

March 22, 1929.

C
O
P
Y

Memorandum to: Dean Gale
Mr. Woodward

In talking over the history of the Department of Astronomy and Astrophysics with Mr. Bliss, I told him that Mr. Frost's recommendations and included nothing regarding the men on the Quadrangles. My private question now is whether the Department should not be made either the special care of the Chairman in related fields, or be broken up. It seems to me entirely feasible that MacMillan, Bartky, and Laves should be added to the Department of Mathematics, possibly giving MacMillan the understanding that he is to care for the courses of the transferred men.

DAVID H. STEVENS
Assistant to the President

March 22, 1929.

C
O
P
Y

Memorandum to: Dean Gale
Mr. Woodward

In talking over the history of the Department of Astronomy and Astrophysics with Mr. Bliss, I told him that Mr. Frost's recommendations and included nothing regarding the men on the Quadrangles. My private question now is whether the Department should not be made either the special care of the Chairman in related fields, or be broken up. It seems to me entirely feasible that MacMillan, Bartky, and Laves should be added to the Department of Mathematics, possibly giving MacMillan the understanding that he is to care for the courses of the transferred men.

DAVID H. STEVENS
Assistant to the President

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

November 8, 1928

Miss E. G. Knobel
Office of the Secretary
University of Chicago
Chicago, Illinois

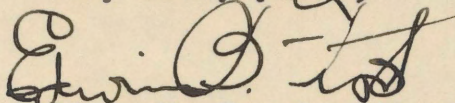
Dear Miss Knobel:

I am very pleased to learn that Mr. Welling is willing to back Mr. Chang for another \$100 which ought to be adequate to cover his expenses until his return to China. I have advised Mr. Chang and he doubtless has already written to Mr. Welling.

With many thanks for your cooperation in this matter,

I remain,

Very truly yours,



Edwin B. Frost, Director

EBF:GE

The University of Chicago

Herbert S. Gantt
WILLIAM D. WISE

November 8, 1928

Miss R. G. Knobel
Office of the Secretary
University of Chicago
Chicago, Illinois

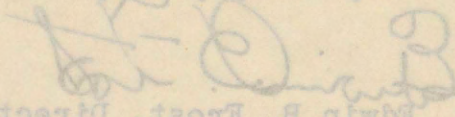
Dear Miss Knobel:

I am very pleased to learn that Mr. Wellin is
willing to back Mr. Chang for another \$100 which ought
to be adequate to cover his expenses until his return to
China. I have advised Mr. Chang and he doubtless has
already written to Mr. Wellin.

With many thanks for your cooperation in this matter,

I remain,

Very truly yours,


Edwin B. Frost, Director

ENR:GE

November 6, 1928

Dear Professor Frost:

Yesterday Mr. Welling gave me a check of \$100.00 for Mr. Chang, which I immediately sent to Mr. Plimpton. Mr. Welling was delightful-- he is very much pleased with Mr. Chang and is planning to help him in his stop-overs at Flagstaff and at the Mount Wilson Observatory on his way to China next spring. I am so glad Mr. Chang has the interest of a layman as thoroly worthwhile as Mr. Welling.

With kindest regards, I am

Very truly yours,

Gratia Esher Knobel

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

November 6, 1928

Dear Professor Frost:

Yesterday Mr. Welling gave me a

check of \$100.00 for Mr. Chang, which I immediately

sent to Mr. Plimpton. Mr. Welling was delighted--

he is very much pleased with Mr. Chang and is planning

to help him in his stop-overs at Placerville and at the

Mount Wilson Observatory on his way to China next

spring. I am so glad Mr. Chang has the interest of

a layman as thoroughly worthwhile as Mr. Welling.

With kindest regards, I am

Very truly yours,

Gratia Fisher Knobel

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

November 2, 1928

Miss Gratia E. Knobel
Office of the Secretary
of the University
Chicago, Illinois

My dear Miss Knobel:

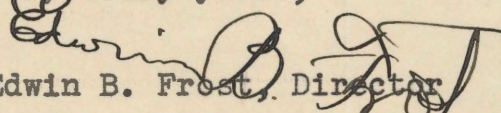
This replies to your inquiry of October 15. With the award of the fellowship which covers the tuition for three quarters and leaves a margin of \$200, Mr. Chang could possibly be carried through until his departure to China. This of course invites the strictest economy and leaves no margin for the purchase of clothes, shoes, or other articles that are often called necessities rather than luxuries.

I have talked with Mr. Chang about it and it seems to us both that it would be much safer, as well as more comfortable to have a margin of \$100. Accordingly, if some kind friend feels like providing this, which may be necessary, he will confer a favor, as well as a service, for China. I am sure that Mr. Chang will be of much service in the future scientific development of his country.

With thanks for your great help in this matter,

I am,

Very truly yours,


Edwin B. Frost, Director

EBF:GE

The University of Chicago

Office of the Secretary
Williams Bay, Wis.

November 2, 1928

Miss Gracie H. Knobel
Office of the Secretary
of the University
Chicago, Illinois

My dear Miss Knobel:

This replies to your inquiry of October 15. With the award of the fellowship which covers the tuition for three quarters and leaves a margin of \$200, Mr. Chang could possibly be carried through until his departure to China. This of course invites the strictest economy and leaves no margin for the purchase of clothes, shoes, or other articles that are often called necessities rather than luxuries.

I have talked with Mr. Chang about it and it seems to us both that it would be much better, as well as more comfortable to have a margin of \$100. Accordingly, if some kind friend feels like providing this, which may be necessary, he will confer a favor as well as a service for China. I am sure that Mr. Chang will be of much service in the future scientific development of his country.

With thanks for your great help in this matter,

I am,

Very truly yours,

Edwin B. Frost
Edwin B. Frost, Director

BBF:88

October 15, 1928

Dear Professor Frost:

I have come back from my vacation and have read your letter about the fellowship which is being transferred to Mr. Chang. That is good news indeed, and I am very glad for His good fortune. He wrote me a little note of thanks which I feel I do not deserve. It was kind of him to do, but I have considered my brief connection with you a most pleasant episode--and a fortunate one, too, as far as the finding of Mr. Welling is concerned.

I want to ask you how much more money you think it necessary for Mr. Chang to have under these new circumstances. If you will tell me what you consider an adequate sum, I'll go to Mr. Welling, as he told me to do several weeks ago. Mr. Shaw, who had promised a contribution, has had to withdraw his offer, so I've really received only \$375.00 of the original \$600.00 required. I am glad that, due to the fellowship, Mr. Welling will not be obliged to make up a large deficit because I am sure that he is going to be a very good friend to go to in the future in emergencies of this kind.

Thank you so much for your invitation to visit the Observatory. It has been one of my dreams for a long time, and I am going to avail myself of this special opportunity very soon.

Cordially yours,

Gratia Esher Knobel

Professor Edwin B. Frost
Williams Bay, Wisconsin

October 12, 1922

Dear Professor Frost:

I have come back from my vacation and have read your letter about the fellowship which is being transferred to Mr. Chang. That is good news indeed, and I am very glad for his good fortune. He wrote me a little note of thanks which I feel I do not deserve. It was kind of him to do, but I have considered my brief connection with you a most pleasant episode--and a fortunate one, too, as far as the finding of Mr. Welling is concerned.

I want to ask you how much more money you think it necessary for Mr. Chang to have under these new circumstances. If you will tell me what you consider an adequate sum, I'll go to Mr. Welling, as he told me to do several weeks ago. Mr. Shaw, who had promised a contribution, has had to withdraw his offer, so I've really received only \$375.00 of the original \$600.00 required. I am glad that, due to the fellowship, Mr. Welling will not be obliged to make up a large deficit because I am sure that he is going to be a very good friend to go to in the future in emergencies of this kind.

Thank you so much for your invitation to visit the Observatory. It has been one of my dreams for a long time, and I am going to avail myself of this special opportunity very soon.

Cordially yours,

Gratia Fisher Knobel

Professor Edwin B. Frost
Williams Bay, Wisconsin

October 1, 1928

My dear Mr. Shaw:

A couple of months ago I had the temerity to telephone you about a young Chinese graduate student in astronomy who is doing exceptional work at Yerkes Observatory, and who needs financial support until he receives his doctors degree next year. You were good enough to say at that time that when I neared the goal--\$600.00--you would be willing to add something to the fund. I have been wondering whether you will think I am presuming too much if I report to you now that I have been able to date to secure a total of \$500.00 from Mr. J. P. Welling, Mr. Henry H. Porter, Mr. Charles B. Goodspeed, and Mr. H. N. Rose.

Your help, whatever the amount, will be deeply appreciated by Professor Frost and the University, and especially so by Mr. Chang, who has been very much touched by the interest and faith shown in him and in what he is trying to do. I am enclosing an interesting postscript to a recent letter from Professor Frost in regard to the important work waiting to be done in China by men of Mr. Chang's caliber.

Very truly yours,

Gratia Esther Knobel

Assistant to the Secretary

Mr. Theodore A. Shaw
414 South Market Street
Chicago, Illinois

October 1, 1928

My dear Mr. Shaw:

A couple of months ago I had the temerity to telephone you about a young Chinese graduate student in astronomy who is doing exceptional work at Yerkes Observatory, and who needs financial support until he receives his doctor's degree next year. You were good enough to say at that time that when I needed the goal--\$600.00--you would be willing to add something to the fund. I have been wondering whether you will think I am presuming too much if I report to you now that I have been able to date to secure a total of \$600.00 from Mr. J. P. Wellin, Mr. Henry H. Porter, Mr. Charles B. Goodspeed, and Mr. H. N. Rose.

Your help, whatever the amount, will be deeply appreciated by Professor Frost and the University, and especially so by Mr. Chang, who has been very much touched by the interest and faith shown in him and in what he is trying to do. I am enclosing an interesting pastscript to a recent letter from Professor Frost in regard to the important work waiting to be done in China by men of Mr. Chang's caliber.

Very truly yours,
Gratia Esther Knobel

Assistant to the Secretary

Mr. Theodore A. Shaw
414 South Market Street
Chicago, Illinois

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

September 11, 1928

Miss Gratia Knobel
The University of Chicago
Office of the Secretary
Chicago, Illinois

My dear Miss Knobel:-

I thank you for your very kind letter of the 31st and for the efforts you are making so successfully in behalf of Mr. Chang. I have felt assured for some weeks past that he can stay with us and perhaps can come up for his doctor's degree at the end of next summer.

Mr. Welling is certainly very generous in his interest in Mr. Chang's welfare and scientific progress and I think that matters will now take a turn which will make it necessary for us ~~not~~ to call upon him for the additional \$200. The circumstances are as follows: Mr. William W. Morgan has found it necessary to resign the fellowship in astronomy which was awarded to him last spring and he will remain here as assistant. I have asked Dean Gale to transfer this fellowship to Mr. Chang. This will take care of his tuition for three quarters and leaves a balance of \$200 which he can use toward his living expenses and for the tuition for the next summer quarter if he cannot be provided in some other way. Accordingly it may not be necessary to ask Mr. Welling for all of the \$200 which he so generously holds in prospect.

I grant that it is surprising that a young man can live decently on \$50 a month at a summer resort like this. It allows for hardly anything but board. I am able to give him a place in the Observatory to sleep so that he has not had expense for room rent. His estimate also assumes that he does not have to buy shoes or clothes and that his health will continue perfect. I ordinarily advise that foreign students come here with not less than \$75 minimum, per month in hand. Accordingly it would be very proper that Mr. Chang should receive something more than \$600 for his estimate in case there are generous people who would provide it.

ack.
Sept. 13.

The University of Chicago

Office of the Secretary
The University of Chicago
Chicago, Illinois

September 11, 1928

Miss Gracie Knobel
The University of Chicago
Office of the Secretary
Chicago, Illinois

My dear Miss Knobel:-

I thank you for your very kind letter of the 8th and for the efforts you are making so successfully in behalf of Mr. Chang. I have felt assured for some weeks past that he can stay with us and perhaps can come up for his doctor's degree at the end of next summer.

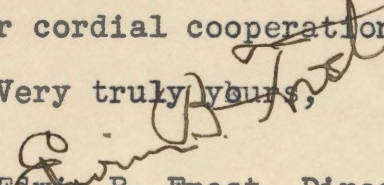
Mr. Wellin is certainly very generous in his interest in Mr. Chang's welfare and scientific progress and I think that matters will now take a turn which will make it necessary for us not to call upon him for the additional \$200. The amount of the fellowship in astronomy which was awarded to him last spring and he will remain here as assistant. I have asked Dean Gale to transfer this fellowship to Mr. Chang. This will take care of his tuition for three quarters and leaves a balance of \$200 which he can use toward his living expenses and for the tuition for the next summer quarter if he cannot be provided in some other way. Accordingly it may not be necessary to ask Mr. Wellin for all of the \$200 which he so generously holds in prospect.

I grant that it is surprising that a young man can live decently on \$20 a month at a summer resort like this. It allows for hardly anything but board. I am able to give him a place in the Observatory to sleep so that he has not had expense for room rent. His estimate also assumes that he does not have to buy shoes or clothes and that his health will continue perfect. I ordinarily advise that foreign students come here with not less than \$75 minimum per month in hand. Accordingly it would be very proper that Mr. Chang should receive something more than \$200 for his estimate in case there are generous people who would provide it.

In case you are spending the week end in the country during the autumn, we shall be very glad to have you call on us here and see this University outpost. We were favored by a call by Miss Jackson of the President's office on a recent Sunday.

With thanks for your cordial cooperation,

Very truly yours,


Edwin B. Frost, Director

EBF:GE

1
Mr. Jackson
Mr. Jackson
Mr. Jackson

10050

In case you are spending the week end in the country during the autumn, we shall be very glad to have you call on us here and see this University outpost. We were favored by a call by Miss Jackson of the President's office on a recent Sunday.

