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## Correspondence - T. 1913-1953

Thwaites, F. T. (Fredrik Turville), 1883-1961

[s.l.]: [s.n.], 1913-1953

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THE STATE UNIVERSITY OF IOWA  
IOWA CITY

DEPARTMENT OF GEOLOGY

PLEASE ADDRESS  
REPLY TO WRITER

December 21, 1935

Dr. F. T. Thwaites  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin

Dear Fred:

If I am not mistaken you were elected to represent Wisconsin on the Tri-States Field Conference for 1936. For your information and whatever use it may be to you, I am sending to you herewith a list of the participants in the 1935 conference, the institutions and states from which they came, etc.

Very sincerely yours,

*Trow - A. C. Trowbridge*

A. C. Trowbridge

ACT:A  
Enc.



ARTHUR C. TROWBRIDGE  
DIRECTOR AND STATE GEOLOGIST  
ALLEN C. TESTER  
ASSISTANT STATE GEOLOGIST

STATE OF IOWA  
**IOWA GEOLOGICAL SURVEY**  
103 GEOLOGY BUILDING  
IOWA CITY

GEOLOGICAL BOARD  
CLYDE L. HERRING  
GOVERNOR OF IOWA  
EUGENE A. GILMORE  
PRESIDENT UNIVERSITY OF IOWA  
RAYMOND M. HUGHES  
PRESIDENT IOWA STATE COLLEGE  
ROBERT E. BUCHANAN  
PRESIDENT IOWA ACADEMY OF SCIENCE  
CHARLES W. STORMS  
AUDITOR OF STATE

August 19, 1935

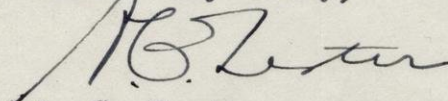
Mr. F. T. Thwaites  
Science Hall  
Madison, Wisconsin

Dear Fred:

Thank you for your letter of August 16 with the description of the <sup>construction</sup> ~~section~~ of wells at Madison and the two blue prints of recent wells drilled at that point. I assume that the temperature of approximately 50 degrees is fairly constant for the Madison district.

I will see you the last of this week at Dubuque.

Yours very truly,

  
A. C. Tester

ACT:ML



ARTHUR C. TROWBRIDGE  
DIRECTOR AND STATE GEOLOGIST  
ALLEN C. TESTER  
ASSISTANT STATE GEOLOGIST

STATE OF IOWA  
**IOWA GEOLOGICAL SURVEY**  
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PRESIDENT IOWA ACADEMY OF SCIENCE  
CHARLES W. STORMS  
AUDITOR OF STATE

October 8, 1935

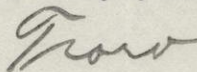
Dr. F. T. Thwaites  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin

Dear Fred:

An unsigned, typed card, dated September 26 and addressed to me is at hand. I presume you are the author.

I shall be glad, of course, to talk over with you the log of the Clarinda well or any other subject during the Tri-State Field Conference, but must explain that I know very little about the Clarinda log. Tester has this subsurface work in hand, and I know will be glad to discuss the Clarinda log with you.

Cordially yours,



A. C. Trowbridge

ACT:A



Thorne

hold to light



Jan. 21, 1936

Mr. L. H. Thorne,  
Des Plaines, Illinois

Dear Mr. Thorne:

In reply to yours of the 20th I would be most pleased to talk at the forthcoming meeting of the American Association of Water Well Drillers but I fear that the date in the middle of a week makes it almost impossible for me to promise to attend. My schedule for that part of the year will not be made up until shortly before the meetings. It is almost the busiest time of the year for me and it is hard to get anyone to take my place just then. On the whole, I think it best not to count on me at all.

Sincerely,



T. W. THORPE, PRESIDENT  
DES MOINES, IA.

HERBERT W. WHELAN, VICE-PRESIDENT  
PROVIDENCE, R. I.



L. H. THORNE, SECRETARY  
DES PLAINES, ILL.

H. H. BROWN, TREASURER  
LINCOLN, NEBR.

# American Association of Water Well Drillers

ORGANIZED 1929

January 18th, 1936

There will be a meeting of the National Council members held at 1:00 P. M. February 18th at the Marquette Hotel, St. Louis, Missouri. This will be the regular annual meeting of the National Council. Everyone is urged to be present either in person or by proxy.

You will notice this meeting is called for the day before the opening of the Convention, which will also be held in the Marquette Hotel, February 19th and 20th.

*L. H. Thorne*  
L. H. Thorne, Secretary.



Thorne 1203 Thacker got Res planer, etc



January 29, 1936

Mr. L. H. Thorne  
W. L. Thorne Company  
1203 Thacker Street  
Des Plaines, Illinois

Dear Sir:

I am enclosing a blue print log of City Well No. 3, Monroe,  
Wisconsin.

Very truly yours

WISCONSIN GEOLOGICAL SURVEY

By

F.T. Thwaites, Geologist in charge of  
Well Records

FTT LMV

enc.



T. W. THORPE, PRESIDENT  
DES MOINES, IA.

HERBERT W. WHELAN, VICE-PRESIDENT  
PROVIDENCE, R. I.



L. H. THORNE, SECRETARY  
DES PLAINES, ILL.

H. H. BROWN, TREASURER  
LINCOLN, NEBR.

## American Association of Water Well Drillers

ORGANIZED 1929

January 20th, 1936

State Geological Survey  
Madison, Wisconsin


Attention Mr. Thwaites

Dear Mr. Thwaites:

At a meeting of the program committee of the American Association I was asked to write you and invite you to speak at the National Convention to be held in St. Louis February 19th and 20th - possibly on the subject of drilling in the Mississippi Valley, or some other subject which you might feel would be more appropriate.

I would appreciate your letting me know immediately, as the time is getting short and we still have the program to print.

Yours ve truly,

  
\_\_\_\_\_  
L. H. Thorne, Sec.

LHT:S



Aug. 16, 1935

Dr. A. C. Tester, Assistant State Geologist,  
103 Geology Building,  
University of Iowa,  
Iowa City, Iowa

Dear Tester:

In reply to yours of the 9th I am enclosing herewith blue-print logs of the last two wells drilled in Madison. The new wells are all cased for some distance into the rock for two reasons. First, the inner liner protects the well from leaks in the drive pipe and surface rock. Second, the upper formations contain iron in the water and the liner reduces the amount of iron very much.

The water averages about 50 deg. F. at the main station. When I lowered a thermometer to the depth of 340 feet it read 55 deg. F.

The depth of wells varies slightly because of the position of the pre-Cambrian floor. Most of them go into the hard rock far enough to provide a settling basin for sand. It is also necessary to provide sand traps at the surface.

The Survey has not issued any publications on ground waters since the Bull. 35 by Weidman and Schultz in 1915. This you must have in your library.

I expect to see you at the Field Conference.

Very truly yours,

F. T. Thwaites



Tigerton

Sept. 23, 1935

State Board of Health,  
State Capitol,  
Madison, Wisconsin Attention Mr. Muegge

Gentlemen:

I have examined the samples from the new village well at Tigerton, Wisconsin. The formation to a depth of 71 feet is sand and sandy gravel. From 71 to 72 feet 4 inches there is a red clay evidently deposited in a glacial lake. A note on the sample bag indicates that the well is cased into this clay. The sample from 72 feet 4 inches to 74 feet 2 inches is a disintegrated granite which may contain some drift material. The information at hand suggests that water is drawn only from this 22 inches of material.

I computed the specific capacity of the well as shown by the figures submitted by Druar and Milinowski, Engineers. This figure fluctuated slightly during the test and finally settled down to about 1.7 g.p.m. per foot of drawdown. Much of the variation is within the limit of error in observation.

No information is available about where the well is located in the village. My map made from a reconnaissance survey in 1926 indicates that granite lies farthest from the surface in the southern part of the village and I presume that the well is located there. If such is the case the feeding area is unknown. The clay capping is probably rather local but it may shut off all water in the sandy gravel above. If such is the case the water is largely supplied through the weathered and broken part of the granite. Granite outcrops in many places through the village. It carries water only in crevices. The clay layer is, therefore, no definite safeguard against contamination. Prolonged pumping in dry years might bring in contaminated waters. The low specific capacity also suggests the danger of shortage of water during prolonged dry spells. Time only can test the reliability of the supply.

All factors considered the well is probably as good a supply of underground water as could reasonably be expected in the near vicinity of Tigerton.

Before reaching a more definite conclusion I think it would be a good idea to have full information on test drillings and well construction sent here for study.

Very truly yours,

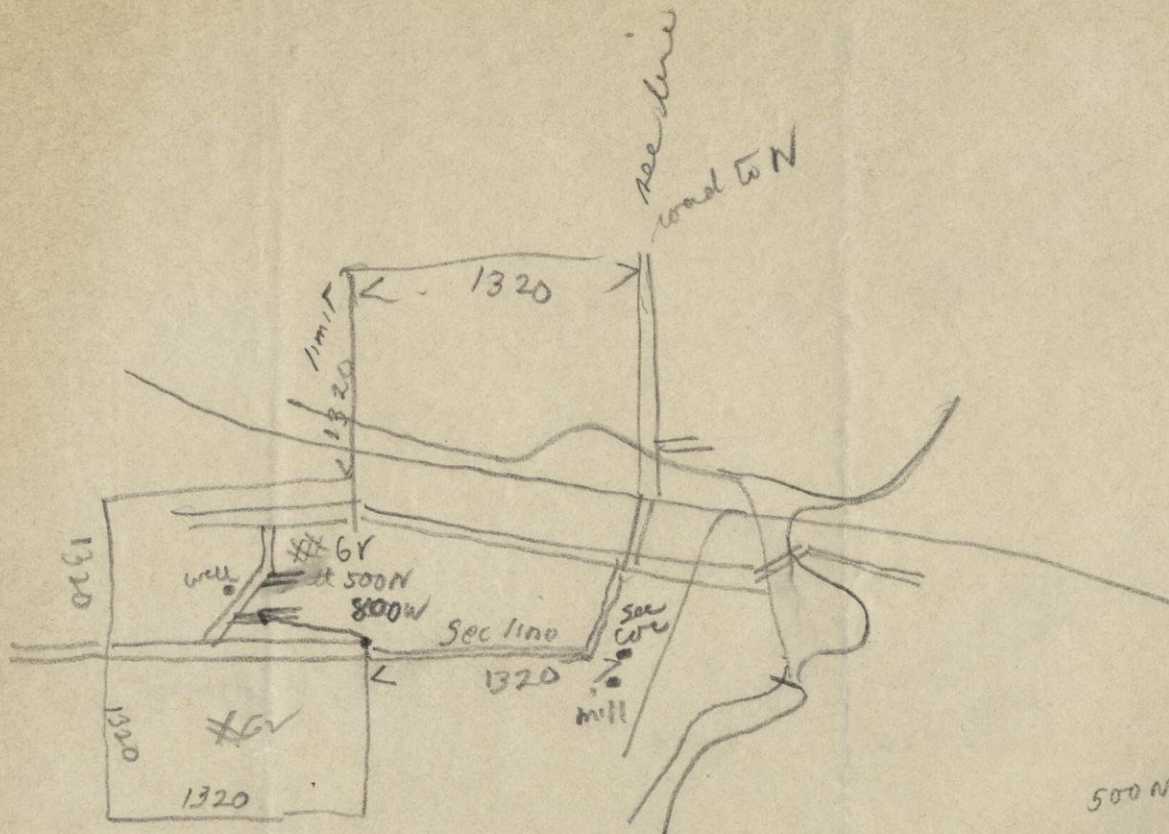
F. T. Thwaites, In charge of well records



600 660

1320

2612.08 ay



500N 2120W

granted at 700N 2800W  
 @ 1/4 m S  
 500' E to granite

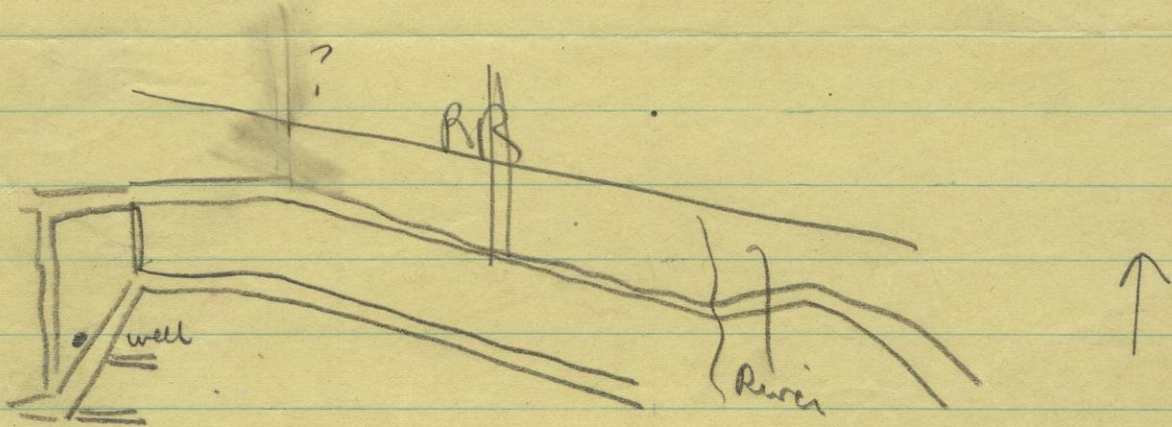
well



2612 E. 08 ~~at~~

a4  
~~03~~

Tipton



area interspersed with granite boulders  
and boulders - had been mapped  
as G.M.

area 1024

New York  
Mich.  
Camb.  
KGS 2  
Ben Pre-e

pre-Wi Ten  
spar. Tonah  
Pal Rocks  
Wi Rocks  
Pittsford  
relax to  
glac Bluff  
mult glau  
KGS 1931  
center  
Washover



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Abram O. Thomas  
Joseph J. Runner  
Allen C. Tester  
Freleigh F. Osborne

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

April 10, 1930.

F. T. Thwaites,  
Geology Department,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Dr. Thwaites:

Many thanks for yours of the 9th. I am sorry to hear that you have not completely regained your strength after an operation.

A matter has just arisen here which will prevent our making the trip this week. May be able to make it next week but cannot be sure right now. Will inform you, Twenhofel, and Roasch when we do come.

Sincerely yours,

*A. C. Trowbridge*

ACT:B



April 7, 1930.

