893. We have, however, tried to take a philosophical view of this delay, although the pro-



CLEVELAND, OHIO, U.S.A.

November 24, 1892.

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Pres't Chicago University,

Chicago, Ill.

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W. & S.

Harper #2.

longation of the time is very unfortunate for us.

We have just written Professor Hale that we would write you and Mr. Yerkes on the subject telling you that we considered it a very dangerous policy to place the Objective in the instrument until the work is near completion.

Assuring you that our best interests are to complete the work as quickly as possible, and at the same time in a manner that will be satisfactory to you all, we remain,

Very respectfully,

Warner & Shasby

Harper &amp; S.

6  
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Assuring you that our best interests are to complete the work as quickly as possible, and at the same time in a manner that will be satisfactory to you all, we remain,

Very respectfully,

*Wm. S. Harper*



Yenker

Johnston

Chicago Dec 28<sup>th</sup> 1896

(22)

President Harper

of the University of Chicago

Dr Sir: About three years ago we had occasion to ask your advice in the matter of a tutor for our daughter.

Mr Morris B Barrett then a post graduate student at the University was recommended.

Mr Barrett's qualifications and methods proved to be all that we could desire, and the results of his teaching were in the highest degree satisfactory.

The acquaintance thus formed has continued without interruption to the present time - Naturally we have taken an interest in Mr Barrett's welfare, and we have noticed with solicitude and surprise that he was not receiving that recognition in University circles to which, as we think, he is fairly entitled -

Nothing in Mr Barrett's conversation or bearing has led us to this conclusion, (he)

Chicago Dec 21 1896

(22)

President Harper

of the University of Chicago

My dear Sir, About three years ago we had an  
occasion to ask your advice in the matter  
of a tutor for our daughter.

We then Dr Barrett then a first graduate  
student at the University was recommended.

Dr Barrett's qualifications as a teacher  
were such that we could not but be  
satisfied of his teaching course in the higher  
degrees satisfactory.

The correspondence thus far has been  
conducted without interruption to the present  
time. Naturally we have been in a hurry  
in the Barrett's matter, and we have  
tried with reluctance not to show the  
man not knowing that we were in the  
necessity of making it which we think, as a  
family matter.

Following in the Barrett's correspondence  
we have been for some time in the  
matter.



he has not in any way suggested aid or interposition from us, he has on the contrary uniformly maintained reticence in all that relates to personal matters.

We have nevertheless judged it proper at this time to express not only our confidence in the solidity of his attainments, but our admiration of his personal character.

When a man's future is yet in the balance a hair's weight may turn the scale in his favor.

In sharing the responsibilities of your position with others as you must, you will from time to time need to look about you for another good man. Under such circumstances you will, as we believe, make no mistake if your choice should light on such a man as Mr Barrett.

I write on behalf of Mrs Johnston as well

Sincerely Yours

J B Johnston  
230 Fifty Second St

Barrett was  
Fellow in Astron-  
Physics 1893-95-  
& Sec. and Librarian  
at Yerkes Obs. 1900.

I have not any more suggestions  
in reference to the matter, as I have  
sufficiently demonstrated it to be  
that related to personal matters.  
The same conclusions reached it before  
the time to express myself on the  
in the ability of his attorney, but  
more than of his personal character.  
There is a great future in the  
which might be any time, the  
I have  
I have no suggestions to  
making with them and your  
from time to time need to  
for the past year, the  
between you will be  
mistaken if you choose to  
such a man as the  
I write on behalf of the  
Truly yours  
J. B. [Signature]  
200 1/2 [Signature]



Barnard

OK

Chicago, Ills. 1897, Jan. 30

My dear Dr. Harper: I have seriously thought over the matter concerning the medal of the R. A. S. It would only be showing my appreciation of the high honor the English have ~~the~~ conferred on me if I should go over to London and personally receive the medal of the R. A. S. On Feb. 12.

I shall therefore accept the generous offer of Mr. Carnegie and shall leave here at 3 pm for New York and London. I only decided late last night or I should have consulted you further on the matter. As it is I must rush now or I shall be in too late.

I trust this will meet with your kind approval. I thank you for the interest you have shown in the matter.  
Very sincerely E. E. Barnard.

Bromine  
M

Chicago Ill. 102 June 22

My dear Mr. Thompson: I have received your letter of the 10th inst. and am glad to hear that you are well. I am sorry to hear that you are not well. I hope you will get better soon. I am very truly yours,  
W. A. S.

K. A. S. for July 10.  
I have received your letter of the 10th inst. and am glad to hear that you are well. I am sorry to hear that you are not well. I hope you will get better soon. I am very truly yours,  
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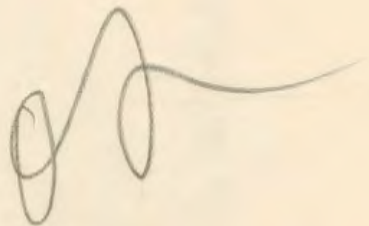


YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS, CHICAGO

Feb. 11, 1897.

President W. R. Harper,  
University of Chicago,  
Chicago.



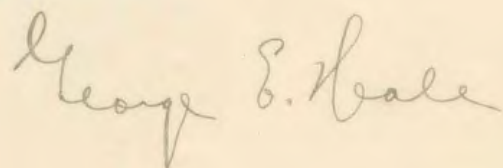
Dear Sir,-

Your letter of Jan. 7th has only just come into my hands, as it was unfortunately placed in my box at the University. Will you kindly instruct your secretaries to send everything to me at my William Bay address?

In reply to this letter I beg to say that Professors Hale, Barnard and Wadsworth will all be at work at the Observatory during the whole summer. This is the season in which by far the greater part of the observational work of the year is done, and it will always be our plan to take our vacations at some other part of the year. Vacation credit amounting to one quarter will be due to each of us.

I will prepare the matter for the summer circular at once and forward it to the Recorder.

Very truly yours,



YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAM BAY, WISCONSIN

DEAR SIR,  
ANSTON, CHICAGO

Feb. 11, 1937.

President E. R. Harper,

University of Chicago,

Chicago.

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I will prepare the matter for the summer circular at once and

forward it to the Harbors.

Very truly yours,

Henry S. G. Hall



Confidential.

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS, CHICAGO

Hall

Feb. 25, 1897.

Dear Dr. Harker,

You will perhaps hear very shortly of another attack upon Professor Hadsoworth. When his house was being built he noticed that the floor in the butler's pantry was put down so poorly that very wide cracks were left between the boards. He called the attention of Mr. Tomkins to the matter, and the latter admitted that the work was so badly done that the floor would have to be pulled up and relaid. Professor Hadsoworth then requested that oak be used in place of maple when the floor was relaid, and Mr. Tomkins expressed his willingness to have this done, providing Professor Hadsoworth would agree to pay the difference in cost due to the substitution of more expensive lumber. It was distinctly understood that no charge was to be made for the labor, as the maple floor was so poor that Mr. Tomkins recognized it would have to be relaid at his own expense. Now Mr. Tomkins threatens to call upon Mr. Rust, and attack Professor Hadsoworth's salary, in case the latter does not pay for both labor and material. I have advised him to do nothing of the kind.

Tomkins and Riddell tried to swindle me in the same way, by sending me a bill for some painting which had been so poorly done that it had to be done over at their expense. I refused to pay it, and if Professor Hadsoworth is to blame for the position he has taken, I am no





Confidential.

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS, CHICAGO

less so. Instead, however, of attacking my salary they decided to drop the item. They knew perfectly well that if any such unjust charges were made me on the house they would be unable to obtain their pay for the same. Professor Hadenwath is not protected in this way, and they therefore decide to attack him. I will send you soon a statement of the incomplete and imperfect work in Professor Hadenwath's house, and you will then see whether he or Tomkins and Riddell are to be blamed.

My experience has taught me to place no reliance in Mr. Tomkins' statements, and it is proper that you should have some acquaintance with his methods of doing business before accepting them.

I need hardly add that Professor Hadenwath knows nothing of this letter.

Very truly yours  
George S. Hale

VERMES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAM BAY, WISCONSIN

VERMES OBSERVATORY  
CHICAGO, ILLINOIS

*Confidential*

has no intention of attacking my salary they desire  
to keep the item. They know perfectly well that if any  
such important changes were made upon this item they  
would be unable to obtain their pay for the same. Professor  
Hobbes is not interested in this way, and they there  
fore decide to attack him. I will send you soon a  
statement of the circumstances and incidents which in Professor  
Hobbes's case, and you will then see whether or not  
Professor and Hobbes are to be blamed.  
My opinion has changed as to place as relations  
in the Hobbes statement, and I prefer that you shall  
have some copy of the statement of his wife of being  
before writing them.  
I will happily add that Professor Hobbes's name  
nothing of the letter.

Very truly  
yours  
J. J. Hobbes



Burnard

Oxford, England; 1897 May  
- March 2 -

My dear Dr. Harper:

I had expected to be home about this time but have found so much kindness and so many things of interest and importance from an astronomical point of view that it has been hard to tear myself away. I expect to sail about the last of the week.

I do not know whether you have heard or not, but on account of the terrific storms encountered immediately after leaving New York and which continued for a full week, the vessel was delayed nearly four days. It was due at Southampton on Feb. 9. It actually got in on the 13<sup>th</sup>. The meeting of the R.A.S. occurred on the 15<sup>th</sup>. You will see therefore that I failed to arrive in time for the annual meeting at which the medal is presented

Dr. Huggins however formally  
presented the medal to me on  
the 13<sup>th</sup> and to make up for  
the disappointment, as I  
could not await the March  
meeting, they have called  
a special meeting for to  
day to give me a "send off"  
and after the meeting, at  
which I am to show my  
slide, there is to be a dinner.  
I am overpowered with the  
kindness shown me on  
every hand.

Professor Turner tells me that  
he had written for your cable  
address and it did not  
arrive in time or he would  
have sent the medal  
announcement to you direct  
as it was he thought it would  
reach you at once if sent  
to the address he used.  
I have been here with  
him since Saturday night



and lectured in the University  
yesterday. about a week  
ago, I lectured at the University  
at Cambridge, <sup>(where I was the guest of Sir Robt. Ball.)</sup> to a fine  
and well pleased audience.

I spent two nights at the  
~~Cannon~~ Greenwich  
Observatory with Mr. Christie  
the Astronomer Royal, and  
got to see their telescopes  
and had a look through  
the instruments. It was a  
most interesting visit.

everybody over here is  
highly interested in the Yerkes  
Observatory.

I trust that you are  
well and that you are  
having more delightful  
weather than you had  
when I left.

With sincere regards,  
Very truly, E. E. Barnard

*Hale*

Yerkes Observatory, University of Chicago,  
Williams Bay, Wis.,

March 29, 1897.

President W. R. Harper,  
University of Chicago,  
Chicago.

Dear Sir,-

I return herewith Dr. Laves' letter to you regarding the establishment of a computing bureau at the University. The plan seems to me an excellent one, and it could not fail to add decidedly to the reputation of the University at very small expense. It is quite true that the greater part of the comets discovered each year are found by American observers, and it follows that the central computing bureau should be in the United States rather than in Germany. I hope it will be possible to carry out the plan in some form.

Very truly yours,

*George E. Hale*



Yerkes Observatory, University of Chicago,

Williams Bay, Wis.,

March 29, 1897.

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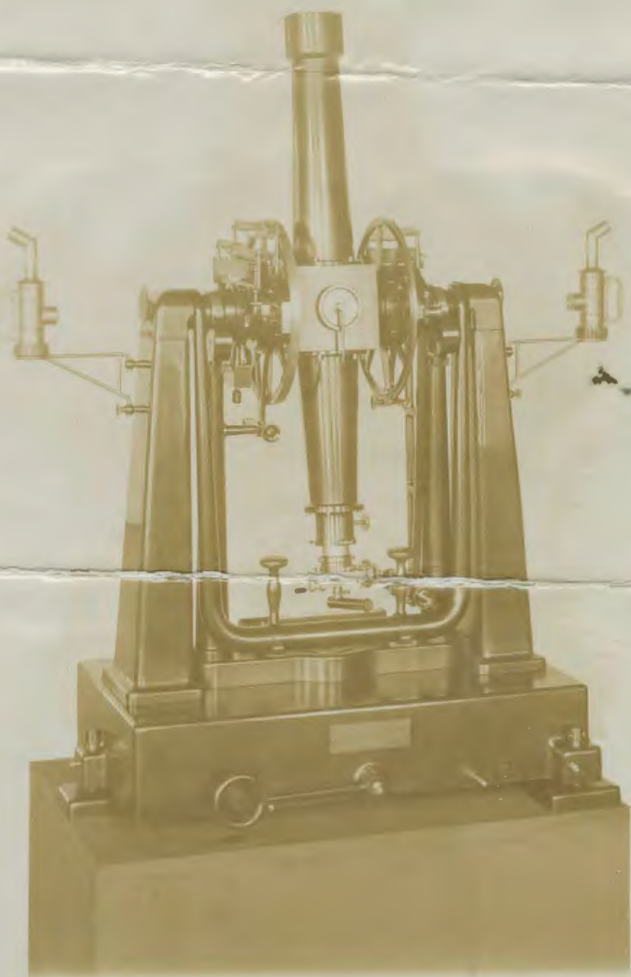
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Very truly yours,

*George F. Smith*





Hanna & Lwasey  
\$1.200.



*Hall*  
*OK*

Yerkes Observatory, University of Chicago,  
Williams Bay, Wis.,

April 13, 1897.

President W. R. Harper,  
University of Chicago,  
Chicago.

Dear Dr. Harper,-

Professor Young has somewhere said that "an Observatory equipped with one great telescope only is much like a warship with no rapid fire guns". This remark applies with special directness to the Yerkes Observatory. We have a magnificent building and telescope, but we have no means whatever of determining the time, or of ascertaining our latitude and longitude! It is absolutely necessary to obtain at once a small transit instrument, with a few accessories, in order that we may be able to reduce and publish the observations made with the Yerkes telescope. In choosing a transit I have avoided the large and expensive instruments commonly found in large observatories, and selected a good but inexpensive instrument made by Warner & Swasey. I enclose a photograph of a transit of this type which they have just completed for the small observatory of Park College. The price is \$1200. It is necessary to have a chronograph (Warner & Swasey make them at \$400) and an astronomical clock (one of the less expensive sort can be purchased abroad for about \$300), to be used with the transit. We already have a more expensive clock from the Kenwood Observatory, but it



Yerkes Observatory, University of Chicago,

Williams Bay, Wis.,

April 12, 1897.

President W. R. Harper,

University of Chicago,

Chicago.

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Dr. Harper, 2.

is made to run on sidereal time, and a mean time clock is also required.

As was pointed out in our previous communications to Mr. Yerkes, the Yerkes telescope will not be ready for use when Warner & Swasey get through with their work. Without eyepieces the telescope can no more be used than it could without the great object-glass. We have had to order a set of eyepieces from Steinheil of Munich, to cost about \$125, and to be paid for out of our apparatus money. Perhaps Mr. Yerkes would wish to pay for these if he appreciated how truly the eyepieces are a part of a telescope. They are always furnished with small telescopes, but for large ones special eyepieces are separately purchased. The same may be said for the two 4-inch objectives needed for the finders and the correcting lens. All of these are absolutely necessary, and must be supplied by us if Mr. Yerkes does not furnish them. The 4-inch objectives will cost \$100 each, and the correcting lens about \$75.

Nothing more quickly gives an observatory a reputation than discoveries of comets. Professor Barnard has discovered more comets than any other astronomer, but here he has no instrument to use for this work. A suitable comet seeker would cost about \$800. Ordinary telescopes are never employed for this purpose.

There is also the small dome to be arranged for. This will cost in the neighborhood of five thousand dollars, if I may judge from the cost of the slightly smaller Kenwood dome. I should suppose, however, that the dome might be built ~~much~~ more cheaply.

I have mentioned above only those things which the Observa-



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I have mentioned above only those things which the observatory-

Dr. Harper, 3.

tory must have. A 16-inch telescope, to stand under the second small dome, and a star camera, are almost equally essential. It was intended to adapt the Kenwood telescope for Professor Barnard's work, but while it is much better fitted for this purpose than it was before the alterations were made, it can never be made ~~quite~~ <sup>as it is designed for very different work.</sup> satisfactory for his and Professor Burnham's important observations. A 16-inch telescope, belonging to Professor Swift, of Mt. Lowe Observatory, can be obtained at the present time at a great saving of expense, and if you think it well to approach Mr. Yerkes with these matters I shall be glad to give you further details regarding them. The cost <sup>of the 16-inch telescope</sup> would be about \$10,000.

