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Correspondence - Illinois Geological Survey. 1925-1935

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

[s.l.]: [s.n.], 1925-1935

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THE BOARD OF NATURAL RESOURCES AND CONSERVATION
OF THE STATE OF ILLINOIS
CORDIALLY INVITES YOU TO BE PRESENT AT THE
OPENING OF THE NEW MINERAL RESEARCH LABORATORIES OF THE
ILLINOIS STATE GEOLOGICAL SURVEY, URBANA
ROOM 218, CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS
AT TWO-THIRTY, WEDNESDAY, DECEMBER NINTH
NINETEEN HUNDRED THIRTY-ONE

INFORMAL DINNER
SOUTHERN TEA ROOM
SIX-THIRTY

R. S. V. P.

~~a~~SPECIAL REPORT ON ERRORS IN TOPOGRAPHIC MAPS of

St. Elmo quadrangle.

The road north from the center of Sec. 27, T. ~~8~~ 9 N., R. 3 E. to about $\frac{1}{4}$ mile from SE corner Sec. 22, same township, had been abandoned for years.

~~Axhausen~~ There is now no trace of it for a long distance and it could not be travelled even on horseback.

A house has been omitted in SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 22, same township, and another, with road leading to it, in NE $\frac{1}{4}$ NE $\frac{1}{4}$, same section.

House omitted in ~~SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec.~~ NE $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 23, T. 8 N., R. 3 E.

These houses were there when the survey was made!

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

May 29, 1931

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

Dear Thwaites:

In reply to your letter of May 9:

I shall reply to Mr. Corrie of the Wayne County
Farm Bureau directly.

With regard to mounting maps with binder's glue,
the maps do stick to the mounting board. We generally re-
move them soon after they are mounted. When removing them
from the board it is desirable to pull them straight off
with a strong, steady pull. Otherwise they will be creased.
The glue leaves a coating on the board which causes trouble
when we attempt to mount maps with the old flour paste, but
according to some experiments we believe that we can remove
the glue from the board with dilute hydrochloric acid.

With regard to work for the summer you should apply
directly to Dr. Leighton.

With best regards to you and Mrs. Thwaites, I re-
main

Cordially yours,

George C. Chelaw
Geologist in Charge
Section of Engineering Geology

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
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URBANA

June 11, 1931

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

Dear Mr. Thwaites:

Thank you for your letter
concerning Dr. James M. Hansell and I
greatly regret that I will be unable to
offer him any opportunity for work at this
time.

Sincerely yours,

M. M. Leighton
Chief

STATE OF ILLINOIS
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UNIVERSITY OF ILLINOIS CAMPUS

URBANA

June 6, 1931

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

Dear Mr. Thwaites:

I have just received a letter from Dr. Flint in which, among other things, he reports that he has had a long letter from you and from your letter he quotes as follows:- "I do not agree with Ekblaw's statement about the Illinoian of central Illinois. I did find what may be outwash in Effingham County but otherwise the outwash deposits are small lenses.... Most of the area I saw in Illinois may well have had stagnant ice during melting of the Illinoian."

Dr. Flint presumes that you refer to his statement on page 433 of his article in which he states "The Illinoian ice sheet farther south in Illinois obviously did not stagnate but maintaining motion throughout its disappearance gave rise to a topography of well-developed ground moraine, recessional moraines, and outwash in marked contrast with that described above. The cause, whatever it may have been, was therefore restricted in Illinois to the northwestern part of the state. The question whether the ice in Wisconsin remained active or became stagnant has not been considered."

It appears that both Dr. Flint and yourself err in applying my statement to areas wider than I intended. By "the Illinoian ice sheet farther south in Illinois" I do not mean the Illinoian ice sheet everywhere in Illinois; I mean only that in central Illinois which is directly south of northwestern Illinois. Strictly speaking the area which you covered is more properly southeastern Illinois and only a portion of it could be considered in central Illinois when that term is applied very broadly. I think that if you had seen the Illinoian drift in central Illinois as the term should be more restrictedly applied you would find that my statement is eminently correct.

As I have written Dr. Flint, he was hardly justified in applying my statement regarding central Illinois to all the rest of Illinois except the northwestern part.