Dr. F. W. Thwaites,  
Geology Department,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Dr. Thwaites:

As you may know, I have always had considerable difficulty in correlating the stratigraphic section around Baraboo with the same section on Mississippi River. Last summer, after a hurried library and field survey, I made a provisionally ~~and~~ stratigraphical *+ Structural* profile along Mississippi River from St. Paul to Grafton, Illinois and thus again came in touch with the problems involved and revived my interest in your stratigraphic work in Wisconsin and Illinois, the work of Twenhofel and Thwaites in the Sparta-Tomah quadrangles, Ulrich's work in the Mississippi Valley and the work of Stauffer and others in Minnesota. In addition, I have three master's theses going, one in the Wauzeka Quadrangle, one in the Viroqua Quadrangle and one in the Stoddard Quadrangle. All three of the men working on these theses have had the Baraboo Field Course and are having difficulty in correlating the eastern and western Wisconsin sections.

I have never seen the section around Madison and hope to include a brief study of the exposures there in a three or four day trip with two and possibly all three men either at this week end or the following week end. I ~~am~~ <sup>was</sup> expecting to write professor Twenhofel to see if he could accompany us in the Madison area but understand that he is out of town and will not be back so that he can go with us in case we come this week. For several reasons this week end would be better than the following week end for me. Under these circumstances would it be possible for you to show us the more important exposures around Madison next Saturday morning and to give us the interpretations that have been put on them by yourself, Twenhofel, Ulrich, Ockerman and others? We would be glad to meet you at the Geology Building at as early an hour as would suit your convenience.

Sincerely yours,

*A. C. Trowbridge*



Devils Lake

April 9, 1930

Dr A. C. Townhidge,  
Dept Geology  
U of Iowa  
Iowa City, Iowa

Please keep for  
personal file

+

Dear Dr. T: In reply to yours of the 7<sup>th</sup>  
I am sorry that I will not be in Madison this  
week. I have my class at Devils Lake for a week.  
Besides I had an operation last winter and the doctor  
will not allow me to drive over rough roads as yet. Here  
I will stay on the level. I suggest you get  
Mr. Gilbert Paasch who has my old job of Curator  
at the University. He has done a lot of detailed  
work in western Wisconsin and his ideas seem to  
agree with the conclusion I reached so long ago.  
Most of my work has been well records only.  
I turned from surface work because I could not  
agree with Welch and did not care to collect fossils  
on which we never got a report. Mr. Paasch will  
be glad to take you around although he has never  
seen the good exposures near Denver and Helad. Would  
be glad to get your ideas and tell you more if you want  
to wait until later.

V. T. G.

FTT



THE UNIVERSITY OF ROCHESTER  
COLLEGE OF ARTS AND SCIENCE  
ROCHESTER, NEW YORK

DEPARTMENT OF GEOLOGY

September 19, 1929.

Professor F. T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Professor Thwaites:

Through Professor Whitbeck the suggestion has come that we may be able to secure for our Department about six copies of your outlines of Glacial Geology. We would appreciate it if these could be forwarded immediately for class use, and a statement rendered.

Thanking you in advance, I am

Very truly yours,

*Olive J. Thomas*

Olive J. Thomas,

Assistant Professor of Geology and  
Geography.

OJT:L

P.S. I had the pleasure of meeting Mrs Thwaites in Prof. Whitbeck's office this summer, but was not fortunate enough to find you in. Prof. Whitbeck and I are collaborating in the preparation of a book and I worked in Science Hall all summer. Sorry not to have seen you.

Cordially  
*Olive J. Thomas*



THE UNIVERSITY OF ROCHESTER  
COLLEGE OF ARTS AND SCIENCE  
ROCHESTER, NEW YORK

DEPARTMENT OF GEOLOGY

September 30, 1929.

Professor F. T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Professor Thwaites:

The six copies of your outlines of Glacial Geology have arrived, however, due to the increased registration for our course, we find that this number will not be sufficient to take care of our students.

Will you please forward six additional copies at the earliest date possible, rendering statement at the time of shipment.

Very truly yours,

*Olive J. Thomas*

Olive J. Thomas,

Assistant Professor of  
Geology and Geography.

OJT:L

*Sent 10/3/29  
11*



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Abram O. Thomas  
Joseph J. Runner  
Allen C. Tester

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

December 17, 1931.

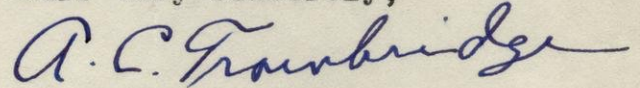
Dr. F. T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Dr. Thwaites:

I have read with great interest your paper on the Buried Pre-Cambrian of Wisconsin which appeared in the September number of the Bulletin Geological Society of America and hope that when you come to distribute your separates you will let me have a copy. Many very interesting questions are raised in this paper and a large number of valuable data are presented.

With sincere personal regards, I am

Yours very sincerely,



A. C. Trowbridge.

ACT:AM



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Joseph J. Runner  
Allen C. Tester  
Arthur K. Miller

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

January 19, 1933

Prof. F. T. Thwaites  
Department of Geology  
Science Hall  
Madison, Wisconsin

My dear Mr. Thwaites:

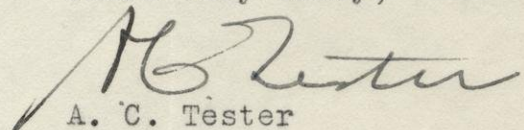
Thank you for your letter of January 18th. I have written to G. M. Orr and Company and hope to have more information concerning the Sandstone, Minnesota well later. You may rest assured that if and when we get the samples we will be glad to give you part of them.

I am writing to Doctor Adams concerning the cuttings from the samples of the wells drilled at the head of Quaker Lake. I will be very glad to have a split of these samples and have the opportunity to give them my study and to benefit by your findings.

I will return to New York this summer and, therefore, will complete the areal geology of the Randolph Quadrangle. I certainly appreciate your offers for assistance and will be glad to do anything possible to aid your work. As I mentioned once before, the material that I have on wells of the Park area is very superficial and in most cases records simply the depth or other rather general information.

With best regards, I remain,

Yours very truly,

  
A. C. Tester

ACT:A



Jan. 18, 1933

Dr. A. C. Tester,  
Department of Geology,  
University of Iowa,  
Iowa City, Iowa

Dear Tester:

I have delayed answering yours of Jan. 6 until Mr. Thorne came to town and I could find out more about the Sandstone, Minnesota, well. He called me up this evening and told me that the work is for the U. S. Department of Justice, Bureau of Prisons and that the engineers are G. M. Orr and Co. of St. Paul, Minnesota. The contract has not yet been awarded. Possibly you can establish a contact with them through some of your friends at Minneapolis. I think their Survey is not interested in samples although possibly Stauffer is. I certainly would be glad to get a split of the samples. I have hoped for 20 years to be able to carry on my work on the Lake Superior sandstones but lack of financial support in either Minnesota or Michigan has prevented such. I have several times considered work in northern Michigan at personal expense. Possibly I could get some advanced student interested in the problem for a Doctors thesis as I got Joe Wannemacher to work on the Baraboo region and bring order out of chaos. His work will be published soon.

I have half finished the final draft of my New York report on the ground waters of Allegany State Park. In case you plan to finish the report on the Randolph quadrangle you will be interested to learn that I have five foot samples from two recent test holes at the head of Quaker Lake. The deeper is 302 feet total depth and passes from the Salamanca to the Chemung showing quite different rocks from those seen in weathered ledges. If you wish a split of these samples and copies of my logs you might communicate with Dr. Adams. I was glad to get these samples in order to convince some of the New York geologists that samples from churn drill holes are reliable when honestly taken from the bailer and not from the slush pit. The logs of the holes will be given in the report although the major portion of that will be of more interest to the medical rather than to the geological profession.

We are all well again and Tommy is learning to talk. Guess that is why he has been cross the last few days. He was terrible when he was learning to walk until he succeeded!

Sincerely,



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Joseph J. Runner  
Allen C. Tester  
Arthur K. Miller

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

January 6, 1933

Prof. F.T. Thwaites  
Science Hall  
Madison, Wisconsin

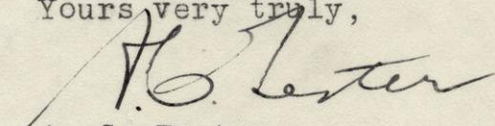
My dear Doctor Thwaites:

Thank you for your letter of December twenty-eighth. First I wish to express my regret to learn that you have had illness in your family but trust that your young son has recovered.

I will make an effort to obtain samples from the well to be drilled near Sandstone, Minnesota. However, I wish you would assist me by asking Mr. Thorne what government bureau or individual is in charge of the contract letting and if possible what drilling contractor was favored. When this information is available, we can make the necessary contacts. In case we get samples, I will be glad to give you some if you have wish to examine them.

With best wishes, I remain,

Yours very truly,



A. C. Tester

ACT:A



Nov. 7, 1932

Dr. A. C. Tester,  
Department of Geology,  
University of Iowa,  
Iowa City, Iowa.

Dear Tester:

Reply to yours of the 31st was delayed by field trips, etc.

We do not have many wells in Wisconsin so situated that they run into the Red Clastics. In localities where these formations are suspected we have never received any samples. No. 8, city, Rockford, Illinois found a fine grained dark red dolomitic sandstone from 1370 to total depth of 1600 but the samples are at Urbana. Test No. 2, city of Two Rivers found some rather unusual rock below the ordinary St. Peter and was a dry hole bottomed in quartzite but I am far from sure that the tight formation is due to anything else than the fact of nearness to a fault. Some wells at a packing plant in South St. Paul, Minnesota drilled during the war found a little red sandstone at the bottom but I am positive that the samples were carelessly taken. No. 2, city, Hayward, Wisconsin drilled last year found some red beds under the drift but samples in the rock were so widely spaced that they are of no value whatever although we got a good drift section. No. 1, city, drilled in 1914 has better samples of some higher strata which are not red.

All considered, I fear that I cannot add much to your quest.

I spent the summer at the A. S. N. H. where you were for three years and had your old cabin. Am interested to know if you have any logs of wells particularly of the School well. I am working on a report on underground waters in the Park and just received samples from a 302 foot test drilled at the head of the Lake. Was astounded to find that they still do not believe in samples in New York! Tried to dispel this illusion but in vain so far.

Hope you are able to come to the conference on the disinterred Sparta-Tomah report. I have read the Ulrich and Campbell knocks with much interest. It is most interesting that Edwards and Raasch who displaced me in western Wisconsin ( I was considered incompetent and insubordinate as well as disrespectful) now hold exactly the views which led to my dismissal!

Very truly yours,

F. T. Thwaites



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Joseph J. Runner  
Allen C. Tester  
Arthur K. Miller

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

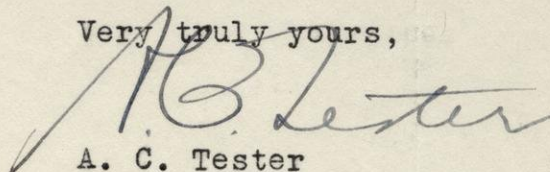
October 31, 1932

Prof. F.T. Thwaites  
Science Hall  
Madison, Wisconsin

My dear Thwaites:

I am very much interested in obtaining two or three samples taken from deep wells in the Red Clastic zone. Any material that you can send me that is typical of this horizon and which you feel is properly classified, I will appreciate it very much.

Very truly yours,

A handwritten signature in cursive script that reads "A. C. Tester". The signature is written in dark ink and is positioned above the printed name.

A. C. Tester

ACT:A



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Joseph J. Runner  
Allen C. Tester  
Arthur K. Miller

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

November 10, 1932

Prof. F. T. Thwaites  
Science Hall  
Madison, Wisconsin

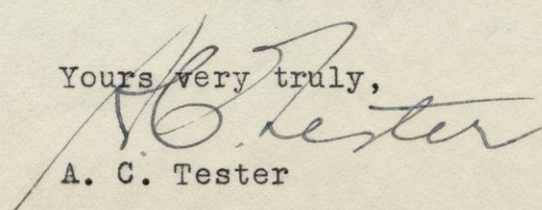
My dear Thwaites:

Thank you for your letter of November seventh. I am sorry that we will not be together this weekend to participate in the field conference but trust that we will make the connections within the very near future.

The information contained in your communication with reference to the red clastics is rather disappointing as I had hoped that you would have some of the samples taken from this formation. I hope you will keep me in mind in case you receive samples of the red clastic series and will be able to give me a small split.

There are a few logs available for the wells in the Allegheny State Park region. I do not have a log of the well drilled at the A.S.N.H. as such was not preserved. However, I was informed that the well passed through forty-two feet of conglomerate. Some of the other logs which I have are of old wells drilled for gas in several localities of the park and are very incomplete and generalized. If you are desirous of obtaining these logs, I will be glad to send them to you. I was very much disappointed in the carelessness of developing some of the water resources of the park, and I attempted to give them some advice but it was not considered very strongly by those in power. I will be very much interested in your report on the underground waters of the park.

Yours very truly,

  
A. C. Tester

ACT:A



Copy of letter from Prof. A. C. Trowbridge.

Iowa City, Iowa, December 12 1932.

Messrs. Leverett and Johnson:

Gentlemen:

As explained in a note to Dr. Leverett, my delay in participating in this discussion is due to personal illness from which I am only now recovering. I am not at all confident that I can contribute anything of value even now.

It is my opinion that Citron and Haney valleys date back to a time when the immediate ancestor of the Kickapoo was meandering at grade over what Grant and Burchard in the Lancaster-Mineral Point Folio called the Lancaster Peneplane. The idea of Dr. Johnson that the broad sweep of the meanders of the older Kickapoo in contrast to the curves of the present stream *indicates that the older stream was larger than the present stream* is new to me, but I believe there is at least some theoretical justification for it, even though definite evidence is lacking. In old age of the Lancaster cycle the ancestral Kickapoo was a main tributary of the ancestral Wisconsin, and drained a large area, this in harmony with normal conditions in the later stages of the geographical cycle. After rejuvenation other tributaries must have started east, west and north of the Kickapoo, which now in maturity of the present cycle have reduced considerably the drainage area of the older stream. It is difficult for me to see how progression could have been made from the few large streams of old age of the previous cycle to the many streams of maturity of the present cycle without a reduction in the drainage area of the old Kickapoo.

Unless I am mistaken, the peneplane in which the meandering Kickapoo entrenched its valley following uplift is not the same peneplane as that which occurs on the summit area in the Tomah and Sparta quadrangles. I believe there is no such radiation of stratigraphic dips from the Sparta - Tomah area as has been suggested.

I believe the exposed surface on the crystalline rocks in north central Wisconsin to be a Pre-Cambrian peneplane somewhat eroded by streams and affected by glacial erosion and deposition since removal of the Paleozoic sediments by which it was buried. Both the Dodgeville and Lancaster plains that bevel the Paleozoics in southern Wisconsin and adjacent portions of Iowa and Minnesota, if projected, would lie several hundred feet higher than the surface farther to the north and east. The oldest rock capable of protecting these younger peneplanes from erosion is the Prairie-du-Chien or Lower Magnesian dolomite. Once this formation had been eroded away from the area of north central Wisconsin, the streams removed the non-resistant formations of the St. Croix series relatively rapidly and exposed the old Pre-Cambrian surface over wide areas, and no traces of the younger peneplanes were left at higher topographic levels.