I have felt compelled to omit the numerous other instruments found in every observatory of importance, but which it seems useless to ask for. It would perhaps be well not to bring up even the matters here referred to until the contracts for the motors and power cable have been actually let. After that there should be as little delay as possible, for we cannot long do without the transit instrument when regular observations are in progress. Three months will be required to build it.

Very truly yours,

*George E. Hale*

† For lack of a star camera Professor Barnard has not been able to carry on at the Yerkes Observatory the important work of photographing the Milky Way, which contributed so largely to the reputation of the Lick Observatory.



Dr. Hargreaves, S.

very much more. A 18-inch telescope, to stand under the second small  
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to adapt the Kennwood telescope for Professor Barnard's work, but while  
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Henry L. Moore

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carry on at the Yerkes Observatory the important work of photographing  
the Milky Way, which contributed so largely to the reputation of the  
Lick Observatory.

*Hale*

Yerkes Observatory, University of Chicago,

Williams Bay. Wis.,

*Received by  
Hale*  
April 19, 1897.

President W. R. Harper,

University of Chicago,

Chicago.

Dear Sir,-

I enclose herewith a draft of regulations governing admission to the grounds and building of the Yerkes Observatory. These regulations represent the unanimous opinion of the members of the Observatory staff. It is felt by all of us that popular interest in astronomy should be encouraged by every suitable means, ~~so~~ long as this does not seriously interfere with the scientific work of the Observatory, which must of course be the first consideration. It has been suggested by certain of the Trustees that one evening in each month be devoted to the public. In view of all the circumstances it seems to us desirable that the Yerkes telescope, like the Lick telescope, be used by the public four times a month. The extreme importance of the instrument for astronomical and astrophysical research forbids that more time ~~than~~ ~~this~~ be devoted to this purpose; but no one can question the liberality of this arrangement, especially when it is remembered that the Lick and Yerkes telescopes are the only two great instruments with which others than astronomers are permitted to observe.

It is evident that if the visitors are to really see anything with the telescope, the number present on any single occasion must be



Yerkes Observatory, University of Chicago.

Williams Bay, Wis.,

April 10, 1907.

President W. R. Harper,

University of Chicago,

Chicago.

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It is evident that if the visitors are to really see anything with the telescope, the number present on any single occasion must be

President Harper, 2.

limited. Professor Barnard informs me that at the Lick Observatory it has been found impossible to handle more than 200 people in an evening. Each one must be told where to look into the instrument, what he may expect to see, etc. The focus must also be adjusted frequently, and the astronomer in charge must ~~also~~ make numerous other adjustments of the instrument, dome and rising-floor from time to time. In the space of three or four hours he will do well to satisfy the wishes of 200 persons, most of whom are naturally unfamiliar with astronomical observations. The fairest and most satisfactory method of limiting the admissions to this number will probably be for the Observatory to issue tickets, which will be sent free of charge to all who apply up to the stated number.

It is most important to the success of the Observatory and ~~kh~~ the safety of its instruments that the grounds be enclosed, and opened to the public only on the occasions stated in the printed regulations. It is easy to see why this Observatory, in common with other large institutions of similar character, will be compelled to adopt this procedure. In the course of the investigations to be undertaken it will be necessary to set up delicate instruments in various parts of the grounds. At present we have two such instruments in position. Other apparatus which will soon be permanently erected outside of the main building will include a heliostat, with silvered mirror, a star camera, meteorological instruments, 24-inch reflector, and a meridian mark. All these are of such construction that they might easily be injured by well meaning persons unfamiliar with their character. In the work last



limited. Professor Barnard informs us that at the Lick Observatory it has been found impossible to handle more than 200 people in any evening. Each one must be told where to look into the instrument, what he may expect to see, etc. The focus must also be adjusted frequently, and the astronomer in charge must make numerous other adjustments of the instrument, both and frequently from time to time. In the space of three or four hours he will be well to satisfy the wishes of 200 persons, most of whom are naturally unfamiliar with astronomical observations. The fairest and most satisfactory method of limiting the admission to this number will probably be for the Observatory to issue tickets, which will be sent free of charge to all who apply up to the stated number.

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President Harper, 3.

summer it was found that many people on their way to the Y. M. C. A. athletic field wandered into our little observatory, breathed upon the delicate silver film of the valuable mirrors which were of necessity in the open air, and stood in the path of the sunlight reflected from one instrument to another. All this with the best of intention, and only ordinary curiosity. Even the immensely valuable object-glass of the Yerkes telescope will not be beyond the reach of thoughtless small boys, if they are allowed in the grounds. At the Kenwood Observatory stones and snowballs were frequently thrown against the dome, even when the shutter was open and the object-glass of the telescope an easy mark. A feeble blow would ruin the Yerkes objective, and subject the University to great loss. Of course an accident of this kind is not very likely to happen, but the astronomers believe that even its possibility should be avoided, when so much is at stake. In spite of the strictest orders to keep the outside doors closed, I find every day ~~that~~ one or two of these doors open or unlatched. A great many times people have come into the Observatory in this way without asking permission; and I have found them in all parts of the building. Once a party of visitors was discovered moving ~~about~~ the 12-inch telescope, and persons in another party rubbed their fingers over an objective (which cost \$2000), in the heliostat room. Our optician has found it impossible to remove the scratches made at that time, so the resulting injury is a permanent one.

If, as has been shown, instruments mounted in various parts of the building and grounds are liable to injury from a few casual vis-



summer it was found that many people on their way to the Y. M. C. A. athletic field wandered into our little observatory, pressed upon the delicate silver film of the valuable mirrors which were of necessity in the open air, and stood in the path of the sunlight reflected from one instrument to another. All this with the best of intention, and only ordinary curiosity. Here the immensely valuable object-glasses of the Yerkes telescope will not be beyond the reach of thoughtless small boys, if they are allowed in the grounds. At the Kenwood Observatory stones and snowballs were frequently thrown against the dome, even when the shutter was open and the object-glass of the telescope an easy mark. A feeble blow would ruin the Yerkes objective, and subject the University to great loss. Of course an accident of this kind is not very likely to happen, but the astronomers believe that even the possibility should be avoided, when so much is at stake. In spite of the strictest orders to keep the outside doors closed, I find every day that one or two of these doors open or unlatched. A great many times people have been into the Observatory in this way without asking permission; and I have found them in all parts of the building. Once a party of visitors was discovered moving ~~near~~ the 12-inch telescope, and persons in another party rubbed their fingers over an objective (which cost \$2000), in the heliostat room. Our optician has found it impossible to remove the scratches made at that time, so the resulting injury is a permanent one.

It has been shown, instruments mounted in various parts of the building and grounds are liable to injury from a few casual vis-

President Harper, 4.

itors in the winter, it is evident that such crowds as comprise the numerous large excursions which visit Lake Geneva in the summer might be expected to do considerable damage if permitted to wander at will in the vicinity of the Observatory. The fact that, as was frequently the case last summer, groups of people would eat their luncheon on the grounds, and leave behind them papers and other refuse, is a secondary but not unimportant consideration to those who will be expected to keep everything in order. It may be added that wandering cattle and other animals, including dogs, are as likely to do harm as are well-meaning persons.

In view of these facts the staff of the Observatory unanimously recommends to the Board of Trustees the adoption of regulations similar to those enclosed herewith. We also request that at least a part of the Observatory property be enclosed by a fence such as men and animals will be likely to respect. In our opinion the only public entrance to the grounds should be near the power-house, where tickets may be collected. Visitors having business with members of the staff can give their message to the engineer, who can telephone to the Observatory, and ascertain whether admission should be granted. If the funds at the disposal of the Trustees do not permit more to be undertaken at the present time, the erection of a fence enclosing a space <sup>about 600 x 1000 ft. (with wing to power-house)</sup> ~~feet~~, <sup>having</sup> with the Observatory at the center, would accomplish many of the results desired.

Very respectfully yours,

George S. Hale



President Harper, 4.

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Respectfully,  
Sincerely,  
Very respectfully yours,

Very respectfully yours,

George P. [Signature]



Office of

Chas. T. Yerkes.

1111 North Clark Street.

CABLE ADDRESS, YERKES, CHICAGO.

Chicago.

Apr. 24th '97.

Dr. Wm. R. Harper,

Pres.-- University of Chicago,

City.

My Dear Doctor:-

Your favor of the 19th is received and read with much interest and considerable thought.

You ask for further donations for the Astronomical Department of the Observatory and use some very good arguments.

On the same date that I received your letter, I also read of a meeting of the Civic Federation, at which you were present and where- at the retiring president, Mr. Baker, was lauded to the skies. It was a notable gathering of the great and good representatives of the great and good few who represent the great and good part of our city, and I see by the names that these people are the ones who uphold all the charities of our city, who are always fairly throwing away their wealth so that others may be benefited thereby, who are building up the great institutions of this city in a most reckless and daring manner, while such people as myself,- according to the theory of your friends, are doing their best to pull it to pieces and destroy what little honor and integrity and worth is left in our community.

As I said, it set me to thinking, and my thought was to this effect: Would it not be much better for you to request these friends of yours to contribute the articles, or the money which would purchase them,- which you name? Without doubt, the slightest hint from you



Apr. 24th '97.

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W.R.H. #2.

would open their pocket-books as well as their hearts, and in all probability you would be overwhelmed with the subscriptions they would fairly force upon you, and that being the case, I do not see whay there should be any necessity for you to make the request from me. With the destruction of our property, which your friends aim at, and the open pocket-book, which I have generally maintained, it seems as though there was but a short road to the end, and the fact that I have acceded to the requests of many persons at the head of the different institutions of Chicago, which we support by contributions, with the result of the actions of these extremely good people which you frequently represent, suggests to me the old adage of "A fool and his money, etc."

Yours respectfully,

*Chas. J. Forbes*



W.R.H. #2.

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Yours respectfully,

Wm. D. Jones



Office of

Chas. T. Yerkes.

1444 North Clark Street.

Chicago.

May 24th '97.

CABLE ADDRESS, YERKES, CHICAGO.

Dr. W. R. Harper,

City.

Dear Sir:-

On my return to Chicago I find your invitation of the 20th, to go to Lake Geneva to look through the telescope. Would have been much pleased to have been present on Friday evening.

A thought has come to my mind in regard to the great care that should be taken to guard the instrument against either accident or malicious acts of anyone who might feel disposed to injure it. It is a sad fact which forces itself upon my mind, and I thoroughly believe that there are many persons,- some of them high in the social scale,- who would even be pleased to see an accident happen to the telescope. I therefore state it as an expressed wish, that no one be allowed, except those in charge, to approach anywhere near the glass. It should never be lowered so that visitors could look at it, or be on the same plane with it. In fact, every precaution should be taken to keep visitors away from it. I do not believe in satisfying peoples' curiosity who merely wish to obtain a look through the instrument. It was not placed in the Observatory for that purpose; it is there for scientific research, and for that only. I particularly desire that it be kept for that purpose. Of course, I do not expect that persons connected with the University should be excluded from the privilege of looking through it, but it is not a toy in any sense of the word, or something which



May 24th '97.

Dr. W. R. Harper,  
City.

Dear Sir:-

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-2-

is to give pleasure to the multitude. As I said before, it is especially for scientific research, and I sincerely hope that those in charge of it will fully appreciate this fact.

If you will kindly communicate my wishes as expressed herein, to Prof. Hale, or whoever else it may be has charge of it, you will oblige me.

Yours truly,

Chas. D. Forbes



is to give pleasure to the multitude. As I said before, it is especially for scientific research, and I sincerely hope that those in charge of it will fully appreciate this fact.

If you will kindly communicate my wishes as expressed herein, to Prof. Hale, or whoever else it may be in charge of it, you will oblige me.

Yours truly,

*Wm. Brewster*

1883

C O P Y.

Springfield, Ill., 6-2, 1897.

Professor George E. Hale,

My Dear Sir,-

I was pleased to receive your favor of the 31st ult. and read such favorable accounts of the telescope. That the accident to the floor should happen is a matter of sincere regret, but we should thank God most sincerely that it was not accompanied with fatal results. The escape of you and your associates was certainly most providential.

Have heard from Mr. Warner and he assures me the work of repair will go on as rapidly as possible. I would advise you, however, to push him as much as you can and frequently.

Very truly yours,

(Signed) Chas. T. Yerkes.



C 27 Y.

Springfield, Ill., 6-2, 1897.

Professor George H. Hale,

My Dear Sir,

I am pleased to receive your favor of the 31st  
ult. and your favorable account of the telescope. That the ac-  
count to the effect should happen is a matter of course, but we  
should think that most especially that it was not accompanied with false  
results. The success of you and your associates is certainly most  
providential.

My friend Mr. Warren and he assured me the work of repair  
will be on the way as possible. I would advise you, however, to  
push him as much as you can and prospectively.

Very truly yours,

(Signed) Chas. A. Barker.

91  
Not pressing.

Mr. Dodd evidently wants some time to think it over.

Mr. McLaughlin does not want to make a special case of this.

Dean Tufts suggests a conference between him and the President.

Mr. Tufts  
Does Pres need  
to do more about this  
file



Not promising.  
It goes awfully well some time  
to think of it.

Mr. Kohnstien does not want to  
take a special case of this.

Good. This suggests a conference  
between him and the President.

Mr. T. J. ...  
...  
...  
...  
...

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

June 2, 1897.

President W. R. Harper,  
University of Chicago,  
Chicago.

My Dear Dr. Harper,-

I am glad to learn from your letter of May 31st that you will require the contractors to rebuild the floor in the briefest possible time. If they put a sufficient force of men at work I have no doubt it could be finished by July first. This is also the opinion of Mr. Coolidge, who examined the wreck on Sunday with Major Rust. It seems to me that the contractors are to a considerable extent in debt to the University on account of this accident. In any commercial transaction they would have to pay heavily for the time and money lost as a result of their carelessness. It should therefore be possible to at least require them to repair the damage without a moment's unnecessary delay. Up to the present time no representative of Warner & Swasey has arrived at Williams Bay. The importance of hastening the work can be better estimated from a consideration of the observation by Professor Barnard of a faint star near Vega, which will be described in my report for the month of May. The discovery is one of no astronomical significance, but it demonstrates most conclusively that the Yerkes telescope is more powerful than the Lick telescope. Add to this the fact that the greater part of the work here must be done in the summer, on account of the

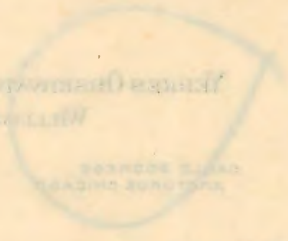
Hale

*No. 1115*

*(Prof. Barnard is very anxious that this be clearly understood)*



James (Hannay) University of Chicago  
William H. Huggins



June 2, 1897.

*W. H. Huggins*

President W. R. Harper,  
University of Chicago,  
Chicago.

My Dear Dr. Harper,

I am glad to learn from your letter of May 21st that you will require the contractors to rebuild the floor in the earliest possible time. It they put a sufficient force of men at work I have no doubt it could be finished by July 1st. This is also the opinion of Mr. Goodridge, who examined the wreck on Sunday with Major Hunt. It seems to me that the contractors are to a considerable extent in debt to the University on account of this accident. In any commercial transaction they would have to pay heavily for the time and money lost as a result of their carelessness. It should therefore be possible to at least reimburse them to repair the damage without a moment's unnecessary delay. Up to the present time no representative of Warner & Swasey has arrived at Williams Bay. The importance of hastening the work can be better estimated from a consideration of the observation by Professor Barnard of a faint star near Vega, which will be described in my report for the month of May. The discovery is one of no astronomical significance, but it demonstrates most conclusively that the Yerkes telescope is more powerful than the Lick telescope. Add to this the fact that the great-  
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President Harper, 2.

excellent conditions prevailing during the warm weather, and you will see why not a moment's time should be lost in repairing the damage caused by the accident to the floor. You therefore cannot insist too strongly that the work shall be completed not later than July first.

Very truly yours,

George E. Hale



President Harper, E.