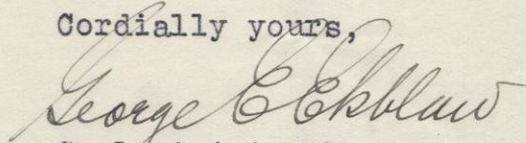
You may recall that when I visited you at Effingham and we examined the deposits west of that town, I was struck by their similarity to the crevasse deposits in northwestern Illinois and that I

Mr. F. T. Thwaites
No. 2

studied them carefully with that possible origin in mind. As I recall I also discussed with you to a considerable length the possibility that the Illinoian drift in southeastern Illinois was deposited by a stagnant ice sheet. For your information I am also favoring the possibility that the Illinoian drift in western Illinois was likewise deposited from a stagnant ice sheet. On the contrary the Illinoian drift in central Illinois behind a moraine which we consider late Illinoian in age possesses characteristics typical of that deposited by an active ice sheet.

I have gone to some length in explaining this situation so that you are better aware of my opinion regarding the whole question, but I wish you would consider these opinions not as matters for reference in publication.

Cordially yours,

A handwritten signature in cursive script, reading "George C. Ekblaw". The signature is written in dark ink and is positioned above the typed name and title.

Geologist in Charge
Section of Engineering Geology

June 9, 1931

Dr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Dr. Ekblaw:

In reply to yours of the 6th I am enclosing copy of my letter to Dr. Flint of May 29. I am sorry there was a misunderstanding but it is often hard to get things all straight in a letter. I now remember very well the conversations we had regarding the assorted drift in Effingham County and the possible stagnation of the Illinoian ice. Knowing conditions in southeastern Illinois and the suggestion that the Kaskaskia Ridge Drift is terminal rather than recessional I could not understand the statement credited to you by Flint.

I am under the impression that a not inconsiderable part of the Illinoian border is marked by a terminal which presumably once had associated outwash deposits. There is certainly a terminal at Monroe but whether or not the scattered kames east of there are recessionals or crevasse fillings I would not be able to say for sure. Some of them lie on high ridges but only a few line up in morainal form. Buell made these into definite moraines but Alden could not show that.

Leverett shows a recessional moraine east of Macomb and I take it that it is the one you mention. By the way, I notice that his striae in southwestern Indiana do not favor the suggestion of last summer that the southern part of the Illinoian area is an Erian lobe. On the whole I would think that the evidence seems to favor extensive stagnation of the waning Illinoian ~~possibly~~ interrupted by a local readvance.

I think I was in error in thinking that any of the larger gravel deposits of Effingham County could be outwash although some of the small lenses must be overridden outwash.

In a later letter to Flint I elaborated my suggestions on glacial motion and stagnation which incorporate some of Hobb's ideas with alterations.

I hope soon to get started on the revision of the outline of glacial geology for I have definitely abandoned all hope of getting a job for the summer. Dr. Leighton told me at Toront that he wanted me back but I never heard anything more of it.

Mrs. Thwaites and I were both much pleased to learn of your recent marriage.

Sincerely,

Lecturer in Geology

June 5, 1931

Dr. M. M. Leighton, Chief,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

In looking over my separates I fail to find a copy of Bevan's Report of Investigations on the Glenwood formation. Could you please send me a copy?

I am planning on staying home this summer and revising my Outline of Glacial Geology. I have burned my bridges behind me on this by destroying the old stencils so must do that before February anyway. I also hope to get up to central Wisconsin with a few students and connect my old district with Alden's. With these facts in mind, as well as personal reasons for wanting to be at home this summer, I did not write you about a summer job. Would be glad to know, however, if I am passing up anything.

Very truly yours,

Lecturer in Geology

June 6, 1931

Dr. M. M. Leighton, Chief,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

I am writing you in reference to the application of Dr. James M. Hansell who is applying to you to see if you have any position open under your program of expansion which we hear has now gone through the legislature. Dr. Hansell is one of those who is thrown out of work by the recent veto of appropriations for the Wisconsin Geological Survey. His experience has mainly been in magnetic surveys but he has also done considerable Pleistocene work having written his doctor's thesis on the glacial lakes of northwestern Wisconsin. He was married last summer.

If you have any opening I am sure you would find him a good worker.

Very truly yours,

Lecturer in Geology

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SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

December 21, 1929

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

In making a study of the well logs that might be included in our report on the Oregon quadrangle, we have one well near Amboy, Illinois, in which there are reported 1965 feet of sandstone in the basal portion of the Cambrian System. According to present classification, this would be the Mt. Simon formation, as it is overlain by a regular succession of 170 feet of Eau Claire, 170 feet of Dresbach, 95 feet of Mazomanie-Franconia, 90 feet of Trempealeau, and only 5 feet of Jordan, as Mr. Workman and myself correlate them. We are amazed at this thickness of the Mt. Simon and wonder if it might not include or actually be truly Potsdam. We note that in Winchell's report in 1873 he separates the St. Croix and Potsdam series.