10

With thanks for your cordial cooperation,

Very truly yours,

Robert B. Frost, Director

EBF:GE

ack. & returned
9/5/28

YERKES OBSERVATORY
THE UNIVERSITY OF CHICAGO
WILLIAMS BAY, WIS.

September 1, 1928

Dear Mr. Welling,

Yours dated August 29 has been received. I thank you most heartily and gratefully for the almost parental concern and anxiety you have shown in your letter about the condition under which I work and study. If from somewhere the University should be able to find such a kind and generous donor as you have been, I shall have plenty to live on for the whole academic year to come.

In a small town like Williams Bay, especially when one can get a room free, the cost of living is low. Fifty dollars a month are what any student would reasonably need. On this I can live with as much comfort as the two other students in the Observatory. This sum probably appears as rather small to you. But it is this which decides whether a student shall be able to accomplish the aspired higher education or he will have to pack and go.

The leaving of an old friend of mine for China called me to Chicago unexpectedly on August 25. I don't think I shall go to attend the Conference at Evanston as first intended, as it would take me away from my duty again. I regret that I would not be able to see you until after a couple of months. However, I would not miss the opportunity to thank you in person for this kind letter when I should come to Chicago again.

Very sincerely yours,

Y. C. Chang

YERKES OBSERVATORY
THE UNIVERSITY OF CHICAGO
WILLIAMS BAY, WIS.

September 1, 1928

Dear Mr. Wellins,

Yours dated August 29 has been received. I thank you most heartily and gratefully for the almost parental concern and anxiety you have shown in your letter about the condition under which I work and study. If from somewhere the University should be able to find such a kind and generous donor as you have been, I shall have plenty to live on for the whole academic year to come. In a small town like Williams Bay, especially when one can get a room free, the cost of living is low. Fifty dollars a month are what any student would reasonably need. On this I can live with as much comfort as the two other students in the Observatory. This sum probably appears as rather small to you. But it is this which decides whether a student shall be able to accomplish the aspired higher education or he will have to pack and go. The leaving of an old friend of mine for China called me to Chicago unexpectedly on August 25. I don't think I shall go to attend the Conference at Evanston as first intended, as it would take me away from my duty again. I regret that I would not be able to see you until after a couple of months. However, I would not miss the opportunity to thank you in person for this kind letter when I should come to Chicago again.

Very sincerely yours,

Y. C. Chang

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

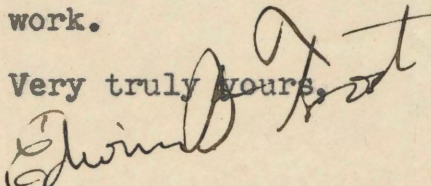
August 6, 1928

Miss Gratia E. Knobel
Office of the Secretary
Chicago, Illinois

Dear Miss Knobel:-

I have received a check for \$100 from Mr. H. H. Porter, First National Bank Building, Chicago, and one for \$25 from Mr. H. N. Rose at the same address to be applied to the fund we are raising for the living expenses of our graduate student, Mr. Y. C. Chang. This brings the amount received to \$375. I have sent the checks to the Auditor's Office and made acknowledgment to Mr. Porter and to Mr. Rose. If we can raise about \$225 more we shall be able to see Mr. Chang through his graduate work.

Very truly yours,


Edwin B. Frost, Director

EBF:GE

The University of Chicago

Herbert S. Gantt
WILLIAMS BAY, WIS.

August 6, 1938

Miss Gracie E. Knobel
Office of the Secretary
Chicago, Illinois

Dear Miss Knobel:-

I have received a check for \$100 from Mr. H. H. Porter, First National Bank Building, Chicago, and one for \$25 from Mr. H. H. Rose at the same address to be applied to the fund we are raising for the living expenses of our graduate student, Mr. Y. C. Chang. This brings the amount received to \$275. I have sent the checks to the Auditor's Office and made acknowledgment to Mr. Porter and to Mr. Rose. If we can raise about \$325 more, we shall be able to see Mr. Chang through his graduate work.

Very truly yours,
Edwin B. Frost
Edwin B. Frost, Director

EBF:GE

The University of Chicago

Office of the Secretary

TELEPHONE MIDWAY 0800

Interoffice Correspondence

Date: June 19, 1928

To: Mr. Plimpton

Subject: Mr. Chang, Chinese Graduate
Student at the Yerkes
Observatory

From: Gratia Esher Knobel

Attached is a copy of a letter just received from Professor Frost.

He has given Mr. Chang's full name and address, and the marked paragraph concerns the arrangement he would suggest for the payment of Mr. Chang's expenses

The University of Chicago

Office of the Secretary

TELEPHONE MIDWAY 0800

Date: June 19, 1933

Subject: Mr. Chang, Chinese Graduate
Student at the Yerkes
Observatory

Interoffice Correspondence

To: Mr. Livingston

From: Dr. H. H. H. H. H.

Attached is a copy of a letter just received from Professor Frost.
He has given Mr. Chang's full name and address, and the marked paragraph
concerns the arrangement he would suggest for the payment of Mr. Chang's
expenses.

The University of Chicago

Yerkes Observatory
WILLIAMS BAY, WIS.

June 18th 1928.

Copy sent to Mr. Plimpton, Auditor, June 19, 1928
G.E.K.

Miss Gratia Esher Knobel,
Office of the Secretary,
University of Chicago,
Chicago, Ill.

Dear Miss Knobel:

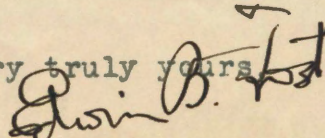
We are very grateful to you for your efficient service in behalf of Mr. Yu Che Chang(his address is simply Yerkes Observatory, Williams Bay, Wisconsin).

It is very good of Mr. Welling to make this generous contribution, which will provide for Mr. Chang's needs for well into the autumn quarter. Mr. Chang has written to Mr. Welling expressing his thanks and enclosing copies of a couple of papers which he has recently published in Astronomical Journal. At the same time I told Mr. Chang that he might invite Mr. Welling to come to the Observatory on any occasion that he might be in the vicinity of Lake Geneva.

Possibly the most convenient way for handling the funds for Mr. Chang would be to have him turn them over to me as Director. I would then deposit the amount in the First National Bank of Lake Geneva where I have an account in the name of Yerkes Observatory against which I write checks in the name of Edwin B. Frost, Director. We could then do Mr. Chang's banking in our office and would let him draw on the balance according to his needs. If this arrangement seems suitable to the Auditor, I will send him a receipt for the amount or have Mr. Chang do so. We have used this method for some of our students whose money has come in in small amounts from outside sources.

I trust that your continued efforts will be equally successful so that we can see Mr. Chang provided for until through next summer when he should be prepared to take his Ph. D. May I say that he is an exceptionally fine young man and his working very industriously and successfully in his graduate work.

Very truly yours



Edwin B. Frost.

EBF.M

The University of Chicago

Yerkes Observatory
Williams Bay, Wis.

June 18th 1928.

Copy sent to Mr. Blincoe, Auditor, June 19, 1928
G.H.K.

Miss Gracie Knobel
Office of the Secretary
University of Chicago
Chicago, Ill.

Dear Miss Knobel:

We are very grateful to you for your efficient service in behalf of Mr. Yu Chong (his address is simply Yerkes Observatory, Williams Bay, Wisconsin). It is very good of Mr. Welling to make this generous contribution which will provide for the needs for well into the autumn quarter. Mr. Welling has written to Mr. Welling expressing his thanks and enclosing copies of a couple of papers which he has recently published in Astronomical Journal. At the same time I told Mr. Chang that he might invite Mr. Welling to come to the Observatory on any occasion that he might be in the vicinity of Lake Geneva.

Possibly the most convenient way for handling the funds for Mr. Chang would be to have him turn them over to me as Director. I would then deposit the amount in the First National Bank of Lake Geneva where I have an account in the name of Yerkes Observatory against which I write checks in the name of Edwin B. Frost, Director. We could then do Mr. Chang's banking in our office and would let him draw on the balance according to his needs. If this arrangement seems suitable to the Auditor, I will send him a receipt for the amount or have Mr. Chang do so. We have used this method for some of our students whose money has come in in small amounts from outside sources.

I trust that your continued efforts will be equally successful so that we can see Mr. Chang provided for until through next summer when he should be prepared to take his Ph.D. May I say that he is an exceptionally fine young man and is working very industriously and successfully in his graduate work.

Very truly yours,
Edwin B. Frost

E.B.F.

P. S.

I meant to have added to my letter an expression of my regret that some of the officers of the Friends of China seem to regard astronomy as outside of the sciences particularly applicable in China. I am sure that they could be convinced, if I were able to meet them (which I am not) that the applications will be of utmost value to China. The government will have to turn to men trained in astronomy for the determination of time and its distribution throughout China; for the establishment of all basis for the geodetic and geologic survey of the country which will have to be carried out with increasing extent and precision, as the republic develops; for the improvement of practical navigation and for its teachings to officers of the navy and the merchant marine; probably also for the development of a weather survey in China adequate to the growing requirements of the people. There are many other contacts of astronomy that the detail of life of every people need but I will not recite them here.

E. B. F.

P. S.

I meant to have added to my letter an expression of my regret that some of the officers of the Friends of China seem to regard astronomy as outside of the sciences particularly applicable in China. I am sure that they could be convinced, if I were able to meet them (which I am not) that the applications will be of almost value to China. The government will have to turn to men trained in astronomy for the determination of time and its distribution throughout China; for the establishment of all basis for the geodesic and geologic survey of the country which will have to be carried out with increasing extent and precision, as the republic develops; for the improvement of practical navigation and for its teaching to officers of the navy and the merchant marine; probably also for the development of a weather survey in China adequate to the growing requirements of the people. There are many other contacts of astronomy that the detail of life of every people need but I will not recite them here.

E. B. F.

June 14, 1928

My dear Professor Frost:

I am so glad to tell you that I have just received a check for \$200.00 toward the \$600.00 we are trying to raise for Mr. Chang's living expenses for the coming year. This check came from Mr. J. P. Welling, 111 West Monroe Street, Chicago, and was made out to the University of Chicago. Mr. Welling, who was most pleasant and cordial about his contribution, told me he was intensely interested in the Chinese and, as a member of the Friends of China, knows something about them. Might I suggest that if Mr. Chang has written, or intends to write, any articles concerning what he has done at the Yerkes Observatory it might be a good thing if he would send copies to Mr. Welling for his information.

I had hoped that the Friends of China would consent to contribute the entire sum for Mr. Chang, but the President and a few other important officers seem to feel that any money they have to give should go to those specializing in either engineering or agriculture. However, I have two or three people in mind of the same caliber as Mr. Welling, and feel confident that I shall not have much difficulty now in completing the \$600.00 you wish for Mr. Chang. You may be sure that I will let you know as soon as I have accomplished this.

Will you please send me Mr. Chang's full name and address? And if you will let me know as soon as possible in what amount and how often Mr. Chang's check should be made out I will see that the Auditor's office carries out your instructions. Please let me know, too, if there is anything I have overlooked or that you would like me to attend to.

Very truly yours,

Gratia Esher Knobel

Assistant to the Secretary

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

June 14, 1933

My dear Professor Frost:

I am so glad to tell you that I have just received a check for \$200.00 toward the \$600.00 we are trying to raise for Mr. Chang's living expenses for the coming year. This check came from Mr. J. P. Welling, 111 West Monroe Street, Chicago, and was made out to the University of Chicago. Mr. Welling, who was most pleasant and cordial about his contribution, told me he was intensely interested in the Chinese and, as a member of the Friends of China, knows something about them. Might I suggest that if Mr. Chang has written, or intends to write, any articles concerning what he has done at the Yerkes Observatory it might be a good thing if he would send copies to Mr. Welling for his information.

I had hoped that the Friends of China would consent to contribute the entire sum for Mr. Chang, but the President and a few other important officers seem to feel that any money they have to give should go to those specializing in either engineering or agriculture. However, I have two or three people in mind of the same caliber as Mr. Welling, and feel confident that I shall not have much difficulty now in completing the \$600.00 you wish for Mr. Chang. You may be sure that I will let you know as soon as I have accomplished this.

Will you please send me Mr. Chang's full name and address? And if you will let me know as soon as possible in what amount and how often Mr. Chang's check should be made out I will see that the Auditor's office carries out your instructions. Please let me know, too, if there is anything I have overlooked or that you would like me to attend to.

Very truly yours,

Gustis Fisher Knobel

Assistant to the Secretary

Professor Edwin B. Frost
Yerkes Observatory
Williams Bay, Wisconsin

May 18, 1928

My dear Mr. Frost:

Mr. Haynes has turned over to me the matter of securing Mr. Chang's tuition for four quarters and the Six Hundred Dollars needed for his living expenses during that period. I am so glad to tell you that the University has agreed to provide his tuition, and within a very short time Mr. Stevens will get in touch with Mr. Chang about it.

The Friends of China, a small group of Chicago citizens interested in Chinese affairs, appointed a Committee yesterday to try to raise the remaining Six Hundred Dollars. I am very hopeful about the outcome, for the membership is composed either of wealthy people or of those who have influence among people of wealth. As soon as I hear from their Secretary, I will let you know how they are succeeding.

Very truly yours,

Gratia Esher Knobel

Assistant to the Secretary

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

May 18, 1928

My dear Mr. Frost:

Mr. Haynes has turned over to me the

matter of securing Mr. Chang's tuition for four
quarters and the six hundred dollars needed for his

living expenses during that period. I am so glad
to tell you that the University has agreed to provide
his tuition, and within a very short time Mr. Stevens

will get in touch with Mr. Chang about it.

The Friends of China, a small group of

Chicago citizens interested in Chinese affairs, ap-

pointed a Committee yesterday to try to raise the

remaining six hundred dollars. I am very hopeful about

the outcome, for the membership is composed either of

wealthy people or of those who have influence among

people of wealth. As soon as I hear from their

Secretary, I will let you know how they are succeeding.