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Very truly yours,

Harper E. Harper

*Hale*

REPORT OF THE DIRECTOR OF THE YERKES OBSERVATORY FOR THE MONTH  
ENDING JUNE 30, 1897.

CONDITION OF THE BUILDINGS.

Great Dome. The work of repairing the accident to the rising floor has advanced rapidly during the month. After the wooden flooring had been removed by Soutar's men there was some delay before the iron men arrived. From some misunderstanding of the true nature of the accident the men came unprovided with the necessary implements, and for two or three days but little work could be done. Later, however, more men were engaged and the work progressed so rapidly that within a few days all of the iron work had been removed from the tower. The iron skeleton was soon ready for Soutar's men, and at the end of the month the wooden flooring had all been laid and was being planed down. There then remained little to be done beyond fastening the cables and putting in the large hoisting drums, which had not arrived from Cleveland.

Northeast Dome. Mr. Morava's work on the Kenwood dome was completed shortly after the writing of the last report. The observing chair, which had been in use with the 40-inch telescope and fell with the rising floor, was repaired in our shop, and has since been employed with the 12-inch telescope.

The work of repairing the roof referred to in the last report was carried on by Messrs. Angus & Gindale during the greater part of the month. New and satisfactory skylights were put in, and most of the defects in the roof were repaired. Some other work was done about the building, leaving only a few details which had not been corrected.



REPORT OF THE DIRECTOR OF THE YERKES OBSERVATORY FOR THE MONTH  
ENDING JUNE 30, 1897.

CONDITIONS OF THE BUILDINGS.

Steel House. The work of repairing the accident to the rising floor has advanced rapidly during the month. After the wooden flooring had been removed by Sauter's men there was some delay before the iron men arrived. From some misunderstanding of the true nature of the accident the men came unprovided with the necessary implements, and for two or three days but little work could be done. Later, however, more men were engaged and the work progressed so rapidly that within a few days all of the iron work had been removed from the tower. The iron skeleton was soon ready for Sauter's men, and at the end of the month the wooden flooring had all been laid and was being planed down. There then remained little to be done beyond fastening the ceiling and putting in the large rotating drums, which had not arrived from Cleveland.

Wetherbee House. Mr. Wetherbee's work on the Hammond dome was completed shortly after the writing of the last report. The observing circle which had been in use with the 40-inch telescope and fell with the rising floor, was repaired in our shop, and has since been employed with the 18-inch telescope.

The work of repairing the roof referred to in the last report was carried on by Messrs. Angus & Lindholm during the greater part of the month. New and satisfactory skylights were put in, and most of the defects in the roof were repaired. Some other work was done about the building, leaving only a few details which had not been corrected.

## RESEARCH WORK OF MEMBERS OF THE STAFF AND STUDENTS.

40-inch Telescope. On account of the work in progress on the rising floor the large telescope could not be used during the month.

12-inch Kenwood Telescope. The instrument has been used for miscellaneous observations, mainly by Professor Barnard. The observational work has included a careful study of the planet Venus, on which none of the fine markings recently announced by Lowell have been detected.

Computing Room. The Director has been engaged during a large part of the month in measuring the wave-lengths of a large number of lines in some remarkable photographs of the solar spectrum obtained at the Kenwood Observatory in 1894.

Star Camera. Professor Barnard has secured with this instrument several photographs of the star clouds in the Milky Way. These were made mainly for the purpose of testing a small portrait lens.

24-inch Reflecting Telescope. This instrument has been used for miscellaneous observations by Mr. Ritchey and other members of the staff.

## WORK OF THE OPTICAL SHOP.

The work on the large grinding machine has progressed rapidly, and at the end of the month the greater part of the machine had been set up. Mr. Ritchey has given his entire time to this work.



## RESEARCH WORK OF MEMBERS OF THE STAFF AND STUDENTS.

40-inch Telescope. On account of the work in progress on the rising

floor the large telescope could not be used during the month.

12-inch Kerwood Telescope. The instrument has been used for miscellaneous

some observations, mainly by Professor Barnard. The observational

work has included a careful study of the planet Venus, on which some of

the fine markings recently announced by Lowell have been detected.

Computing Room. The Director has been engaged during a large part of

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some remarkable photographs of the solar spectrum obtained at the Ker-

wood Observatory in 1894.

Star Camera. Professor Barnard has occupied with this instrument sever-

al photographs of the star clouds in the Milky Way. These were made

mainly for the purpose of testing a small portrait lens.

24-inch Reflecting Telescope. This instrument has been used for mis-

cellaneous observations by Mr. Hickey and other members of the staff.

## WORK OF THE OPTICAL SHOP.

The work on the large grinding machine has progressed rapidly, and

at the end of the month the greater part of the machine had been set

up. Mr. Hickey has given his entire time to this work.

## WORK OF THE INSTRUMENT SHOP.

The mechanics have been principally engaged in making the metal parts of the grinding machine and the heavier parts of the heliostat. The work on the ruling machine has progressed satisfactorily.

## PUBLICATIONS OF MEMBERS OF THE STAFF AND STUDENTS.

|                   |   |
|-------------------|---|
| S. W. Burnham,    | The Orbit of 35 Comae Berenices ( <del>Σ</del> 1687) and of<br><i>OS 4</i> . Popular Astronomy, July 1897.  |
| F.L.O. Wadsworth, | The Orbit of <i>μ</i> Draconis. Monthly Notices, May 1897.<br>On the Conditions which Determine the Ultimate Optical Efficiency of Methods for Observing Small Rotations, and a Simple Method of Doubling the Accuracy of the Mirror Method. Phil. Mag., July 1897. |
| " " " "           | On the Conditions which Determine the Limiting Time Exposure of Photographic Plates in Astronomical Photography. Knowledge, July 1897. Astronomische Nachrichten, July 1897.  |
| " " " "           | The Effect of Heat on Phosphorescence. Letter to Nature, June 1897.   |

REMARKS.

The Observatory has been visited during the month by some three hundred students from the Y.M.C.A. Encampment, and by several other smaller parties. The scientific visitors have included Capt. A. Zettl and Herr L. de Tolnay, Official Representatives of the Hungarian Government, sent to inspect the American observatories; Professor H. A.



# WORK OF THE INSTRUMENT SHOP.

The mechanicians have been principally engaged in making the metal parts of the extending machine and the heavier parts of the heliostat. The work on the ruling machine has progressed satisfactorily.

## PUBLICATIONS OF MEMBERS OF THE STAFF AND STUDENTS.

- |  |                     |
|--|---------------------|
| The Orbit of 33 Cornelia Bernice (21827) and of 34 H. P. Asteroid. July 1897.  | S. W. Burnham.      |
| The Orbit of 4 Brucia. Monthly Notices, May 1897.  |                     |
| On the Conditions which Determine the Ultimate Optical Efficiency of Methods for Observing Small Rotations, and a Simple Method of Determining the Accuracy of the Mirror Method. Phil. Mag., July 1897. | T. A. O. Wadsworth. |
| On the Conditions which Determine the Limiting Time Exposure of Photographic Plates in Astronomical Photography. Knowledge, July 1897.   |                     |
| Astronomische Nachrichten, July 1897.  |                     |
| The Effect of Heat on Phosphorescence. Letter to Nature, June 1897.  |                     |

## REMARKS.

The Observatory has been visited during the month by some three hundred students from the Y.M.C.A. Movement, and by several other smaller parties. The scientific visitors have included Capt. A. Estlin and Herr L. de Tolnay, official representatives of the Hungarian Government, sent to inspect the American observatories; Professor H. A.

Howe, Director of the Chamberlin Observatory, Denver; Professor G. W. Hough, Director of the Dearborn Observatory, Evanston; and Mr. J. A. Parkhurst, of Marengo, Ill.

# STATEMENT OF ACCOUNT.

A statement of the minor expenses incurred during the month is appended. A copy of this has been sent to the Comptroller.

## THE UNIVERSITY OF CHICAGO in account with George E. Hale.

|         |                        |                 |
|---------|------------------------|-----------------|
| June 7, | Stamps,                | \$ 1.00         |
| " "     | Postage due,           | .10             |
| " 9,    | " "                    | .10             |
| " "     | Telegram,              | .50             |
| " 14,   | Stamps,                | 5.00            |
| " 16,   | Iron and pipe,         | .63             |
| " 17,   | 1 Gal. lard oil,       | 1.00            |
|         | Machine steel,         | 1.10            |
|         | Telegrams,             | 1.50            |
| " 21,   | Iron,                  | 1.25            |
| " 24,   | Freight Bill 1,        | .55             |
| " 25,   | Muslin,                | .35             |
| July 1, | Telegram and delivery, | .58             |
|         |                        | <u>\$ 13.66</u> |

*George E. Hale*



Howe, Director of the Chamberlin Observatory, Denver; Professor G. W. Hough, Director of the Dearborn Observatory, Evanston; and Mr. J. A. Parkhurst, of Menasha, Ill.

# STATEMENT OF ACCOUNT.

A statement of the minor expenses incurred during the month is ap-

pendent. A copy of this has been sent to the Comptroller.

## THE UNIVERSITY OF CHICAGO in account with George F. Hale.

|         |                        |              |
|---------|------------------------|--------------|
| June 7. | Stamps.                | 1.00         |
| "       | Postage due.           | .10          |
| "       | "                      | .10          |
| "       | Telegram.              | .50          |
| "       | Stamps.                | 8.00         |
| "       | Iron and pipe.         | .03          |
| "       | 1 Gal. kerosene oil.   | 1.00         |
| "       | Machinist steel.       | 1.10         |
| "       | Telegram.              | 1.50         |
| "       | Iron.                  | 1.25         |
| "       | Freight Bill 1.        | .50          |
| "       | Mailin.                | .35          |
| July 1. | Telegram and delivery. | .35          |
|         |                        | <u>13.00</u> |

*George F. Hale*

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

July 20, 1897.

President W. R. Harper, -

University of Chicago,  
Chicago.

OK

My Dear Dr. Harper, -

Has any word been received as yet from Lord Kelvin regarding the possibility of his being present at the dedication of the Observatory? If you wrote to him early in July, requesting him to cable his reply, it would seem that we should have heard by this time. from him. Kindly let me know as soon as you hear from him, as I am publishing a statement in the August number of the Astrophysical Journal regarding the dedication, and wish to announce his address if possible.

I am meeting with marked success in arranging the programme. for the astronomical and astrophysical conferences, to be held here preceeding the dedication. Some fifteen persons have already promised to be present and to take part in the conferences, and a series of important experimental demonstrations in the laboratories of the Observatory have been arranged for. As no one has yet declined the informal invitations I have been sending out, I think we may confidently expect to have a large attendance of scientific men. There is also likely to be no difficulty in providing for their entertainment here, Mr. Ayer has offered to take eight or ten, and to induce other people about the Lake to do likewise. He will place his steamer at our disposal during the entire time of the conferences, and do everything he can to aid us.



Office of the Secretary  
University of Chicago

July 20, 1937

RECEIVED  
JUL 21 1937

President W. R. Harper, -

University of Chicago,

Chicago.

My Dear Dr. Harper, -

Has any word been received as yet from Lord Kelvin regarding the possibility of his being present at the dedication of the observatory? If you wrote to him early in July, requesting him to send his reply, it would seem that we should have heard by this time from him. Kindly let me know as soon as you hear from him, as I am publishing a statement in the August number of the Astrophysical Journal regarding the dedication, and wish to announce his address if possible.

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Pres. Harper, 2.

The work on the rising floor is lagging somewhat of late, though hitherto it has gone on very rapidly. We can hardly hope to use the telescope before August 1st, but it should be ready shortly after that time.

Very truly yours,

George E. Hale



Pres. Harper, S.

The work on the rising floor is lagging somewhat of late,  
though hitherto it has gone on very rapidly. We can hardly hope to use  
the telescope before August 1st, but it should be ready shortly after  
that time.

Very truly yours,

Leopold Stroll

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

July 26-1897

W. R. Harper, President,

The University of Chicago.

My dear Sir: I take pleasure

in handing you herewith a certificate of deposit for seven thousand dollars (\$7000 <sup>00</sup>), of the Northern Trust Company, bearing interest, which I have received from Miss Catherine W. Bruce, 810 Fifth Ave., New York City, to be used for the purchase of a <sup>Bruce</sup> photographic telescope <sup>Fund</sup> and a suitable building to be erected on the Observatory grounds of the University of Chicago at Williams Bay. This money is given with the understanding that the fund, including the principal and the interest which may accrue thereon, until it is needed for this purpose, is to be known as the "Bruce Telescope Fund." It is further understood that all the plans, specifications and contracts for the instruments and building are to be approved by me in writing, and that all work is to be done under my supervision and to my entire satisfaction - after due consultation with Professor George E. Hale, the Director of the Yerkes.

Barnard

File

Book of  
Huslies

Yerkes





2

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

Observatory.

It is also requested that no announcement be made of this gift until the dedication of the Yerkes Observatory.

Miss Bruce is exceedingly interested in all departments of Astronomical work, as her large gifts to Observatories in this country and abroad so clearly prove. I am sure she would be greatly gratified and feel that the motive of her gift had been thoroughly appreciated by the University, if the seven thousand dollars which will be received from Mr. Rockefeller in fulfillment of his pledge, should be appropriated to the purpose of improving the equipment of the Yerkes Observatory.

Very Respectfully,

E. E. Barnard.

Ent 7/26 '97.  
Cash 92 and 105.



THE UNIVERSITY OF CHICAGO  
LIBRARY

TABLE 1000000  
RECEIVED 1000000

Chicago, Ill.

It is also agreed that no separate  
institute of the right will be  
founded.

The purpose of this institution is to  
provide a place for the study of  
the history and culture of the  
people of the world. It is to be  
a place where the people of the  
world may learn of each other  
and of their own people. It is to  
be a place where the people of the  
world may learn of the history and  
culture of the people of the world.  
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may learn of the history and culture  
of the people of the world. It is to  
be a place where the people of the  
world may learn of the history and  
culture of the people of the world.

Very respectfully,  
J. E. Brown

Oct 10 1892  
J. E. Brown



YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

1897, July 28<sup>th</sup>

Barnard

Botany Institute  
Board of Trustees  
20

Dr. W. R. Harper:

President,

the University of Chicago.

File under  
Barnard,

My dear Dr. Harper:

On the 26<sup>th</sup> inst. I left with Dr. Goodenow and Major Rust, a formal letter to you concerning a gift of seven thousand dollars to the University of Chicago from Miss Catherine W. Bruce of 810 Fifth Avenue New York City. This letter has doubtless by now been transmitted to you. I also left with these gentlemen a certificate of deposit for the seven thousand dollars - the original check having been made out in my name by Miss Bruce.

This money is given by Miss Bruce for the purchase of a photographic telescope and for the erection of a suitable observatory to contain it - the same to be placed on the grounds of the Yerkes Observatory.

I cannot properly express to you the importance of this gift. As you know, this Observatory is not equipped with any proper instrument for stellar photography within the past eight or ten years that form of telescope known as a doublet - with a lens of the portrait combination, has become one of the most accurate and powerful means of research in certain lines of Astronomy - such as the photography of comets, the Milky way, the larger nebulae, millions, etc. It was with



James Francis Wood, M.D., F.R.S.  
Library of the University of Cambridge

12 July 1872

(20)

Dear Mr. Wood,  
The University of Cambridge

has been very kind

to the extent of 2 lbs. with the following and

has been a favour to the University of Cambridge from

the University of Cambridge of 2 lbs. 5 1/2 lbs. and 1 lb.

has been a favour to the University of Cambridge from

the University of Cambridge of 2 lbs. 5 1/2 lbs. and 1 lb.

has been a favour to the University of Cambridge from

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YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

an instrument of this kind that a great deal of my most important work at the Lick Observatory was done - where I first put it to the special use indicated above. It was a ~~some~~ disappointment therefore to find that we had nothing of the kind with <sup>which</sup> to carry on this work at the Yerkes Observatory.

When I found that circumstances would prevent the Observatory having such a lens, I began a search for some one who would supply a fund for the purchase of ~~such~~ this instrument. For the past two years I have sought for some one to give such an instrument to the University, but only to meet with repeated discouragement.

At last in desperation I ~~wrote~~ asked Miss Bruce to give us the telescope. I had refrained from asking her before because I knew how much she had already given to astronomy and I was afraid it would be too great a tax upon her liberality to ask for any thing for this great Observatory which was supposed to have every instrument it could want.