May I suggest that Dr. Lawrence Martin be invited to participate in case this discussion is to be continued? He has ideas concerning the post-Paleozoic history of the Driestless Area which differ from mine, and he might be able to contribute much more to the solution of the problems involved than I am able to do.

Sincerely yours,

(Signed) A. C. Trowbridge.



Dec. 28, 1932

Dr. A. G. Trowbridge,  
Department of Geology,  
University of Iowa,  
Iowa City, Iowa

Dear Dr. Trowbridge:

I wish to thank you for the copy of your letter of Dec. 23 to Leverett, also for the copy of your recent bulletin on the Rio Grande Country which arrived a few days ago.

I might add that the evidence of the bends of the Kicapoo impresses me much more in favor of more than one erosion cycle than does the character of the present uplands. I feel that ancient curves were kept because the river was actively cutting into hard rocks or at least firm rocks until the accidents of glaciation raised its outlet causing floodplains. This resulted not only in cutoffs but also in meandering on a smaller scale in the soft silt. In fact I suggest that underfit rivers may in many cases be due to the accidental development of floodplains by aggradation.

So far as I can see Martin did not change a word in his discussion of peneplains in the "revised edition" of Bull. 36. I made a number of suggestions but not one was heeded. This may have been due to several things including the climate of Washington which seems (to me) to be injurious to the growth of new ideas! I now have the manuscript of the Sparta-Tomah  
all  
report but have postponed any work on it until the matter of nomenclature of the rock formations can be brought into the open and fought out.

You may be interested in the fact that I am at work on a text book of glacial geology now delayed by the well-known Depression.

Very truly yours,

Lecturer in Geology



December 23, 1932

Dr. Frank Leverett,  
Ann Arbor, Michigan.

Dear Dr. Leverett:

In reply to your kind letter of December 17th, please let me say I did mail a copy of my letter of December 12th to Professor Johnson, that I have a copy of Professor Johnson's letter dated December 2nd, and that I have recently heard again from Professor Johnson.

All of us, Professor Johnson possibly excepted, seem to agree upon the existence of a pre-Cambrian peneplane now exhumed in northern Wisconsin but still buried under Paleozoics in central and southern Wisconsin.

Although I still find myself in disagreement with Martin and Thwaites in regard to what have been called the Dodgeville and Lancaster peneplanes, it seems to me that Thwaites and I are not far apart in our ideas concerning the conditions under which the crookedness of the ancestral Kickapoo was developed. I consider the curves to be of the nature of meanders on an ancient peneplane and Thwaites writes: "The incised bends are inherited from irregularities of stream course at some ancient time when the river flowed on the Magnesian upland."

I note that you have read the 1916 edition of Martin's Bulletin 36 but not the 1932 edition. I have not compared the two editions in detail but believe that Martin has not changed his ideas to any great extent since 1916. I still hope that Martin will be brought into the discussion if it is to be continued.

The question of a decrease in the volume of the Kickapoo is still open. Whether Johnson's direct evidence is good or not I do not know. I note your suggestion that any loss in the drainage area of the Kickapoo by diversion should have taken place during or soon after the uplifting. This may be so but it seems to me that the encroachment by new drainage systems would have taken place slowly and that the main diversions would have occurred only after the new streams had worked headward and narrowed and shifted the divides which at first had considerable area on the old erosion surface.



Dr. Frank Leverett:

- 2 -

December 23, 1932

Thwaites' idea of the time and conditions under which the Kickapoo straightened its course by cutting off the older bends seems very reasonable and possible to me.

In order that Thwaites may have this comment and so that he may have my own ideas for whatever they may be worth, I am sending to him a copy of this letter.

It seems to me that if any more is to be done with this matter it would be advisable for some one person to assemble all the letters that have been written so that each of us may have all the material.

With sincere personal regards and the Greetings of the Season, I am

Very truly yours,

A. C. Trowbridge.

ACT:AM

CC:Thwaites

*Dear Thwaites: -  
Merry Christmas  
Trowbridge*



Department of Geology

George F. Kay  
Arthur C. Trowbridge  
Joseph J. Runner  
Allen C. Tester  
Arthur K. Miller

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

December 19, 1932

Prof. F. T. Thwaites  
Science Hall  
Madison, Wisconsin

My dear Mr. Thwaites:

As I have written to you on previous date concerning the red clastics of Wisconsin and Minnesota, I am still looking for more information.

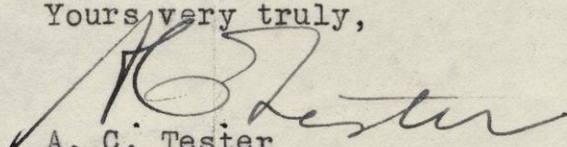
Is there any later published account of the red sandstones of the Lake Superior district other than the Wisconsin Survey Bulletin 25 of 1912?

Can you give me any reference to mineral analyses of the Keweenawan (?) red sandstones of upper Wisconsin?

Can you tell me where I can obtain some representative samples of this locality?

Thanking you in advance for your trouble, I remain,

Yours very truly,



A. C. Tester

ACT:A



Dec. 28, 1932

Dr. A. C. Tester,  
Department of Geology,  
University of Iowa,  
Iowa City, Iowa

Dear Tester:

The manifold distractions of the season as well as the recent illness of our little boy have conspired to delay answer to yours of the 19th.

I know of no recent studies of the Red Clastics except that of Stauffer at Minnesota and am inclined to think that it was not very thorough. If they have any new information it must have been concealed!

The same remark applies to mineral analyses.

When I worked around Lake Superior in 1910 I collected many specimens which are almost all buried in the basement of Science Hall in boxes now under the control of Mr. Gilbert Raasch, the new Curator. I expect that you would find sentiment of the powers that be opposed to giving away any of these no matter how willing I might be. Besides this fact I venture to suggest that no specimens collected by another ever compare in value to ones collected by the person making the study. The best way would be for you to go to some of the fine exposures of St. Louis River, Middle River, and Fish Creek if it is in any way possible.

Mr. Thorne, the well driller who has the contract for the next well here, called me up the other day and asked for information on a proposed 750 foot well to be drilled for the Government near Sandstone, Minnesota. This well would enter the Red Clastics. As the Minnesota Survey has, so far as I know, never been active in getting well samples I suggest that you follow up this matter and see if you can get cuttings. Thorne promised that he would save a set if he got the contract but I fear that despite his extraordinarily low prices such as \$5.00 a foot for a 20 inch hole, he will lose out in favor of some of the Minnesota or South Dakota drillers.

With best wishes of the season,

Very truly yours,



Nov. 3, 1934

Mr. Lon B. Turk,  
2810 First National Bldg.,  
Oklahoma City, Oklahoma

Dear Turk:

Yours of the 17th did not reach me until the morning of the 22nd as I was out of town on a field trip over the weekend. It was then too late to reach you as I hardly thought that you would care to pay the expense of telegraphing the information.

The Survey has never published anything on oil prospecting but Twenhofel got some separates of his paper entitled "The negligible oil possibilities of Wisconsin" which appeared in the A. A. P. G. some years ago. I regret that I have no extra copies of this left although he may have some. I used up mine in dissuading attempts at wildcatting. I have never secured any adequate records of the majority of the wildcats in this state. Hard feelings with the Survey prevented the obtaining of reliable samples or logs in most instances. The only one with accurate samples is the DeForest test just north of here which showed granite within five feet of the predicted depth and a section just like that at Madison. A few samples were grabbed from the Cambria tests (two holes) and the Friendship well. All three of these ended in pre-Cambrian granite. We had some cores from a deep test near Pelican in pre-Cambrian schist. Oil tests have also been drilled at Oil City (log in Geology of Wisconsin), Sheboygan, Pewaukee, Kaukauna, Black Creek. Several deep holes were drilled near Brussels several years ago and I have seen samples from one of them. Probably many other tests have been drilled of which we have no record. Several encountered "shows" but none came near to commercial production. I might also mention the water well at Gasco Junction which had a show of oil and gas which on testing proved very small in amount. My structural maps are all way behind the times and I hesitate to send you any of them. We will revise several for the forthcoming Field Conference if we can although I am pretty well occupied for the winter as is.

With regard to the Garvin County royalty the matter fell through without a sale being made.

Thank you for the offer of information. I hope next time that I will be able to answer sooner but a constant round of field trips which are not yet over is not conducive to promptness.

Mrs. Thwaites and the boys are well but my mother is quite poorly and went into the Madison General this morning.

With best regards,

Sincerely,

F. T. Thwaites



July 21, 1933

Mr. Lon B. Turk,  
1237 East Tenth St.,  
Okmulgee, Oklahoma

Dear Turk:

A few days ago I mailed you a copy of the revised edition of the map of the surface of the pre-Cambrian in Wisconsin. It was marked "confidential" for this reason but you are welcome to use it for any purpose except publication.

Since you left we have an addition to the family and now Tommy has a brother William. Both came home yesterday from the hospital and now I hope to devote a little of the time spent in running over there to catching up on my own affairs. W. weighed 10 pounds and is turning out to be a heavy eater. Both he and his mother are feeling fine.

In ten days I am going on the glacial geology excursion of the International Congress and will be gone 8 days. Later I hope to go on the Kansas Society trip to the Ozarks.

Hope you have been able to find a job. I am still numbered among the unemployed although I can hardly describe myself as idle.

Sincerely,



Oct. 20, 1932

Dr. George A. Thiel,  
Department of Geology,  
University of Minnesota,  
Minneapolis, Minnesota

Dear Sir:

I wish to thank you for the separates of your recent papers on "Glacio-lacustrine sediments reworked by running water" and "Giant current ripples in coarse fluvial gravel".

You may be interested to know that I am working on a text of glacial geology in which I specially stress the criteria of sedimentary environment by which glacio-aqueous deposits may be separated. Unfortunately these criteria are still in the formative stage but at least I will give a mark to shoot at for future improvement.

Very truly yours,

F. T. Thwaites, Lecturer in Geology



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WASHINGTON

*Tomah - Sparta*

May 20, 1932.

Dr. W. H. Twenhofel, Chairman,  
Division of Geology and Geography,  
National Research Council,  
2101 Constitution Ave.,  
Washington, D. C.

My dear Doctor Twenhofel:

In accordance with the conclusions reached in the conference in my office this morning in which you, Colonel Martin, Doctor Mansfield, and myself have participated, I am holding the manuscript on the Sparta and Tomah quadrangles, Wisconsin, subject to Colonel Martin's call. I understand it to be your desire, and the desire of your co-authors, to bring this manuscript up to date in a number of respects and to resubmit it to the Survey, when your revision may have been completed, for publication as a bulletin. This form of publication will give you more latitude than the folio form originally contemplated and will enable you to treat more fully such elements of the problems presented in the area, as in your judgment require fuller treatment than has been given them in the existing manuscript. I understand that since the original submission of this manuscript a certain amount of new material has come into your hands and perhaps somewhat different interpretations of facts already in hand may now be desirable.

With the manuscript, you will find comments made by those who have read it in its original form. You will give these comments such consideration as is appropriate, will utilize in your revision those of them that in your judgment are constructive and helpful, and naturally, as would any other author, disregard such as you, with your detailed knowledge of the region, find yourselves unable to accept.

If, after you have completed your revision, you desire, everything considered, to resubmit the manuscript to the Survey for publication as a bulletin, the Survey will be glad to receive it and to consider the possibility of its publication under the conditions that exist at that time.

Yours very cordially,

*W. C. Mendenhall*

c.c.:  
Col. Lawrence Martin  
Dr. F. T. Thwaites

Director.



L. H. Thorne, Des Plaines, Illinois

Day letter collect, 50 words

Lowest temperature depth sixty feet below that rises one degree every  
seventy feet stop water at eighteen hundred feet above seventy but well  
would produce a cooler mixture stop believe best chance for water is first  
lime down to eight fifty stop deep waters probably salty and sandstones  
are tight.

Thwaites



My dear Mr. Thwaites,

I intended writing before this to thank you for the picture of William Mueller Thwaites that you sent us at Xmas time but time does slip away so.

Our vacation last year was spent at Atlantic City as I was not well and we felt that the sea air would be beneficial. And it was. It gave me new life.

We were three days in Chicago for the Fair and enjoyed it very much. I feel that the people who say it was not



worth while, did not expect  
to get anything from it, and so  
naturally did not.

I enjoyed too the art loan and  
the Malvina Hoffman bronzes in  
the Field Museum.

We have had a very severe winter. I  
am glad that Spring will soon be here.

Please remember me to Mrs. Buell. I  
did so enjoy my visit with her.

Sincerely

Eleanor C. Tumbull-

March 9, 1934



an  
**Answer**  
is  
expected  
by the sender of this  
message. Please give  
it to the messenger or  
telephone it to . . . .  
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TJ18 20/27 = MANITOWOC WIS FEB 26 1241P

F T THWAITES =

WIS GEOLOGICAL SURVEY MADISON WIS =

CAN WE GUARANTEE ONE THOUSAND GALLONS PER MINUTE FOR  
CONDENSING FROM POSSIBLY EIGHTEEN HUNDRED FEET WHAT WOULD  
THE TEMPERATURE BE WIRE ANSWER COLLECT WESTERNUNION HOTEL  
HAY MANITOWOC =

L H THORNE.

1259P..

*answer: yes but may take two wells  
temperature over sixty  
Thwaites*



Jan. 20, 1934

Dr. A. G. Trowbridge,  
Department of Geology,  
State University of Iowa,  
Iowa City, Iowa

Dear Trowbridge:

Many thanks for the blueprint copy of the structure map which came several days ago. Had been too busy to thank you before.

Sorry I missed you the last day at Chicago.

Am trying to rush through my text of glacial geology for the second semester but will not be able to make it on time.

The Kansas Society trip work is inactive as we cannot do very much until the route is decided upon.

Sincerely,

F. T. Thwaites



February 13, 1934

Dear Mrs. Trumbull:

I was so rushed at Christmas that I did not write a note to go with the card. As you note we now have another son who arrived on July 10. Though he has dark eyes, he seems to look more like my family than Tommy. William Mueller Thwaites also is much larger than Tommy; at present he is wearing clothes that fit Tommy when he was over a year old.

We have not taken any extensive trips but did manage to spend two days at the Fair. I had the nurse come over who took care of me in 1921, 1931, and 1933 and Fred in 1929. Everything went along very nicely and she seemed to enjoy taking care of well children for a change.