Very truly yours,

Gratia Esther Knobel

Assistant to the Secretary

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

207810

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

April 4th 1928.

Copy sent
Dr. McLean
April 11, 1928
G. E. H.
Rockefeller
Foundation

Dean Henry G. Gale,
University of Chicago,
Chicago, Ill.

Dear Sir:

I am disappointed that it was not possible to award a fellowship to Mr. Y. C. Chang, B S and M S of our University who is now working here as a graduate student. He is an exceptionally fine young man and is greatly desirous of staying one year more so that he can take his doctor's degree before returning to China. He had a letter from Dr. Y. H. Woo, one of our doctors, asking him if he would take a place on the faculty of the National Fourth Chung San University at Nanking, China. It would be most desirable that he should complete his American education by this extra year of work for the P H D. The Chinese fellowship which he has had for five years cannot be renewed beyond the present summer, as he has been lately informed. Mr. Chang feels quite sure that the place at Nanking will be held open for him for another year if he can be allowed to keep on in graduate work. He would need only about Six Hundred Dollars aside from tuition to live here until the end of next summer. He has recently done an excellent piece of work under Mr. Van Briesbroeck on the orbit of the Stearns comet which will be published in a forthwith coming number of the

The University of Chicago

Physics Department
Williams Bay, Wis.

April 4th 1928.

Dear Henry D. Hale,
University of Chicago,
Chicago, Ill.

Dear Sir:

I am disappointed that it was not possible to award a fellowship to Mr. Y. C. Chang, B.S. and M.S. of our University who is now working here as a graduate student. He is an exceptionally fine young man and is greatly desirous of staying one year more so that he can take his doctor's degree before returning to China. He had a letter from Dr. Y. K. Woo, one of our doctors, asking him if he would take a place on the faculty of the National Peking University at Peking, China. It would be most desirable that he should complete his American education by this extra year of work for the Ph.D. The Chinese fellowship which he has had for five years cannot be renewed beyond the present summer, as he has been lately informed. Mr. Chang feels quite sure that the place at Peking will be held open for him for another year if he can be allowed to keep on in graduate work. He would need only about six hundred dollars aside from tuition to live here until the end of next summer. He has recently done an excellent piece of work under Mr. Van Briesbroeck on the orbit of the Stearns comet which will be published in a forthcoming coming number of the

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

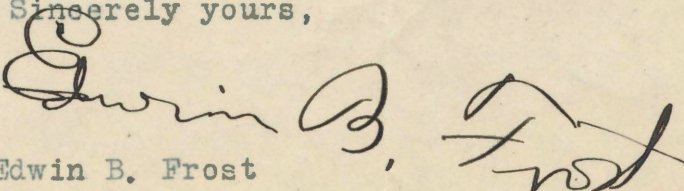
Dean Henry G. Gale,

April 4th 1928

-2-

Astrophysical Journal. He is a thoroughly reliable young man whom we should like to have as the first astronomical representative of the University of Chicago in China. Is it not possible that he could be given a scholarship for four quarters beginning with July first to cover his tuition? Then is it not possible that some wealthy Chinese merchant or group (a Tong? or a pair of them?) could be approached by some representative of the University with a view of contributing Six Hundred Dollars toward his support during the year. We must try to do what we can for this young man. I have no acquaintance among the wealthy Chinese residents of Chicago but there ought to be some who would take an interest in his case. Will you not discuss this with Mr. Woodard or the President, or both? Eventually could you not induce the best mah jong players to hold a benefit that will net Mr. Chang Six Hundred Dollars.

Sincerely yours,


Edwin B. Frost

EBF.M

The University of Chicago

Herbert S. Gessner
Williams Bay, Wis.

April 4th 1928

Dean Henry G. Gale,

-2-

Astronomical Journal. He is a thoroughly reliable young man whom we should like to have as the first astronomical representative of the University of Chicago in China. Is it not possible that he could be given a scholarship for four quarters beginning with July first to cover his tuition? This is if not possible that some wealthy Chinese merchant or group (a Tong? or a pair of them?) could be approached by some representative of the Uni-

versity with a view of contributing Six Hundred Dollars toward his support during the year. We must try to do what we can for this young man. I have no acquaintance among the wealthy Chinese residents of Chicago but there ought to be some who would take an interest in his case. Will you not discuss this with Mr. Woodard or the President, or both? Eventually could you not induce the best man among players to hold a benefit that will net Mr.

Cheng Six Hundred Dollars.

Sincerely yours,

Edwin B. Frost

HBT:M

The University of Chicago

Office of the Secretary

TELEPHONE MIDWAY 0800

928

Interoffice Correspondence

Date: June 14, 1928

To: Mr. Woodward

Subject: Contribution from
Mr. J. P. Welling

From: Gratia Esher Knobel

Mr. J. P. Welling, 111 West Monroe Street, sent a check yesterday for \$200.00 to help pay the living expenses for a year of Mr. Chang (see copy of letter enclosed). I am taking care of the manner in which the payments are to be made to Mr. Chang; Mr. Stevens has already arranged for Mr. Chang's tuition.

Mr. Mason is acknowledging Mr. Welling's gift, which was made in the pleasantest and most cordial manner possible. I am sure it will not be difficult to raise the remaining \$400.00

The University of Chicago

Office of the Secretary
TELEPHONE MIDWAY 6800

Date: June 14, 1928

Subject: Contribution from
Mr. J. P. Welling

Correspondence

Mr. Woodward

Gracie Baker Knobel

Mr. J. P. Welling, 111 West Monroe Street, sent a check yesterday for \$200.00 to help pay the living expenses for a year of Mr. Chang (see copy of letter enclosed). I am taking care of the manner in which the payments are to be made to Mr. Chang; Mr. Stevens has already arranged for Mr. Chang's tuition.

Mr. Mason is acknowledging Mr. Welling's gift, which was made in the pleasantest and most cordial manner possible. I am sure it will not be difficult to raise the remaining \$400.00.

The University of Chicago

Yerkes Observatory
Williams Bay, Wisc.

April 4, 1928

Dean Henry G. Gale
University of Chicago
Chicago, Ill.

Dear Sir:

I am disappointed that it was not possible to award a fellowship to Mr. Y. C. Chang, B.S. and M.S. of our University who is now working here as a graduate student. He is an exceptionally fine young man and is greatly desirous of staying one year more so that he can take his doctor's degree before returning to China. He had a letter from Dr. Y. H. Woo, one of our doctors, asking him if he would take a place on the faculty of the National Fourth Chung San University at Nanking, China. It would be most desirable that he should complete his American education by this extra year of work for the Ph. D. The Chinese fellowship which he has had for five years cannot be renewed beyond the present summer, as he has been lately informed. Mr. Chang feels quite sure that the place at Nanking will be held open for him for another year if he can be allowed to keep on in graduate work. He would need only about Six Hundred Dollars aside from tuition to live here until the end of next summer. He has recently done an excellent piece of work under Mr. Van Briesbroeck on the orbit of the Stearns comet which will be published in a forthwith coming number of the Astrophysical Journal. He is a thoroughly reliable young man whom we should like to have as the first astronomical representative of the University of Chicago in China. Is it not possible that he could be given a scholarship for four quarters beginning with July first to cover his tuition? Then is it not possible that some wealthy Chinese merchant or group (a Tong? or a pair of them?) could be approached by some representative of the University with a view of contributing Six Hundred Dollars toward his support during the year. We must try to do what we can for this young man. I have no acquaintance among the wealthy Chinese residents of Chicago but there ought to be some who would take an interest in his case. Will you not discuss this with Mr. Woodward or the President, or both? Eventually could you not induce the best mah jong players to hold a benefit that will net Mr. Chang Six Hundred Dollars.

Sincerely yours,

(Signed) Edwin B. Frost

The University of Chicago

Yerkes Observatory
Williams Bay, Wisc.

April 4, 1928

Dear Henry C. Gale
University of Chicago
Chicago, Ill.

Dear Sir:

I am disappointed that it was not possible to award a fellowship to Mr. Y. C. Chang, B.S. and M.S. of our University who is now working here as a graduate student. He is an exceptionally fine young man and is greatly desirous of staying one year more so that he can take his doctor's degree before returning to China. He had a letter from Dr. Y. H. Woo, one of our doctors, asking him if he would take a place on the faculty of the National Fourth Chung San University at Hanking, China. It would be most desirable that he should complete his American education by this extra year of work for the Ph. D. The Chinese fellowship which he has had for five years cannot be renewed beyond the present summer, as he has been lately informed. Mr. Chang feels quite sure that the place at Hanking will be held open for him for another year if he can be allowed to keep on in graduate work. He would need only about six hundred dollars aside from tuition to live here until the end of next summer. He has recently done an excellent piece of work under Mr. Van Biesbroeck on the orbit of the stars comet which will be published in a forthcoming coming number of the Astrophysical Journal. He is a thoroughly reliable young man whom we should like to have as the first astronomical representative of the University of Chicago in China. It is not possible that he could be given a scholarship for four quarters beginning with July first to cover his tuition. Then is it not possible that some wealthy Chinese merchant or group (a Tong? or a pair of them?) could be approached by some representative of the University with a view of contributing six hundred dollars toward his support during the year. We must try to do what we can for this young man. I have no acquaintance among the wealthy Chinese residents of Chicago but there ought to be some who would take an interest in his case. Will you not discuss this with Mr. Woodward or the President, or both? Eventually could you not induce the best men among players to hold a benefit that will net Mr. Chang six hundred dollars.

Sincerely yours,

(Signed) Edwin B. Frost

The University of Chicago

Office of the Secretary

TELEPHONE MIDWAY 0800

Interoffice Correspondence

Date: June 14, 1928

To: Mr. Mason

Subject: Contribution from Mr. J. P.
Welling

From: Gratia Esher Knobel

Professor Frost of the Yerkes Observatory at Williams Bay, asked this Office several weeks ago to secure tuition for four quarters and living expenses for a year (amounting to \$600.00) for a Chinese graduate student in astronomy who has been doing exceptionally fine work and who would like to get his doctor's degree before returning to be a member of the faculty of the National Fourth Chung San University at Nanking, China. Mr. Stevens has arranged for his tuition. Yesterday morning I telephoned Mr. J. P. Welling, 111 West Monroe Street, who is a member of Friends of China, whether he would help raise the \$600.00, and he was so very pleasant and cordial about the matter, promising to send a check immediately for \$200.00 (which I received yesterday afternoon) that I wish it would be possible for you to find time to write him a personal letter of thanks.

Mr. Welling gave \$500.00 to the Endowment Fund and \$500.00 to the Frank Billings Medical Clinic. His wife is a sister of Mrs. James Field of the University. He is an alumnus of Princeton

The University of Chicago

Office of the Secretary
TELEPHONE MICHIGAN 6666

Date: June 14, 1928

Interoffice Correspondence

Subject: Contribution from Mr. J. P. Welling

To: Mr. Mason

From: Gratia Fisher Knobel

Professor Frost of the Yerkes Observatory at Williams Bay, asked this office several weeks ago to secure tuition for four quarters and living expenses for a year (amounting to \$200.00) for a Chinese graduate student in astronomy who has been doing exceptionally fine work and who would like to get his doctor's degree before returning to be a member of the faculty of the National Fourth Chung San University at Hankow, China. Mr. Stevens has arranged for his tuition. Yesterday morning I telephoned Mr. J. P. Welling, 111 West Monroe Street, who is a member of Friends of China, whether he would help raise the \$200.00, and he was so very pleasant and cordial about the matter, promising to send a check immediately for \$200.00 (which I received yesterday afternoon) that I wish it would be possible for you to find time to write him a personal letter of thanks.

Mr. Welling gave \$200.00 to the Endowment Fund and \$200.00 to the Frank Billings Medical Clinic. His wife is a sister of Mrs. James Field of the University. He is an alumnus of Princeton.

925
January 19, 1928

Dear Mr. Frost:

Thank you for sending me the Barnard "Atlas" together with your interesting letter of January 17. I do not think it out of the question that we may gain some support for Yerkes through the General Education Board. I do not believe that the time is ripe for a request just now, but I think it will be within a month or two. Of course, I have no knowledge that support will be granted but believe it worth a trial. I would be very glad if you would outline the greatest needs for the department and let me have the memorandum as early as is convenient.

Sincerely yours,

Max Mason

President

Mr. Edwin B. Frost
Yerkes Observatory
Williams Bay
Wisconsin

1928, January 19

Dear Mr. Frost:

Thank you for sending me the Barnard "Atlas" together with your interesting letter of January 17. I do not think it out of the question that we may gain some support for Yerkes through the General Education Board. I do not believe that the time is ripe for a request just now, but I think it will be within a month or two. Of course, I have no knowledge that support will be granted but believe it worth a trial. I would be very glad if you would outline the greatest needs for the department and let me have the memorandum as early as is convenient.

Sincerely yours,

Max Mason

President

Mr. Edwin S. Frost
Yerkes Observatory
Williams Bay
Wisconsin

The University of Chicago

Yerkes Observatory
WILLIAMS BAY, WIS.

January 17, 1928.

Dr. Max Maxon, President,
University of Chicago,
Chicago, Illinois.

Dear Dr. Mason:

As I promised, when I saw you so pleasantly on Thursday evening, I have had sent to you by parcel post a copy of the Barnard "Atlas of Selected Regions of the Milky Way." It is in two parts and both are supposed to be opened when any photograph is being examined, the key charts in Part II being numbered to correspond with the photographs in Part I. I hope that you will find time to examine this work at your convenience. It has been in preparation for two decades.

|| received
1-19-28

The University and the Department of Astronomy are under great indebtedness to the Carnegie Institution of Washington for the large financial support it has given us. The cost to it for publishing this Atlas was between \$9000 and \$10,000. Of course the University contributed even more in the salaries of the author and editors and others concerned in its production.