To my great delight, Miss Bruce kindly forwarded to me a check for seven thousand dollars as I have stated above. This money is now in the hands of the University.

This generous gift will not only provide us with a first class and powerful instrument of the kind needed - one in every way worthy of the Yerkes Observatory - but it also furnishes means







YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

to build a suitable observatory for it, so that it will be complete in every way.

I personally feel the deepest gratitude to Miss Bruce, and I know that you will fully appreciate the practical interest this noble lady has shown in us and our work.

We shall at once find out the best means of constructing the instrument so that as little delay as possible ~~may~~ shall occur in establishing it in working order at Williams Bay.

I cannot recount to you all the individual gifts Miss Bruce has made in the interests of Astronomy. It is perhaps only necessary to state that the Harvard College Observatory, the Lick Observatory, the Dudley Observatory (Albany, N.Y.), the Observatory at the University at Cambridge, England, the Observatory at Heidelberg, Germany, and many other places in America and Europe, are indebted to her for some of their most important instruments, to show how wide is the interest she has taken in the work of Astronomers.

I am sure, every Astronomer will feel







4

YERKES OBSERVATORY, UNIVERSITY OF CHICAGO  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

that it is an honor to the University of Chicago and to the Yerkes Observatory that Miss Bruce has contributed this instrument.

I would respectfully ask, ~~that~~ in commemoration of this generous gift and as a recognition of Miss Bruce's kindness, ~~that~~ that the instrument and its Observatory when completed shall be known as the "Bruce<sup>Actno</sup> Photographic Observatory."

In conclusion, I need scarcely tell you that Professor Hale is in hearty sympathy with the sentiments I have expressed.

I should feel very grateful if you would personally acknowledge to Miss Bruce the receipt of the ~~money~~ gift.

Very Sincerely,

E. E. Barnard.



James (James) W. Brown  
Brown, James W.

James W. Brown  
Brown, James W.

that it is an honor to the University of  
Chicago and the State's character that  
Miss Brown has contributed the monument.  
I would respectfully ask that in  
commemoration of this generous gift and  
as a recognition of Miss Brown's kindness,  
that the monument and its inscription  
when completed shall be known as the  
"Brown Monument".

In conclusion, I would say to you  
that Professor Hale is in hearty sympathy  
with the sentiment of our expression.

I should feel very grateful if you would  
personally acknowledge to Miss Brown the  
receipt of the monument.

Yours sincerely,  
J. W. Brown

J. W. Brown



Yerkes' Observatory.

William's Bay, Barnard

Wisconsin.

My dear Dr. Harper:

Oct. 897 August 11

I know you would be pleased that

Miss Bruce had taken such a practical interest in us.

She is an elderly lady and is in very feeble health. My main object in accepting an invitation to lecture at Vassar College and at Pittsburgh, in January last, was that it would enable me to visit New York City, as I was anxious to see Miss Bruce on the subject of a portrait lens. When I called, I found her in such feeble health I did not have the heart to bring up the subject further than the intimate indirectly that we were in need of instruments, and I did not mention even this to her but to her sister. I was told that I was the first one to be permitted to see her in a great while on account of her enfeebled condition, and that only one or two outsiders persons had seen her in several years. It made my heart ache to see how feeble she was, and I thought it would be heartless to mention money in her presence. The sister, who is also elderly, was very kind to me. It was only about a month ago that I finally wrote to Miss Bruce as there seemed no prospect of help elsewhere.

My expenses to New York and back were paid by Vassar College and Pittsburgh — my expenses alone were charged. There is therefore nothing for the University to pay me back. I thank you sincerely for your kindness in thinking of my expenses — it shows your kindness of heart.  
Very sincerely, E. E. Barnard







REPORT OF THE DIRECTOR OF THE YERKES OBSERVATORY FOR THE THREE MONTHS  
ENDING OCTOBER 31, 1897.

Condition of the Buildings.

*Filed  
Reports  
Hale*

Great Dome. When the last report was written the rising floor seemed to be nearly completed and it was hoped that work with the large telescope could soon be undertaken. In the second week of August the floor was declared to be ready for use; but as soon as it was tried it was found that more work had to be done. It was hoped, however, that the floor could be left at some fairly convenient height and the telescope used on certain objects of suitable altitude. On August 12th the dome was moved for the first time since the accident to the floor, and it was found that many of the wheels had been forced so far over on the track that there was danger of their actually running off. When the dome was moved the whole building was set into vibration, which could be felt in the Secretary's office. It was thus impossible to use either the dome or floor during the month of August. As it was wished, however, to make all possible use of the telescope, observations were commenced on August 13th with the dome and floor fixed. Thus only such objects as crossed the observing slit could be seen.

Meanwhile, the changes reported necessary by Mr. Potis were being made in the towers and cable fastenings of the rising floor. The bolts which had been used to hold the towers together were replaced by rivets. After considerable delay new guide wheels were received for the dome, and placed opposite the old ones with their edges bearing against the inside of the track. The dome and floor were ready for use about the middle of September. The temporary motor loaned by the Sie-



REPORT OF THE DIRECTOR OF THE YERKES OBSERVATORY FOR THE THREE MONTHS

ENDING OCTOBER 31, 1907.

Condition of the Buildings.

*Final Report*  
*Wells*

Great Dome. When the last report was written the rising floor seemed to be nearly completed and it was hoped that work with the large telescope would soon be undertaken. In the second week of August the floor was declared to be ready for use; but as soon as it was tried it was found that more work had to be done. It was hoped, however, that the floor could be left at some fairly convenient height and the telescope used on certain objects of suitable altitude. On August 12th the dome was moved for the first time since the accident to the floor, and it was found that many of the wheels had been forced so far over on the track that there was danger of their actually running off. When the dome was moved the whole building was set into vibration, which could be felt in the Secretary's office. It was then impossible to use either the dome or floor during the month of August. As it was wished, however, to make all possible use of the telescope, observations were commenced on August 12th with the dome and floor fixed. Thus only such objects as crossed the observing slit could be seen.

Meanwhile, the changes required necessary by Mr. Fiske were being made in the towers and cable connections of the rising floor. The bolts which had been used to hold the towers together were replaced by rivets. After considerable delay new guide wheels were received for the dome, and placed opposite the old ones with their edges bearing against the inside of the track. The dome and floor were ready for use about the middle of September. The temporary motor loaned by the St.

2.

mens & Halske Company was again put in position by our own mechanics and after that time observational work with the large telescope was carried on regularly. In the latter part of September<sup>the</sup> work of installing the permanent motors was undertaken by the Siemens & Halske Company, and early in October these were ready for use. The starting boxes were placed on the rising floor just north of the telescope column, where they are very conveniently situated. The operation of the motors is very satisfactory except that the speed of both the dome and floor is too great. This will have to be changed by Messrs. Warner & Swasey. As at present arranged the dome continues to move a long distance after the current has been cut off. At the date of writing the elevator safety catch recommended by Mr. Potis for the rising floor has not been put in place.

Various repairs to the skylight, etc., have been made by Messrs. Angus & Gindele.

Southeast Tower. A 30-foot dome with observing slit five feet wide was erected by Warner & Swasey on this tower during the months of September and October.

#### RESEARCH WORK OF MEMBERS OF THE STAFF AND STUDENTS.

40-inch Telescope. The telescope was used for the first time since the accident to the floor on August 13th. As the star spectroscope could not be attached at that time the principal observations during August were made by Professor Barnard. In August and September he discovered some twenty very faint nebulae and four or five close and difficult double stars. He also determined the value of the micrometer~~to~~ screw



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ly catch recommended by Mr. Peile for the rising floor has not been put  
in place.

Various repairs to the skylight, etc., have been made by  
Messrs. Angus & Lindbergh.  
Southeast Tower. A 50-foot dome with observing slit five feet wide was  
erected by Warner & Swasey on this tower during the months of September  
and October.

RESEARCH WORK OF MEMBERS OF THE STAFF AND STUDENTS.  
40-inch Telescope. The telescope was used for the first time since the  
accident to the floor on August 13th. As the star spectroscopes could  
not be attached at that time the optical observations during August  
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double stars. He also determined the value of the micrometer screw

3.

from repeated measures of the difference in declination of Atlas and Pleione. The close agreement of the measures made on successive nights demonstrated in a most satisfactory way the advantages which may be expected from the use of the 40-inch telescope in parallax work and similar observations. On several nights in September the seeing was particularly good, and on one occasion it was found possible to use with advantage the highest eyepiece supplied with the telescope, which gives a power of 3750. Under this power the spurious disks were round and well defined. No better proof of the excellence of the great object glass could be desired. Professor Burnham commenced his work in September, and on one of his first nights observed the very close and difficult star  $\kappa$  Pegasi. Although the components at that time were less than  $0''.4$  apart and consequently below the theoretical resolving power of the telescope, the spurious disk was seen to be elliptical in form under a power of 2100. Other close double stars were examined with equally satisfactory results. Professors Barnard and Burnham made a large number of measures of such objects. Professor Barnard also made a series of measures of the dimensions of certain planetary nebulae, the distance of the satellite of Neptune from the planet, etc. He was able to see Hind's remarkable variable nebula in Taurus, which was invisible with the Lick telescope when he last looked for it at Mt. Hamilton. A supposed new star in the nebula of Orion announced by Professor Leavenworth, of the University of Minnesota, was looked up by Professor Barnard, but no object as bright as the fourteenth magnitude was seen in this position. Subsequently Professor Leavenworth published a note that the object was no longer visible on his photographs and was proba-

*disturb*



from repeated measures of the difference in declination of Atlas and  
Polaris. The close agreement of the measures made on successive nights  
demonstrated in a most satisfactory way the advantage which may be ex-  
pected from the use of the 40-inch telescope in parallel work and simi-  
lar observations. On several nights in September the seeing was par-  
ticularly good, and on one occasion it was found possible to use with  
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enworth of the University of Minnesota, was looked up by Professor  
Barnard, but no object as bright as the fourteenth magnitude was seen  
in this position. Subsequently Professor Leavenworth published a note  
that the object was no longer visible on his photographs and was prob-

bly due to some variable condensation in the nebula.

Early in September stellar spectrographic work was taken up by the Director and Mr. Ellerman with the 40-inch telescope. Photographs of the spectra of several stars were made, partly for use in determining the color curve of the object glass. Later the Director found it necessary to give up the greater part of this work in order to concentrate his attention upon solar investigations and also upon the preparations for the dedication of the Observatory.

On September 14th the old solar spectroscope of the Kenwood Observatory was attached to the 40-inch telescope, and the first observations of the spectrum of the chromosphere with this instrument were made. It was immediately seen that a large number of bright lines not ordinarily visible with smaller instruments could be observed whenever the seeing was fairly good. Observations of the spectrum of the chromosphere were made on several other days during the month, and numerous bright lines were recorded. On September 29th the green fluting of carbon was found for the first time in the spectrum of the chromosphere. The seeing was so good that the form of the chromosphere was well defined with a power as high as 600. M. Deslandres, of the Paris Observatory, was present at the time and confirmed the observation of the carbon fluting. Several photographs of the spectrum were taken.

12-inch Kenwood Telescope. This instrument has been regularly used for micrometric work by Professor Barnard.

Star Camera. Professor Barnard has obtained numerous photographs with this instrument of both stars and nebulae. He also obtained two photographs of a meteor.



ly due to some visible condensation in the nebula.

Early in September stellar spectrographic work was taken up by the Director and Mr. Ellerman with the 40-inch telescope. Photographs of the spectra of several stars were made, partly for use in determining the color curve of the object glass. Later the Director found it necessary to give up the greater part of this work in order to concentrate his attention upon solar investigations and also upon the preparations for the dedication of the Observatory.

On September 14th the old solar spectrograph of the Lick Observatory was attached to the 40-inch telescope, and the first observations of the spectrum of the chromosphere with this instrument were made. It was immediately seen that a large number of bright lines not ordinarily visible with smaller instruments could be observed whenever the seeing was fairly good. Observations of the spectrum of the chromosphere were made on several other days during the month, and numerous bright lines were recorded. On September 20th the green tinting of carbon was found for the first time in the spectrum of the chromosphere. The seeing was so good that the form of the chromosphere was well defined with a power as high as 600. M. Deslandres, of the Paris Observatory, was present at the time and confirmed the observation of the carbon tinting. Several photographs of the spectrum were taken.

18-inch Lick Telescope. This instrument has been regularly used for meteorologic work by Professor Barnard. Star Spectra. Professor Barnard has obtained numerous photographs with this instrument of both stars and nebulae. He also obtained two photographs of a meteor.

5.

Meridian Room. Mr. Ellerman has made regular time observations with the small universal instrument belonging at the University. He has fastened to the wall in the northeast corridor the sidereal clock which belonged to the Kenwood Observatory and the mean time clock presented to the Yerkes Observatory by Mr. Behr. These clocks have been kept running and their rate has been determined by Mr. Ellerman's observations. Unfortunately, it became necessary to return the universal instrument to the University in October, so that we no longer have any means of determining time. As the Trustees did not think it advisable to spend the greater part of the equipment fund for a transit instrument, it has become necessary to get our time from the telegraph station at Williams Bay. This is of course very unsatisfactory, and every effort should be made to procure a suitable transit instrument at the earliest opportunity.

Computing Room. Many of the measures of the peculiar photograph of the solar spectrum mentioned in the last report have been reduced.

Theoretical Investigations. Professor Wadsworth has continued his important theoretical investigations on astronomical photography, etc.

Spectroscopic Laboratory. The interferometer made by Mr. Mors for the ruling machine has been set up in the spectroscopic laboratory and will soon be employed by Professor Wadsworth for work in the infra-red spectrum.

Concave Grating Room. The mounting of the concave grating has been completed and partly adjusted.

Physical Laboratory. A large spectrometer has been fitted and used with the 5-inch flat grating, in connection with Professor Crew's demonstration of the rotating arc at the time of the conferences.



Horizon Room. Mr. Milner has made regular time observations with the  
small universal instrument belonging at the University. He has been  
ed to the wall in the northeast corner the sidereal clock which belong-  
ed to the Kenwood Observatory and the mean time clock presented to the  
Yerkes Observatory by Mr. Behr. These clocks have been kept running  
and their rate has been determined by Mr. Milner's observations. Un-  
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made to procure a suitable transit instrument at the earliest opportunity.  
Longitude Room. Many of the measures of the geodetic photograph of  
the solar spectrum mentioned in the last report have been reduced.  
Theoretical Investigations. Professor Wadsworth has continued his im-  
portant theoretical investigations on astronomical photography, etc.  
Spectroscopic Laboratory. The information made by Mr. Hale for the  
ruling machine has been set up in the spectroscopic laboratory and will  
soon be employed by Professor Wadsworth for work in the infra-red spec-  
trum.  
Concave Grating Room. The mounting of the concave grating has been com-  
pleted and partly adjusted.  
Physical Laboratory. A large spectrometer has been fitted and used  
with the 5-inch flat grating, in connection with Professor Hale's de-  
monstration of the rotating arc at the time of the conference.

## WORK OF THE OPTICAL SHOP.

The large grinding machine was completed and set in motion about the middle of October. The work of grinding the 5-foot disk will be undertaken by Mr. Ritchey immediately.

## WORK OF THE INSTRUMENT SHOP.

The principal work of the shop has been as follows:

Mr. Lorenz spent several weeks in Chicago at the shop of the Standard Elevator Company, where he was engaged in finishing the larger parts of the grinding machine, which were too large to finish on our machine tools. He has also completed the mounting for the concave grating and done considerable work on the large spectroscope used for Professor Crew's demonstrations.

Mr. Kers has completed the interferometer for the ruling machine, planed the bed and carriage, and is at present at work on the large nut for grinding the screw.

Mr. Kathan was engaged in September for special work. He has remodelled the solar spectroscope of the Kenwood Observatory for use with the 40-inch telescope, and completed the parts necessary to permit its use as a spectroheliograph. He has also made a new sliding plate holder for the stellar spectrograph.

The large observing chair for use with the 40-inch telescope was completed and put in good working order.

Work was begun on carriages for the solar spectroscope and stellar spectrograph.

The large induction coil was mounted on rolling castors.



# WORK OF THE OPTICAL SHOP.

The large grinding machine was completed and set in motion about the middle of October. The work of grinding the 8-foot disk will be undertaken by Mr. Ritchey immediately.