It would probably interest you to know that the upper 75 feet of the Mt. Simon, as we correlate it, is fine-grained, dolomitic sandstone; that the next 70 feet is light colored, medium sandstone; that the next 100 feet is gray, fine to coarse sandstone; and that below that we have very coarse grained sandstone and fine conglomerate, pink, yellow, purple, and red in color, with not infrequently red shale. This lower 1700 feet of coarse sandstone strongly suggests a distinct series, but as it is impossible to separate the lighter colored, finer grained sandstone in the upper part from the lower, coarser part, we believe that the entire 1965 feet should be considered as a single unit. Further, we have some evidence that there is an unconformity at the top of this unit, on which basis we separate the Eau Claire from it. Therefore, we are tempted, as I said before, to consider the basal unit truly correlative with the Potsdam.

I should like to know what your ideas are in regard to this question. Specifically, I might ask what do you know about the Mt. Simon formation in Wisconsin - its thickness, its color, character, et cetera? Have any arguments been propounded controverting

Mr. F. T. Thwaites
No. 2

Winchell's contentions, which I mentioned before, that the St. Croix and Potsdam are distinct series? Do you have any true Potsdam in Wisconsin or is all the Cambrian Croixan? Do you consider that the Potsdam in Michigan is the same as the Croixan in Wisconsin, or is it the same as the Potsdam in New York? On what basis is the Mt. Simon formation included in the Croixan? I should appreciate your answers to these questions and any additional discussion that you might wish to make. I wish that you would express yourself freely. I assure you that I will respect anything you may have to say at this time as confidential and not publish any reference to it unless you wish it and even then not until you have had opportunity to prepare it in such form as you would like to have it used. In other words, I wish you would write now just as if we were discussing it in person.

You realize that the data provided by this well record, in the shape of a complete section of the Cambrian, give us cause to consider the possibility of dividing it into Croixan and Potsdam, and as this is a considerable departure from the practice heretofore generally followed, we should appreciate any contributions you can make from your own knowledge or any references you can cite as bearing on the question.

With very best regards of the season, I remain

Cordially yours,

George C. Chubb
Geologist

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

I delayed answering yours of Dec. 21 for two reasons. First I wished to talk over the matter with Mr. Raasch who has done much work on the Cambrian fossils and second I met with an accident the Sunday after Christmas which has partially crippled me. I will have to go to the hospital for an operation during the two weeks between semesters before I will be fit to do any hard work again.

The Mount Simon formation in Wisconsin is only vaguely known except in wells. In fact it should not be regarded as a definite unit since it is simply the coarser grained sandstones which are characteristic of the lower part of a great thickness of alternating sandstone and shale which occurs beneath the Dresbach. In central Wisconsin no division between Dresbach, Eau Claire, and Mt. Simon is possible. I often think that the division into three formations was made prematurely so far as knowledge of their outcrops is concerned. In places we have assigned a thickness of 250 feet to the Dresbach only to find a few miles away that a well-defined shale bed has pinched out in the interval and that we have therefore included possibly 150 feet of what at the other locality was definitely classed as Eau Claire. Very little work has thus far been done in areas where the base of the Eau Claire is exposed. In Illinois, however, the deep wells seem to show a much more definite lower limit to the Eau Claire. It is obvious that nowhere in Wisconsin can we possibly expect to see more than a small fraction of the Mt. Simon beds which deep wells show to the south.

Now as to the lower limit or total thickness of the Mt. Simon. Winchell's work is so old and so hazy as to details and definitions that it should undoubtedly be disregarded. He included even the Animikie and Sioux quartzite formations in his Potsdam. Ulrich says that the original Potsdam of New York is really the Madison or very high Upper Cambrian. Stauffer has recently found Middle Cambrian fossils in the red rocks below the light colored Upper Cambrian or Croixan. In State Survey Bull. 25 I classed these rocks, the Red Clastic Series of Hall, as an extension of the sandstones of the west end of Lake Superior. The age of these formations is still unsettled. They seem to be wholly non-marine and in Monography 52 Van Hise and Leith suggest the possibility that they may be deposits in an enclosed basin during the time of the formation of the marine Cambrian. My conclusions of 1910 on the inclusion of the red sandstones with the recognized Upper Keweenaw, whatever its real age may be, seem to still stand. Hotchkiss has recently thought that he had found an unconformity between the red sandstones of northern Michigan and the overlying Upper Cambrian marine deposits but his observations were very slight so this is merely a suggestion. The older geologists certainly would not have noticed such a contact if it exists.