Other large works published for our Department by the Carnegie Institution are Professor Burnham's monumental volumes on double stars (No. 5) and Moulton's (et al) on periodic orbits (No. 161); also Parkhurst's "Researches in Stellar Photometry" (No. 33), Burnham's "Measures of Proper Motion Stars" (No. 168), and a small volume by Hale and Fox on the solar rotation (No. 93).

In the early years of its existence, before it had its own departments organized, the Carnegie Institution also contributed liberally to the researches at the Yerkes Observatory. In some years, around 1903, it contributed more than \$4000 to pay the salaries of assistants whom the University could not pay.

Although Barnard's Atlas includes the most interesting regions that could be reached from the latitudes of the Yerkes Observatory and of Mount Wilson, it actually covers less than 25 per cent of the Via Lactea. However, from counts made in sampling different plates, we may safely estimate that the Atlas shows the images of between five and ten million stars.

You may recall that I spoke to you of a project for photographing the entire Milky Way, with the use of the remark-

The University of Chicago

Director Observatory
WILLIAM BAY WILSON

January 19, 1922

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

Dear Mr. Mason:

As I promised, when I saw you so pleasantly on
Thursday evening, I have had sent to you by express a
copy of the Harvard Atlas of Selected Regions of the Milky
Way. It is in two parts and both are supposed to be good
when any photograph is being examined, the key charts in
Part II being numbered to correspond with the photographs in
Part I. I hope that you will find time to examine this work
at your convenience. It has been in preparation for two
decades.

The University and the Department of Astronomy are
under great obligations to the Carnegie Institution of Wash-
ington for the large financial support which has been given us. The
cost to us for publishing this Atlas was between \$2000 and
\$30,000. Of course the University contributed even more in
the salaries of the printer and editor and a large sum in
the production.

Other large works published for our Department by
the Carnegie Institution are Professor Barnard's monumental
volumes on double stars (No. 3) and (No. 4) (let all on
periodic orbits (No. 101); also Barnard's "Measurements of Proper
Motion" (No. 35), Barnard's "Measurements of Proper
Motion" (No. 128), and a small volume by Hale and Fox
on the solar rotation (No. 33).

In the early years of its existence, before it had
its own department organized, the Carnegie Institution also
contributed liberally to the researches at the Yerkes Obser-
vatory. In some years, around 1903, it contributed more than
\$2000 to pay the salaries of assistants whom the University
could not pay.

Although Barnard's Atlas included the most inter-
esting regions that could be reached from the latitude of
the Yerkes Observatory and of Mount Wilson, it actually covers
less than 25 per cent of the Via Lactea. However, from counts
made in sampling different places, we may safely estimate that
the Atlas shows the images of between five and ten million
stars.

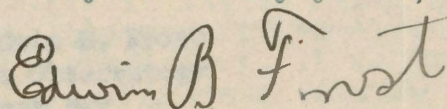
You may recall that I spoke to you of a project for
photographing the entire Milky Way, with the use of the tele-

able new photographic lenses designed by our Professor Ross, two of which are now in operation on the mounting of our Bruce photographic telescope. It involved a five year campaign from two stations in addition to the Yerkes, one probably in South America. My first estimates of the cost of this undertaking, without allowing for the publication of an atlas, was \$96,000. I would not, in fact, advocate the publication of another comprehensive atlas of the entire Milky Way. I did, however, allow for the deposit of copies on glass from the original negatives at certain strategic centers of astronomical research, such as the Royal Astronomical Society in London. Is it not likely that such a project would arouse the interest of the Rockefeller Foundation, or some other of the large corporations for research and education? I have not wished to push the matter until the Barnard Atlas was distributed and critically reviewed by the astronomical authorities of the world. I shall be glad to hear your views on this matter when you have had time to consider it.

My remarks at the Faculty Dinner did not have at all the finish that I would have liked, as I had to compress them so much and I left out references I had intended to make to the results of the productive cooperation of our department with that of Geology and others. However, these were briefly stated ~~in~~ a paper which I had already written at Mr. Dickerson's request and they are appearing in the January number of the University Record.

I trust that we shall have the pleasure of seeing you here this year. I am also anxious to have a visit from vice-President Woodward, as well as from Mr. Steere, who is so busy that he has not yet been able to inspect the large property at this outpost of the University.

Very sincerely yours,



Edwin B. Frost
Director

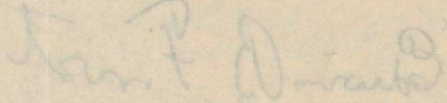
EBF:MRC

able new photographic lenses designed by our Professor Ross,
two of which are now in operation on the mounting of our
three photographic telescopes. It involved a five year cam-
paign from two stations in addition to the Yerkes, one prop-
ably in South America. My first estimate of the cost of
this undertaking, without allowing for the publication of an
atlas, was \$25,000. I would not, in fact, advocate the pub-
lication of another comprehensive atlas of the entire Milky
Way. I did, however, allow for the deposit of copies on
glass from the original negatives at certain astronomic centers
of astronomical research, such as the Royal Astronomical Soc-
iety in London. It is not likely that such a project would
arouse the interest of the Rockefeller Foundation, or some
other of the large corporations for research and education?
I have not wished to push the matter until the Harvard Atlas
was distributed and critically reviewed by the astronomical
authorities of the world. I shall be glad to hear your views
on this matter when you have had time to consider it.

My remarks at the faculty dinner did not have at
all the finish that I would have liked, as I had to compress
them so much and I left out references I had intended to make
to the results of the productive cooperation of our depart-
ment with that of Geology and others. However, these were
briefly stated in a paper which I had already written at Mr.
Dickerson's request and they are appearing in the January
number of the University Record.

I trust that we shall have the pleasure of seeing
you here this year. I am also anxious to have a visit from
vice-president Woodward, as well as from Mr. Speere, who is
so busy that he has not yet been able to inspect the large
property at this outpost of the University.

Very sincerely yours,



Edwin B. Frost
Director

EBF:WFO

astronomer yerkes (note)

ADDRESS

Delivered by the President, Professor E. A. Milne, on the Award of the Gold Medal to Professor Otto Struve, Director of the Yerkes and the McDonald Observatories

The Council has awarded the Gold Medal of the Society to Professor Otto Struve for his work on the observation and interpretation of the spectra of stars and nebulae.

It will be my duty and privilege shortly to lay before you the grounds for this award. But before doing so I should like to remind the Society of what an historic occasion this is, historic in the annals of the Society and historic in the annals of the Struve family. For this is the fourth time that a representative of the astronomically minded family of the Struve's has been awarded the Society's Gold Medal—four times in a hundred and eighteen years, or once in each generation.

My predecessors in this office, when presenting Gold Medals to members of the Struve family, have begun by addressing you on the grounds of the award, leaving to the end of their discourses the remarkable family connection of the Struve's with this award. But the present occasion is so notable that I ask to be allowed to dwell on this aspect of the matter first. I should mention that your Council in making this award was totally uninfluenced by the glamour that surrounds the name Struve in the history of astronomy. The present recipient was selected in fair and indeed severe competition with other names, severe not only in these war-time conditions, where the choice of medallist is partly limited by questions of nationality, but severe also by any absolute standard. It is to the glory of our subject that there has never been any shortage of names of the standard of this, the highest award in the Society's gift, and it was partly because of the probable future abundance of astronomers worthy of receiving the Medal that your Council decided to continue the restoration of its normal practice of awarding the Gold Medal at the Annual General Meeting of the Society—a change from earlier war-time procedure fittingly initiated by the award last year to the Astronomer Royal. Professor Otto Struve, I repeat, has earned this distinction in his proper right, by the overwhelming significance and value of his brilliant observational and interpretational work in stellar and nebular spectroscopy. I shall come to this later. First, however, I want to set his contributions in their historical setting, by mentioning briefly the astronomical contributions of his distinguished forbears so far as they concern this Society.

Science in the last century or two has given us many examples of families in which son has followed father with a like distinction. In physics this country has given us the Strutts, the Thomsons and the Braggs. France has produced the Curies, mother and daughter. In meteorology the elder and the younger Bjerknes are famous. Coming nearer to our own subject, the notable and continuously able family of Darwin has given to astronomy a son perpetuated in our George Darwin lectureship, whose son in turn we are happy to number now amongst our Fellows. In astronomy, amongst contemporary names we can claim the Plasketts, and amongst the giants of old the Herschels. But perhaps no family can vie with the Struve family in its devoted pursuit of, and its achieved distinction in, astronomy.

Wilhelm Struve, great-grandfather of our Medallist, was born in 1793 and died in 1864. After working first at Dorpat, he founded in 1839 the Pulkova Observatory, which he directed for nineteen years. He was awarded the Gold Medal of the Royal Astronomical Society in 1826, in the early days of the Society, for his work in discovering and measuring double stars. It was on April 14 of that year—note the date—that J. F. W. Herschel, acting as proxy for Wilhelm Struve, received the Gold Medal at the

hands of Francis Baily, the then President; Gold Medals were also presented in their own right to J. F. W. Herschel and to his collaborator J. South. The work of Wilhelm Struve had been accomplished at Dorpat, with the aid of a telescope made by Fraunhofer. Double stars were then a study of recent date, the subject having been opened up by Sir William Herschel, who, beginning with a knowledge of only four double stars, went on to determine a great many cases of relative orbital motion in close pairs. His work had been continued by his son and by South, working together, and independently by Wilhelm Struve. I have already referred to the Herschels as giants of old, and this bracketing of their names with that of Wilhelm Struve shows that he too is to be regarded as amongst the giants of old. Baily concluded his address of presentation to Wilhelm Struve, even more prophetically than he can have anticipated, by saying: "His services in the cause of science assure us that the name of Struve will be imperishable in the annals of astronomy."

The grandfather of our Medallist was also an Otto Struve. The son of Wilhelm, he was born in 1819 and died on 1905 April 14. He followed his father in the directorship of the Pulkova Observatory, though not immediately; he directed it from 1862 to 1890. Like his father before him, he won our Gold Medal before becoming Director of Pulkova—the year was 1850, during his father's directorship. The grounds of the award were a paper on "The Determination of the Constant of Precession with regard to the Proper Motion of the Solar System". It had been again Sir William Herschel who, in 1783, first drew attention to the proper motion of the solar system towards the constellation Hercules, by considering the directions of the then available proper motions of the stars. The subject was taken up by Otto Struve the elder, who made use of some 265 double stars and 174 wider pairs observed at Dorpat, together with other stars. From their proper motions between 1755 and his own epoch he isolated the geometrical precessional motion. His great problem was how to correct the observed proper motions for the solar motion, which is of course more important for the nearer stars. Struve attempted to connect distance and magnitude, and, adopting 0".2 as the annual parallax of a star of the first magnitude, found the Sun's annual motion to be $1\frac{1}{2}$ times the radius of the Earth's orbit. This was a very creditable estimate, the true value being about four times the radius of the Earth's orbit. On this occasion, 1850 February 8, the Gold Medal was presented by Airy.

The third generation in the Struve family to receive the Gold Medal was represented by Hermann Struve, elder son of Otto Struve, grandson of Wilhelm Struve and uncle of our present Medallist. He was born in 1854 and died in 1920. He founded the Berlin-Babelsberg Observatory in 1913. He was awarded the Gold Medal of this Society in 1903 for his work on the satellites of Saturn. This was an arduous and comprehensive performance, involving comparisons of the satellites in pairs made over many years, and a huge labour of arithmetic. He deduced the true position of Saturn's equator, and from the orbits of the satellites themselves went on to determine the changes in their orbits, and so to the masses of the satellites and the shape of the planet. He confirmed Clerk Maxwell's theoretical work on the smallness of the mass of the rings. H. H. Turner, who presented the Medal on this occasion (1903 February 13), described him as "master of all his weapons, from the 30-inch telescope to the complexities of the gravitational analysis". Turner went on: "It is natural that our thoughts should stray to-day from the present occasion to the past; from the man himself to his father, who was awarded our Medal half a century ago; and to *his* father, who received it a quarter of a century before that. For the third time we welcome the name Struve to our list of honour, and a welcome as cordial awaits an unlimited number of those who in the future may produce work of the same quality as their forefathers." "We are glad to think that its value to him will be enhanced by the knowledge that it ranks him with his venerable father" (then still living at the age of eighty-four) "and his famous grandfather."

That welcome then hypothetically held out by Turner we extend in actual fact to-day

to the fourth generation, to the great-grandson of Wilhelm Struve, to Otto Struve the second. He has been faithful to his family tradition, and is ranked with his progenitors. Our Otto, as I may now call him, is the son of Ludwig Struve, who was the younger brother of Hermann Struve and the second son of Otto Struve the first. Ludwig Struve, it should be recalled, was also an astronomer of reputation: he was Professor of Astronomy in the University of Kharkov, and died in 1920. Thus do we welcome, in 1944, the successor to honours previously bestowed by this Society in 1826, 1850 and 1903.

Double stars, the solar motion and precession, the Saturnian system—after these three major and representative astronomical themes it is meet and right that the youngest of the Struves should have devoted himself to astrophysics, that younger sister of the classical astronomy. And with no sparing hand; for he has distinguished himself equally in the precision and wealth of his spectroscopic observations, his fertility in the design of new spectrographs, his power of execution of new astrophysical projects, his modernity in his analysis of spectroscopic phenomena, the width and generality of the problems he has selected and attacked, and the brilliance of his solutions of these problems and the bold sweep of his interpretational grasp. Add to this that he has throughout shared in the actual observing and reduction of spectrograms; that he has edited the senior journal in astrophysics and personally reviewed most of recent astrophysical literature in its pages; that he has followed the family tradition in founding a new observatory, but that he has exceeded the family tradition by directing not merely one but simultaneously two great observatories; and lastly that he has inspired and gathered round himself a devoted band of loyal and original-minded co-workers—and we have the parts of an astrophysicist indeed, one who has carried the family fame, in a new subject, to a new continent, and made good.