## WORK OF THE INSTRUMENT SHOP.

The principal work of the shop has been as follows:

Mr. Loomis spent several weeks in Chicago at the shop of the Standard Elevator Company, where he was engaged in finishing the larger parts of the grinding machine, which were too large to finish at our machine tools. He has also completed the mounting for the concave grating and done considerable work on the large spectroscopes used for Fraunhofer lines' observations.

Mr. Loomis has completed the instrument for the ruling machine, ground the bed and carriage, and is at present at work on the large nut for grinding the screw.

Mr. Nathan was engaged in September for special work. He has re-adjusted the solar spectrograph of the Harvard Observatory for use with the 40-inch telescope, and completed the parts necessary to permit its use as a photoheliograph. He has also made a new sliding plate holder for the smaller spectrograph.

The large observing chair for use with the 40-inch telescope was completed and put in good working order.

Work has begun on a spectrograph for the solar spectroscopy and stellar spectroscopy.

The large induction coil was mounted on rolling supports.

## PUBLICATIONS OF MEMBERS OF THE STAFF.

- George E. Hale, The Yerkes Observatory of the University of Chicago, Bulletin No. 3. Astrophysical Journal, October 1897.
- " " " On the Presence of Carbon in the Solar Chromosphere Astrophysical Journal, November, 1897.
- " " " Note on the Level of Sunspots. Astrophysical Journal, November 1897.
- " " " The Aim of the Yerkes Observatory. Address delivered at the conferences held in connection with the dedication, October 18, 1897. Astrophysical Journal, November 1897.
- E. W. Barnard, On the Companions to Vega. Astronomical Journal, October 6, 1897.
- " " " On the Photography of Meteors. Popular Astronomy, October 1897.
- " " " A Micrometrical Determination of the Dimensions of the Planets and Satellites of the Solar System, made with the 36-inch Refractor of the Lick Observatory. Popular Astronomy, October 1897.
- " " " Photograph of an August Meteor. Astronomical Journal, Sept. 14, 1897.
- " " " The Great Nebula of Rho Ophiuchi and the Smallness of the Stars forming the Ground Work of the Milky Way. Popular Astronomy, September 1897.
- " " " Observations of the Partial Solar Eclipse of 1897, July 29. Astronomical Journal, August A4, 1897.
- F. L. G. Wadsworth, ~~A Comparison of the Photographic and of the Hand and Eye Methods of Delineating the Surface Markings of Celestial Objects. Popular Astronomy, Aug. 1897.~~ (An Astr. Report.)
- " " " On the Effect of the Size of an Objective on the Visibility of Linear Markings of the Planets. Astronomical Journal, October 6, 1897.
- " " " On the Conditions which Determine the Limiting Time of Exposure of Photographic Plates in Astronomical Photography. Astronomische Nachrichten, Aug. 7, 1897.



PUBLICATIONS OF MEMBERS OF THE STAFF.

George H. Hale.

The Yerkes Observatory of the University of Chicago.  
No. Bulletin No. 3. Astrophysical Journal, October  
1907.

" " "

On the Presence of Carbon in the Solar Chromosphere.  
Astrophysical Journal, November, 1907.

" " "

Note on the Level of Emission. Astrophysical Jour-  
nal, November 1907.

" " "

The Air of the Yerkes Observatory. Address deliv-  
ered at the conference held in connection with the  
dedication, October 10, 1907. Astrophysical Jour-  
nal, November 1907.

E. H. Barnard.

" " "

On the Composition of Venus. Astronomical Journal,  
October 6, 1907.

" " "

On the Photography of Mars. Popular Astronomy,  
October 1907.

" " "

A Historical Determination of the Dimensions of  
the Planets and Satellites of the Solar System, made  
with the 36-inch Refractor of the Lick Observatory.  
Popular Astronomy, October 1907.

" " "

Photograph of an Ancient Nebula. Astronomical Jour-  
nal, Sept. 16, 1907.

" " "

The Great Nebula of the Orionid and the Smallness  
of the Stars forming the Great Work of the Milky  
Way. Popular Astronomy, September 1907.

" " "

Observations of the Partial Solar Eclipse of 1907,  
July 20. Astronomical Journal, August 14, 1907.

T. L. C. Underwood.

" " "

On the Effect of the Size of an Object on the  
Visibility of Linear Features of the Planets. As-  
tronomical Journal, October 6, 1907.

" " "

On the Conditions which Determine the Limiting Time  
of Exposure of Photographic Plates in Astronomical  
Photography. Astronomische Nachrichten, Aug. 7, 1907.

- F. L. O. Wadsworth, The Determinations of the Specific Resistance and Temperature Coefficient of Oil in thin Films, and the Application of the Results to the Measurements of the Thickness of the Oil Film in Journal Boxes. *Physical Review*, August 1897.
- " " " " On the Photography of Planetary Surfaces, *Observatory*, September, October and November, 1897.
- " " " " On the Reduction of Observations. *Observatory*, October 1897.
- " " " " Astronomical Photography. *Knowledge*, August and September, 1897.
- " " " " Sur le pouvoir séparateur des lunettes et des spectroscopes pour des raies de largeur finie. *Journal de Physique*, August 1897.
- " " " " Conditions required for Attaining Maximum Accuracy in the Determination of Specific Heat by the Method of Mixtures. *American Journal of Science*, October 1897.

#### Miscellaneous.

Conferences and Dedication. A report on the conferences and dedication, together with some of the addresses delivered on these occasions will be found in the November number of the *Astrophysical Journal*.

Resignation of Mr. Wilhoit. Late in September Mr. Wilhoit, who had given admirable satisfaction as janitor, resigned his position in order to continue his studies at the Armour Institute. Mr. Wolff has been appointed janitor in his place.

Appointment of Mr. Gray. Mr. Gray arrived at the Observatory September 18th to undertake the duties of night engineer.

Visitors. Many scientific visitors were received at the Observatory in addition to those who came at the time of the conferences. Professor Schuster, of Manchester, England, and M. Deslandres, of the Paris



|                               |   |
|-------------------------------|---|
| Physical Review, August 1897. | The Determination of the Specific Resistance and Temperature Coefficient of Oil in Thin Films, and the Application of the Results to the Measurement of the Thickness of the Oil Film in Journal Boxes. |
| Physical Review, August 1897. | On the Photography of Planetary Surfaces. Observations, September, October and November, 1897.  |
| Physical Review, August 1897. | On the Reduction of Observations. Observations, October 1897.   |
| Physical Review, August 1897. | Astronomical Photography. Knowledge, August and September, 1897.  |
| Physical Review, August 1897. | Sur la nouvelle expérience de l'insolation et des espaces tropiques pour la détermination de l'angle de l'axe de la Terre. Journal de Physique, August 1897.  |
| Physical Review, August 1897. | Contribution nouvelle pour l'attribution de l'axe de la Terre à la détermination de l'angle de l'axe de la Terre. Journal de Physique, August 1897.   |

Miscellaneous.

Conferences and Discussions. A report on the conferences and discussions held, together with some of the addresses delivered on these occasions will be found in the November number of the Astrophysical Journal.

Resignation of Mr. White. Late in September Mr. White, who was given admirable satisfaction as janitor, resigned his position in order to continue his studies at the Army Institute. Mr. White has been appointed janitor in his place.

Appointment of Mr. Gray. Mr. Gray arrived at the Observatory September 15th to undertake the duties of night assistant.

Visitors. Many scientific visitors were welcomed at the Observatory in addition to those who came at the time of the conferences. Prof. von Helmholtz, of Hannover, Knyrka, and M. Babinet, of the Paris

3.

Observatory, who spent several days at the Observatory and made observations with the large telescope, should be mentioned among them. Professor Colton, formerly of the Lick Observatory, and Professor Leuschner, of the University of California, also visited us. Dr. Wilczynski spent several weeks at the Observatory and carried on some solar and stellar work. Mr. Lyon, of the Detroit Observatory, University of Michigan, has been here for several weeks.

Absence of the Director. In the latter part of August the Director was absent a week in Toronto, attending the meeting of the British Association for the Advancement of Science.

Subscriptions for new spectroheliograph. Mr. W. E. Hale, Mr. Martin A. Ryerson and Mr. E. E. Ayer have each offered to give \$250 toward the construction of a spectroheliograph for the 40-inch telescope.

Nov. 4, 1897.

George E. Hale  
Director



Observatory, who spent several days at the Observatory and made obser-  
vations with the large telescope, should be mentioned among them.  
Professor Gifford, formerly of the high Observatory, and Professor  
Lambert, of the University of California, also visited us. Dr.  
Willschroder spent several weeks at the Observatory and carried on some  
star and stellar work. Mr. Lyon, of the Detroit Observatory, Univer-  
sity of Michigan, has been here for several weeks.  
Abstract of the Director. In the latter part of August the Director  
was absent a week in Toronto, attending the meeting of the British As-  
sociation for the Advancement of Science.  
Investigation for the spectrograph. Mr. W. E. Hale, Mr. Martin  
A. Ryerson and Mr. E. E. Lyon have each offered to give \$250 toward the  
purchase of a spectrograph for the 40-inch telescope.

Chas. F. Johnson  
Director

Nov. 4, 1892.

REUBEN G THWAITES,  
Secretary  
ISAAC S. BRADLEY,  
Librarian.

THE STATE HISTORICAL SOCIETY OF WISCONSIN  
MADISON.

Butler

Nov. 4, '97

Yerkes  
President - Harper.

Sir:

(do)

It is possible that in publishing the proceedings at the opening of the Yerkes Observatory you may wish to print the Prayer. I therefore take the liberty to write down for you the words it was my purpose to use, and which I did use in substance - except such omissions as were filly suggested by you.

!!  
In spite of clouds and cold we all felt that "such a day, so fought, so followed, and so fairly won, came not till now to dignify the times since Caesar's fortunes."

I said to Prof. Hale. You are happier than Plato. When Plato was asked where will your ideal republic be realized? he looked upward and answered, "In Heaven". But your ideal you behold becoming actual here and now in the midst of your best years.

Respectfully yours,  
James D. Butler.



Nov. 4, '97

President - Harpner.

Sir,

It is possible that in publishing the proceedings of the meeting of the  
 Yarker Observatory you may wish to print  
 the Oregon. I therefore take the liberty to  
 write down for you the words it was  
 my purpose to use, and which I did use  
 in substance - except such omissions as  
 were felt suggested by you.

In spite of clouds and cold we

all felt that "such a day,  
 so bright, so favorable, and so fairly warm,  
 came not all year to dignify the times  
 since Caesar's fortunes."

I said to Prof. Hall: "You are happy  
 on that date. When that was asked where will your  
 ideal republic be realized? He looked upward  
 and answered, "In Heaven." But your ideal  
 you behold hovering actual here and now  
 in the midst of your best years.

Respectfully,  
 James B. Boutwell.

*Hale*

Yerkes Observatory, University of Chicago,

Williams Bay, Wis.,

Nov. 10, 1897.

President W. R. Harper,

University of Chicago,

Chicago.

Dear Dr. Harper,-

For some time past Mr. A. C. Behr, 1303 Jackson Boul., Chicago, has been considering the idea of making some gift to the Observatory. Last spring he proposed to get for Professor Barnard a portrait lens, and would probably have done so had it not been for Miss Bruce's gift, which was larger than he had in mind. Recently he has been proposing to sell us some small instruments and to return part of the money as a gift to the University. I enclose a copy of a letter just received from him, which explains the situation as it exists at present. Some of the instruments are not very valuable, but the telescope would be very useful for Dr. Laves' purposes at the University. We have been endeavoring for a long time to provide Dr. Laves with a suitable equipment, for he is very greatly in need of one. Mr. Behr's proposition as it now stands is not one that we would do well to accept. In case we had the thousand dollars we could invest it to better advantage in some other way. Unless he changes the proposition I think it best for us to build a small telescope for Dr. Laves in our own shop, and put the small dome on the campus in good order. At present there is no special difficulty about doing this except in providing a suitable ob-



File

Yerkes Observatory, University of Chicago.

William Bay, Wis.

Nov. 10, 1907.



Professor W. A. Huggins,

University of Chicago,

Chicago.

Dear Mr. Huggins:-

For some time past Mr. A. G. Behr, 1503 Jackson Blvd., Chicago, has been considering the idea of making some gift to the Observatory. Last spring he proposed to get for Professor Barnard a portrait frame, and would probably have done so had it not been for Miss Birney's gift. When the latter was made known, however, he has been hesitating to call us some small instrument and to return part of the money as a gift to the University. I enclose a copy of a letter just received from him, which explains the situation as it exists at present. Some of the instruments are not very valuable, but the telescope would be very useful for Dr. Lavan's purposes at the University. We have been endeavoring for a long time to provide Dr. Lavan with a suitable equipment, for he is very greatly in need of one. Mr. Behr's proposition as it now stands is not one that we would be well to accept. In case we had the thousand dollars we could invest it in better advantage in some other way. Unless he changes the proposition I think it best for us to build a small telescope for Dr. Lavan in our own shop, and put the small home on the ground in good order. At present there is no special difficulty about doing this except in providing a suitable ob-

Dr. Harper, 2.

ject glass for the telescope, which would cost about \$350. I understand from Mr. Behr's letter that his proposal to make a gift to the Observatory of a comet seeker is conditional upon our paying him \$1500 for his equipment. As the comet seeker would probably not cost over \$500 I do not advise that this be done. The sextant Dr. Laves already has, and the chronometer we are going to test at the Observatory soon. If it turns out to be a good one it would be well worth our while to invest \$150 of our equipment fund in these two instruments, as they are worth much more than this. Mr. Behr has recently given to the Observatory a fairly good astronomical clock.

It seems to me that if you could see him you might induce him to give the whole outfit to the University. I have proposed this to him, but I think your persuasive powers could go further than mine. Unless you think it worth while to take up the matter, I think the Observatory will do best to take no further action regarding it except to purchase the chronometer <sup>and sextant.</sup>. Please be kind enough to inform me at once when and where you could see Mr. Behr. I should add that his means are very limited, and it is a great credit to him that he is willing to make any gifts to the Observatory. We do not seriously need the dome which he proposes to furnish, as the one on the campus can be put in good repair for less than it would cost to move the other one. I believe, however, that the dome and building which Mr. Behr has is much better than the one on the campus.

Very truly yours,

George E. Hale



Mr. Harp, A.

foot glass for the telescope, which would cost about \$250. I under-  
stand from Mr. Behr's letter that his proposal to make a gift to the  
observatory of a comet seeker is conditional upon my paying him \$1500  
for his equipment. As the comet seeker would probably not cost over  
\$500 I do not advise that this be done. The next Mr. Langer already  
has, and the observatory is now going to look at the observatory soon.  
It is true that to be a good one it would be well worth our while to  
invest \$150 of our equipment fund in these two instruments, as they are  
worth much more than this. Mr. Behr has recently given to the obser-  
vatory a fairly good astronomical clock.

It seems to me that if you could see him you might induce him  
to give the whole outfit to the University. I have proposed this to  
him, but I think your persuasive powers could do better than mine.  
Unless you think it worth while to take up the matter, I think the ob-  
servatory will do best to take no further action regarding it except  
to purchase the chronometer. <sup>substant</sup> Please be kind enough to inform me as  
soon as you can where you could see Mr. Behr. I should add that his means  
are very limited, and it is a great credit to him that he is willing to  
make any gift to the observatory. We do not seriously need the clock  
which he proposes to furnish, as the one on the campus can be put in  
good repair for less than it would cost to move the other one. I be-  
lieve, however, that the clock and building which Mr. Behr has is much  
better than the one on the campus.

Very truly yours,

Harvey E. Langer

C O P Y .

Chicago, Nov. 7, 1897.

Professor G. E. Hale,

I regret very much of having been unable to reply before to-day.

While it is a great honor to have ones name connected with the University of Chicago, I feel that if accepted, it would at some future time embarrass them in obtaining something much more valuable than I could hope to give. I am obliged to move the observatory to the Wesleyan grounds if not sold, for they are unable to do so; to move it, build a foundation and connect it with their observatory will cost me over \$150.

As the dome is useless to me otherwise, I have decided to sell the entire equipment at a figure that will prove a great bargain. For the 6 1-2", transit, altaximuth, comet seeker and dividing machine and dome I have asked \$1500; for the sextant and chronometer \$150 extra.