In my paper of 1923 I suggested that the red sandstones below the light colored rocks might be Keweenawan, whatever the real relations of that be to the marine Cambrian. In 1926, however, I ignored this suggestion on the ground that red rocks are by no means confined to either the Keweenawan or to non-marine sediments as was once thought. They simply represent conditions of sedimentation such that the supply of iron oxides was too great for the available reducing matter. Red rocks occur in the Trempealeau, Mazomanie, and Eau Claire not to mention red sandstones and shales in what must certainly be Mt. Simon. Since writing my Illinois report, however, I was struck with the profound difference between the red beds at Rockford and the overlying strata. These red rocks are found at different stratigraphic horizons in different wells. I therefore now think it possible that we have two unconformable sandstone series in Illinois. The lower or red series might easily be either Keweenawan non-marine, or Middle Cambrian marine as suggested by Stauffer in a recent paper before the G. S. A.

I would not regard the old subdivisions seriously but would use the term Croixan if at all as meaning the light colored Upper Cambrian with its included red beds. I am sure that no underlying red bed series outcrops in Wisconsin unless it might be the Barron quartzite. This would make all our Cambrian of Croixian age although I admit that it is very hard to tell just what was originally intended to be included under this name. I am sure that in northern Michigan there is both Croixan, as defined above, and an underlying series of red non-marine sandstones. I have never seen the New York Potsdam so cannot say anything about that. The Mt. Simon is included with the Croixan on the base of its conformable contact with the overlying Eau Claire. I advise conservatism in any published statements about the deeply buried sandstones of Illinois. I started to prepare a paper last spring on the surface of the concealed pre-Cambrian of Wisconsin in which I hoped to discuss a number of these problems but this fall I was entirely too busy to touch it and now my accident has still further deferred completion. However, I thoroughly appreciate that all conclusions lie in the realm of conjecture.

I used to lay stress on the fact that the known Keweenawan had suffered in many places from faulting and folding but later work has shown that the recognized Paleozoics are by no means free from such disturbances. A geologist who has visited Glover Bluff, 75 miles north of Madison, would certainly no longer be impressed by differences in amount of disturbance! I had just completed a paper on Glover Bluff before I was hurt.

It just occurred to me that I have never had the refund for cost of inspections on the Ford truck last summer. I wrote Miss Nyberg about it last fall. When at Mt. Vernon the dealer gave us a free greasing and a free front wheel bearing. Possibly they thought this squared the account.

With best regards,

L₂

Very truly yours,

F. T. T.

Geologist



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SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

URBANA

November 18, 1930

Mr. F. T. Thwaites
Wisconsin Geol. & Natural Hist. Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I have your letter of November 13 and note your remark about the work you have been doing, as well as your request. I am sending to Mr. Wascher a copy of the photograph he wanted.

In mounting maps such as you used last summer we have used ordinary book binders' glue which dissolves in hot water. However, I wish to warn you that this glue causes maps to curl and wrinkle in damp weather; at least it did so this summer but I am not positive whether it was due to the glue or the cloth on which it was mounted. Until the last two years we have used a mixture of flour and water to which is added a small amount of glue. The latter process gives maps that lie straight and somewhat stiffer, but as the cloth must be stretched and soaked before mounting, the process requires time for drying, usually a full day.

With best regards to you and Mrs. Thwaites, I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

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5-14-31

May 13, 1931

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

Dear Mr. Thwaites:

Your letter to Dr. Ekblaw was received in his absence. He is on a vacation of about two weeks; we expect him back in the office about May 27 or 28. Your letter will have his attention then.

Yours very truly,

Margaret Curtis Moyer
Secretary to Chief

May 9, 1931

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

Enclosed is letter from Wayne County Farm Bureau with my reply. I suppose the information must have been derived from the hotel since they had my name so correctly.

I have been meaning to write for some time about your method of mounting maps with glue. Our man tried it and found that the cloth stuck fast to the board. We would appreciate knowing how you prevent this whether by kind of cloth or by a coating on the board.