Mr. Thwaites' mother has not gone south to date. We have had very little snow and she has enjoyed being here.

Mrs. Buell has spoken to me about you several times at the Woman's Club.

Whenever you come out this way, be sure to call on us!

Sincerely,



DEPARTMENT OF GEOLOGY

GEORGE F. KAY  
ARTHUR C. TROWBRIDGE  
JOSEPH J. RUNNER  
ALLEN C. TESTER  
ARTHUR K. MILLER

THE STATE UNIVERSITY OF IOWA  
IOWA CITY

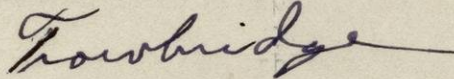
January 8, 1934

Dr. F. T. Thwaites  
Science Hall  
University of Wisconsin  
Madison, Wisconsin

Dear Thwaites:

Under separate cover I am sending you a blue print copy of my general structure map of the Upper Mississippi Valley. I had a copy for you at Chicago, but did not get to see you during the closing hours of the meetings.

Cordially yours,



A. C. Trowbridge

ACT:A



Teaching

The undersigned has given the course in Mapping every spring semester since 1920 with the exception of 1923 when too few students registered.

The course is designed to familiarize the student with the instruments which are commonly used in the field by geologists. The class meets once a week for eight weeks for discussion. Each student also puts in at least six hours a week for eight weeks in the laboratory and as the weather moderates in the field. Laboratory work has been progressively modified until more and more is done indoors. This allows of better supervision and eliminates delays due to bad weather. The course as organized at present involves only the common instruments used in this country and does not touch upon geophysics. It has proved impossible to teach geologic technique in this course chiefly because the average student (graduate credit is seldom given) is not fitted by his experience in the field to profit by such teaching.

After the eight weeks preparation the course is finished by a week in the field. After one year's disastrous trial at Madison it was decided that this work is best done at Devils Lake. Freedom from distractions greatly enhances the morale of the class. The main trouble is to get them to stop working in time to get some sleep. Through the courtesy of the Conservation Commission a house has been placed at the disposal of the class whenever needed. So far as weather permits this work is done during the spring recess but as this falls very early in the year this has not always been possible. In such event two week end trips are made.

At Devils Lake every student puts in about half the time at the telescopic alidade and plane table and the remainder in making a map of a square mile with less precise instruments.

Although students all report that they learned a great deal from the course the undersigned has always felt that the allotted time is far too short. A week cannot make a good instrument man and field training during the summer is greatly needed.

A mimeographed text of over 50 pages supplemented by illustrated laboratory directions makes the only text. This was prepared in 1927 and needs revision in the light of subsequent experience.



The course in Glacial Geology has been given by the writer every year since the spring of 1921. At first it was intended to train geologists for the State Geological Survey and particularly for road materials investigations. In recent years the numbers of such students has steadily declined until it has reached nothing. Stress is now laid on the features of the subject which appeal to teachers and to students of sedimentation.

At first readings were assigned to every student. In 1922 a rough outline was mimeographed. In 1925 and 1927 this was enlarged until a text book of over 200 typewritten pages was completed. In 1931 this was revised and supplied with illustrations with the intention of publishing by the "off-set" or photo mimeograph process. This has to date been prevented by the Depression and the supply of the 1927 text has been exhausted. Last year the class got along with texts borrowed from former students and placed in the library.

The subject is treated from the standpoint of the field man. Facts are stressed rather than theories and most of the time (over half) is put on the study first of glacial processes and sediments and second of land forms due to glaciation. The environment which lead to these deposits is studied with the aid of advance blueprint copies of the illustrations prepared for the revised text. (Last summer these advance copies were distributed among the members of the Glacial Geology excursion of the 16th International Geological Congress and many valuable comments and suggestions thus secured.) The remainder of the semester is devoted first to a study of the glacial succession in the United States, second to field work consisting of several (four or more) full days in the field) and last to economic problems of glacial geology, etc. Students have the option of either taking an examination on the field work or writing a report. In recent years nearly all have elected to write the report.

During the time that this course has been given the writer has spent three 18 week field seasons in northern Wisconsin and two three month seasons in southern Illinois. He has also studied glacial phenomena in New York, Iowa, and elsewhere. These studies have been of great help in preparing the proposed text which now consists of nearly 400 typewritten pages.

References only. No published text



The undersigned has given the course in Physiography of the United States every year since the fall of 1929.

He has in general followed the methods followed by Dr. Lobeck who formerly gave the course although he has tried to make the treatment of the subject somewhat more thorough and critical. As the course has been transferred to the Department of Geology the geological angle of approach has been stressed. Owing to the fact that the course draws to a large extent from the Geography Department it has not been possible, however, to carry out this policy as far as might be desired. Students from outside either of these departments also take the course and require special consideration because they lack the preparation of the students in geology. Another difficulty is that the course is often taken by graduates of some years field experience along with undergraduates who have had no such training.

The text used for the first semester is now 23 years old and is far from satisfactory. It was at first supplemented by readings assigned to each student. Written reports were required on these as well as discussion in class. In the last two years, however, the smaller number of students (due mainly to the decrease in geography students) has permitted the assignment of outside readings to all the class. This has worked better but it is still confusing to the inexperienced student to have a text book which is not entirely reliable. Liberal allowance of time for review has helped to overcome this trouble to as great an extent as possible.

The class work consists ~~of~~ a mixture of recitation, lecture, and general discussion, the last now easier because classes have been smaller. The country is taken up province by province. Every effort is made to stress facts and principles rather than a purely areal or geographic study.

During the fall semester two field trips comprising three full days in the field serve to give the student some idea of the actual facts. No field trips are possible in the second semester because the regions then under consideration are too far from Madison.



This course has never been given by the undersigned. It was given once by Dr. Lobeck to a group of graduates in geology. It consisted of three lectures a week and covered in one semester the ground covered in Course 130 in two. It appears that no outside readings were given.

Since the undersigned took over Dr. Lobeck's work in the fall of 1929 only two or three students have ever asked about the course. Most of these had already had Course 130 which disqualified them. As it was felt that to make it simply more advanced than Course 130 would compete too much with Course 109 so ~~that~~ the idea was abandoned. It now seems unlikely that the conditions which necessitated this course ( 230) will recur.



The undersigned has given this course twice, i. e. in 1930 and 1932. The method has been entirely changed from that followed by Dr. Lobeck. Instead of a resurvey of the entire field of land forms the course has been divided into three parts.

During the first third of the semester a field problem in the Baraboo district (which despite the large numbers of students who visit it every year contains many unsolved problems) has been taken up. This involved two or three days in the field followed by class discussion and reading of references which bear on the problem. Each student then prepared a written report. The idea was to present early in the course the methods of securing data in the field so as to place the student in a better position to appraise the work of others as given in the literature.

The second third of the semester was devoted to class discussion of readings along some definite line in physiography usually one suggested by the field problem but not directly a part of it. From one to four papers were read each day but the class met only twice a week in this period. ( Another time this would be changed to three meetings a week.)

The remainder of the semester was devoted to a cooperative cross section project, to readings which bore on that project which were discussed in two meetings a week of the class, and to the preparation by each student of a written report on his part of the project.

The above has never satisfied the undersigned completely but in view of the wide differences in preparation of the relatively few students who elected the course it seemed to be the best that could be done.

No text; references too many to list



September 18, 1934

Dear Sir:

The second annual Tri-State (Wisconsin, Iowa, Illinois) Field Conference will be held on Friday and Saturday, October 20 and 21. The party will assemble in Madison in front of Science Hall of the University of Wisconsin before 9 A.M. on Saturday, October 20, and, leaving at 9 A.M. there will be visited in succession the outlier of Blue Mound, showing a succession from the Galena to the Silurian, the section into the Wisconsin Valley, reaching well down into the Cambrian, the Baraboo Range with its various Pre-Cambrian, Cambrian, and Ordovician sections, and the Dells of the Wisconsin River. The section examined will extend from the Pre-Cambrian to the Silurian, possibly the Cretaceous in the Windrow gravels, and the Pleistocene. Important features of the physiography will be examined and new interpretations of the structure and stratigraphy of the Baraboo Range will be examined in the light of the various sections. Maps and directions will be provided at the time of starting. Saturday night will be spent in Baraboo and the party will disband about noon on Sunday.

Geologists from near-by localities may leave on Saturday morning, October 20, and be able to reach Madison by the time of starting. Those coming from a considerable distance should arrange to arrive in Madison on Friday evening, October 19. Accommodations for a limited number may be reserved at the University Club. Prominent hotels in Madison are the Loraine, Park, Monona and Belmont. All of these are centered around the State Capitol. The Loraine is the most expensive. It is probable that quite a number of persons may receive accommodations in the various fraternity houses.

As a geologist of the three states participating in the conference, you are cordially invited to attend and bring as great a number of students with you as possible. It is hoped that these conferences will aid in the development of our science, and you may help us who are working on the local area with your suggestions and criticisms. I would appreciate information that you may be expected, and also information as to the number of students who will accompany you. A postal card is enclosed for your convenience, and on this will you please note the number of your students that will accompany you.

Those who may desire to do so may bring their bed rolls and stay in the shelter house at Devil Lake. Cots will be provided.

While you are not in the three states with which the Conference is immediately concerned, it has been thought that you might be interested in attending. A number of additional announcements are enclosed which you may wish to give to some of your students or members of your staff.

Sincerely yours,

Chairman of the Executive and Local Committees



Oklahoma City, Okla.  
2810 First National Bldg.  
October 17, 1934

Mr. Fred T. Thwaites  
Geology Department  
Madison, Wisconsin

Dear Mr. Thwaites:

I regret very much that during the short time that I was in Madison I didn't have the time to get up to Science Hall to visit with some of my friends there. However, I had only a few days in which to get married and then get back to Oklahoma and those few days were hardly sufficient to do all the details fitted to the occasion for I went to Madison.

Since the time that you and I tried to work out some plan to help you made a sale on some royalty here in Oklahoma I have not heard from you. I never learned whether or not there was any disposal of any part of the royalty and have wondered several times just what was decided by the administrators, the Union Trust Co. My feeling has been that I gave you my sincere recommendation to make a sale because it was likely that no subsequent activity would occur in the general area for some time, if ever. From the present interest in the area, it seems to be fairly well condemned for activity for several years. I hope that the Union Trust Co. negotiated some kind of a sale.

On Monday night October 22 I am scheduled to give a paper on the Geology of Wisconsin to the Oklahoma City Geological Society. I have searched thru all of my material pertaining to this subject and find that I did not make a record of the several discussions that you and I had on the drilling activity in Wisconsin in search of oil. If I remember correctly the Survey put out a small circular relating to the past history of oil activity in which there was included some of the details relating to the total depths, formations drilled, and the results. If I am mistaken in this regard and this information is not obtainable in printed form, I am wondering if you would give me a short resume relating to the location, total depths, formations drilled or formation in which the well was abandoned, the results--such as oil shows or any live oil and its general character. I hope that you will not feel that I am asking you for considerable reference to some of your records and therefor involve a lot of time. I would like to have whatever resume your time will allow you to give me. It will be of the greatest help to me in preparing an interesting paper for the Society here. It is my hope that I can create enough interest by this paper that not a few will be interested



in making the trip under the auspices of the Kansas Geological Society into Wisconsin and other adjacent areas.

I am wondering also if you will send me any available published information on the Historical or Structural Geology of Wisconsin and I will be glad to refund you whatever expense is involved to you. I have some available information but not as much as I would like to have for preparation of the paper.

If at any time in the future I can furnish you with samples, information, maps, or data I will be more than glad to help you.

With my best regards to you and Mrs. Thwaites and the boys, I am

Yours very truly,



Lon B. Turk



Nov. 26, 1934

Mr. L. H. Thorne,  
W. L. Thorne Co.,  
1509 Park Place,  
Des Plaines, Illinois

Dear Mr. Thorne:

In reply to yours of the 21st the matter of the A. O. Smith well has been up for a number of years. My advice to drillers has always been given in one word: DON'T.

In justification of the above opinion I wish to state that in the present state of knowledge of underground conditions it is unwise for any driller to state positively that he will make a well which will yield water of a certain definite hardness. The hardness of water at different levels in the ground varies widely. It also varies with the rainfall. Now when you pump any well you get a mixture of different waters from several different sources. The length of time you pump and the rate at which you pump affect the hardness of the product. This makes it impossible to promise water of a definite quality.

If the Smith plant were located a few miles to the southwest you could go ahead and get the water specified without much danger of loss although you would undoubtedly have to shoot the well heavily to get the drawdown to the figure specified. But the site specified is located near to an abrupt change in hardness of the average underground water. In Wawatosa they get water of 378 to 450 parts per million hardness compared to your base hardness of 480 p.p.m. (28 grains). At Shorewood school we had water far harder than this and in fact most of the downtown Milwaukee wells are much worse. They claim that Prof. Bagg was able to so case the well at the Greenbaum Tanning Co. in North Milwaukee as to get 21 grain water. The details of construction were kept secret, however and I know very little about this job. In all probability they had to sacrifice capacity to get this quality. That is where you run the great risk for after long and expensive experiments you might easily loose out on drawdown. I suggest further study of the Greenbaum well before making any decision. Another suggestion is that if you make a contract you reserve the right to fill the well with concrete to the rock surface and to pull the drive pipe in case it is not accepted.

My feeling is that the owner ought to assume the risks of hardness and drawdown and the driller should not guarantee anything but a workmanlike job. Exclusion of contaminated surface waters is another matter which it seems fair to ask a driller to take care of but any experimental work on chemical quality is not guided by sufficient precedent now. In fact the work at the Vocational School and Journal Building some years ago is not very encouraging.

Thank you for the information on Manitowoc. The hard sandstone is probably due to a fault.

Very truly yours,

F. T. Thwaites



625 North Ottawa Avenue,  
Dixon, Illinois.

August 6, 1937.

Prof. F. T. Thwaites,  
Univ. of Wisconsin,  
Madison, Wisconsin.

My dear Dr. Thwaites,

I suppose you are back from the "North Woods" by now, and I am wondering if you will have any time between now and the opening of school to come down and go over the Pleistocene geology of my thesis area.

The glacial deposits consist of Illinoian ground moraine, with associated drumlins, moulin kames & gravels, Wisconsin terminal moraine, and a complex series of terrace gravels, slackwater silts, & lake clays, some of which are highly fossiliferous, of Wisconsin age, as well as Sangamon & Peorian loess sheets.

I don't know whether you will find it possible to get down here this summer, but I would greatly appreciate any advice or help that you could give me in a field-conference. I am

Very sincerely yours,  
J. S. Templeton



# THE TEXAS COMPANY

Fort Worth, Texas, September 12, 1936

## EMPLOYMENT - APPLICATIONS

Allen R. Ostrander,  
Washington University,  
St. Louis, Mo.