If you know of any one who would purchase the instruments for the University I will let them go at \$1,000, exclusive of the observatory, the balance \$650 and the cost of moving the dome \$150, I will donate to the University of Chicago.

If you know of any one contemplating such a purchase I will be glad to call on them and make terms that will prove satisfactory. At 1680 including chronometer and sextant or \$1500 without , I would furnish a 5 1-2 or 6-inch comet seeker if you prefer; this is needed, so I am informed.

Under the circumstances I feel that the above is about the best ~~in~~ that can be done, but if you can suggest anything different I will try to meet it, assuring you that no one else has a higher regard for the Yerkes Observatory and its splendid staff. If you decide not to take the equipment or a buyer can not be found, kindly return the sextant, comet telescope and transit by the 15th, as I am negotiating with parties in Iowa about the outfit.

Very truly yours,

(Signed) A. C. Behr.

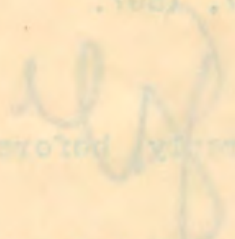
1303 Jackson, Boul  
Chicago:



COPY

Chicago, Nov. 7, 1937

Professor C. E. Hoyle



I regret very much of having been unable to reply before to-

day.

There is a great honor to have one name connected with the University of Chicago. I feel that it is accepted. It would at some future time represent them in obtaining something much more valuable than I could hope to give. I am obliged to have the observatory to the Western Group. It is not sold, but they are unable to do so; to move it, build a foundation and connect it with their observatory will cost me over \$150.

As the time is passing so as otherwise, I have decided to sell the entire equipment of a telescope that will prove a great bargain. For the 4 1/2", 8" and 10" telescopes, about \$100 each and the 4 1/2" and 8" telescopes \$150 each. Some I have asked \$100; for the sextant and chronometer \$150 each. If you know of any one who would purchase the instruments for the University I will let them go at \$1,000, exclusive of the observatory, the balance \$850 and the cost of moving the same \$150. I will

donate to the University of Chicago. If you know of any one contemplating such a purchase I will be glad to call on them and make terms that will prove satisfactory. At \$100 including chronometer and sextant of \$150 each, I would furnish a 3 1/2" or 4 1/2" telescope to you gratis; this is needed, as I am informed. Under the circumstances I feel that the above is about the best that can be done, but if you can suggest anything different I will try to meet it, assuming you that no one else has a higher regard for the Yerkes Observatory and its affiliated staff. If you decide not to take the equipment as a buyer can not be found, kindly return the sextant, chronometer and sextant by the 15th, as I am negotiating with parties in Iowa about the outfit.

Very truly yours,  
(Signed) A. D. Holt  
1505 Jackson Blvd.  
Chicago

OFFICE OF  
WILLIAM E. HALE,  
RELIANCE BUILDING,  
100 STATE STREET,  
CHICAGO.

*Hale*  
Chicago, Nov. 24th, 1897

*Yerkes*  
President W. R. Harper,  
University of Chicago, City

My dear Sir:-

In conversation with George on Sunday after he saw you, he told me of his disappointment in finding it seemed to you impossible to think of getting money from the University funds to employ Prof. Keeler; and that you had proposed to ask Mr. Yerkes for sixty-thousand dollars to endow this professorship, and thus secure Prof. Keeler's services.

It occurs to me that a request of this kind at the present time might imperil the good prospect, which I think you have, of securing from Mr. Yerkes some time within the next three or four years, when he may be especially prosperous, a sufficient sum to endow the Observatory fully.

Would it not be wiser to ask him for three-thousand dollars per year for five years, which he would very likely consider a bagatelle, and rely upon the future to provide the necessary endowment?

Please pardon these suggestions, but I am so much interested in the future work which the Observatory ought to do that I have taken the liberty of making them to you, whose wisdom in such matters is proverbial.

Very truly yours,

*W. E. Hale*



Office of  
William E. Hall  
Reference Building  
100 State Street  
Chicago

Chicago, Nov. 24th, 1897

President W. E. Hall,  
University of Chicago, City

My dear Sir:-

In conversation with George on Sunday after he saw you, he told me of his disappointment in finding it seemed to you impossible to think of getting money from the University funds to employ Prof. Keeler; and that you had proposed to ask Mr. Yerkes for sixty-thousand dollars to endow this professorship, and thus secure Prof. Keeler's services. It occurs to me that a request of this kind at the present time might imperil the good prospect, which I think you have, of securing from Mr. Yerkes some time within the next three or four years, when he may be especially prosperous, a sufficient sum to endow the Observatory fully. Would it not be wiser to ask him for three-thousand dollars per year for five years, which he would very likely consider a bagatelle, and rely upon the future to provide the necessary endowment? Please pardon these suggestions, but I am so much interested in the future work which the Observatory ought to do that I have taken the liberty of making them to you, whose wisdom in such matters is proverbial.

Very truly yours,

W. E. Hall

Hale

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

Brooklyn, Jan. 15, 1898.  
~~WILLIAMS BAY, WISCONSIN~~

JK

Dear Dr. Harker,

I saw Mr. Gates this morning and found that he entirely misunderstood the terms on which it was proposed to give Keeler a "permanent" appointment. He supposed that Keeler would not take the place unless its permanence for all future time were granted to him, thus making the professorship different from any other in the University. When I replied that by a "permanent" appointment I meant nothing more or less than is meant when Associate and Full Professors are given "permanent" positions, he seemed to think that Mr. Rockefeller might consent to this arrangement. I am to obtain from Keeler a written statement of the terms on which he would accept the position and present it to you. If you will then report them to Mr. Gates he will consult Mr. Rockefeller. From what was said I have little doubt that permission will be given to make the appointment, not for a term of five years only, but for a term of five years after which the position will be on exactly the same footing as that of any other Professor of the same grade.

Very truly yours Geo. L. Hale



Vol. 1

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

Brooklyn, Jan. 11, 1897.

THE UNIVERSITY OF CHICAGO  
WILLIAM BAY WINGDORF  
CARE OF THE  
RECTOR

Dear Dr. Wingdorf,

I am sorry to hear that

you are unable to attend the meeting and  
it was proposed to give you a "permanent" office  
want. We suppose that you will be able to  
please under the circumstances for all future time  
we are grateful to you for the way in which you  
different from any other in the University. When  
I replied that by a "permanent" appointment I  
meant nothing more or less than a permanent  
position and that all professors are given permanent  
positions, he seemed to think that I had made a  
commitment to the University. I am to return from  
Kahn a visiting professor of the University in which  
I will accept the position and present to you. If  
you will then report to the Board as well as to  
the Rockefeller Foundation what we said I will be  
gratified to be given to make the appointment and for  
a term of five years only but for a term of five years after  
which the position will be open to the University and I  
the Professor of the same.



OK *Hale*  
*Lusk*  
Yerkes Observatory, University of Chicago,  
Williams Bay, Wisconsin.

February 8, 1898.

President W. R. Harper,  
University of Chicago,  
Chicago,

Dear Dr. Harper,-

*File*

Professor Wadsworth has recently received an offer of an important position of a scientific character, which is of so attractive a nature that I fear there is danger of our losing him. The salary attached to the position is so much larger than what he is now receiving that it cannot fail to be a strong inducement for him to accept the offer. Moreover, I was informed by the members of the Committee on the Observatory at Allegheny that in the event of Professor Keeler's leaving, the Directorship would almost certainly be offered to Professor Wadsworth. As Professor Keeler also told me that if Professor Wadsworth wished to leave the Yerkes Observatory he would recommend him for this position, there is no doubt that he can have the place if he wishes it. Professor Keeler, however, was quite as anxious as myself that we should be able to retain his services at the Yerkes Observatory, and I have done my best to convince Professor Wadsworth that he ought to stay here. He did not at first feel inclined to do so, but finally drew up the enclosed proposition, which he told me I might present to you if I cared to do so. The offer in Chicago is of such a nature that he could devote either the whole or a part of his time to the work.



Yerkes Observatory, University of Chicago.

William Bay, Wisconsin.

February 8, 1898.

President W. R. Harper,

University of Chicago,

Chicago,

Dear Dr. Harper,

Professor Wadsworth has recently received an offer of an important position of a scientific character, which is of no attractive nature that I fear there is danger of our losing him. The salary attached to the position is so much larger than what he is now receiving that it cannot fail to be a strong inducement for him to accept the offer. Moreover, I was informed by the members of the Committee on the Observatory at Allegheny that in the event of Professor Keeler's leaving, the Directorship would almost certainly be offered to Professor Wadsworth. As Professor Keeler also told me that if Professor Wadsworth wished to leave the Yerkes Observatory he would recommend him for this position, there is no doubt that he can have the place if he wishes it. Professor Keeler, however, was quite as anxious as myself that we should be able to retain his services at the Yerkes Observatory, and I have done my best to convince Professor Wadsworth that he ought to stay here. He did not at first feel inclined to do so, but finally threw up the enclosed proposition, which he told me I might present to you if I cared to do so. The offer in Chicago is of such a nature that he could devote either the whole or a part of his time to the work.



Dr. Harper, 2.

In case this proposition were accepted by the Board of Trustees he would live either at Williams Bay or at Chicago, dividing his time between the Observatory and the other work, in accordance with the terms stated.

I need hardly tell you that if we were to lose him altogether the Observatory would be most unfortunately situated. The work of providing the instruments necessary for our equipment, which is now going on so satisfactorily, would necessarily be almost completely stopped, for if Professor Wadsworth were not here to design the instruments and superintend their construction, it would probably not be desirable for us to employ more than one mechanician, instead of the three (paid in part by the University and in part from outside sources) who are now at work for us. The result would be that the large equipment of instruments which will be absolutely necessary to the success of the Observatory's work could not be obtained unless the Trustees were able to appropriate large sums of money for this purpose. I speak advisedly when I say that so far as I know it would be impossible to find a man who could satisfactorily take Professor Wadsworth's place in designing instruments and superintending their construction.

This of course refers to only one side, though a very important one, of Professor Wadsworth's services to the Observatory. The loss of his work as an investigator would be almost equally severe. I therefore recommend that the enclosed proposition be presented to the Trustees as soon as possible. I am in full accord with Professor Wadsworth in the proposals made in ~~in~~ each of its clauses, particularly in



Dr. Harper, S.

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OFFICE OF THE  
Clerk of the Circuit Court of the United States,  
NORTHERN DISTRICT OF ILLINOIS.

S. W. BURNHAM,  
Clerk.

MONADNOCK BUILDING.

CHICAGO,

May 25 1898

Return to Mr. H.

Dear Dr. Harper,


The Yerkes Obsy. and the great telescope are now in a condition for regular use, and the season has come when we can expect to accomplish something in the way of original work. I hope to do at least my full share of observing with the large refractor. I wish now to suggest the propriety on the part of the University of paying me something in the way of salary from this time on. So far it has been an outcome, and that I have been content with, but now I do not think the suggestion I have made will seem to you unreasonable or out of order. I can give two nights per week at the Observatory, and expect to do so, but no further time except the work which I can do in my office. I may say here that that amounts to a good deal, though it may <sup>not be</sup> abuse apparent. I do not ask to be put on the same footing pecuniarily with the others. This part of it I leave entirely to you.

Sincerely yours

S. W. Burnham



S. W. BURNHAM,  
Clerk.



831

CHICAGO

(a)

I do not wish to be put out the same footing  
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 I can give two nights per week at the Observatory, and  
 make will be to your convenience or out of order.



THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

*Hale*

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

May 5, 1893.

President W. R. Harper,  
University of Chicago,  
Chicago.

*File*  
*Hub*

Dear Dr. Harper,-

I now send a fuller statement of Professor Frost's academic record, which has reached me by letter since his telegram of Monday last.

"I graduated here (Dartmouth) in 1886 with the degree of B.A. and honors in Physics and Astronomy. In the next year I taught school part of the time and then went to Princeton and took the course in Practical Astronomy privately with Professor Young. For the three following years I was Instructor in Physics and Astronomy in the Scientific Department here. In 1890 I went to Germany and studied one semester at Strassburg. Thence I improved the chance of being Volontär at Potsdam. I had intended to return to Strassburg after six months and study for a degree, but Director Vogel offered me a position on the staff (with a small salary), and this opportunity seemed to me far more valuable than a degree. So I continued at Potsdam until June 1892. Then I was appointed here as Assistant Professor of Astronomy and Director of the Observatory for three years. For the past three years I have been Professor of Astronomy.

The degree of A. M. was given "in course" (after the reprehensible usage prevailing until more recent years) in 1889 by this College.



The University of Chicago

William Brewster

May 6, 1903.

James H. Brewster

William Brewster

James H. Brewster

President W. R. Harper,

University of Chicago,

Chicago.

Dear Mr. Harper:-

I now send a fuller statement of Professor Brewster's academic

record, which has reached me by letter since his telegram of Monday

last.

"I graduated here (Dartmouth) in 1883 with the degree of B.A.

and honors in Physics and Astronomy. In the next year I taught school

part of the time and then went to Princeton and to the summer in New

Princeton Astronomy privately with Professor Young. For the three fol-

lowing years I was Instructor in Physics and Astronomy in the Scientific

Department here. In 1886 I went to Germany and studied one semester

at Göttingen. Thence I improved the chance of being Volontär at Pots-

dam. I had intended to return to Strasbourg after six months and study

for a degree, but Director Vogel offered me a position on the staff

(with a small salary), and this opportunity seemed to me far more valu-

able than a degree. So I continued at Potsdam until June 1890. Then I

was appointed here as Assistant Professor of Astronomy and Director of

the Observatory for three years. For the past three years I have been

Professor of Astronomy.

The degree of A. M. was given "in absentia" before the regis-

tration board graduating until more recent years) in 1885 by this col-

lege.

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

Dr. Harper, 2.

I was born on July 14, 1866.

All of which is submitted not so much on your own account as to give authentic information to the authorities if they desire it of you."

I hope my telegram was received in time to permit of Professor Frost's election last Tuesday. Please be kind enough to inform me if this was the case, as I wish to communicate with Miss Bruce as soon as possible.

Will you please be kind enough to add the following names to the list already submitted for the Observatory Visiting Committee?

D. H. Burnham,  
Huntington W. Jackson,  
Charles Crane,  
Dr. George S. Isham,  
Clement W. Andrews.

Will you also please remove Professor Pickering's name from the list, as I find that he could not make the trip annually? He suggests that in place of appointing him a member of the Committee, we request each year some well-known astronomer to be present at the meeting of the Committee. This seems to me an excellent idea, and I hope it will be carried into effect. I have reason to believe that if the gentlemen whom I have just named are added to the Committee they will greatly strengthen it. I hope the appointments will be made soon, as it would be well to arrange to have the first annual meeting held in July.

Very truly yours,

*George S. Hale*



William B. Ewing

James Observatory  
Williams Bay Wisconsin

Case 100-10000  
Chicago, Illinois

Dr. Harper, B.

I was born on July 14, 1883.

All of which is submitted not so much on your own account as to give authentic information to the authorities if they desire it of you.

I hope my telegram was received in time to permit of Professor Brent's election last Tuesday. Please be kind enough to inform me if this was the case, as I wish to communicate with Miss Birnie as soon as possible.

Will you please be kind enough to add the following names to the list already submitted for the Observatory Visiting Committee?

E. H. Burdick,  
Washington F. Johnson,  
Charles Evans,  
Dr. George S. Fisher,  
Clement W. Andrews.

Will you also please remove Professor Pickering's name from the list, as I find that he could not make the trip annually? He suggested that in place of appointing him a member of the Committee, we request each year some well-known astronomer to be present at the meeting of the Committee. This seems to me an excellent idea, and I hope it will be carried into effect. I have reason to believe that if the gentleman whom I have just named are added to the Committee they will greatly strengthen it. I hope the appointments will be made soon, as it would be well to arrange to have the first annual meeting held in July.

Very truly yours,



OFFICE OF THE  
Clerk of the Circuit Court of the United States,  
NORTHERN DISTRICT OF ILLINOIS.

S. W. BURNHAM,  
Clerk.

MONADNOCK BUILDING.

CHICAGO,

May 18 1898

Burnham

Dear Dr. Harper,

I have yours of the 12<sup>th</sup> inst., and will be glad to meet you at any time and place you may suggest. I do not know that I can add anything of importance to the brief statement I have already made, other than as to matters of detail.