Also I was wondering about the chance for work during the summer. Our survey, as you probably know, agreed to a heavy cut which would have shut me out in any case and then the governor vetoed what was left. They are trying a special bill but chances are slim. I would like to stay home for once and rewrite my Outline of Glacial Geology and possibly take a few students, many of whom cannot get jobs for the summer, for a months work in the territory which I was obliged to abandon in 1929 but I wonder if I can afford such a luxury. If you have a chance of an opening I would like to know about it soon for I must make plans before long.

Field trips are in full swing. We go to the Forest Bed in the morning. I persuaded Alden to route the 1933 International Congress trip that way. Now I have to work out details of that route, also cooperate with the Kansas Geological Society on a north-south detailed cross section of the United States. This will pass through Galena, Illinois and I will show the log of the well there as given in my Report of Investigations. So you can see that my time will be taken up until July first, anyway!

With best regards,

Very truly yours,

Mr. Lester L. Morrie
Wayne County Farm Bureau,
Fairfield, Illinois

Dear Sir:

In reply to yours of the 6th I have no notes of my work last summer and so am forwarding your letter to Mr. George E. Ekblaw of the Illinois State Geological Survey at Urbana who has charge of the survey of road materials for secondary highways.

Very truly yours,

F. T. Thwaites, Lecturer in Geology

Sept. 15, 1930

Dr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

Enclosed please find one set prints and negatives of Roll No. 8. Prints are identified on the back. I think that this is the last of the photographs as I do not want any personal prints from the first two rolls so far as I can recall them. I did not charge for the lost roll nor for the second set of prints which was made by mistake.

We arrived safely at Madison at 8:30 Thursday night and were very glad to get home again. Am now getting my well record work in shape. We hope to go to Hamilton Mounds and to the Forest Bed later in the week.

If you find an old automatic pencil with the tip scarred by plier marks which was left in your office it is mine. It slipped out of my pocket after Utterback returned it to me.

I look back on my association with the Illinois Survey with great pleasure. The summary of the two years work will be started soon. Sorted over all reports today in preparation but it took most of the time to catch up on letters which I have to do myself.

Mr. Hansell, Aldrich's assistant, just announced his marriage to one of the girls in the office.

Very truly yours,

P. S. Am sending a copy of "Multiple glaciation" under separate cover.

June 12, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

I expect to leave Madison early on the morning of June 19 which will get me into Urbana about noon. I intend to express or mail some of my equipment to your office. Can you kindly store it for me until I arrive.

I will have to buy a few things in Urbana after I arrive.

I am feeling all right although my side is stiff. The doctor thinks it will soon be all right in the warm climate of Illinois. I can walk and climb all right but still have to be careful about lifting heavy weights.

Very truly yours,

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305 CERAMICS BUILDING
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URBANA

June 3, 1930

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Thwaites:

I have your letter of May 31. Your presumption that you are to report June 19 is correct. I said nothing about it in my letter to you because you had made a definite statement that that was the date when you would report.

Looking forward to seeing you at that time, I am with best regards,

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

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UNIVERSITY OF ILLINOIS CAMPUS

URBANA

January 31, 1930

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I trust that the operation which you mentioned in your recent letter has been performed with evident success. I should like to learn how you are progressing.

In my letter to you two weeks ago, I mentioned that I should like to know the dates between which you can work next summer in order that I can lay out for you an area that you can cover in that time. As I hope that we will be able to formulate our plans in the next few days, I should appreciate it if you would let me know promptly these dates.

With very best regards to you and Mrs. Thwaites,
I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

Feb. 5, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

I am sorry that I have been unable to reply sooner to your letters of Jan. 16 and 31. I was in the hospital two weeks and am still confined to my home although I feel much improved. The hernia doubtless started last summer if not previously. It was not noticed because plugged by a fatty tumor. I hope that the repair will be permanent this time but for several months I will be unable to do any heavy work or to ride over rough roads. On this account I am obliged to put the date of going to Illinois as late as possible. Exams last through June 17 and grades must be in the next day. I therefore cannot start before June 19. I hope that by then I can safely undertake everything but the hardest lifting. The doctor told me that the first time the place was not sewn up tightly enough so that failure was inevitable someday. I was lucky to find it out while at home rather than down in Egypt.

I cannot imagine how Dr. Ulrich can possibly form any opinion as to the age of strata which do not outcrop within hundreds of miles. Only a small part of the Mt. Simon reaches the surface in Wisconsin and none in Missouri.