Professor F. T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison, Wisconsin.

Dear Sir:

The above named has applied to this Company for a position, and in so doing has authorized each former employer to give any and all information that may be sought in connection with applicant's work, habits, character or skill. Applicant has referred us to you for this information.

Will you kindly advise us as to the quality of the applicant's work and whether it would merit employment.

Your opinion of the character and ability of the applicant, with such additional information as you may be willing to furnish, will assist us in determining fitness for service in our organization.

The information requested will be appreciated and we assure you will be held as strictly confidential.

Very truly yours,

THE TEXAS COMPANY,  
Producing Department,

By R. S. Powell

JHMJr:CMM



Sept. 15, 1936

The Texas Company,  
Producing Dept.,  
Fort Worth, Texas

Attention Mr. R. S. Powell

Gentlemen:

In reply to yours of the 12th Mr. Allen R. Ostrander took his Masters degree here. For his thesis he worked on the topography and geology of the then newly-discovered Hamilton Mounds in the sand country of central Wisconsin. Although signed by Prof. Twenhofel I took the supervision of the field work and feel that Ostrander did a very good job. Later he assisted me in caring for and bottling well samples. He helped in the work which led to the development of the deep water-producing zone at Waukesha, Wisconsin which is now the source of most production there. I found him a careful and thorough worker.

At the time Ostrander was here his health was not very good but I presume that your medical examiner will find out if he is all right now. He looked much better the last time I saw him.

Very truly yours,

F. T. Thwaites





UNIVERSITY OF MAINE  
ORONO, MAINE

DEPARTMENT OF  
CIVIL ENGINEERING

December 11, 1940

Dear Fred:

I am inclosing the check for \$2.50 for the Glacial Geology. I don't know if I can make a reply to Lougee's artical or not. I think one is called for, but where there are others more concerned with the glacial deposits in New England now, than I am, it might be better for someone else to do that. I drew up a rough draft of a paper on the subject, and then decided that I should get out into the field again to review some of the deposits here that might have a bearing on the subject, so have laid the thing aside.

Lovejoy is moving up here to Orono for winter quarters this month, so I shall see him some. He mapped the soils of York County, and in doing so mapped the glacial geology and much of the bed rock. I am going to go over some of his material with him this winter. I don't see how any of the soils men can map well without glacial geology and some knowledge of bed rock types, but some of them seem to have no lack of confidence in their work.

I have quite a number of things stirring around in the kettle now, that keeps me pretty busy. Besides the family which, like yours, no doubt is pretty boistroous at times. I judge that C.K. must be pretty well tied up with defense problems. Wish we could get out to Madison for a visit, but with the family that seems impossible for some time.

Helen sends her regards,

Joe



# The New York Times

TIMES SQUARE, NEW YORK, N. Y.  
LACKAWANNA 4-1000

CIRCULATION DEPARTMENT

June 20, 1941

Mr. F. T. Thwaites  
41 Roby Road  
Madison, Wisc.

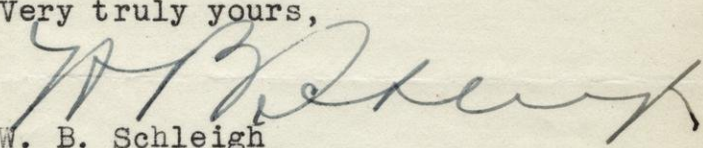
Dear Mr. Thwaites:

We have your postal card of June 16, and regret that the Review of the Week section was missing from your copy of the June 15 issue.

We have forwarded the section and trust it reaches you satisfactorily. We have referred the matter to the Superintendent of our Mail Room requesting him to see that the complete paper is mailed in the future.

We are sorry indeed for the inconvenience you have been caused and shall appreciate hearing from you if there are any further omissions.

Very truly yours,



W. B. Schleigh  
Circulation Manager

WBS/DC



ARTHUR C. TROWBRIDGE  
DIRECTOR AND STATE GEOLOGIST  
H. GARLAND HERSHEY  
ASSISTANT STATE GEOLOGIST  
KATHRYN T. NEUZIL  
SECRETARY

STATE OF IOWA  
**IOWA GEOLOGICAL SURVEY**  
GEOLOGY ANNEX  
IOWA CITY

**GEOLOGICAL BOARD**  
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PRESIDENT IOWA ACADEMY OF SCIENCE  
CHET B. AKERS  
AUDITOR OF STATE

November 14, 1941

Dr. F. T. Thwaites  
41 Roby Road  
Madison, Wisconsin

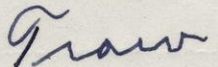
Dear Fred:

As requested under date of November 11 I am glad to send you under separate cover "Pollen Analysis of Interglacial Peats of Iowa". This is a reprint from volume 37 of our annual reports.

I am certainly glad to learn that you have completed and submitted a report on northeastern Wisconsin. I shall look forward to seeing it when it is published.

We missed you on the Tri-State Conference in October.

Cordially,



A. C. Trowbridge

ACT:N



Nov. 28, 1941

Dr. A. C. Trowbridge,  
Geology Annex,  
Iowa City, Iowa

Dear Trow:

Thank you for yours of Nov. 14 but no reprint of the paper has ever arrived. Could you please check up and see if it was sent?

Sorry I was unable to go on the Conference but with both Trenchhofel and Newell away somebody had to stay and put through a field trip for Trenchhofel's class.

I have been advising Frank Gray in regard to the new deep well near Burlington. I still wonder why you can go so deep with no salt water whereas around Chicago they get into it at such shallow depths.

Sincerely,



Nov. 11, 1941

Prof. A. G. Trowbridge, State Geologist,  
Dept. of Geology,  
University of Iowa,  
Iowa City, Iowa

Dear Trow:

I notice in your last annual report a paper on pollen analyses of Iowa interglacial deposits. I have not received a copy of the same and would greatly appreciate one if you could send it. Dean Kay has sent me a copy of his paper on gravels.

My report on northeastern Wisconsin went in to Aldrich on July 17 but I have had no official report on it as yet. Now I can start on other projects.

Best regards,

Sincerely,



ARTHUR C. TROWBRIDGE  
DIRECTOR AND STATE GEOLOGIST

H. GARLAND HERSHEY  
ASSISTANT STATE GEOLOGIST

KATHRYN T. NEUZIL  
SECRETARY

STATE OF IOWA  
**IOWA GEOLOGICAL SURVEY**  
GEOLOGY ANNEX  
IOWA CITY

December 4, 1941

GEOLOGICAL BOARD  
GEORGE A. WILSON  
GOVERNOR OF IOWA  
VIRGIL M. HANCHER  
PRESIDENT STATE UNIVERSITY OF IOWA  
CHARLES E. FRILEY  
PRESIDENT IOWA STATE COLLEGE  
ROY A. NELSON  
PRESIDENT IOWA ACADEMY OF SCIENCE  
CHET B. AKERS  
AUDITOR OF STATE

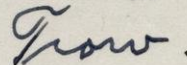
Dr. Fred T. Thwaites  
41 Roby Road  
Madison, Wisconsin

Dear Fred:

I must certainly apologize for the fact that the promised reprint was not sent to you until after receipt of your reminder of November 28. This resulted from a slip here in the office. A copy has been sent under separate cover which you should have by this time.

Garland Hershey who is also in touch with Frank Gray in regard to the deep well near Burlington has no very satisfactory explanation for the fact that the water in southeastern Iowa at given depths is less salty than that around Chicago. The two areas, however, are to a certain extent at least separated by the Mississippi River anticline and to this extent are in different artesian basins or at least in different parts of the same basin. We are not aware, however, that there are more salts in the Chicago section than in our eastern Iowa section. If you find the answer I hope you will write me again about it.

Cordially,



A. C. Trowbridge

ACT:N



41 Roby Road,  
Madison, Wisconsin,  
January 9, 1942

Truth or Consequences, Ivory Soap,  
Radio City,  
New York, New York

Gentlemen:

I wish to submit the following:

Question: Why is manganese so vital for national defense?

Answer: Because steel cannot be made without it and there is no substitute.

Question: Does the United States build Aeroplanes in part from sea water?

Answer: Magnesium is derived from sea water and is used chiefly in making aeroplanes engines. It is very light in weight.

Consequence: Have the person who fails to answer the question carry ten peanuts across the stage on a silver knife without touching his hands to the peanuts.

Yours very truly,

William M. Thwaites  
Age 8



Feb. 24, 1942

Independent Exploration Co.,  
901 Esperson Bldg.,  
Houston, Texas

Attention Mr. T. I. Harkins, President

Gentlemen:

In reply to yours of the 21st I have known Robert Tomment for several years while he was attending the University of Wisconsin. His character is excellent and he does not have any bad personal habits. He is noted as an extremely industrious worker and a careful computer. He is entirely dependable and thorough. He appears to be liked by the other boys here. I am confident that he would make good at geophysical work.

Very truly yours,

Assistant Professor of Geology



INDEPENDENT EXPLORATION COMPANY  
GEOPHYSICAL SURVEYS  
901 ESPERSON BUILDING  
HOUSTON, TEXAS

February 21, 1942

Dr. F. T. Thwaites  
Science Hall  
Madison, Wisconsin

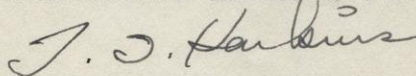
Dear Sir:

Robert Tennant has applied to us for employment, and we are wondering if you will be kind enough to write us a letter telling us what you think about his character, ability, and suitability for geophysical work.

A self-addressed, stamped envelope is enclosed for your convenience in answering.

Yours very truly,

INDEPENDENT EXPLORATION CO.



T. I. Harkins, President

TIH:mj  
Enc.





# The State of Wisconsin

STATE TEACHERS COLLEGE

WHITEWATER, WISCONSIN

IN REPLY PLEASE REFER TO:

September 28, 1942

O. J. Thomas

Professor F. T. Thwaites  
Science Hall  
Madison, Wisconsin

Dear Mr. Thwaites:

Your letter of September 24th, in which you give me valuable suggestions concerning aerial photographs and stereoscopes, is truly appreciated. How I wish I might have been a member of your class last year. I have not yet had time to digest all you have on the mimeographed sheet but I know that it will be a great help to me if I can talk over your experiences and see your equipment. I regret that I was unable to do so this week-end.

There is a possibility that I may be able to spend this coming week-end in Madison. I would be unable to leave here until after four o'clock on Friday but if more convenient for you I might arrange to see you at Science Hall or in your home as you desired, Friday evening, October 2, or at any time Saturday or Sunday forenoon.

I am enclosing a self addressed card for your convenience. If I am unable to come I will let you know. As you may be aware I have a home in Madison with Miss Gordon-Smith at 16 Lathrop Street, Fairchild 4681.

Cordially yours and with real appreciation,

A handwritten signature in cursive script that reads "Olive J. Thomas".

Olive J. Thomas  
Professor of Geography

OJT:OK





# The State of Wisconsin

STATE TEACHERS COLLEGE

WHITEWATER, WISCONSIN

IN REPLY PLEASE REFER TO:

September 22, 1942

Mr. Frederick Thwaites  
Department of Geology  
Science Hall  
Madison, Wisconsin

Dear Mr. Thwaites:

I am offering a pre-induction course in Map Interpretation and Military Mapping. The course was planned by a group of geologists and geographers in conference with officers of the Sixth Corps Area at Northwestern University June 26-27, 1942.

A portion of the work includes the correlating of air photographs with topographic maps. A committee of the conference selected the maps and the section of the maps which were covered by air photographs. The photographs are on a scale of 1:20,000 so that it would take approximately four to cover a 5-minute rectangle. Single photos are 9x9 and I believe need to be ordered in "Stereoscopic Pairs" at twenty cents each. The War Department is releasing some of these to aid in our courses, but all orders from the colleges in the Sixth Corps Area have to be placed at the same time so as to minimize expense in printing.

Frankly this is a new field to me and I am wondering if you can give me any advice. A self-addressed envelope is enclosed for your convenience.

For example, the SW corner of the Madison map was selected as convenient territory for the University and the area includes from lat.  $43^{\circ}00'$  -  $43^{\circ}05'$ . This would require 4 photos. Two copies of each photo I presume would be needed to secure the stereoscopic effect and thus if we were to cover that 5' of latitude, 8 prints @ 20¢ each or \$1.60 would be needed.

My first question is: do we need as many pictures as are necessary to cover the 5' of latitude or would we not better serve our classes by covering such an area as the 9x9 photos picture and then select prints depicting portions of widely scattered areas covered by maps which emphasize various physiographic types throughout the U. S.

Secondly - Mr. Hanley stopped by here the other day and told me that you were doing quite a bit with relief interpretation from aerial photographs. I am interested in knowing what kind of stereoscope is best to secure, where they may be secured, and at what price.

Our budget is thin indeed - so that I shall need to make my order as economical as possible, yet I wish to prepare my fifty men as well as possible.

I shall deeply appreciate your advice and whatever suggestions you may wish to make.



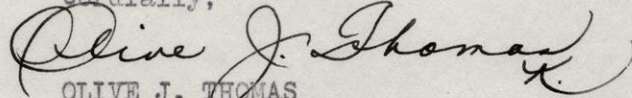
Mr. Frederick Thwaites

-2-

September 22, 1942

It was pleasant to have a visit with your wife and to become acquainted with your children, even under the stress of crowded travel. Kindly extend my regards to them.

Cordially,

A handwritten signature in cursive script that reads "Olive J. Thomas". The signature is written in dark ink and is positioned above the typed name.

OLIVE J. THOMAS

Instructor in Military Mapping

OJT:OK



Sept. 24, 1942

Miss Olive J. Thomas,  
State Teachers College,  
Whitewater, Wisconsin

Dear Miss Thomas:

Your letter of the 22nd is at hand.

I take it from conversation with Prof. Finch that the proposed work will be quite similar to that given last year in Military Geology. Although I drew up the problems for that the actual supervision of the laboratories was divided among three assistants and we cannot now find any copies of the work on aerial photographs. However, I am enclosing copy of the problem used in more advanced mapping with list of references. We used F. M. 21-26 last year for Military geology and found it all right.

The price quoted for photographs is so much less than that charged by the Highway Commission that you ought to take advantage of it. You are mistaken in thinking that it takes two copies of each. You need every photograph taken in a N\*S flight, however. Pictures are taken about every 3/4 mile and each overlaps the next about 60%. It is the observation of photographs taken from different points of view which gives the stereoscopic effect on the ground common to both.

There is no mystery to a stereoscope as explained in my directions. We made our own here buying the thin plate glass mirrors from Olson Glass Co., 619 Williamson St. in this city. Cost is very low. Then we had the mechanic here make the wooden frames. Any carpenter ought to be able to make such an instrument especially if several are made at once.