If it were a question of interfering in any manner with the pecuniary status of Professors Hale and Barnard, I would be willing to pay my own expenses and furnish my own supplies, and continue to be a free horse and a free lance in the interests of all concerned; but now the Observatory is running a large force of one sort and another, and having large expenses, all entirely proper and desirable if the University can afford it, but \*more or less unnecessary when economy is essential.

In addition to this, the Observatory seems to be attempting to secure the services of other astronomers who probably cannot afford to give their services entirely gratuitously. At this time, so far as I know, I am the only one in any capacity at the Observatory whose service is considered, practically at least, as absolutely worthless.

I have no right to criticize in any manner



E. W. BURHAM,  
CLERK

MONROD BUILDING  
CHICAGO, ILL.

(14)

May 10 1891

Dear Mr. Rogers,  
I have upon of the 12th inst., and will be  
glad to meet you at any time and place you may  
suggest. I do not know that I am at anything  
of importance to the brief statement I have already  
made. The time is a matter of detail.  
If it were a question of entering in any  
manner with the pecuniary status of the  
Hall and Board, I would be willing to pay my  
own expenses and furnish my own supplies, and  
continue to be a free laborer and a free lance in  
the interests of all concerned; but now the situation  
is running a large force of one sort and another  
and having large expenses, not only proper and  
feasible if the University can afford it, but  
more or less necessary. The Board is essential.  
In addition to this, the Board is essential to be  
attempting to secure the services of other persons  
who probably cannot afford to give their services  
entirely gratuitously. At this time, for an hour,  
I am the only one in any capacity at the University  
whose services are considered, practically at least, as  
absolutely worthless.  
I have no right to expect in any manner



Clerk of the Circuit Court of the United States,

2

NORTHERN DISTRICT OF ILLINOIS.

MONADNOCK BUILDING.

S. W. BURNHAM,  
Clerk.

CHICAGO, \_\_\_\_\_ 189\_\_\_\_\_

the relative value which the University sees fit to place upon the labors of those connected with it, and do not wish to do so, but you can easily see how it would be impossible for me, or for any one in this situation, in justice to himself, to continue in this way. You must bear in mind all this, and two things in addition; first that this situation is none of my seeking at any time, and second that I am doing, and should continue to do exactly as much astronomical work as if I lived permanently at Lake Geneva.

I do not wish to embarrass you in any way. Don't let me have enough of that from other quarters. If my position does not seem to you to be well taken, and you will merely say so, without giving any reasons, I will promptly drop out, and that will end the whole matter.

Yours very truly  
S. W. Burnham



the relative value which the Government has fit to  
place upon the labor of those convicted with it,  
and the fact that it is, for you can easily  
see how it would be impossible for me, or for  
any one in this situation, in practice to himself, to  
continue in the work. You must bear in mind  
all this, and two things in addition; first that the  
situation is one of very serious consequence, and  
second that I am going, and should continue to  
do so, as much as I can, and if I  
could I should like to see you in  
any way. Therefore you have heard of that from  
the situation. If you have heard of that from  
the fact that, and you will surely say so.  
Without giving any reason, I will simply say  
that, and that will be the whole matter.

Yours very truly,  
J. W. Burham



THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

July 7, 1898

President U. R. Harper,

University of Chicago,

Chicago.

Dear Dr. Harper,-

In a letter just received from Professor Frost he remarks incidentally that his appointment is for five years. I understood that the Trustees would make the same arrangement in his case as was made for Professor Keeler, giving an appointment for six years. If this was not done, can you not arrange to have the change made, as it is a matter of very considerable importance to the Observatory? Professor Frost expects to reach Chicago Saturday of this week, and will probably call upon you Sunday or Monday. Please also make note of the fact that he should have been appointed Professor of Astrophysics, and not of Astronomy. Dr. Goodspeed's telegram was incorrect in this particular.

I telephoned to Miss Cobb last Saturday, asking her to send the letters of Dr. See and Mr. Douglass, referred to in my last conversation with you. She promised to do so, but as they have not yet arrived, I trust you will be kind enough to have them sent soon.

I was led to understand from a statement made in your announcements at the Convocation that an annual report of the work of the astronomical department would be published next fall. Please be kind enough to inform me whether this is the case, in order that I may prepare a suitable report. In this connection let me ask whether any fur-



THE UNIVERSITY OF CHICAGO  
JULY 7, 1900

WILLIAM BAX WOODWARD

JULY 7, 1900

JOHN D. HANCOCK  
WILLIAM BAX WOODWARD

CHICAGO

President of the University of Chicago

University of Chicago

Chicago

Dear Mr. Harper:

In a letter just received from Professor Frost he requests in-  
formation as to the appointment in for five years. I understood that  
the trustees would make the same arrangement in his case as was made  
for Professor Kessler, giving an appointment for six years. If this was  
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Frost expects to reach Chicago Saturday of this week, and will probably  
call upon you Sunday or Monday. Please also make note of the fact that  
he should have been appointed Professor of Astrophysics, and not of As-  
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I telephoned to Miss Cobb last Saturday, asking her to send  
the letters of Dr. Bax and Mr. Bengtson, referred to in my last com-  
munication with you. She promised to do so, but as they have not yet ar-  
rived, I trust you will be kind enough to have them sent soon.  
I was led to understand from a statement made in your announce-  
ment at the Convention that an annual report of the work of the as-  
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THE UNIVERSITY OF CHICAGO  
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YERKES OBSERVATORY  
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CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

Dr. Harper, 2.

ther arrangements have been made for appointing the Visiting Committee. So far as the Observatory is concerned it is of considerable importance that if any action is to be taken this year, the Committee should be appointed very soon, in order that it may visit the Observatory during the summer. As many of the members suggested for the Committee reside at Lake Geneva, where would be little difficulty in getting them together in July or August. Later the difficulty would naturally be greatly increased.

Very sincerely yours,

*George E. Hale*



WILLIAM HAY WISCONSIN

HARVEY GREENWORTHY  
WILLIAM HAY WISCONSIN

CARL A. HOFFER  
JACQUES CHICAGO

Dr. Harper, E.

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Very sincerely yours,

W. H. W.

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

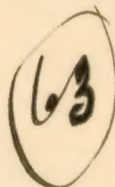
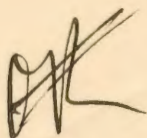
YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

July 14, 1898.

President W. R. Harper,  
University of Chicago,  
Chicago.



Dear Dr. Harper,-

Will you please be kind enough to request Mr. Hughitt to furnish a pass to Professor Frost, (Edwin B.) as he will have immediate use for it between here and Chicago. Please be careful to ask in your letter for a pass between Williams Bay and Chicago, as the first ones sent us were made out for Lake Geneva.

I enclose a letter just received from Mr. F. R. Chandler. In reply to a request from him I thought it proper to invite the Real Estate Board to visit the Observatory on Saturday afternoon. I have now written that as observations with the large telescope are invariably disappointing to those who are unfamiliar with work of this kind, there would probably be little advantage to the members of the Board if they were given an opportunity to make them. I add, however, that the letter has been referred to you.

I do not consider it desirable to accede to this request for the following reasons:

1. The members of the Real Estate Board would certainly be disappointed in what they saw, and would gain no benefit from the observations.
2. A precedent would be established which might overwhelm us



YERKES OBSERVATORY  
WILLIAM RAY WISCONSIN

CHICAGO, ILL.  
JULY 14, 1898

WILLIAM RAY WISCONSIN

July 14, 1898

President W. R. Harper,

University of Chicago,

Chicago.

Dear Mr. Harper:-

Will you please be kind enough to request Mr. Huggins to transfer a year to Professor Frost, (Edwin D.) as he will have immediate use for it between here and Chicago. Please be careful to ask in your letter for a pass between William Ray and Chicago, as the first ones sent us were made out for Lake Geneva.

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THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

WILLIAMS BAY, WISCONSIN.

CABLE ADDRESS  
ARCTURUS CHICAGO

Dr. Harper, 2.

with similar requests in the future.

3. Mr. Burnham would lose one of his observing nights. In view of the fact that he has recently had very bad weather, and also because of the feelings he expressed in his recent correspondence with you, it seems to me particularly undesirable that any of his time should be taken. Last Sunday night a small accident to the boiler feed pump in the power house cut off the power early in the evening and prevented him from continuing his work.

However, the matter is one which you and not I should decide, and I therefore leave it in your hands.

I enclose herewith the letter which you requested me to return. With your permission I will retain the statement written by Dr. See for a short time.

Very truly yours,

*George E. Hale*



WILLIAM BAY WISCONSIN

WILLIAM BAY WISCONSIN

WILLIAM BAY WISCONSIN

Dr. Harper, E.

with similar requests in the future.

3. Mr. Burdick would lose one of his observing nights. In view

of the fact that he has recently had very bad weather, and also because

of the feelings he expressed in his recent correspondence with you, it

seems to me particularly undesirable that any of his time should be

taken. Last Sunday night a small accident to the boiler feed pump in

the power house cut off the power early in the evening and prevented

him from continuing his work.

However, the matter is one which you and not I should decide.

and I therefore leave it in your hands.

I enclose herewith the letter which you requested me to re-

turn. With your permission I will retain the statement written by Dr.

See for a short time.

Very truly yours,

Harper, E.

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

August 5, 1898.

Dr. W. R. Harper,  
University of Chicago,  
Chicago.

Dear Dr. Harper,-

I am sending by express today the tickets of admission to the Observatory, addressed to you. Please have printed on the back the statement on the enclosed slip, and be kind enough to have the tickets sent back to me as soon as possible. I have reserved a number for immediate use, but as the demands upon us are very great, they will not last long. Also please be kind enough to have the same statement printed in the form of circulars, or on light cards, for distribution to persons visiting the lake, etc. I do not know how many of these will be needed, but am inclined to think that 300 would suffice.

Very truly yours,

George E. Hale



THE UNIVERSITY OF CHICAGO

RECEIVED BY THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY  
WILLIAM RAY WILSON

CHICAGO, ILL.

WILLIAM RAY WILSON

August 5, 1893.

Dr. W. R. Harper,  
University of Chicago,  
Chicago.

Dear Dr. Harper:-

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statement on the enclosed slip, and be kind enough to have the tickets  
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mediate use, but as the demands upon me are very great, they will not  
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printed in the form of circulars, or on light cards, for distribution  
to persons visiting the lake, etc. I do not know how many of these  
will be needed, but am inclined to think that 300 would suffice.

Very truly yours,

W. R. Wilson

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

August 6, 1898.

President W. R. Harper,  
University of Chicago,  
Chicago.

(iel)

*Committee on  
Master's*

Dear Dr. Harper,-

Our need of assistants at the Observatory is so great that I have decided to recommend that two assistants at \$1,000 each be appointed, instead of one Assistant Professor at \$2,000, in the place which will be left vacant by Professor Wadsworth's resignation next February. At the present time I ask authority to arrange with Dr. Frank Schlesinger, recently of Columbia University, to take one of these assistant's positions at the salary named. Dr. Schlesinger has acted as a volunteer assistant during the summer, and has shown great ability. As it is necessary for him to know in case the appointment is to be offered to him, in order that he may make his plans accordingly for the opening of the coming college year, I trust that necessary authority can be given me within a short time. I think it best not to recommend any one for the other position until I have had a further opportunity to examine into the qualifications of certain men who have been recommended to me.

In looking over our stock of admission tickets to the Observatory we find only about 1700 on hand. Of these I must reserve 700 for immediate use, and thus have only 1,000 to be sent to the University Press. As 5,000 tickets were ordered and charged for by the Uni-



The University of Chicago

PRINTED BY JAMES H. HODGKINS

YERKES OBSERVATORY  
WILLIAM BAY WILSON

CABLE ADDRESS  
YERKES OBSERVATORY  
CHICAGO

WILLIAM BAY WILSON

August 2, 1900

President W. R. Harper,

University of Chicago,

Chicago.

Dear Dr. Harper:-

Our need of assistants at the Observatory is so great that I have decided to recommend that two assistants at \$1,000 each be appointed, instead of one Assistant Professor at \$2,500, in the place which will be left vacant by Professor Wadsworth's resignation next February. At the present time I ask authority to arrange with Dr. Frank Schuster, formerly of Columbia University, to take one of these assistant's positions at the salary named. Dr. Schuster has acted as a volunteer assistant during the summer, and has shown great ability. As it is necessary for him to know in case the appointment is to be offered to him, in order that he may make his plans accordingly for the opening of the coming college year, I trust the necessary authority can be given me within a short time. I think it best not to recommend any one for the other position until I have had a further opportunity to examine into the qualifications of certain men who have been recommended to me.

In looking over our stock of observation tickets for the Observatory we find only about 1700 on hand. Of these I must reserve 700 for immediate use, and thus have only 1,000 to be sent to the University Press. As 5,000 tickets were ordered and charged for by the Uni-

THE UNIVERSITY OF CHICAGO

FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY

WILLIAMS BAY, WISCONSIN

WILLIAMS BAY, WISCONSIN.

CABLE ADDRESS  
ARCTURUS CHICAGO

Dr. Harper, 2.

versity Press, I assume that you have kept the balance at the University.  
After the printing has been done I hope you will send me as many as can  
be spared, as the demand is very great and constantly increasing.

Very truly yours,

*George S. Hale*



The University of Chicago  
PRINTED BY JOHN A. JOHNSON

WILLIAM DAY WISCONSIN

YERKES OBSERVATORY  
WILLIAM DAY WISCONSIN

CABLE ADDRESS  
ASTORUS CHICAGO

Dr. Harper, B.

Very truly yours,  
After the printing has been done I hope you will send me as many as can  
be spared, as the demand is very great and constantly increasing.  
Yerkes Press, I enclose that you have kept the balance at the University.

*Harper, B.*

*Paul Baudette*

*Pile*

*Hale*  
*Brooklyn*  
*of Dudley*

Chicago, September 19th, 1898.

President W. R. Harper,

University of Chicago,

Chicago, Ill.

Dear Sir:-

The 60in. mirror for a reflecting telescope, upon which Mr. Ritchey has been working at the Yerkes Observatory for two years, is now approaching completion. Every step in the process, from the efforts of the French glass makers to produce so large a disk to the fine grinding on which Mr. Ritchey is at present engaged, has been entirely successful. There can now be no doubt that the great mirror, which is equalled in size by only one telescope in use at the present time, will prove to be all that the optician has expected of it. It only remains to provide a suitable mounting and a building with 60ft dome, to contain the telescope.

The work for which this telescope is specially designed differs from anything previously undertaken. In many kinds of observation the 40" Yerkes Refractor is superior to all other telescopes. The 60" reflector will not rival its performance in these fields. But for investigations



Chicago, September 19th, 1898.

File

Paul G. W. L.

President W. E. Harper,

University of Chicago,

Chicago, Ill.

Dear Sir:-

The 60 in. mirror for a reflecting telescope, upon which Mr. Ritchey has been working at the Yerkes Observatory for two years, is now approaching completion. Every step in the process, from the efforts of the French glass makers to produce so large a disk to the fine grinding on which Mr. Ritchey is at present engaged, has been entirely successful. There can now be no doubt that the great mirror, which is equalled in size by only one telescope in use at the present time, will prove to be all that the optician has expected of it. It only remains to provide a suitable mounting and a building with cellars, to contain the telescope. The work for which this telescope is specially designed differs from anything previously undertaken. In many kinds of observation the 40" Yerkes Reflector is superior to all other telescopes. The 60" reflector will not rival its performance in these fields. But for investigations

of the spectra of stars, the new telescope should give results much beyond the reach of even this powerful instrument. Its first and most obvious advantage will be in the amount of light concentrated in the image of a star more than twice as much as that given by the 40". But more important than this will be the advantages of the mounting which it is proposed to use. This will be so constructed as to bring the star's image to a fixed point in a constant temperature room, where it can be kept on the slit of a spectroscope as long as may be desired. It will thus be possible to use with the telescope apparatus that cannot be employed with the 40", which is never at rest and must always be used in an open dome, where the temperature is constantly changing.