I would now remind you that the Gold Medal is awarded for his individual work, some of which I will try to pass in review. To deal with the whole of it would be beyond my time and my powers. His first paper, in the *Astrophysical Journal*, is dated 1923. Appropriately enough, it relates to observations of a double star—the spirit of his great-grandfather was stirring in him. These observations, like many of those which followed, were made with the Bruce Spectrograph of the Yerkes Observatory. The star was γ Argus, a star which had been first marked for observation at Yerkes in 1905 by E. B. Frost, under whom Struve was working. This is a visual double (of period $23\frac{1}{2}$ years), which can also be observed spectroscopically. Combination of visual with spectroscopic elements gave him the mass-ratio as 0.6, and the total mass of the system as $1.0-1.1 \odot$. This paper was followed in 1924 by observations of the spectroscopic binary 43 β^2 Orionis, of which he took 39 plates. This star showed a K line of Ca^+ not participating in the periodic shifts of the other lines—an observation foreshadowing studies to come; it was found that this K line, and the Balmer lines in emission, gave a radial velocity nearly the same as that of the surrounding Orion nebula, and differing by 20 km./sec. from that of the star proper. Spectroscopic binaries as a whole now engaged our Medallist's attention. He examined the data for 144 such binaries and found a relation between their periods P and semi-amplitude of velocity-variation K in agreement with their supposed binary nature for periods in excess of 2.4 days, whilst for those which were Cepheids he found no variation of K with P ; as for the shorter-period stars, he found them to form two groups, true binaries and Cepheids. The most interesting general conclusion emerging from the study was that the average total mass of the actual doubles was $3 \odot$. The next year or two saw more work on particular spectroscopic binaries, ending with a very substantial paper in 1926 (in conjunction with Frost and Barrett) giving the radial velocities of 368 B-type stars, determined from Bruce plates taken in the years 1901-25. Of these, 43 per cent. were found to be spectroscopic binaries. There resulted a determination of the apex of the solar motion as $\alpha = 283^\circ.8$, $\delta = +11^\circ.7$, velocity 17.2 km./sec. and a K term of 5.6 km./sec. The p.e. of an average radial velocity was ± 3.5 km./sec.; from

a single spectrogram it was ± 9.0 km./sec.; and the average residual radial velocity was 10 km./sec. This monumental paper gave the observational data both for each star, averaged, and for each separate plate of each star.

I have dwelt at length on these early studies by our Medallist because, apart from a natural transfer of interest from visual binaries to spectroscopic binaries, it looked as though the younger Otto were merely following lines of attack opened up by his grandfather and great-grandfather. Our Medallist was to turn again and again to spectroscopic binaries in the years that were to follow, especially to such difficult stars as 27 Canis Majoris, with its enormous inferred mass, and 29 Canis Majoris. But wider interests lay ahead.

It had been in 1924 that J. S. Plaskett had published his famous investigations on interstellar calcium lines. I have already reminded you that these lines do not share in the oscillatory motions of those in the spectroscopic binaries they accompany, and indeed have their own radial velocities in single stars. The exceptional behaviour of these lines had been discovered by Hartmann in 1905, in the star δ Orionis, but it was J. S. Plaskett who cleared the matter up, showing that the K-line velocities were the reflex of the solar motion, and that accordingly the Ca^+ cloud was associated not with particular stars but with the galaxy as a whole. Further, Eddington had made extensive theoretical calculations on the same subject in his Bakerian Lecture for 1926. To this then rapidly developing subject our Medallist in 1926-27 turned his attention, using for the purpose a collection of slit-spectrograms taken at the Mt. Wilson, Victoria, Lick and Yerkes Observatories, together with additional plates of his own taking secured with the 60-inch reflector at Mt. Wilson. He found that interstellar K lines showed their greatest intensity for stars at a distance of 500-600 parsecs, this being based on intensity estimates in 321 stars. He established the important point that in *visual* doubles the two components gave identical intensities for the K line. He even found one star, 2 Lacertæ, which showed an interstellar K line *between* two "stellar" components. He made a special study of the Ca^+ cloud for 36 stars in Cepheus, finding the K lines systematically more intense than in Orion. The distance of the Ca^+ cloud in Cepheus he put as beginning at 250 parsecs away, whilst the dark nebula in the same region, indicated by star counts, is at 350 parsecs. Interstellar lines were not found in types later than B3—why, seemed difficult of explanation, but was perhaps due to the failure of later-type stars to contribute free ions under radiation pressure. The Ca^+ cloud, as disclosed by Struve's investigations at this stage, seemed to correspond to Charlier's local cluster of B-type stars. Struve found, as predicted generally by Eddington, that the interstellar lines nearly doubled in strength for a doubling of the distance of the star concerned. Though the exact significance of this, quantitatively speaking, depended on the calibration of Struve's intensity scale, it was clear that the interstellar cloud was widespread.

He returned to the subject in 1928 with a study of 1728 stars of types O to B3, and 338 later-type stars. This larger amount of material was made available by the use of Harvard objective-prism spectrograms. The general conclusion was to confirm that the intensity of the interstellar K line was a function of distance, for each spectral type; the distances were obtained by the assumption of a correlation of absolute magnitude with spectral type. Spectroscopic binaries with *oscillating* K lines were shown to be capable of interpretation in terms of blends. The existence of peculiar radial velocities in the interstellar K lines suggested the occurrence of characteristic velocities in different parts of the Ca^+ cloud.

The fruits of these observational studies were seen in a piece of successful collaboration between our Medallist and B. P. Gerasimovič, in an important paper in 1928 entitled "The Physical Properties of a Gaseous Substratum in the Galaxy". Whilst Eddington had started on the basis of an Emden isothermal gas-sphere, Struve and Gerasimovič started from the observational end. By first determining the absorption coefficient of the Ca^+ cloud per cm., and then using the absolute value of the atomic absorption

of the spectrum is not a simple one, and the distance of the spectrum from the eye is not a simple one. The distance of the spectrum from the eye is not a simple one, and the distance of the spectrum from the eye is not a simple one.

It is not a simple one, and the distance of the spectrum from the eye is not a simple one. The distance of the spectrum from the eye is not a simple one, and the distance of the spectrum from the eye is not a simple one.

It is not a simple one, and the distance of the spectrum from the eye is not a simple one. The distance of the spectrum from the eye is not a simple one, and the distance of the spectrum from the eye is not a simple one.

It is not a simple one, and the distance of the spectrum from the eye is not a simple one. The distance of the spectrum from the eye is not a simple one, and the distance of the spectrum from the eye is not a simple one.

It is not a simple one, and the distance of the spectrum from the eye is not a simple one. The distance of the spectrum from the eye is not a simple one, and the distance of the spectrum from the eye is not a simple one.

coefficient as disclosed by my own chromospheric studies, combined with line-width estimates, they estimated the mass-density of Ca^+ gas in the galaxy as about 3.6×10^{-22} gr./cm.³. Allowing for its state of ionization, which, owing to the high temperature of even dilute starlight (as shown by Eddington), is mostly the doubly ionized state, and allowing further for the probable cosmic abundance of calcium relative to the other elements, they deduced finally the density of the gaseous cloud forming the substratum as of the order of 10^{-26} gr./cm.³. The total mass of the cloud they estimated as not greater than one per cent. of the total stellar mass per unit of volume. The rotation of the galaxy had then recently been discovered by Oort, and Gerasimovič and Struve were able to confirm J. S. Plaskett's result, that the Ca^+ cloud shared the rotation of the galaxy. It was of course subsequently shown by Plaskett and Pearce that the degree of rotation corresponded to a mean distance one-half that of the stars concerned, thus suggesting a generally uniform distribution of the cloud.

In 1929 our Medallist went on to use the Stark effect in line spectra to determine the absolute magnitudes of certain B-type stars. How this was possible can be seen as follows. He first showed that intermolecular electric fields could cause the appearance of "forbidden" lines in stellar spectra, and by means of various criteria deduced that the Stark effect is more pronounced in dwarfs than in giants. This is in accordance with our expectation that dwarfs, having larger values of surface gravity, will have higher pressures in their atmospheres. Struve's Stark-effect investigations confirmed the usual estimate of 10^{-4} atmospheres pressure, as deduced from Saha's theory of high-temperature ionization. Now the value of surface gravity can be expressed in terms of absolute magnitude and effective temperature, and hence for stars of given colour-type or spectral class, observations of the relative strengths of lines influenced by the Stark effect—that is, by the degree of packing of neighbouring ions—can be used to derive absolute magnitudes, just as in Adams and Joy's original method of spectroscopic parallaxes. In this way Struve used the ratio of the forbidden line of helium $\lambda 4470$ to the permitted line $\lambda 4472$, and deduced for example that the star 67 Ophiuchi is highly luminous, of an absolute magnitude 3.0 magnitudes brighter than the star 88 γ Pegasi; and he estimated its distance as 600 parsecs.

In collaboration with Shajn, Struve had communicated to our own *Monthly Notices* in 1929 a paper on the contours of absorption lines in rapidly rotating stars, a subject which had been independently investigated by J. A. Carroll in 1928. Carroll's work, which was of great beauty, was mathematical. Struve and Shajn adopted a more empirical method of approach. They pointed out that the profile of an absorption line so produced would be "dish-shaped" if the axis of rotation were approximately normal to the line of sight; that is to say, the lines should be shallow, but with well-defined edges. Struve and Shajn succeeded in correlating line-widths with rotational velocities in short-period spectroscopic binaries, on the assumption that in such close binaries the rotational velocities of the components must be approximately the same as the orbital angular velocity; and they suggested that the results indicated rotational equatorial speeds of the order of 20–150 km./sec., with most of them of the order of 50–70 km./sec. In 1931 Struve published a study of bright lines in stars of type B in which he showed that stars having widely separated, doubled bright lines are characterized by extremely flat and broad absorption lines, suggestive of rapid axial rotation, about an axis nearly perpendicular to the line of sight, of the order of several hundred km./sec. He suggested further that such stars, being near the limit for stability, would be ejecting matter at their equators, and this matter would form a nebulous ring and so explain the accompanying doubled emission lines. Struve was of opinion that "the theory of ionization accounts so satisfactorily for even small changes in the intensities of stellar absorption lines that the occurrence or non-occurrence of bright lines must be attributed to real structural differences amongst the stars, and not to changes in the conditions of excitation. In analogy with the Novæ and with the Wolf-Rayet stars, it is natural to attribute the bright

lines to an outer gaseous envelope or nebula. But in Novæ the nebulous material is receding from the star. . . . The much greater stability of the phenomena observed in Be stars and especially the absence of absorption on the violet sides of the emission lines suggest that the nebula in a Be star is a permanent feature." He claimed that only those stars showing dish-shaped absorption contours, *i.e.* exhibiting rotation effects, tended to possess bright lines; further, narrow emission lines were associated with narrow absorption lines, the two features together indicating a star whose axis tended to be more nearly coincident with the line of sight. In 1930 he had shown that very rapid rotation is peculiar to the earlier spectral classes, a conclusion which was confirmed by another study of the contours of lines in the components of spectroscopic binaries. For example, in α Virginis, the two components were found to give quite different line-profiles, corresponding to equatorial velocities of 200 km./sec. and 50 km./sec. respectively. The single star η Ursæ Majoris was also studied and found to be similar to the fast-spinning component of *Spica*.

Our Medallist's output in these years, and indeed in all years since, was and has been enormous. He followed up his studies of axial rotation, in 1931, with a comprehensive standard list of wave-lengths in the spectra of B-type stars together with intensity-estimates, and applied it to elucidate many points in the theory of high-temperature ionization, studying lines of helium (neutral and ionized), and ionized oxygen, nitrogen and silicon.

In 1934 Struve returned to the subject of the calcium clouds. By comparing distances determined from line-intensities with distances determined by means of the galactic rotation effect, he inferred that condensations must be present at different places in the cloud. He was able to use his results to deduce the distance of the galactic centre as 10,000 parsecs.

E. B. Frost, the Director of the Yerkes Observatory, had retired on 1932 July 1, and Struve, who had worked under him for ten years, then became Director. It is apparent now that he immediately set about inaugurating stellar and nebular spectroscopic programmes of the widest interest, and that from this time forth his was the driving force behind the brilliant output of the staff of the Yerkes Observatory. As was natural, joint papers with members of his staff now become more frequent. But it is usually easy to recognize the characteristic Struve touch, the touch of one to whom the individual stars, with their individual peculiarities, were personal friends. And ever and anon Struve would himself summarize and discuss the recent progress in each new subject under development, and illumine it with statesmanlike breadth of vision, sure judgment and acute deductive power. Throughout he saw each problem *physically*. And though he attracted round himself a brilliant band of ardent mathematicians from all parts of the world, who were able to develop his physical ideas in mathematical symbolism, the inspiration and initial originality were usually Struve's, as they would be the first to admit. One gets the impression, from the pages of the *Astrophysical Journal*, of a steadily maturing mind, no longer content with defeatist solutions of astrophysical problems but bent on winning through to the essential physical explanations. As the decade of his Directorship wore on, there is a veritable crescendo of coruscating papers from the Yerkes Observatory, to which from 1939 the McDonald Observatory added its share.

For example, in 1933, in a broadly conceived paper, Struve dealt with the problem of the need for a more detailed classification of stellar spectra than Miss Cannon's linear sequence. It is well known that this sequence corresponds in the main to an "effective temperature" classification, with surface gravity (or absolute magnitude) as a cross-parameter in each division. Struve questioned whether this classification was adequate, or whether (apart from rotational effects) other parameters might not be needed. He concluded that to make possible an advance in our knowledge it was imperative "that new and more refined methods than are at present available be used in stellar spectroscopy". He suggested that the principal criterion for the B stars should be the intensity

of *Hel* 4472; the varying intensities of *MgII* 4481 would then show how other parameters were at work. To separate more parameters, more lines would be needed.