With regard to choice of photographs I feel that your idea of scattering the purchases is a good one but with verticals the choice should be of sets of three consecutive pictures in a flight so as to get complete stereoscopic coverage of the center one. The Madison area is not very good for students.

If you could come up here I would be glad to show you our equipment and tell you more of my experience in teaching. It is essential with a large class to have several copies of every photograph. They are easily damaged and soon wear out unless you watch the students very carefully. Just tracing from them leaves marks underneath unless extreme care is used.

With best regards,

Sincerely,

F. T. Thwaites



March 1, 1943

Prof. R. Maurice Tripp,  
Dept. of Geophysics,  
Colorado School of Mines,  
Golden, Colorado

Dear Prof. Tripp:

In reply to your request of Feb. 26 I am enclosing blueprints of the machine we recently made. It has been very useful and is almost constantly in use now. Bearings are bronze with oil in it with hard steel bushings. The stereoscope is not shown but is a Meiss pocket one. The legs fit in tubes so it can be adjusted. It mounts on a board 30 in. square.

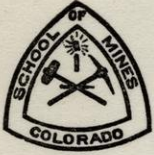
If not able to make the full apparatus I found that a wooden model with a scale on celluloid instead of the micrometers was very good for many purposes.

Very truly yours,



# COLORADO SCHOOL OF MINES

GOLDEN, COLORADO



February 26, 1943

DEPARTMENT OF GEOPHYSICS

Professor F. T. Thwaites  
University of Wisconsin  
Madison, Wisconsin:

Dear Professor Thwaites:

I understand from Dr. Smith that you have designed and built a stereoscopic contouring machine which Dr. Smith says looks very good. If you could spare a copy of the plans, I would appreciate receiving it very much.

Thank you.

Yours truly,

A handwritten signature in cursive script that reads "R. Maurice Tripp".

R. Maurice Tripp

RMT:m





# The State of Wisconsin

STATE TEACHERS COLLEGE

WHITEWATER, WISCONSIN

January 12, 1943

IN REPLY PLEASE REFER TO:

Professor Frederick T. Thwaites  
Science Hall  
University of Wisconsin  
Madison, Wisconsin

Dear Mr. Thwaites:

Under separate cover I am sending to you Technical Manual 5-230 Topographic Drafting. I regret that I did not think to send it to you immediately upon my return. I hope this delay has not caused you any concern.

Please accept my most sincere thanks for all the assistance which you have rendered.

Very truly yours,

A handwritten signature in cursive script that reads "Olive J. Thomas".

Olive J. Thomas  
Instructor of Geography

rmn



IN REPLY ADDRESS ~~NOT~~ THE SIGNER  
OF THIS LETTER, ~~BUT~~

HYDROGRAPHIC OFFICE  
NAVY DEPARTMENT  
WASHINGTON, D. C.

REFER TO NO.



HYDROGRAPHIC OFFICE

WASHINGTON, D. C.

April 28th, 1943.

Mr. F. T. Thwaites  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin

Dear Mr. Thwaites:

As plans stand at the present time it appears that I will be very fortunate in representing the Hydrographic Office in summer work in the Canadian Arctic. The Navy is unable to furnish some of the more personal equipment that we would like to have with us for this survey work.

It has occurred to me that most of the Bruntons in our department will be lying idle this summer. Will it be possible for me to arrange for the loan of a Brunton and case for this coming summer? Please advise me as to what arrangements can be made in the event that this request meets with the approval of the department. In the event that a loan will not be possible, can you give me any information regarding where I may purchase a new or used Brunton?

Present plans are that we shall ship out of the country some time about the middle of May. Can you give me the above information as soon as possible to facilitate my finding one before we leave?

I have heard very little from any of the members of the Geology Department this winter, but assume that with the depleted staff and student body everything is going strong and ready for another summer season as much as may be expected.

Yours sincerely,

A handwritten signature in blue ink that reads "Dan Turner". The signature is written in a cursive style with a long horizontal stroke at the end.

Dan Turner

DST:IG



Dear Dan :

In reply to yours of the 28<sup>th</sup> we

would be glad to help you out with ~~one~~ of the idle Bruntons here. But there are

State property and we cannot loan them out without definite assurance that we will either get them back or be paid.

Therefore, a letter from ~~the chief~~ your

chief accepting financial responsibility is needed. If he will assume that then it will be OK.

It has occurred to me that most of the Bruntons in our department will be lying idle this summer. Will it be possible for me to arrange for the loan of a Brunton and case for this coming summer? Please advise me as to what arrangements can be made in the event that this request meets with the approval of the department. In the event that a loan will not be possible, can you give me any information regarding where I may purchase a new or used Brunton?

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I have heard very little from any of the members of the Geology Department this winter, but assume that with the depleted staff and student body everything is going strong and ready for another summer season as much as may be expected.

Yours sincerely,

*Dan Turner*

Dan Turner



April 30 1943

Mr. Dan Turner,  
Hydrographic Office,  
Navy Dept.,  
Washington, D. C.

Dear Dan:

Yours of the 28th is at hand. We have several Bruntons which are idle and bid fair to be so for the duration. We would be glad to help you out but you will appreciate the fact that these are the property of the State of Wisconsin for which we are responsible. We cannot loan out any without assumption of financial responsibility by the organization. If you really need a Brunton can the officer in charge write us a letter taking such responsibility. Do you really need a Brunton? It is designed primarily for geological work and is not as good for surveying as a prismatic. If you decide you can meet the above requirement please let me know and I will send one.

The Department is like a morgue so far as activity is concerned. There is only one grad but there are still a few seniors. Most alarming is that there are no juniors. Winchell, Con and I have been teaching Physics. I managed to make a Mapping trip with party of 11 for 6 days. There will be no trip in General and probably none in 17. Reason, no morning trains. ( N. B. I do'nt usually type like this but am in a hurry to get home.) Newell is in South America and Kummel is to join him soon. Marvel is gone and Mrs. Hemmingway in charge of the Museum. Hear Gil Raasch is collecting fossils in Africa.

Best regards,

Sincerely,



Washington, D.C.  
Hydrographic Office  
Survey Section  
May 3, 1943

Dear Mr. Thwaites:

Sorry I don't have a typewriter and stationery on hand this evening, because at the present time I am "standing the night watch" where there are no such facilities.

In reply to your letter re: the Brunton I find I shall have to clarify a statement I made about it. The country into which we are going abounds in considerable  $PE$  exposures, and of course, with the Navy, we will not officially be doing any geology. However, one can never miss the opportunities to see such when he is walking over it all day on other missions. My request was therefore purely a personal one and only for my personal use could I be requesting a Brunton. The Officer in Charge, would not possibly approve an official Navy request for one. I would like to have one only for my own use, thru my interest in the geology of the area. I had no idea of using it for survey work.

If it is impractical for me to obtain one on loan under my own



responsibility, it is best that I not consider it further.

Can you tell me whether or not the instruments are available from the Brunton Co. in Denver?

Was very glad to hear the news of the Dept. in its present depleted state and hope we can all keep in touch with Science Hall during our absence. I sincerely appreciate your consideration of the request and hope I may hear from you again.

Yours sincerely,

Dan T



May 7, 1943

Mr. Dan Turner,  
Hydrographic Office, Survey Section,  
Navy Dept., Washington, D. C.

Dear Dan:

Yours of the 3rd is at hand. Much as we would like to help you I think you will see our position. We simply can not scatter State property on non-state business. The hazard of loss is too great and we would be severely blamed if we did it. As to personal instruments one never knows when he may be sent on some job which requires them.

In view of a request from the U. S. G. S. for loan of our Bruntons for use in this country it would seem that they were unable to purchase any. Ours were made by W. Ainsworth and Sons, Denver, Col. There are other makers.

You can easily improvise a geological compass by setting a pocket compass into a square board. In some parts of the north a magnetic compass is little use by reason of the high dip of the earth's field. There a solar is the best answer. You can improvise one with thread raised at angle to be parallel to earth's axis and graduate it at a point of known azimuth by marking time on it for a day. Then you set it up by your watch. A clinometer is very easy to make from a board, protractor, and string with a weight. It can be combined with the compass.

With best regards and regrets,  
Sincerely,



Tennant

Jan. 30, 1945

Mr. A. H. Mitchell,  
The Carter Oil Co.,  
Box 801,  
Tulsa 2, Oklahoma

Dear Mr. Mitchell:

In reply to yours of the 26th <sup>Mr.</sup> R. H. Tennant was in several of my classes commencing in 1940. He also wrote a masters thesis under my direction. His class work was uniformly excellent. He was a careful and thorough worker although not strikingly original or inventive. The last refers to thinking up new ideas. His personal character is so far as I know of above reproach. His father is a consulting engineer in a small town near here and I have been in the field with both of them so that I know his home background rather well. I feel confident that he would prove a good man in the oil fields where he has already had some experience prior to entering the Army. I am not personally acquainted with his record since leaving school here.

Very truly yours,

F. T. Thwaites,  
Assistant Professor of Geology  
Assistant to State Geologist



# THE CARTER OIL COMPANY

PERSONNEL & INDUSTRIAL RELATIONS DEPARTMENT

NATIONAL BANK OF TULSA BUILDING

TULSA 2, OKLAHOMA

January 26, 1945

POST OFFICE BOX 801

A. H. MITCHELL  
MANAGER

Professor T. T. Thwaites  
Science Hall  
University of Wisconsin  
Madison, Wisconsin

Dear Professor T. T. Thwaites:

Robert Hudson Tennant has given us your name as a personal reference. We shall appreciate your frank comments as to his character, habits, personality, community interest, hobbies, and ability.

It is important to our present war effort that we have as much information as possible about each person we employ. All information you furnish us will be regarded, of course, as confidential.

Because of the large number of inquiries we must make for references, we find it convenient to use this form letter. If you wish, you may place your reply on the lower portion or reverse side of this letter. A stamped envelope is enclosed for your convenience.

Thank you for your cooperation and prompt reply.

Yours very truly,

A. H. MITCHELL

BY:

*J. B. Morrison*  
*ak*

FL-23-B



# STANDARD OIL COMPANY OF TEXAS

P. O. Box 1249

**HOUSTON 1, TEXAS**

June 27, 1946

Dr. F. T. Thwaites  
Science Hall  
University of Wisconsin  
Madison, Wisconsin

Dear Doctor Thwaites:

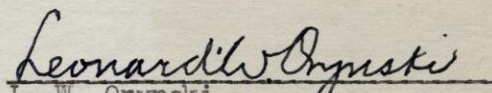
Mr. R. H. Tennant of Portage, Wisconsin, has applied to us for a position in our Geological Department and has furnished you as a reference.

There is a possibility that we may be able to use the services of Mr. Tennant in the near future as an Assistant Geologist, either doing sample examination work or subsurface work in our Midland Office in West Texas.

We will appreciate it very much if you advise us at your earliest convenience what you know of the character, education, and general fitness of Mr. Tennant for either of the positions enumerated above.

Thanking you kindly, I am

Yours very truly,

  
L. W. Orynski  
Consulting Geologist

LWO/hb



July 3, 1946

Dr. L. W. Orynski,  
Standard Oil Co. of Texas,  
Box 1849,  
Houston 1, Texas

Dear Dr. Orynski:

In reply to yours of June 27 in regard to the application of Mr. R. H. Tennant I am convinced that you would find him satisfactory for the work mentioned. He was in several of my classes and did his master's thesis under my direction. He did not work with me after his discharge from the Army.

I always found that Mr. Tennant was a hard worker, conscientious, and dependable. So far as I can tell he has no personal bad habits. I recommend him highly for the type of work mentioned because of these qualities.

Very truly yours,

Assistant Professor of Geology  
University of Wisconsin





WALTER SCHROEDER  
PRESIDENT

# HOTEL LORAINÉ

FIREPROOF  
**SCHROEDER HOTELS**  
SLEEP IN SAFETY

HOTEL SCHROEDER  
MILWAUKEE, WIS.  
HOTEL LORAINÉ  
MADISON, WIS.  
HOTEL NORTHLAND  
GREEN BAY, WIS.  
HOTEL RETLAW  
FOND DU LAC, WIS.  
HOTEL DULUTH  
DULUTH, MINN.

HOTEL ASTOR  
MILWAUKEE, WIS.  
HOTEL VINCENT  
BENTON HARBOR, MICH.  
HOTEL CALUMET  
FOND DU LAC, WIS.  
HOTEL INDIANA  
WABASH, IND.  
HOTEL WAUSAU  
WAUSAU, WIS.

MADISON  
WISCONSIN

Prof. F. T. Swaites,

While continuing my travel in this beautiful country, I want you to know how much I have enjoyed my stay in Madison. It was delightful to learn from you about the glacial geology of Wisconsin.

I am especially grateful for the nice trip of last Sunday. Please will you also give my kind regards to Mrs. Swaites in your family.

Yours very truly

*R. Tavernier*

R. TAVERNIER

P.S. In case it should happen that some-mail for me is still arriving at your address, may I ask you to forward it to my address in Minneapolis.

R. Tavernier to Prof. Sharp.

Geological Department  
University of Minnesota  
Minneapolis 74



April 17, 1947

Prof. R. Tavernier,  
Belgian American Educational Foundation,  
420 Lexington Ave.,  
New York 17, New York

Dear Prof. Tavernier:

Yours of 6th April from Globe,  
Arizona arrived just as I was leaving town for a week in  
the field. I will be in Madison on April 25 and you can  
find me at my office, 207 Science Hall. Next day,  
Saturday I take my glacial geology class on a 200 mile  
trip to see some of the features of southeastern  
Wisconsin. I would be happy to have you go along.  
Departure will be at 7:30 A. M. from Science Hall,  
return about 6 P. M. We may also be making a trip  
just before the longer one but I do not have the day  
recorded here. I will be pleased to take you on any of  
the trips you care to go on. Also to talk over things  
with you.

Very truly yours,



May 13, 1947

Prof. Rene Tavernier,  
Belgian-American Educational Foundation,  
420 Lexington Ave.,  
New York 17, New York

Dear Prof. Tavernier:

Your letter from Minneapolis came soon after you left. No more mail arrived for you. I have been extremely busy for it is the end of the semester with reports and final examinations to grade but tonight I will have time to mail you copies of the two photographs I took when you went to Devils Lake with us. I am sorry we could not have had more time there.

The other field trips went off well. The interglacial forest bed was well exposed and we had satisfactory weather. I have been able to begin to catch up on work with samples from wells which studies I was forced to neglect for several months. A week from tomorrow I have to go to the northern part of this state for a conference with some of the men from the Department of Agriculture who are mapping soils. After that I hope to do some work on quantitative geomorphology and then perhaps do some field work.