In photographing the spectrum of a star, exposures with such instruments as the 40" must practically be confined to a single night. With the new telescope, for which spectroscopes much more powerful than any hitherto used for the analysis of stellar radiations will be provided, it should be possible to continue the photographic exposures from night to night for a whole month, should this be necessary. Thus the spectra of stars might perhaps be



of the spectra of stars, the new telescope should give results much beyond the reach of even this powerful instrument. Its first and most obvious advantage will be in the amount of light concentrated in the image of a star; more than twice as much as that given by the 40". But more important than this will be the advantages of the mounting which it is proposed to use. This will be so constructed as to bring the star's image to a fixed point in a constant temperature room, where it can be kept on the slit of a spectrograph as long as may be desired. It will thus be possible to use with the telescope apparatus that cannot be employed with the 40", which is never at rest and must always be used in an open dome, where the temperature is constantly changing.

In photographing the spectrum of a star, exposures with such instruments as the 40" must necessarily be confined to a single night. With the new telescope, for which spectroscopes much more powerful than any hitherto used for the analysis of stellar radiations will be provided, it should be possible to continue the photographic exposures from night to night for a whole month, should this be necessary. Thus the spectra of stars might perhaps be

photographed on so large a scale as to permit the study of their chemical composition, the temperature and pressure in their atmospheres, and their motions, with that high degree of precision which can now be reached only in the case of the sun.

During the past summer Professor Nichols of Dartmouth College, using at the Yerkes Observatory a radiometer of great sensitiveness with a 24" mirror made by Mr. Ritchey, has been able to detect for the first time a small amount of heat sent to the earth by the stars. The large aperture of the new reflector will permit this work to be extended, and important advances in our knowledge of stellar constitution should result from such investigations. Finally, the new instrument will be especially well adapted for photographing stars and nebulae, work for which the 40" telescope was not designed.

The 60" mirror is estimated to be worth ten thousand dollars. Mr. W. E. Hale, who purchased the glass disk and has borne the expense of the optical work, offers the mirror to the University of Chicago, on condition that a suitable building, with dome, and mounting for the telescope, and all necessary auxiliary apparatus be provided,



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The 30" mirror is estimated to be worth ten thousand dollars. Mr. W. E. Hale, who purchased the glass disk and has borne the expense of the optical work, offers the mirror to the University of Chicago, on condition that a suitable building, with dome and mounting for the telescope, and all necessary auxiliary apparatus be provided.

and that arrangements be made to keep the optical parts of the instrument in good condition. From sixty to seventy-five thousand dollars should be sufficient to provide the building, mounting and auxiliary apparatus, and leave an amount which, if invested, would provide for an assistant to keep the instrument in order, and take part in the observational work and reductions. Mr. Hale does not wish to have his name attached to the telescope.

Should a person be found who is willing to give the money required, the telescope (or, if desired and considered necessary, the observatory, which may be regarded as distinct from the Yerkes Observatory) may be called by his name.

Very respectfully yours,

George E. Hale



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necessary, the observatory, which may be regarded as distinct  
from the Yerkes Observatory) may be called by his name.

Very respectfully yours,

*James C. Hale*

*Karl Baudette*

*File*

*Yerkes Obs. Case*  
*Profr*  
*q. Tucker*

Chicago, September 19th, 1893.

President Wm. R. Harper,

University of Chicago,

Chicago, Ill.

Dear Sir:-

The 60in. mirror for a reflecting telescope, upon which Mr. Ritchey has been working at the Yerkes Observatory for two years, is now approaching completion. Every step in the process, from the efforts of the French glass makers to produce so large a disk to the fine grinding on which Mr. Ritchey is at present engaged, has been entirely successful. There can now be no doubt that the great mirror, which is equalled in size by only one telescope in use at the present time, will prove to be all that the optician has expected of it. It only remains to provide a suitable mounting, and a building with 60ft dome, to contain the telescope.

The work for which this telescope is specially designed differs from anything previously undertaken. In many kinds of observation the 40" Yerkes Refractor is superior to all other telescopes. The 60" reflector will not rival its performance in these fields. But for investigations





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Should a person be found who is willing to give the money required, the telescope (or, if desired and considered necessary, the observatory, which may be regarded as distinct from the Yerkes Observatory) may be called by his name.

Very respectfully yours,

George E. Hale





THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

year? 1899  
Post

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

Jan. 16, 1898.

Dear Dr. Goodspeed,

The following list is intended to include all gifts to the Yerkes Observatory since Oct. 30, 1895, excepting books and photographs, of which we have received a large number from various persons and institutions.

|                                     |          |   |
|-------------------------------------|----------|---|
| Mrs. Catherine K. Bruce             | \$1500.  | for Professor Frost's salary            |
| "                                   | 7000.    | for Bruce Photographic Telescope        |
| "                                   | 1000.    | for Bruce Illustration Fund             |
| William S. Heale                    | 350. (?) | for moving house.                       |
| "                                   | 250.     | for Spectroheliograph Fund              |
| Martin A. Ryerson                   | 250.     | " " "                                   |
| Edward C. Ayer                      | 250.     | " " "                                   |
|                                     | 50.      | (telegraph poles)                       |
| Mrs. William Thaw                   | 100.     | for Thaw Illustration Fund              |
| A. C. Behr                          |          | astronomical clock and minor apparatus. |
| F. L. D. Hadsenorth                 | 100.     | for wags of pattern maker.              |
| Lady Ruggins                        |          | portrait of Galileo.                    |
| Astronomical Society of the Pacific |          | bronze replica of the Bruce Medal       |
| Subscriptions to Marguerite Fund -  |          |   |
| Very truly yours<br>George S. Heale |          |   |





C O P Y .

Chicago, May 10th, 1899.

Prof. Geo. E. Hale,

Yerkes Observatory.

Williams Bay, Wis.

Dear Sir,-

Your favor of the 9th is received. I would be much pleased if you could have made for publication in the Inter Ocean, a full statement of the discoveries and work of the telescope since its dedication. I think it would be a good thing for the Observatory to have such a statement published.

Yours truly,

(Signed) Chas. T. Yerkes.



COPY.

Chicago, May 10th, 1892.

Prof. Geo. E. Hale,

Yerkes Observatory,

Williams Bay, Wis.

Dear Sir:-

Your favor of the 6th is received. I would be much pleased

if you could have made for publication in the Inter Ocean, a full  
statement of the discoveries and work of the telescope since its dedi-  
cation. I think it would be a good thing for the Observatory to have  
such a statement published.

Yours truly,

(Signed) Chas. T. Yerkes.

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

*Hale*

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

May 11, 1899.

*on*

President W. R. Harper,  
University of Chicago,  
Chicago.

Dear Dr. Harper,-

A few days ago I sent Mr. Yerkes an account of the work of the Observatory since the dedication. I enclose a copy of his reply. I shall of course prepare a statement of the work for publication in the Inter-Ocean, in accordance with his request.

Very truly yours,

*George S. Hale*



The University of Chicago  
FOUNDED BY JOHN WOODSWORTH

JENNIS GUNN/JOHN  
WILLIAMS NEW WOODSWORTH

CHAS. WOODSWORTH  
CHICAGO

WILLIAMS NEW WOODSWORTH

May 11, 1900

W

President W. H. Harper,

University of Chicago,

Chicago.

Dear Dr. Harper:-

A few days ago I sent Mr. Yerkes an account of the work of  
the Observatory since the dedication. I enclose a copy of his reply.  
I shall of course prepare a statement of the work for publication in

the Inter-Oceanic, in accordance with his request.

Very truly yours,

Philip S. Davis



OFFICE OF THE  
Clerk of the Circuit Court of the United States,  
NORTHERN DISTRICT OF ILLINOIS.

S. W. BURNHAM,  
Clerk.

MONADNOCK BUILDING,

CHICAGO,

*Burnham*

June 19 1899

(76)

Dear Dr. Harper,

I see no objection to counting in that fund with reference to Mr. Kitchell's duplication of gifts, but I have not wished to make any announcement concerning my work until it was completed, and could speak for itself. I became long ago pretty nearly disgusted with the plans, promises, and programmes of astronomers, advertising far and wide great things to be accomplished in the future. If a small fraction of these things had been done really, astronomical knowledge would be a long way in advance of what it is now. I have therefore always preferred so far as my work is concerned to have no announcements in advance, and let the results speak for what they are worth. This particular work is now in the hands of the printer, and I am crowding them all I can to get it out as soon as practicable.

As to the other matter, permit me to remind you that it is considerably more than a year since the matter was first presented. Sincerely yours S. W. Burnham



(75)

Dear Sir,

I am in receipt of your letter of the 10th inst. and in reply to inform you that the same has been forwarded to the proper authorities for their consideration. I am, however, unable to say whether or not they will be successful in their efforts to secure the same. I am, nevertheless, sure that they will do their best to secure the same for you.

I am, Sir, very respectfully,  
Your obedient servant,  
E. W. Burman,  
Clerk.

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

*File*

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

Sept. 20, 1899.

President W. R. Harper,  
University of Chicago,  
Chicago.

*96*

Dear Dr. Harper,-

On September 19, 1898, I offered to the University in my father's name a 60-inch mirror for a reflecting telescope, on condition that a suitable building, with dome and mounting for the telescope and all necessary auxiliary apparatus be provided and arrangements be made to keep the optical parts of the instrument in good condition. In your letter of September 21st you say:

"The proposed gift of the 60-inch glass was accepted on conditions named, provided that and when the money for the building, etc., should be secured."

As a year has now elapsed I write to ask what you consider the prospects to be of securing the money, and how long the Trustees would like to have the offer remain open. I of course recognize the difficulty of securing the money, but as it is a matter of great importance that the mirror should be mounted and made ready for use as soon as possible, I am anxious that something should be done. If it does not seem probable that the University can undertake to secure the necessary funds it might become desirable to endeavor to make arrangements in some other direction. The Harvard Observatory and probably other institutions would very likely be glad to obtain the use of such



THE UNIVERSITY OF CHICAGO  
OFFICE OF THE PRESIDENT

YERKES OBSERVATORY  
WILLIAM S. WOODWARD  
CHICAGO, ILL.

WILLIAM S. WOODWARD

Sept. 30, 1900.

President W. R. Harper,

University of Chicago,

Chicago.

Dear Dr. Harper:-

On September 19, 1900, I offered to the University in my father's name a 30-inch mirror for a reflecting telescope, on condition that a suitable building, with dome and mounting for the telescope and all necessary auxiliary apparatus be provided and arrangements be made to keep the optical parts of the instrument in good condition. In your

letter of September 21st you say:

"The proposed gift of the 30-inch glass was accepted on condition named, provided that and when the money for the building, etc., should be secured."

As a year has now elapsed I write to ask what you consider the prospects to be of securing the money, and how long the Trustees would like to have the offer remain open. I of course recognize the difficulty of securing the money, but as it is a matter of great importance that the mirror should be mounted and made ready for use as soon as possible, I am anxious that something should be done. It is does not seem probable that the University can undertake to secure the necessary funds it might become desirable to endeavor to make arrangements in some other direction. The Harvard Observatory and probably other institutions would very likely be glad to obtain the use of such

THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

WILLIAMS BAY, WISCONSIN.

an instrument, and rather than have the mirror remain unused it might be considered advisable to make some arrangement of this character. I would of course greatly prefer, however, to have the instrument become the property of the University of Chicago, and I should therefore wish to hold the offer open as long as possible. My own position in the matter of course depends in considerable degree upon the desire I naturally have to see this great instrument, which promises so much for science, brought into use. The remarkable photographs of nebulae recently obtained by Professor Keeler with the much smaller reflecting telescope of the Lick Observatory, and exhibited here during the astronomical Conference, give some idea of what may be expected from our instrument in one department of research. The mounting, for which drawings have been completed during the past few months, is of an entirely novel design, and will permit work to be undertaken which is beyond the reach of any existing telescope.

Trusting that you will appreciate my position in the matter,  
I am,

Yours very sincerely,

George S. Hale



an instrument, and rather than have the mirror remain unused it might  
be considered advisable to make some arrangement of this character.  
I would of course greatly prefer, however, to have the instrument be-  
come the property of the University of Chicago, and I should therefore  
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ings have been completed during the past few months, is of an entirely  
novel design, and will permit work to be undertaken which is beyond the  
reach of any existing telescope.  
Trusting that you will appreciate my position in the matter,

I am,

Yours very sincerely,

James C. Smith



THE UNIVERSITY OF CHICAGO  
FOUNDED BY JOHN D. ROCKEFELLER

YERKES OBSERVATORY  
WILLIAMS BAY, WISCONSIN

CABLE ADDRESS  
ARCTURUS CHICAGO

23

WILLIAMS BAY, WISCONSIN.

Feb. 21, 1900.

President Wm. R. Harper,  
University of Chicago,  
Chicago, Ill.

My dear Dr. Harper:-

I write to ask whether you have yet met with any success in raising the Eclipse Fund. It will be necessary for us to decide at once whether the Observatory is to send an expedition as a very large amount of apparatus must be constructed, and we cannot hope to get it finished without rushing the instrument shop to the fullest capacity. The optical parts alone, which will comprise two perfectly plane mirrors, one 24 inches in diameter, the other 30 inches in diameter, and one concave mirror of 24 inches aperture and 20 feet focus, together with various small mirrors, photographic objectives, etc., would cost several thousand dollars if we were to purchase them from any optician. Fortunately we can make them here at an expense of two or three hundred dollars, but not for much less. The construction of the great heliostat, which will be the largest hitherto constructed (excepting the one for the Paris Exposition) will also involve considerable expenditure although the cost will be far less than it would be if we were to obtain the instrument elsewhere. As I explained to you the other day, the heliostat and all other instruments to be used are required for the regular equipment of the Observatory, and would be



23

RECEIVED  
JANUARY 1900

JAN. 21, 1900.

President Wm. W. Harper,

University of Chicago,

Chicago, Ill.

My dear Dr. Harper:

I write to ask whether you have yet met with any  
success in raising the Helipos Fund. It will be necessary for us to  
decide at once whether the Observatory is to send an expedition as a  
very large amount of apparatus must be constructed, and we cannot hope  
to get it finished without running the instrument shop to the limit  
capacity. The optical parts alone, which will comprise two perfectly  
plane mirrors, one 24 inches in diameter, the other 30 inches in diam-  
eter, and one concave mirror of 24 inches aperture and 50 foot focus,  
together with various small mirrors, photographic objectives, etc.,  
would cost several thousand dollars if we were to purchase them from  
any optician. Fortunately we can make them here at an expense of  
two or three hundred dollars, but not for much less. The construction  
of the great heliostat, which will be the largest instrument constructed  
(excepting the one for the Paris Exposition) will also involve consid-  
erable expenditure, although the cost will be far less than it would be  
if we were to obtain the instrument elsewhere. As I explained to you  
the other day, the heliostat and all other instruments to be used are  
required for the regular equipment of the Observatory, and would be

2-21-1900.

constructed as soon as possible in any event. After my conversation with you in New York I decided to go ahead with them as far as we could, using parts of the 12 inch telescope and other instruments in order to cheapen and hasten the work. Everything has gone on admirably, and both the optical and mechanical work is well advanced; but we cannot hope to carry it through in time for the eclipse (it would be necessary to send the instruments South about May 1st) unless funds can be secured. In any event I would like to have the enclosed requisitions for the heliostat, for which some previous requisitions have already been sent in, put through if possible. The expenses of shipping the apparatus to the eclipse station and return (it will weigh several tons), erecting piers and temporary shelters, transportation for observers, etc., will probably amount to six hundred or seven hundred dollars.

I need hardly tell you that it is of the utmost importance for the University to be represented on this occasion. As Secretary of the Eclipse Committee of the Astronomical and Astrophysical Society of America, charged with the duty of organizing the eclipse work as far as possible, I have reason to know that almost every institution of any importance, including many small colleges, which takes any part in astronomical work will be represented by parties.

Requesting an early reply, I remain,

Yours very truly,

*George E. Hale*



conducted as soon as possible in any event. After my conversation with you in New York I decided to go ahead with them as far as we could, using parts of the 12 inch telescope and other instruments in order to cheaper and hasten the work. Everything has gone on admirably, and both the optical and mechanical work is well advanced; but we cannot hope to carry it through in time for the eclipse (it would be necessary to send the instruments South about May 1st) unless funds can be secured. In any event I would like to have the enclosed requisitions for the heliostat, for which some previous requisitions have already been sent in, but through it possible. The expenses of shipping the apparatus to the eclipse station and return (it will weigh several tons), erecting pier and temporary shelter, transportation for observers, etc., will probably amount to six hundred or seven hundred dollars.

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George F. Smith