In 1935 he re-examined 27 *Canis Majoris* and decided that on the evidence of his new observations it ought to be dropped from the list of spectroscopic binaries, owing to the non-recurrent character of its velocity curve.

In the same year, with Morgan and Henyey, he made a special study of the spectrum of *P Cygni*, the forerunner of a multitude of detailed studies, especially later with *P. Swings*, of stars with peculiar spectra. For *P Cygni* 158 absorption lines were measured, of which all but 4 were identified, and 63 emission lines, of which all but 15 were identified. The absorption lines were found to be characteristic of a higher level of excitation than the emission lines, as measured by the ionization potentials. The general results suggested a shell of gas, with an accelerated outward motion. *P Cygni*, it may be mentioned, is an old Nova (1600). The central star has an effective temperature of 20,000°, and is about 1000 parsecs from the Sun. Selective interstellar absorption (the interstellar K line is exceptionally strong) reduces the effective temperature to approximately 6000°. The spectrum observed originates in an expanding nebular shell, its velocity varying from 50 km./sec. to 200 km./sec.

From 1936 onwards, the brightnesses of nebulae, both dark and bright, began to engage his attention. With Elvey, he attempted to answer such questions as: What are the surface brightnesses of dark nebulae? These investigators constructed a Fabry photometer for use in the focus of the Yerkes 40-inch refractor; the method was photographic, and the measures made finally with a Hartmann microphotometer. Their very accurate measures disclosed an unexpectedly small value for the excess of surface brightness of the dark nebulae over that of the comparison regions, and they concluded that the albedo per nebular particle was smaller than had been surmised, and that scattering in interstellar space is nearly as efficient as scattering within dark nebulae.

This negative result was followed by one of emphatically positive a character. It had been shown by V. M. Slipher, Hertzprung, Hubble and Zanstra that galactic nebulae derive their illuminating power by simple scattering of the light of near-by stars. Struve and Miss Story went on to investigate the albedos of the particles forming diffuse nebulae; in the region of ρ Ophiuchi it came out as 0.7. Next, Struve, Elvey and Roach determined the colour index of the nebula in Scorpion illuminated by *Antares*, which you will remember is a red giant (*cMo*). By the use of a Schmidt camera they compared photographs taken with photovisual and photographic emulsions, and they found for the colour index of the nebula the enormous positive value of 1.9 mag. The shape of the nebula was brilliantly outlined on photovisual plates, whilst practically invisible on photographic plates. Nebulae illuminated by B stars, on the other hand, were found to have the negative colour index of -0.4 mag. This work was of the utmost value in establishing with certainty the existence of reflexion nebulae. The colour index of the night sky, in the same investigation, was found to be +0.5 mag.

A further paper was devoted to the dark cores and bright rims of many of Barnard's dark nebulae. The narrow bright rims found in emission nebulae but not in nebulae having continuous spectra were investigated on the basis of the Lommel-Seeliger theory.

For further studies on nebulae, Struve, van Biesbroeck and Elvey constructed a 150-foot nebular spectrograph at the McDonald Observatory on Mt. Locke, and described it in 1938. It was being used by Struve in 1939 to estimate the density of excited hydrogen atoms per cm.³ in the line of sight for certain regions of the Milky Way which were the seat of Balmer emission. Later, with the new quartz spectrograph of the McDonald Observatory Struve and Swings observed the ultra-violet region $\lambda\lambda$ 3200-3900 in the spectra of various early-type stars; they verified the presence of expanding shells, and discovered some extremely "hot" nuclear stars. The stars studied included *Oe* stars, *P Cygni* stars, *Be* stars, and spectra showing simultaneously an *M*-type spectrum and forbidden lines of high excitation. Amongst them was *Z Andromedae*, previously studied

by H. H. Plaskett; this had recently shown a remarkable change from an emission spectrum to one of P Cygni type.

As a consequence of these studies of peculiar spectra, Struve and his collaborators were able to infer, from the effects of dilution of radiation, the ratio of radius of parent star to radius of expanding shell. This led in turn to the suggestion that such expanding shells tend to be associated with early-type binary stars on the verge of instability. As an example of his powers of interpretation, I may instance his re-attack, in collaboration with Kuiper, on the problem of the structure of β Lyræ, that obstinately mysterious eclipsing binary. Their conclusions are that the system consists of a central star of type B9, with a small F-type companion which eclipses it, the whole surrounded by an expanding or spirally moving shell of gas and the space between the two stars being the seat of currents of gas, to and from the primary, arising from the instability of the primary. These general physical ideas have been given mathematical expression by Kuiper.

As recently as 1942 Struve followed up his numerous, indescribably detailed studies of stars with peculiar spectra by a markedly individual discussion of the variety of problems they give rise to. He refined the simple notion of a reversing layer, or an extended stellar atmosphere, by showing from the available observational data that in an ideal case three distinct layers co-exist: (1) the ordinary reversing layer; (2) a stationary, high-level, chromospheric layer producing a fine-line spectrum of a Cygni type; (3) above this an expanding layer producing a spectrum of P Cygni type.

It is scarcely possible to do justice in present circumstances to the most recent of Struve's contributions, for discussion of them in astronomical circles in this country has scarcely been possible since the outbreak of war. I will only say that they have continued unabated in quality and quantity.

I said at the outset that the individual work of Otto Struve covered astrophysics in the widest sense. The calcium cloud, the Stark effect, stellar rotations, the properties of the B stars, expanding stellar shells, peculiar spectral types, reflection properties of nebulae—to each of these he has made both pioneering and sustained contributions of permanent value. He has shown personal skill in his choice, design and use of instruments, and scientific imagination of the highest kind in his interpretation of the results of their use. He has well earned our Gold Medal.

But this is not all that I would bring to your notice. I have already mentioned repeatedly the Yerkes and McDonald Observatories. But I have not paused to relate how Struve, whilst full-time Director of the Yerkes Observatory and Professor in the University of Chicago, found time to plan, construct and inaugurate a new observatory in Texas, and thereafter, becoming its Director whilst not ceasing his Yerkes work, to execute a brilliant programme of observations at the newly founded McDonald Observatory on Mt. Locke.

Mr. William Johnson McDonald, of Paris, Texas, bequeathed a large sum of money to the Regents of the University of Texas "to aid in erecting and equipping an astronomical observatory as a part of the University for study and the promotion of the study of astronomical science". The result was that by an almost unprecedented piece of University collaboration, under Struve's *de facto* leadership, the Universities of Chicago and Texas agreed to co-operate in constructing and maintaining such an observatory. The Director of Yerkes was to be the Director of McDonald, and the latter's staff were to be supported by the University of Chicago. A site was selected by Struve in the Davis Mountains in Texas, and an 82-inch reflecting telescope was constructed. It was declared open for research on 1939 May 5—your present President had the honour of being present at the dedicatory exercises. The contract had been given to the Warner and Swasey Company in 1933, the observatory building was completed in 1936 and the great telescope in 1939.

Each of our previous Struve Gold Medallists has either founded or directed with great distinction a great observatory. Our present Medallist has founded one new observatory, already great, and he is directing two. It is generally recognized that the

speedy and successful carrying out of the project of the joint observatory, up to the final installation of the 82-inch telescope, and the outlining and inauguration of its research programme, are due to the scientific and executive abilities and marked personal qualities of Dr. Otto Struve, our Medallist of to-day.

With the Gold Medal the Society tenders to Dr. Otto Struve, Director of the Yerkes and McDonald Observatories, its heartfelt congratulations on the outstanding success and comprehensiveness of his personal contributions to the science of astrophysics, together with its profound wishes for the welfare in the future of the observatories he directs and of the devoted staff associated with him and with them.

ADDRESS

*Delivered by the President, Professor E. A. Milne, On the Nature of
Universal Gravitation*

I quote the following passage from Grant's *History of Physical Astronomy*:—

Among the various circumstances which are calculated to excite our admiration, while reviewing this portion of the history of Physical Astronomy, not the least remarkable are the resources of the transcendental analysis; by means of which the geometer has been enabled to unravel the most complicated relations of the system of the world, and to decipher in the anomalous movements of the celestial bodies the constant operation of one all-pervading principle. In vain would the human mind have ever attempted to penetrate into the more recondite parts of the theory of gravitation without the aid of this powerful instrument of research. Its assiduous cultivation was, therefore, essentially necessary for the development of that theory; and on this account the pure analysts, such as Leibnitz and the two eldest Bernoullia, deserve to be associated with those who have more directly contributed to the progress of the science. "The discovery of the system of the world by Newton", says Delambre, "was a fortunate event for geometers. Never could the transcendental analysts find a worthier or more sublime theme. Whatever progress is made in it, the original discoverer will always maintain his rank. Lagrange, who often asserted Newton to be the greatest genius that ever existed, used to remark also—'and the most fortunate; we do not find more than once a system of the world to establish.'"

By the phrase, "the system of the world", as used by the eighteenth- and early nineteenth-century mathematicians, was evidently meant the solar system. There was, or was then, only one solar system to be discovered, and that discovery, in its dynamical relations, was made by Newton. Thus Newton is acclaimed by Lagrange as fortunate in his generation.

But "the system of the world" means to-day something vaster, immensely vaster—I will not yet say infinitely vaster—than the solar system. It means something vaster even than the galactic system. It means the totality of all galactic systems. If Newton was fortunate in his generation, how much more fortunate is every astronomer of to-day, born to live at a time when the discovery has been made of a system, if system we can yet call it, grander in every sense—grander in its structure and grander in its constituents—than the solar system. We must all consider ourselves fortunate to have the opportunity of sharing in the analysis of this grand "system of the world".

The vista of research thus opened is so splendid as to be dazzling. We have to re-orient our terminology even to speak of it. The phrase "solar system" is itself a

The University of Chicago

ERNEST DE WITT BURTON
PRESIDENT

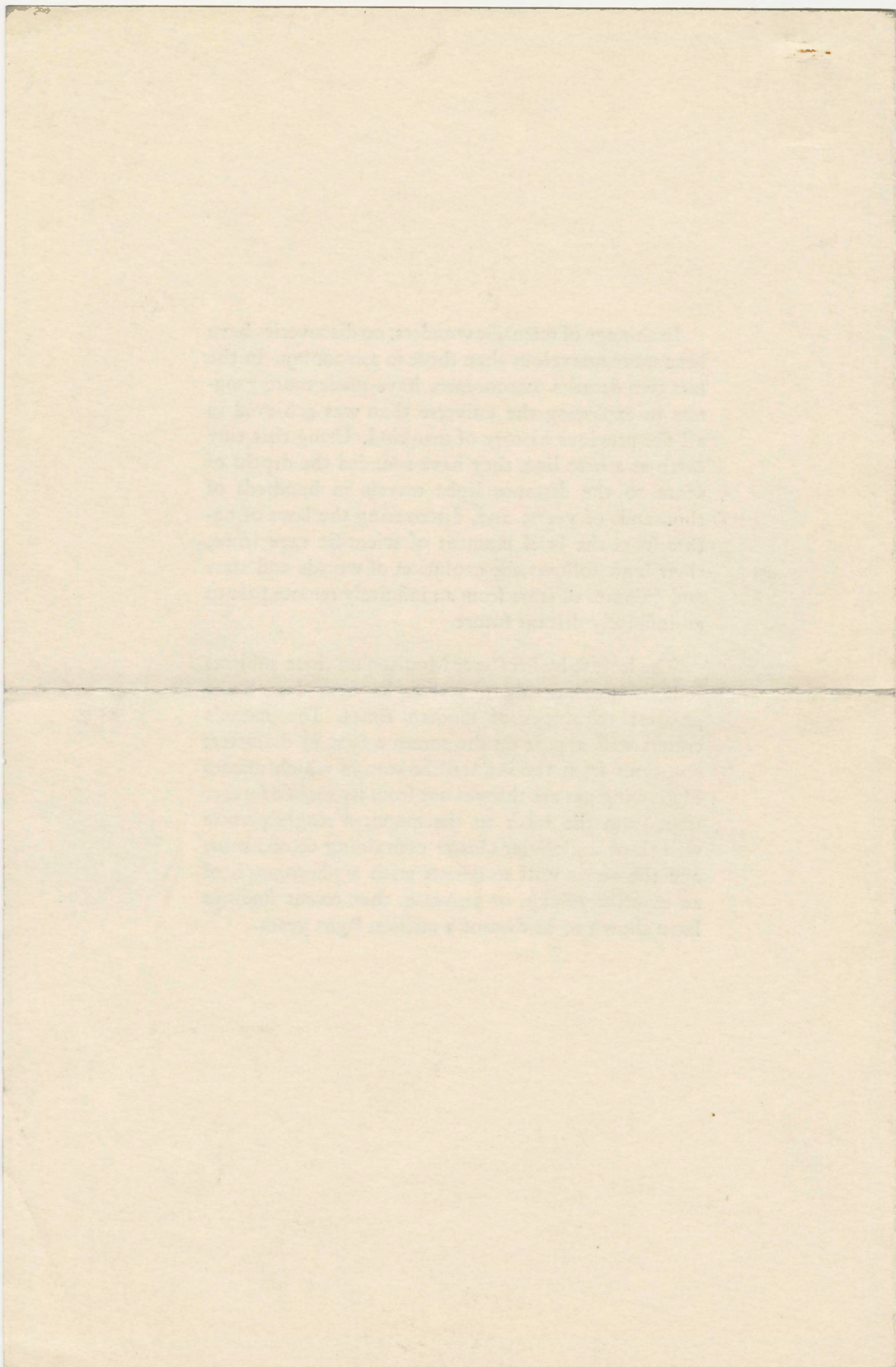
F5 XVIII

The President and the Trustees of the University of Chicago invite you to attend a lecture to be given by Professor Forest Ray Moulton, of the Department of Astronomy, on "Recent Astronomical Explorations in Space and Time," February 9, 1925, at 8:30 P.M., in Orchestra Hall.