With best regards,

Sincerely,



Globe, Arizona, 6<sup>th</sup> April 47

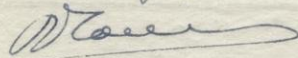
Prof. Dr. F. T. Thwaites  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin, U.S.A.

Dear Professor Thwaites,

I am presently making an instructional tour on the American continent. My friends, ~~Old~~ <sup>Old</sup> ~~Dr.~~ <sup>Dr.</sup> ~~Werner~~ <sup>Werner</sup> of the Uppsala University gave me the advise to visit you during my stay in ~~the States~~. With the same mail I am sending you his letter of introduction he gave me when passing Sweden on my way to the U.S.

Coming from Chicago I intend to arrive at Madison on the 25<sup>th</sup> of April and I would be delighted if you let me know when I can meet you there.

Very sincerely yours



R. TAVERNIER

Ghent University - BELGIUM

Mailing Address in the U.S.A.

Belgian American Educational Foundation

Lexington Ave, 420

graybar 2325

New York, 17. N.Y.



Jan. 3, 1948

Prof. O. W. Tollefson,  
Department of Geology and Geography,  
Kansas State College,  
Manhattan, Kansas

Dear Mr. Tollefson:

I am writing you in accordance with the statement in Professor Meeons' letter of Dec. 17.

The research projects which I have in mind include some which you might be interested in for thesis subjects. At present I am at work on completing the Pleistocene mapping of the area in north-eastern Wisconsin east of Fox River and north of latitude 44. This will require a moderate amount of field work as some has already been done and in this project I am already associated with Dr. Kenneth Bertrand who did his doctor's thesis on the human geography of the same area and who worked with me in the field in 1936. This project, which will be based largely on aerial photographs, is thus too far advanced for you to wish to finish. However, it sets a pattern for other projects in the largely unknown field of the Pleistocene of northern Wisconsin. Other field projects include the deposits of glacial lakes in this state many of which contain varved clays.

In projects which are largely indoors I am now working on a new text book of Geomorphology using a quantitative approach. I have just scratched the surface in the mathematical study of slopes. I have found that slopes of different origins obey definite mathematical laws but extension of observations and the transition from these laws to those which cause them, that is the nature of the forces involved awaits more time than I could give to the subject. Here is a big field which is scarcely scratched. Yet the mathematics are simple, for the most part no more than ordinary algebra. When solved, as seems entirely possible, we may be able to distinguish the effects of changes in climate on the activity of streams from the results of earth movement. Here lies an opportunity to supply the foundation upon which geomorphology must eventually rest for so far it has been mainly an empirical study for the most part devoted largely to inventing new technical terms, certainly not to the discovery of basic principles.

Any further questions you may have I will be glad to answer to the best of my ability.

Very truly yours,

P. T. Elwaiter



Dr. E. M. Todtmann  
Hamburg 39  
Blumenstr. 41

14th February 1948

Prof. Dr. F. T. Thwaites  
University of Wisconsin  
Madison, Wisconsin

---

Dear Prof. Thwaites,

In the course of my correspondence with Dr. A. E. Fath, Broadway 26, he gave me the advice to ask for Your opinion, because of Your eminence in glacial geology, in the following questions.

Since several years I am devoted to glacial geology, especially to glacial morphology. In the pursuit of my avocation I have made besides my studies in North and South Germany, more or less extended trips during my vacations to formerly or nowadays glaciated regions. Two to Spitzbergen ( together with Prof. Gripp ), two to Iceland, 10 to Switzerland, Tirol and North Italy. I have published a few short articles on these excursions.

consequently I should wish now and strive for getting knowledge of foreign formerly glaciated regions. Especially the diluvial regions of the states would be of high interest to me. They would provide a particular good field in order to research the morphological features of the different periods of glaciation and compare them afterwards with those of Europe. Clearly, the Wisconsin would have the greatest attraction among them.

However, under the existing circumstances I cannot bring up myself the considerable costs for such investigations. Therefore I am bound, I am sorry to say, to some stipend given by a scientific institute.



Shortly, the purpose of my letter is to learn if there would interest for such studies made by a foreign geologist. The next nearly more important question is to learn and to hear Your kind opinion whether it would be possible for me to come to the States for the purpose of continuing my glacial geological studies at some university where I might be able to earn my living by obtaining a fellowship or some minor teaching position. This stipend should be ample to cover my complete livelihood requirements for one year.

References on me will be kindly given by :

Dr. A. E. Fath, Socony Oil Co. Broadway 26, New York

Mrs. Charles H. Wacker, Commonwealth Ave 2340, Chicago, Illinois

Prof. Dr. Fr. Zeuner, Department of Geochronology, University, London

Prof. Dr. Hans Frebold, Danm. Geol Undersökelse, Kopenhagen

Prof. Dr. E. Voigt, Director , Geolog. Institute, University, Hamburg

Prof. Dr. Carl Schott, Geograph. Institute, University, Kiel

Prof. Dr. Carl Troll, Geograph. Institute, University, Bonn/Rhein

Prof. Dr. Alfred Bentz, Director, Reichsamt f. Bodenforschung,

Hannover

Your consideration of my plan will be highly appreciated and I hope that I, as totally unknown to You, will not trouble You too much with my question and its answering.

Very truly Yours

*Emmy Mercedes Todtmann*



May 10, 1948

Dr. Max M. Fodtmann,  
Blumenstrasse 41,  
Hamburg 39,  
Germany

Dear Dr. Fodtmann:

Your letter of 14th February has been on my desk a long time but I have been unable to find any way in which your visit to this country could be financed. The funds of the University are more than taken up on research by our own people here. I am under the impression that the Geological Society of America finances work by its own members only. However, this is a possibility. Our own State Geological Survey is doing very little. In fact, I have had no support for Fies'ocene studies since 1938. I plan on some work this summer but will apparently be forced to pay for the field expenses myself. It may, in fact, prove impossible to do very much. This country is not as wealthy as many think and around here rising costs of almost everything have cut deeply into what money is available.

Very truly yours,



U. S. A.

Prof. Dr. F. T. Thwaites

41 Roby Road

Madison 5

Wisconsin



*D. Jenny Muelles  
Gottmann Hausberg 39  
Auerbach, 41  
Deutschland*



Dr. E. M. Todtmann  
Hamburg 39  
Blumenstr. 41

20 th Jun 2 1948

Prof. Dr. F. T. Thwaites  
41 Roby Road, Madison, Wisconsin

Dear Prof. Thwaites,

Your kind letter of May 10 th has been received.  
I thank you very much for Your words although they  
are not encouraging. Nevertheless I don't give up  
my plan. As soon as I have finished a pressing work  
I will start a new attack.

In former times I used to pay myself for my investi-  
gations in Germany as well as in foreign countries.  
But today we are too much handicapped. But I am only a  
very simple geologist. So I am rather astonished to  
learn of Your difficulties You have with Your field  
work.

I am anxious to get Your book, Outline of Glacial  
Geology which I hope to get by my cousin. She pro-  
mised to send it to me. Just as well as the Glacial  
Geology of Flint which I received some days ago.  
If it troubles You not too much would You be so kind  
and name some works to me being of use for the know-  
ledge of glacial morphology of the last glaciation  
in the Middle West ?

Very sincerely Yours

*Ernst Mercedes Todtmann*





DEPARTMENT OF  
CIVIL ENGINEERING

# UNIVERSITY OF MAINE

ORONO, MAINE

July 31, 1948

Dear Fred:

I am afraid my last letter hasn't gotten to the top of your pile yet, or went astray.

I am putting out an engineering geology text, and would like to get your permission to reproduce a photo you took on one of our field trips of glacial topography, and in addition, the table "Condensed Summary of Drift Deposits and Topography" p. 52 of your Outline of Glacial Geology, 1935 ed.

I noted in Con's letter that you were working on a geomorphology text. I shall be glad to see it when it comes out. How is it going? I am through with mine except for a few details of pictures, etc.

Regards,

*Joe*  
Joseph M. Trefethen



41 North Roby Road,  
Madison 5, Wisconsin  
July 6, 1948

Mr. Roger E. Trafford, Principal,  
West Junior High School,  
Madison 5, Wisconsin.

Dear Sir:

I am inclosing the medical blank which I promised  
to send you as soon as Bill had his examination for Camp  
Tichora. I want to thank you for your courtesy in granting  
this delay.

Yours very truly,

Mrs. F. T. Thwaites

Dear Sir:

Madison 5, Wisconsin  
West Junior High School  
Mr. Roger E. Trafford, Principal

Mrs. F. T. Thwaites  
41 North Roby Road  
Madison 5, Wisconsin



41 North Roby Road,  
Madison 5, Wisconsin.  
July 6, 1948

Mr. Roger E. Trafford, Principal,  
West Junior High School,  
Madison 5, Wisconsin.

Dear Sir:

I am inclosing the medical examination blank which  
I promised to send you as soon as

Very truly yours,

Dr. J. H. ...

I am sorry to hear that you have been ...

I am enclosing the ...

Very truly yours,

Dr. J. H. ...  
Madison 5, Wisconsin.

Very truly yours,  
Dr. J. H. ...  
Madison 5, Wisconsin.



# TENNERSTEDT MANUFACTURING CO.

MANUFACTURERS OF VESTS

1934-1936 W. NORTH AVENUE

CHICAGO,

9/16

1913

Professor Fred T. Thwaites

Dear Sir

Enclosed please find clippings from the Chicago Daily Press, I should consider it a favor if you would kindly inform me of the exact location of the Iron ore, I am the owner of some land 12 Miles North of Rhineland and 8 Miles West of Eagle River in Oneida County.

Yours Respectfully  
R Tennerstedt



Oct. 1, 1913.

Mr. R. Tennerstedt,  
1936 W. North Ave.,  
Chicago, Ill.

Dear Sir:-

Your letter of the 16th arrived while I was away and I am sending you under separate cover a description of the localities where iron ore has been discovered in eastern Wisconsin. It is not anywhere near the lands which you mention, but they are in a possible mineral-bearing area which is shortly to be covered by the State Survey .

Very truly yours,



June 18, 1948

Mr. Joseph M. Trefethen  
State Geologist  
Maine Geological Survey  
Orono, Maine

Dear Mr. Trefethen:

Professor Thwaites is out of town at present and will not be in his office until the end of June. When he does return, I shall call your letter to his attention.

Very truly yours,

WISCONSIN GEOLOGICAL SURVEY

bsc



MAINE GEOLOGICAL SURVEY  
UNIVERSITY OF MAINE  
ORONO, MAINE

JOSEPH M. TREFETHEN  
STATE GEOLOGIST



June 14, 1948

Dear Fred:

Everytime I seem to write to my old friends it appears that I want some favor or another; this is no exception.

On our glacial geology trip with you fifteen years or so ago, you took some photographs that we used in our report of that trip. I am trying to get together some illustrations for a work on engineering geology and would like to have permission to use a couple of these. In addition, I need a good picture of a kettle hole and of a drumlin. I wouldn't mind having a longitudinal profile of a drumlin and a cross-sectional cut showing the nature of the drift if you had any such that you wanted used in this manner.

Regards from us both,

Joe Trefethen

A handwritten signature in dark ink, appearing to read 'Joe Trefethen', written in a cursive style.



Aug. 6, 1949

Dr. Joseph M. Tuffethen,  
Dept. of Geology,  
University of Maine,  
Orono, Maine

Dear Joe:

Yours of June 14 and July 31 have been in my folder altogether too long but it just could not be helped. First, I was out west and got back to find a flood of well cuttings ahead of me. I have done a lot but more keep coming so am just as far behind as ever. Then some of your requests puzzled me. The kettle hole was the hardest and I tried to get new and better photos. At last I decided to reprint the one of the big kettle south of Greenbush in Sheboygan County. Of course, vertical aerials show this best. For a drumlin I wanted the aerial oblique taken by G. G. Bradley some time ago. He was unable for a time to find the negative and then could not make a print. At last I printed it. Then our new super enlarger will not do good work with large negatives which took quite a bit of experimenting. Some had to be printed by contact and we do not have any printing mats as almost all our work is now enlargements. I am enclosing what I get ready for you. Then to further complicate matters Amy has not been well and is to have another operation soon. So I think you can realize the many causes of delay. Have you seen the 1948 edition of the "Outlines"? It is all right for you to reproduce anything from it you desire, naturally giving credit for it, also you can use any of the photos you get now or obtained before.

The geomorphology is now dormant and may never get any farther than now. Yours, sincerely,



Oct. 1, 1948

Dr. Joseph M. Trefethen,  
Dept. of Geology,  
University of Maine,  
Orono, Maine

Dear Joe:

Since writing you on August 6 I decided to make a contact print of Bradley's negative of the drumlin on Highway 30 just north of Goose Lake (Sun prairie quadrangle). Here it is and I think its much better than the copy made with the enlarger. There is also a photo of a kettle hole in the Kettle Moraine made last summer after I wrote you. It is not very good although trimming out the fence might improve it. It is near Steinthal.

My classes are somewhat smaller than last year but are pretty good quality. I find time to do a little on the northeastern Wisconsin area east of the first one. But the geomorphology will have to wait until this is done and how long that will be nobody can tell.

Hoping the pictures are all right,

Sincerely yours,



2050 No. 15 th Street,  
Grand Junction, Colo.  
November 12, 1948

Prof. F. T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison, 6, Wisconsin.

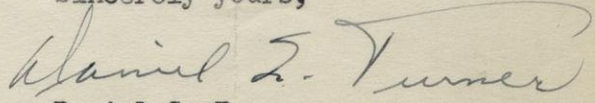
Dear Fred:

You may have heard, via the corridors of Science Hall, that I have joined the staff of the Department of Geology at the University of Wyoming. During this coming winter quarter, I will be teaching some of the general courses and geomorphology, as a fill in for one of the men who is leaving in December.

It has been some time since I have been exposed to geomorphology, so I would like to have the opportunity to review some of the reference material in that field. I do not have a copy of your recent text and would like to get one as soon as possible, in order to review your particular approach to the subject. Could you send me a copy, in care of the Department of Geology, University of Wyoming, Laramie? If there is a charge for the material, please include your statement. I will be very glad to forward all charges and postage, as soon as it is received.

I will greatly appreciate receiving a copy, if they are still available. My best regards to you and all the gang at Science Hall.

Sincerely yours,

  
Daniel S. Turner



303 No. 15th Street,  
Great Junction, Colo.  
November 19, 1918

Dear Dan

In reply to yours of the 12<sup>th</sup> I am glad to hear you have what looks like a very good place. We are making you the note on geomorphology.

If your department wants to refund in the postage all right but I would not like to make you pay for it personally.

With best wishes  
to you who is leaving in December.

It has been some time since I have been exposed to geomorphology, so I would like to have the opportunity to review some of the reference material in that field. I do not have a copy of your recent book and would like to get one as soon as possible, in order to review your particular approach to the subject. Could you send me a copy, in care of the Department of Geology, University of Wyoming, Laramie? If there is a charge for the material, please include your statement. I will be very glad to forward all charges and postage, as soon as it is received. I will greatly appreciate receiving a copy, if they are still available. My best regards to you and all the gang at Science Hall.

Sincerely yours,

*Daniel S. Turner*  
Daniel S. Turner



November 17, 1948

Dr. Daniel S. Turner  
2050 No. 15th Street  
Grand Junction, Colorado

Dear Dan:

In reply to yours of the 12th, I am glad to hear you have what looks like a very good place. We are mailing you the notes on geomorphology. If your department wants to refund us the postage it's alright, but I would not like to make you pay for it personally.

With best wishes.

Sincerely,

F. T. Thwaites

FTT:EMM





DEPARTMENT OF  
CIVIL ENGINEERING

UNIVERSITY OF MAINE  
ORONO, MAINE

T

October 23, 1948

Dear Fred:

Thanks very much for the photos. I should have acknowledged these long ago, but have been trying to keep my head above water with school getting underway, and week-end field trips.

We hope to see you in New York next month.

Regards,

*Jon*  
Joseph M. Trefethen



TELEPHONE: 7266



THE UNIVERSITY OF TASMANIA,

Box 647 C, G.P.O.,

HOBART

10th Jan., 1949.

SWC:HI

Mr. F.T. Thwaites,  
Department of Geology,  
University of Wisconsin,  
Madison 6.

Dear Sir,

I acknowledge your letter of November the 12th, enclosing four studio pairs of glacial features in Wisconsin. I am very grateful indeed to receive these and will gladly send you others in exchange. However, I will be grateful if you would bear with me to leave this in abeyance for two months because I am Tasmanian Secretary of the Australian and New Zealand Association for the Advancement of Science and am arranging a Congress of some fifteen hundred delegates to arrive in Tasmania during the next few days. As you may well imagine I will be extremely busy until this Congress is over.

Yours faithfully,

Professor of Geology.



T  
November 12, 1948

Dr. S. Warren Carey  
The University of Tasmania  
Box 6476., G.P.O.  
Hobart, Tasmania  
Australia

Dear Sir:

I am sorry my reply to yours of May 28 has been so long delayed, but I could only get the requested photographs with a larger order which keeps the cost within reason.

Enclosed are four stereo pairs made about 1:20,000, camera focal length 8.25 inches. This is one more than those in the article you mention. We will be glad to get others in exchange. All of these are described in my "Outline of Glacial Geology".

Regretting the long delay and hoping you find these satisfactory, I am,

Very truly yours,

F. T. Thwaites

I want to thank you for the fine set of aerial photography you sent which arrived during the summer



## THE UNIVERSITY OF TASMANIA



Box 647C., G.P.O.,

HOBART 28th May, 1948.

YOUR REFERENCE. SWC:JMB

F.T. Thwaites, Esq.,  
 University of Wisconsin,  
WISCONSIN...U.S.A.

Dear Sir,

I was very interested in your paper "Use of Aerial Photographs in Glacial Geology" which appeared in the Photogrammetry in Geology issue of Photogrammetric Engineering, Volume XIII, Number 4 last December.

For some time I have been building up a teaching collection of aerial photographs from many climatic and topographic environments and diverse geological provinces in many parts of the world.

I am now writing in the hope that you might be willing to join with me in an exchange. I would like to get stereoscopic vertical prints of the four areas figured by you in your paper and perhaps a few more that you might select. In return I would send you an equivalent number of stereoscopic verticals of glacial features of Tasmania.

It will assist me greatly if you will co-operate in this way.

Yours faithfully,

PROFESSOR OF GEOLOGY



Dear Sir:

THE UNIVERSITY OF TASMANIA

I am sorry <sup>my</sup> reply to yours of 28 May has been so long delayed but I could only get the requested photographs with a larger order which keeps the cost within reason? -

Enclosed are four stereo pairs, made about 1:20,000, camera focal length 8.25 inches. There is one more than those in the article you mention we will be glad to get others in exchange

all of them are described in my "outline of glacial geology"

Regretting the long delay and hoping you find these satisfactory, I am,

very truly yours



T  
September 27, 1949

Dr. S. Warren Carey  
The University of Tasmania  
Box 647G., G.P.O.  
Hobart, Tasmania  
Australia

Dear Sir:

I wish to thank you for the fine set of aerial photography you sent which arrived during the summer.

Very truly yours,

F. T. Thwaites



*Refer to Fred*

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Lincoln, Nebr.  
September 10, 1948

Chairman  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin

Dear Sir:

I contemplate entering the University of Wisconsin Graduate School for advanced work in geology beginning with the Spring term, 1949. I will complete work for the masters degree at the University of Nebraska in January and plan to begin on a Ph.D program.

Would you be so kind as to advise me whether a major (Ph.D) is offered in the fields of Glacial geology or geomorphology. I have also had undergraduate work in geography (16 hours) and would be interested in a program combining both geology and geography such as physiography.

Thank you very much for any information you may have concerning courses in the above fields.

Very truly yours,

*Paul C. Tychsen*

Paul C. Tychsen  
1325 R Street  
Lincoln, Nebraska





Could begin with Glacial (143)

Plan of research problem in glacial geology of Wis.  
Other degrees granted in the field

DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

In reply to yours of the 10<sup>th</sup>, degrees have been given  
for work completed in glacial geology. I give a  
course in that subject in the second semester and a course  
in geomorphology in the first. Many research problems  
in both subjects are available for their study.

September 10, 1948  
Lincoln, Neb.

Chairman  
Department of Geology  
University of Wisconsin  
Madison, Wisconsin

Dear Sir:

I contemplate entering the University of Wis-  
consin Graduate School for advanced work in geology  
beginning with the Spring term, 1949. I will complete  
work for the masters degree at the University of Neb-  
raska in January and plan to begin on a Ph.D. program.  
Would you be so kind as to advise me whether  
a major (Ph.D.) is offered in the field of Glacial  
geology or geomorphology. I have also had undergrad-  
uate work in geography (18 hours) and would be inter-  
ested in a program combining both geology and geo-  
graphy such as physiography.  
Thank you very much for any information you  
may have concerning courses in the above fields.

Very truly yours,  
Paul C. Tophan

Paul C. Tophan  
1325 R Street  
Lincoln, Nebraska





September 16, 1948

Mr. Paul C. Tyohsen  
1325 R Street  
Lincoln, Nebraska

Dear Mr. Tyohsen:

In reply to yours of the 10th, degrees have been given with a major in glacial geology. I give a course in that subject in the second semester, and a course in geomorphology in the first. Many research problems in both subjects are available for thesis study.

Very truly yours,

F. T. Thwaites

FTT:EWM



In 1912 I began the study of cuttings from water wells in and near Wisconsin. At first, attention was directed only to the rock formations. As the study progressed, personal contacts with drillers and engineers steadily increased the number of samples sent in for examination. Soon it became evident that such studies were of value in developing underground water supplies. As one driller remarked, "I don't save these samples just for you but for my own advantage; I want the benefit of your advice." Thus, attention was directed more and more to the practical side of the problem. Calls for assistance became steady and more numerous. In a number of instances lawsuits were settled on the basis of opinions based upon these observations. It was, however, seldom possible to go into the field or to make full observations of the behavior of underground waters. Knowledge of the rocks penetrated by water wells was in fact more extensive than knowledge of these rocks at the surface. In the last quarter century few new general principles were discovered, although a vast fund of details were added to our knowledge. Many studies were made of water supply conditions for the benefit of municipalities and industries, most of which carried the actual field expense. Another service offered has been the construction of display well records showing the material penetrated by the well. At first these were made in glass tubes, but in recent years these were displaced by material cemented into a groove in a board on which the names of formations and other information was lettered. Only the actual expenses for labor and material was charged to the person ordering the record. Otherwise, blueprint logs were supplied free by the State Geological Survey. Much work was done on construction of wells in such manner as to safeguard the purity of the water. Many of these suggestions are now incorporated in the well construction code of the State Board of Health which has found more and more use for the records of wells prepared from sample cuttings.



1631 Hall

THE UNIVERSITY OF WISCONSIN  
MADISON 6

Tom

COLLEGE OF LETTERS AND SCIENCE  
OFFICE OF THE ASSOCIATE DEAN

May 19, 1950

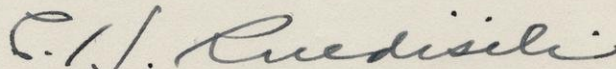
Mr. F. T. Thwaites  
41 North Roby Road  
Madison 5, Wisconsin

Dear Mr. Thwaites:

I am sure that you were both proud and happy when the published list of those students elected to Phi Eta Sigma included your son's name. By achieving a grade-point average that satisfied the requirements for initiation into this honorary fraternity he has distinguished himself and honored you. His record is an outstanding one, and it promises success not only in the remainder of his University program but also in future years.

It is my great privilege to extend the congratulations of the College to you and to your son,

Sincerely yours,



C. H. Ruedisili  
Associate Dean

CHR/ml





11-7-51

Turner

# THE CARTER OIL COMPANY

RESEARCH DEPARTMENT  
1133 NO. LEWIS

TULSA 2, OKLAHOMA

November 2, 1951

P. S. WILLIAMS  
CHIEF OF RESEARCH

POST OFFICE BOX 801

Professor F. T. Thwaites  
41 North Roby Road  
Madison 5, Wisconsin

Dear Fred:

We are at present interested in the possibilities of a detailed Pleistocene stratigraphic study in the vicinity of Cadillac, Michigan. This area falls within a block enclosed by T.18-25N., R.11-16W., adjacent to the eastern shore of Lake Michigan. Identified by counties, this area is included in parts of Oceana, Newaygo, Mecosta, Osceola, Lake, Mason, Manistee, Wexford, and Missaukee counties.

In view of your intensive studies in the Wisconsin-Michigan region and the large volume of data and references you undoubtedly assembled for the G.S.A. Glacial Map, I presume you are the most familiar with the type of data we are seeking.

Our library coverage leaves something to be desired in the field of the more obscure Pleistocene literature on that part of the country. Can you conveniently list or refer me to the sources of information which would give us data on the full columnar glacial section? We are primarily interested in the section, rather than morphology. Any papers or maps which present the detailed glacial history of that small area, from which we might construct a reasonable stratigraphic section, would be valuable to us.

Does the Michigan State Survey require and retain water well logs and samples similar to your collection? We are also interested in all data on the depth to basement for construction of a detailed map showing the topography of the pre-glacial surface. In your opinion, is there sufficient penetration to basement in this area to be of use to us in

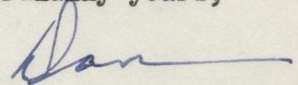


such a project? I note from the drift isopach map of the state that thicknesses of 900 feet are not unusual in some of this area; not very encouraging!

One of the most interesting and challenging features of this research laboratory work is the wide variety of subjects available for study. The current interest in glacial geology is just one of the many unexpected fields of investigation that I have had the pleasure to work on. Your guidance of my Pleistocene experience in Wisconsin has served me well as one of the most valuable assets of my varied background. Your leadership and good counsel have been deeply appreciated many times since I last worked with you in 1937.

My very best wishes to you and congratulations on the completion of another outstanding paper; your current presentation at the G.S.A. convention. I wish that I could hear it.

Cordially yours,



Daniel S. Turner

DST:ee



November 13, 1951

Mr. Daniel S. Turner  
Carter Oil Co., Research Department  
1133 No. Lewis  
Tulsa 2, Oklahoma

Dear Dan:

Yours of November 2 came while I was at the G.S.A. meetings in Detroit. Fortunately, I secured some information there which may help you.

In the first place, I want to make it clear that no stratigraphic column can be established in drift deposits. The keynote of the drift is both horizontal and vertical variability. Moreover, I have not followed the drift geology of that region in detail. The Michigan Survey has a blueprint map with bed rock contours, also mimeographed logs of both water wells and oil tests. I can only refer you to them.

The new idea I secured at Detroit was from Prof. Donald C. MacLaughlan of Wayne University, Detroit. He found in detailed surveys of the abandoned lake beaches that the slope is very irregular with minor rolls superimposed on the regional tilt. He related these rolls to the structure of the bed rock. I am uncertain just how this relation is caused; by renewed movement of the rock structure or by differential compaction related to rock topography controlled by the structure. Anyhow, I suggest that it be looked into by releveling the beaches of Lake Michigan or rather its predecessors. The booklet with this data is the guidebook for one of the field trips which was being sold there for \$1.50. Prof. Bretz has published some recent papers on beaches in the Journal of Geology and American Journal of Science.

With best regards.

Sincerely yours,

F. T. Thwaites



May 7, 1953

Mr. E. J. Tower  
2839 North 60th Street  
Milwaukee 10, Wisconsin

Dear Sir:

As stated in my letter of March 12 Mr. Fink visited the locality near Retreat, Wisconsin, shortly afterward and reports that he could find no evidence of a large cavern. The St. Peter sandstone outcrops not far below so that the source of the sound was apparently only an open crevice. I have seen similar phenomena in Deer County. He could find no way of entering such a crevice without extensive excavation so the matter of its size and extent is still unknown.

Sincerely yours,

F. T. Thwaites



E. J. TOWER - Milwaukee, Wisconsin 10

2839 No. 60th St.  
March 2, 1953

Prof. Stanley A. Tyler  
Chairman, Geology Department  
University of Wisconsin  
Madison 6, Wis.

Dear Sir

Do you have anyone in your department who might be interested in searching for a new Wisconsin cave?

More than forty years ago I was fascinated by the drumbeats of the horses' hooves at a spot on the old dirt road near Retreat, which is a hamlet on West Prairie between Viroqua and DeSoto.

With the coming of the automobile, and possibly the improvement of the road, that seems to have been forgotten as a local phenomenon but one of my correspondents has now located it for me as about ten rods north of the Retreat school.

1284 This would be one of the high spots of that entire area. Sink holes are relatively common and I remember one of some size about two miles south but on somewhat lower land. The belief at the time, as I recall, was that this was an underground cavern of considerable size, although it must have been close to the surface as I can recall hearing the sound both when crossing it with a fast team and a plodding old mare.

I have no knowledge as to land ownerships in the area today, but possibly you have a student from the vicinity who might be interested in checking it as a field project.

Yours,

*E. J. Tower*

Yours of the 2nd to Prof. Tyler was given to me for reply I found that one of my students, Don Fink is much interested and intends to check the matter as soon as the weather permits. We much appreciate the information