NOTE: A brief description of the lecture is given on page three. Guests are asked to request only the number of tickets that are likely to be used and to mail their requests on the inclosed card by February 2. No tickets will be sold.

In this age of scientific wonders, no discoveries have been more marvelous than those in astronomy. In the last two decades astronomers have made more progress in exploring the universe than was achieved in all the previous history of mankind. Using this tiny earth as a base line, they have sounded the depths of space to the distance light travels in hundreds of thousands of years; and, discovering the laws of nature from the brief moment of scientific experience, their logic follows the evolution of worlds and stars and galaxies of stars from an infinitely remote past to an infinitely distant future.

The lecture by Professor Moulton on these subjects will be illustrated by photographs secured with the greatest telescopes of modern times. The moon's craters will appear on the screen a foot in diameter; eruptions from the sun will be seen in which masses of glowing gas are thrown out from its surface farther than from the earth to the moon; a single picture will show a globular cluster containing 60,000 suns; and the series will terminate with a photograph of an exterior galaxy, or universe, that recent findings have shown to be distant a million light years.



921

October 28,
1927.

My dear Mr. Frost:

Thank you very much for your care in preparing the bibliographical reports of the department for the past two years. They will be printed as you request with a special reference to the double entry.

Very truly yours,

David H. Stevens.

Assistant to the President.

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

DHS W

159

October 28,

1927.

My dear Mr. Frost:

Thank you very
much for your care in preparing
the bibliographical reports of the
department for the past two years.
They will be printed as you request
with a special reference to the double
entry.

Very truly yours,

David H. Stevens.

Assistant to the President.

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

DHS W

The University of Chicago

Verkes Observatory
WILLIAMS BAY, WIS.

October 27, 1927

Mr. David H. Stevens
Office of the President
The University of Chicago
Chicago, Illinois

Dear Mr. Stevens:

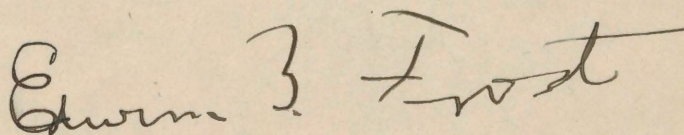
Herewith I send you the bibliographic material for the members of the Department of Astronomy, who have been residents at the Observatory during the two years between July 1, 1925 and June 30, 1927, the period to be covered by the bibliographies. I presume that you will wish to use a foot note in the President's Report explaining that the bibliography for 1925-26 is included, having been regrettably lost, or words to that effect. I have included the work published during that period for two deceased members of the staff, and one who has resigned, and one or two who are not now here, but who should be properly included.

The names covered by the list in the normal ranking order, are; Frost, Barnard, Van Biesbroeck, Barrett, Parkhurst, Ross, Lee, Moffitt, Struve, Farnsworth, Bobrovnikoff.

The sheets for Moulton (resigned January, 1927), MacMillan, Laves and Bartky, have doubtless been received by you direct, and will go in in their proper places in the list of the Department.

I am registering this package, so there shall be no miscarriage, as we do not have carbon copies.

Very truly yours,



Edwin B. Frost

EBF:BH

The University of Chicago

Herbert Observatory
Williams Bay, Wis.

October 27, 1927

Mr. David H. Stevens
Office of the President
The University of Chicago
Chicago, Illinois

Dear Mr. Stevens:

Herewith I send you the bibliography material for the members of the Department of Astronomy who have been residents of the Observatory during the two years between July 1, 1925 and July 30, 1927. The period to be covered by the bibliography. I assume that you will wish to use a list of the President's Report explaining that the bibliography for 1925-26 included, having been regrettably lost or worse than lost effect. I have included the work published during that period for two deceased members of the staff, and one who has resigned, and one of the who are not now here, but who should be properly included.

The names covered by the list in the normal running order are: Frost, Bernard, Van Biesbroeck, Bartlett, Parkhurst, Ross, Lee, Hollitt, Struve, Barnard, Barnard.

The sheets for the list (resigned January, 1927), Barnard, Struve and Bartlett, have doubtless been received by you direct, and will go in their proper places in the list of the Department.

I am registering this package, as there shall be no misarrangement, as we do not have carbon copies.

Very truly yours,

Ernest E. Frost
Ernest E. Frost

EEF:BA

G21

July 12, 1927

Dear Warren:

I have on my desk a copy of Lorentz
"Problems of Modern Physics", which contains
Lorentz' lectures at the California Institute
of Technology, in the year 1922. Frost wants
a review for the Astrophysical Journal - a
review of from one to three pages. When we
get together I will hand you the book, and see
if you care to make the review. Hope to be
free pretty soon so we can get some talks
together.

Cordially yours,

Max Mason

Mr. Warren Weaver
Department of Mathematics
Faculty Exchange

621

July 12, 1927

Dear Warren:

I have on my desk a copy of Lorentz
"Problems of Modern Physics", which contains
Lorentz' lectures at the California Institute
of Technology, in the year 1922. Frost wants
a review for the Astrophysical Journal - a
review of from one to three pages. When we
get together I will hand you the book, and see
if you care to make the review. Hope to be
free pretty soon so we can get some talks
together.

Cordially yours,

Max Mason

Mr. Warren Weaver
Department of Mathematics
Faculty Exchange

The University of Chicago

The Astrophysical Journal

July 11, 1927

EDITORIAL OFFICE
YERKES OBSERVATORY

WILLIAMS BAY
WISCONSIN

President Max Mason
The University of Chicago
58th & Ellis
Chicago, Illinois

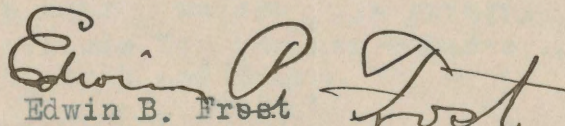
My dear Dr. Mason:

I thank you for your letter of July 8.

I should be very glad to have you hand the copy of Lorentz's Physics to Mr. Warren Weaver, with the request that he supply the review for the Astrophysical Journal. I can well understand that your manifold duties make it difficult for you to take on such an extra task.

I thank you for your kindness in expediting the assignment of \$5,000.00, continuing the rehabilitation of our twelve-inch telescope as a twin.

Very truly yours,


Edwin B. Frest

EBF: BH

The University of Chicago

The Astrophysical Journal

July 11, 1927

WILLIAM BAY
WISCONSIN

EDITORIAL OFFICE
YERKES OBSERVATORY

President Max Mason
The University of Chicago

58th & Ellis

Chicago, Illinois

My dear Dr. Mason:

I thank you for your letter of July 8.

I should be very glad to have you send the copy

of Robertson's paper to Mr. Warren Weaver, with

the request that he supply the review for the

Astrophysical Journal. I can well understand that

your kind consideration makes it difficult for you

to take on such an extra task.

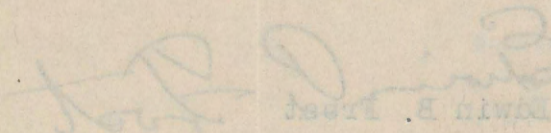
I thank you for your kindness in expedite-

ing the assignment of \$3,000.00, continuing the

rehabilitation of our twelve-inch telescope as a

twain.

Very truly yours,


Edwin H. Frost

KEB:BN

July 8, 1927

Dear Dr. Frost:

It would indeed be a great pleasure if I could review the book of Lorentz, but much as I should like to, I know that I am not going to have time for it.

It happens that Mr. Warren Weaver, of the University of Wisconsin, is teaching this summer quarter at Chicago. Mr. Weaver and I are writing a book on electrodynamics. I think if he would be willing, he could do a good review of the Lorentz book. If you care to have me, I will pass it on to him with the request; but if you have anybody else in mind, please let me know, and I shall forward the book wherever you say.

I am sorry I did not get up to the observatory for the evening. I do indeed wish to talk over the general situation as soon as this will be possible. In the meantime I am putting through the recommendation for the \$5,000 appropriation for the twelve inch.

Sincerely yours,

President

Dr. Edwin B. Frist
Yerkes Observatory
Williams Bay
Wisconsin

July 8, 1927

Dear Dr. Frost:

It would indeed be a great pleasure if I could review the book of Lorentz, but much as I should like to, I know that I am not going to have time for it.

It happens that Mr. Warren Weaver, of the University of Wisconsin, is teaching this summer quarter at Chicago. Mr. Weaver and I are writing a book on electro-dynamics. I think if he would be willing, he could do a good review of the Lorentz book. If you care to have me, I will pass it on to him with the request; but if you have anybody else in mind, please let me know, and I shall forward the book wherever you say.

I am sorry I did not get up to the observatory for the evening. I do indeed wish to talk over the general situation as soon as this will be possible. In the meantime I am putting through the recommendation for the \$5,000 appropriation for the twelve inch.

Sincerely yours,

President

Dr. Edwin B. Frost
Yerkes Observatory
Williams Bay
Wisconsin

The University of Chicago

The Astrophysical Journal

EDITORIAL OFFICE
YERKES OBSERVATORY

WILLIAMS BAY
WISCONSIN

July 6, 1927.

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

Dear Dr. Mason:

It would give ^{to} me, as editor, great satisfaction and to the readers of the Astrophysical Journal much benefit and pleasure if you could find it possible with your manifold duties, to write us a review of Professor H. A. Lorenz's "Problems of Modern Physics", edited by Professor H. Bateman, as recently published by Ginn & Company. The review copy is attached herewith. The space that we should ordinarily allot for a review of a work of this sort would be from one to three pages, but you would have entire freedom as to the space you wished to use.

I certainly have no desire to try to impose an unwelcome burden upon you but I have the feeling you may enjoy being brought back into your own field of research by undertaking this, if you find it possible. In the event that you will be unable to undertake it, will you kindly have the book returned and we will reluctantly try to get someone else.

It was a pleasure to see you here at the lake and I should have been glad to have had a chance to talk over some of our problems at the Observatory; but that joyous occasion was not one for shop talk. I hope you may be able to get up here and have leisure for us to explain the various pieces of work we have in hand. We are just getting some piers up on part of our grounds for the new ether-drift experiment by Professors Michelson and Gale.

Very sincerely yours,

Edwin B. Frost

Edwin B. Frost, Editor.

EBF:ES

The University of Chicago

The Astrophysical Journal

WILLIAMS BAY
WISCONSIN

EDITORIAL OFFICE
VERMILION OBSERVATORY

July 6, 1937

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

Dear Dr. Mason:

I would like to see your review of my paper on the subject of the "Problems of Modern Physics" as published by the University of Chicago Press. The review copy is attached. The space that we should ordinarily allow for a review of a work of this sort would be from one to three pages, but you would have entire freedom as to the space you wished to use.

I certainly have no desire to try to impose an un- welcome burden upon you but I have the feeling you may enjoy being brought back into your own field of research by undertaking this, if you find it possible. In the event that you will be unable to undertake it, will you kindly have the book returned and we will reluctantly try to get someone else.

It was a pleasure to see you here at the lake and I should have been glad to have had a chance to talk over some of our problems at the Observatory. I hope you may be able to get up here and have leisure for us to explain the various pieces of work we have in hand. We are just getting some pieces up on part of our program for the new ether-drift experiment by Professor Michelson and Gale.

Very sincerely yours,

Robert A. Frost

Robert A. Frost, Editor.

1937:25

C 20a

May 6, 1927

Dear Mr. Frost:

I am glad to get from Mr. Mather the request for further assistance to Mr. Huger.

On May 1st we began a plan under which students needing remission of tuition are to be asked to fill out the usual application for a loan. By this routine we expect to find all the most worthy cases, for a great many students know nothing of the remission privilege, and when applying for loans will be considered by us on the true basis of their needs. I am sure that many students of the highest scholastic ability and perhaps with the greatest financial need have signed notes in the past, while less worthy students have been given complete release from repayment. I have explained the reason for the change in detail, so as to make clear why Mr. Huger's case did not come up at the opening of this Quarter. We should like to have new applications for each quarter in which a student wishes either remission of tuition or a loan.

I am writing Mr. Huger that he has been granted \$30 for the present Quarter. I should like to know whether his future plans are settled and whether or not he may come to us for further help.

David H. Stevens

Very truly yours,

David H. Stevens

Assistant to the President

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

G 200

May 6, 1927

Dear Mr. Frost:

I am glad to get from Mr. Huffer the request for further assistance to Mr. Huffer.

On May 1st we began a plan under which students needing remission of tuition are to be asked to fill out the usual application for a loan. By this routine we expect to find all the most worthy cases, for a great many students know nothing of the remission privilege, and when applying for loans will be considered by us on the basis of their needs. I am sure that many students of the highest scholastic ability and perhaps with the greatest financial need have signed notes in the past, while less worthy students have been given complete release from repayment. I have explained the reason for the change in detail, so as to make clear why Mr. Huffer's case did not come up at the opening of this quarter. We should like to have new applications for each quarter in which a student wishes either remission of tuition or a loan.

I am writing Mr. Huffer that he has been granted \$80 for the present quarter. I should like to know whether his future plans are settled and whether or not he may come to us for further help.

David H. Stevens

Very truly yours,

David H. Stevens

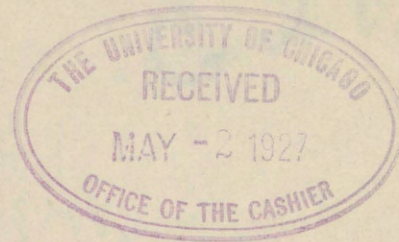
Assistant to the President

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

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

April 30, 1927



Mr. William J. Mather
The University of Chicago
Chicago, Illinois

Dear Mr. Mather:

Mr. Stevens { In his letter of January 22, Mr. Stevens, of the President's office, says that they will try to do something out of the ordinary for Mr. Huger, and I recommended that instead of giving him \$60.00 for the winter quarter, they divide this between the winter and spring quarters, namely, give \$30.00 for each. He is just about able to earn the other \$30.00 by outside operations.

A check for the winter quarter was sent from the President's office from the J. Mason Jackson Fund, for \$30.00, and I had expected that a similar check would be provided for the spring quarter. Will you not consult the President's office and see if this can be done?

I have recently called the attention of Dr. Vernon Kellog of the International Research Council, and also of Dr. C. R. Mann, at Washington, to the injustice that the Czechoslovakian Republic does in awarding a traveling fellowship which pays nothing but traveling expenses and obliges a man to spend much of his time earning his living, instead of devoting himself fully to graduate work. These representations may help the situation.

Very truly yours,

Edwin B. Frost

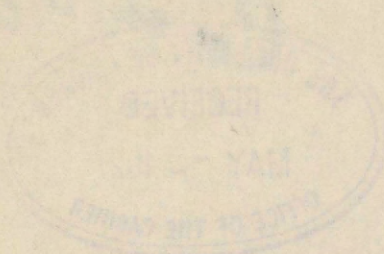
EBF:BH

Edwin B. Frost

The University of Chicago

NOTES OF OBSERVATIONS
WILLIAM S. WILSON

April 30, 1927



Mr. William J. Matheson
The University of Chicago
Chicago, Illinois

Dear Mr. Matheson:

In his letter of January 22, Mr. Stevens, of the President's office, says that they will try to do something out of the ordinary for Mr. Matheson, and I recommended that instead of giving him \$50.00 for the winter quarter, they divide this between the winter and spring quarters, namely, give \$25.00 for each. He is just about able to earn the other \$25.00 by outside operations.

A check for the winter quarter was sent from the President's office from the J. Mason Jackson Fund, for \$50.00, and I had expected that a similar check would be provided for the spring quarter. Will you not consult the President's office and see if this can be done?

I have recently called the attention of Dr. Vernon Kellogg of the International Research Council, and also of Dr. C. R. Mann, at Washington, to the injustice that the Czechoslovakian Republic does in awarding a traveling fellowship which pays nothing but traveling expenses and obliges a man to spend much of his time earning his living, instead of devoting himself fully to greatest work. These representations may help the situation.

Very truly yours,

Edwin E. Frost

WILLIAM S. WILSON
NOTES OF OBSERVATIONS
APRIL 30, 1927

THE COMMONWEALTH FUND

1 EAST 57TH STREET

NEW YORK

BARRY C. SMITH
GENERAL DIRECTOR

DIVISION OF EDUCATION

MAX FARRAND

DIRECTOR

ROBERT S. LYND

ASSISTANT DIRECTOR

WHITTEMORE LITTELL

ASSISTANT, COMMONWEALTH FUND FELLOWSHIPS

Yerkes
Robb
February 2, 1927.

Vice-President F. C. Woodward,
University of Chicago,
Chicago, Illinois.

Dear Mr. Woodward:

It is quite natural to be writing to you, but it is much pleasanter to write to some one that you have met. I am keeping your suggestions in mind, and when we learn which of next year's Fellows are going to Chicago, I shall do my best to apply them.

You will be glad to hear that brother Robb is at last safely settled. At Michigan he has found just what he was looking for. He is, however, very glad to have had his three months stay at Yerkes, which he said was most profitable.

Yours sincerely,

W. Littell

WL J

THE COMMONWEALTH FUND

1 EAST 87TH STREET

NEW YORK

GARRY C. SMITH
GENERAL DIRECTOR

DIVISION OF EDUCATION

MAX PARSONS

DIRECTOR

ROBERT S. LYND

ASSISTANT DIRECTOR

WHITMORE LITTLE

ASSISTANT COMMONWEALTH FUND FELLOWSHIP

February 2, 1937.

Vice-President F. C. Woodward,
University of Chicago,
Chicago, Illinois.

Dear Mr. Woodward:

It is quite natural to be writing to you, but it is much pleasanter to write to some one that you have met. I am keeping your suggestions in mind, and when we learn which of next year's Fellows are going to Chicago, I shall do my best to apply them.

You will be glad to hear that Professor Robb is at last safely settled. At Michigan he has found just what he was looking for. He is, however, very glad to have had his three months stay at Yerkes, which he said was most profitable.

Yours sincerely,

W. Little

WL 1

THE COMMONWEALTH FUND
1 EAST 57TH STREET
NEW YORK

BARRY C. SMITH
GENERAL DIRECTOR

DIVISION OF EDUCATION

MAX FARRAND
DIRECTOR

ROBERT S. LYND
ASSISTANT DIRECTOR

WHITTEMORE LITTELL
ASSISTANT, COMMONWEALTH FUND FELLOWSHIPS

January 8, 1927.

Vice-President F. C. Woodward,
University of Chicago,
Chicago, Illinois.

Dear Mr. Woodward:

When Mr. Farrand was in Chicago he talked over with you the question of Mr. Richard A. Robb's transfer to another university. This is merely to give you notification of what you already know, that Mr. Robb has transferred to the University of Michigan.

We appreciate very much the trouble you have taken over Mr. Robb.

Yours sincerely,

Whittemore Littell

WL J

Index
Internal?
Yikes-?
G20a

THE COMMONWEALTH FUND

1 EAST 87TH STREET

NEW YORK

BARNEY C. SMITH
SECRETARY

DIVISION OF EDUCATION

MAX FARRAND

DIRECTOR

ROBERT S. LYND

ASSISTANT DIRECTOR

WHITMORE LITTELL

ASSISTANT COMMONWEALTH FUND FELLOWSHIP

January 8, 1927.

Vice-President F. C. Woodward,
University of Chicago,
Chicago, Illinois.

Dear Mr. Woodward:

When Mr. Farrand was in Chicago he talked
over with you the question of Mr. Richard A. Robb's transfer
to another university. This is merely to give you notification
of what you already know, that Mr. Robb has transferred to the

University of Michigan.
We appreciate very much the trouble you have
taken over Mr. Robb.

Yours sincerely,

Whitmore Littell

The University of Chicago

Perkes Observatory
WILLIAMS BAY, WIS.

XVIII

June 30, 1924.

President Ernest D. Barton
University of
Chicago.

My dear Mr. President:-

I am enclosing herewith a carbon of a letter which I have just sent to the Auditor in regard to the manner of advising Mr. Wrigley that there is a balance of \$209.52 left in the fund which he gave us for the eclipse. Dr. Butler wrote me that you would expect from me suggestions in the matter. I shall be very glad, therefore, to be advised whether or not I am to have the privilege of writing Mr. Wrigley. I shall be perfectly willing to acquiesce in any decision which may be made by yourself or by a committee of the Trustees.

I should like to express the great satisfaction which I have felt at the appointment of Dr. Frank E. Ross as associate professor here. I believe that it is an appointment of very great importance to the Observatory and to the University.

Very truly yours,

Edwin B. Frost

EBF/EW

Edwin B. Frost.

Encl.

18863

The University of Chicago

James B. Conant
Director of the
Department of Zoology

June 30, 1934.

President Ernest D. Horton
University of
Chicago.

My dear Mr. President:-

I am enclosing herewith a carbon of a letter which I have just sent to the Assistant Secretary to the manner of advising Mr. Wigglesworth that there is a balance of \$200.00 left in the fund which he gave us for the college. Dr. Butler wrote me that you would expect from me suggestions in the matter. I shall be very glad, therefore, to be advised whether or not I am to have the privilege of writing Mr. Wigglesworth. I shall be naturally willing to accept any suggestion which may be made by yourself or by a committee of the trustees.

I should like to express the great satisfaction which I have felt at the appointment of Dr. Frank A. Ross as associate professor here. I believe that it is an appointment of very great importance to the Observatory and to the University.

Very truly yours,

Edwin S. Frost

Edwin S. Frost

Enc.

Enc.

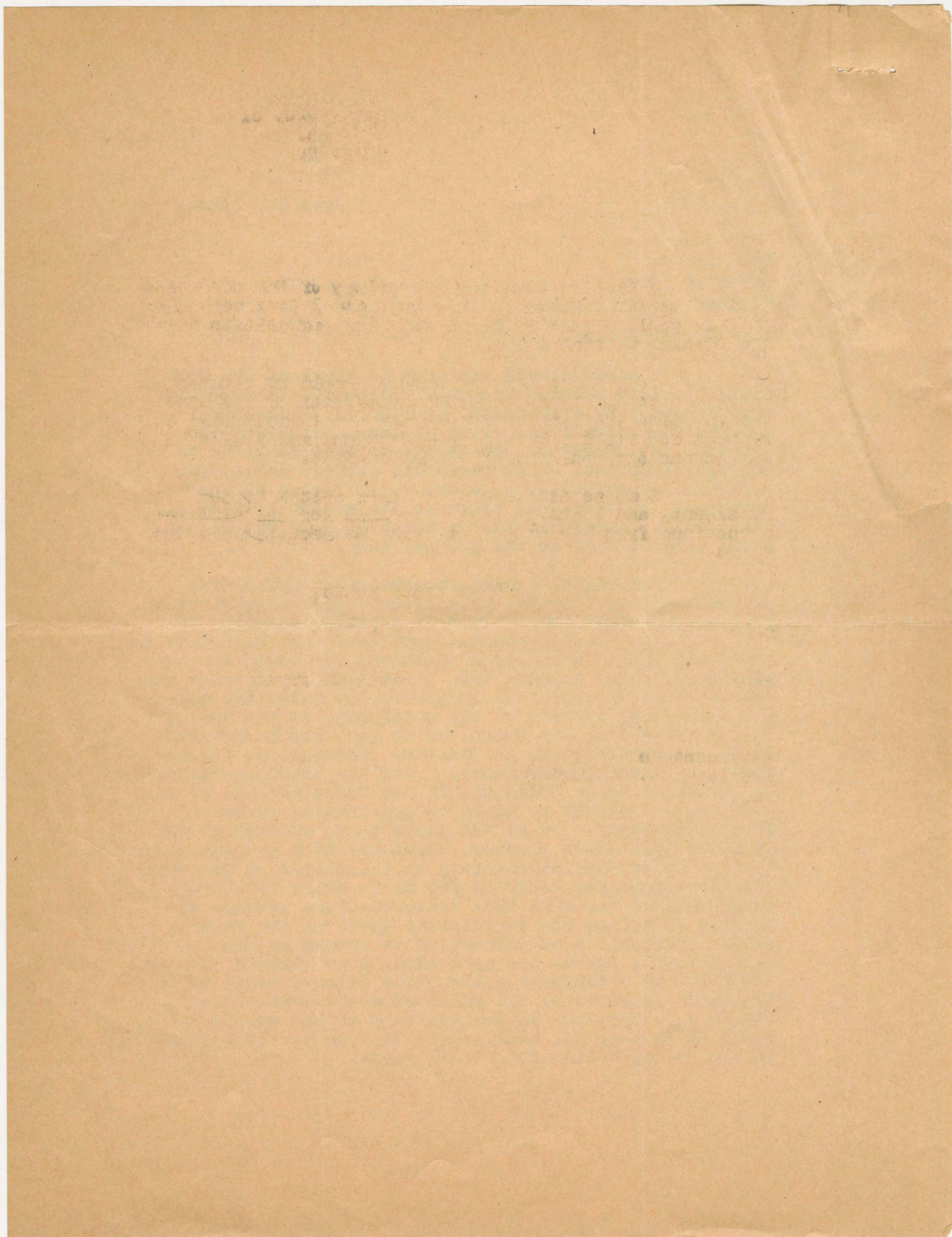
June 30, 1924.

The Auditor
University of
Chicago.

Dear Mr. Plimpton:-

I have delayed replying to yours of the 18th until I should receive from the Wilmington Transportation Company, of Wilmington, California, a check for \$20.89, for which I had given duplicate receipts in advance, on account of overcharge on freight bills on eclipse apparatus. This check has arrived today, and I enclose it herewith, endorsed to the order of the University of Chicago. Added to the amount of \$188.63, this would, therefore, make a total of \$209.52, as the final balance left on the Wrigley fund. *Correct*

Meanwhile, I have received from the office of the President, by Dr. Butler, an acknowledgment of my printed report on the eclipse in a letter in which he also states: "I understand...that later you will make to President Burton some recommendations regarding the expenditure of the balance left in the fund." I trust that you will not send a check to Mr. Wrigley until the matter is plainly settled by the president, or the Board, or a committee of the Board, as to just how Mr. Wrigley is to be approached in the matter. Inasmuch as I solicited and obtained the money, I ask the privilege of writing a letter to Mr. Wrigley, if the Board decided it was best that he should be given an opportunity to receive this money. It is not plain to me whether or not my request has been granted. When and if I receive permission to be the intermediary in the matter, I now think that the procedure would be for me to write to him and advise him of the fact that there was this balance of \$209.52 left from the expedition; that, at the request of the trustees, I am authorized to return to him the balance left, but at the same time, I am allowed to make the offer of a suggestion that this balance could be very well used in covering the small expenses involved in a slight participation in observations of the eclipse to occur on January 24, 1925, which will be the last recurring in the United States for twenty years. *Incorrect*



The Auditor
University of
Chicago.
30/VI/24.

-2-

I believe that the psychology of the situation will be better handled in this way, and I feel very sure that he would cordially agree with the proposition that the balance be thus expended.

If a check for the amount should be bluntly forwarded to him by an accounting official of the University like yourself, I do not see how I could make any request for its use at the next eclipse, and I think that the psychology would be quite unfortunate.

I am sending a copy of this letter to the President, and I shall be glad to wait for definite instructions from his office or from the secretary of the Board.

Very truly yours,

EBF/BW

Edwin B. Frost.

Copy sent to
President B. D. Burton.