It's all right about the inspection expense as the amount involved is too small to bother about.

Very truly yours,

F. T. T.

Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION
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305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

November 26, 1929

Mr. F. T. Thwaites, Geologist
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

We received in due course the additional seven cents to pay for the additional print.

Mr. Krumbein's initials and address are as follows: W. C. Krumbein, Comptroller, U. S. National Building, 3408 S. Michigan Ave., Chicago, Illinois. Dr. Brown's initials are I. C. but I do not have his present address as he has not sent it to us since he arrived in Washington, presumably on November 1.

I can appreciate your busy work as I find myself frequently in the same situation. But as you do, I manage to get in a few opportunities for recreation which enables me to keep up the requisite duties.

With best regards, I remain

Sincerely yours,

George E. Ekblaw

Geologist
Section, Engineering Geology

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

November 9, 1929

Mr. F. T. Thwaites, Geologist
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I wish to acknowledge the receipt of your check
for \$2.59 in payment of 37 photographic prints.

I am sorry that the envelope in which the prints
were inclosed misled you as to the number and amount due. There
were a total of 38 prints costing \$2.66, but when we first sent
the negatives to the photographers they neglected to print one
of them and sent us the bill for only 37. We then later sent
them the negative which they had failed to print at first and then
sent all 38 to you at once. If you wish you may send the additional
7 cents in stamps at any time it is convenient, as we will now
settle with Duncan's direct.

I am not certain which set of films was taken in Clinton
County, but I do know that one set of your films must have been
slightly mistreated in developing as the negatives as well as the
prints show scratches and other marks.

Mr. Sellin, who served as Mr. Brown's assistant the
latter part of this season and who is continuing the work for a few
weeks, has encountered some very interesting situations in Logan
County where he is working. The area there is nearly as complicated
as the ridged drift in the Kaskaskia basin.

With very best regards, I remain

Cordially yours,

George E. Ekblaw

Geologist
Section, Engineering Geology

Nov. 25, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: In reply to yours of the 9th I evidently miscounted the number of prints for a check showed that the larger sum was correct. I am enclosing the 7 cents in stamps.

Could you please give the the initials and present addresses of Brown and Krumbein for I wish to send them copies of my report on Vilas County. I have mailed you one under separate cover.

My class keeps me so busy that I often wonder what will happen during the second semester when I will have two others with lots of field trips. Our trips thus far total about 600 miles and just now I am struggling through 25 reports. We took two days off to go to the game at Chicago on the 9th as I felt that I needed a little change.

With best regards,

Very truly yours,

F. T. T.

Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

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URBANA

December 4, 1929

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I was very glad to receive a reprint of your paper "Glacial Geology of Part of Vilas County, Wisconsin" and I thank you for it. I gather that this is the paper that includes the outwash plain and associated deposits which you were talking about last summer.

There is nothing particularly new that has occurred about here in recent times. I presume that you are having the same sort of real winter weather in Madison that we have had here in the past week.

With best regards,

Cordially yours,

George C. Chblaw

Geologist
Section, Engineering Geology

DEPARTMENT OF
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SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

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UNIVERSITY OF ILLINOIS CAMPUS

URBANA

May 17, 1930

Mr. F. T. Thwaites
Geological & Natural History Survey
Madison, Wisconsin

Dear Thwaites:

I note your preference of areas and shall plan accordingly. Your preference for a car other than a truck has been noted and I believe that we will be able to arrange this.

I have forgotten whether you had your own Brunton with you last year or not, but we find that our supply of Bruntons is not sufficient to take care of the needs of all of our parties this summer and it is doubtful if we can obtain enough to fill the need. Consequently, if you wish to use one I should advise you to bring your own if you have one.

I am glad to learn that you are getting along all right and I hope that nothing will develop to prevent your carrying on the work this summer.

With best regards, I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

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URBANA

May 27, 1930

Mr. F. T. Thwaites
Geological & Natural History Survey
Madison, Wisconsin

Dear Thwaites:

In following up my letter of May 17, I wish to inform you that your assistant this year will be Mr. D. D. Utterback, a graduate student at the University of Illinois. He will report to you in the field after you get there, as he will go out earlier with Mr. Foster who will work southern Illinois. I might mention at this time that you will take with you into the field Mr. David Hunter, who will become Foster's assistant when Utterback transfers to your party.

With best regards and anticipating a fine summer's season, I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

May 31, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

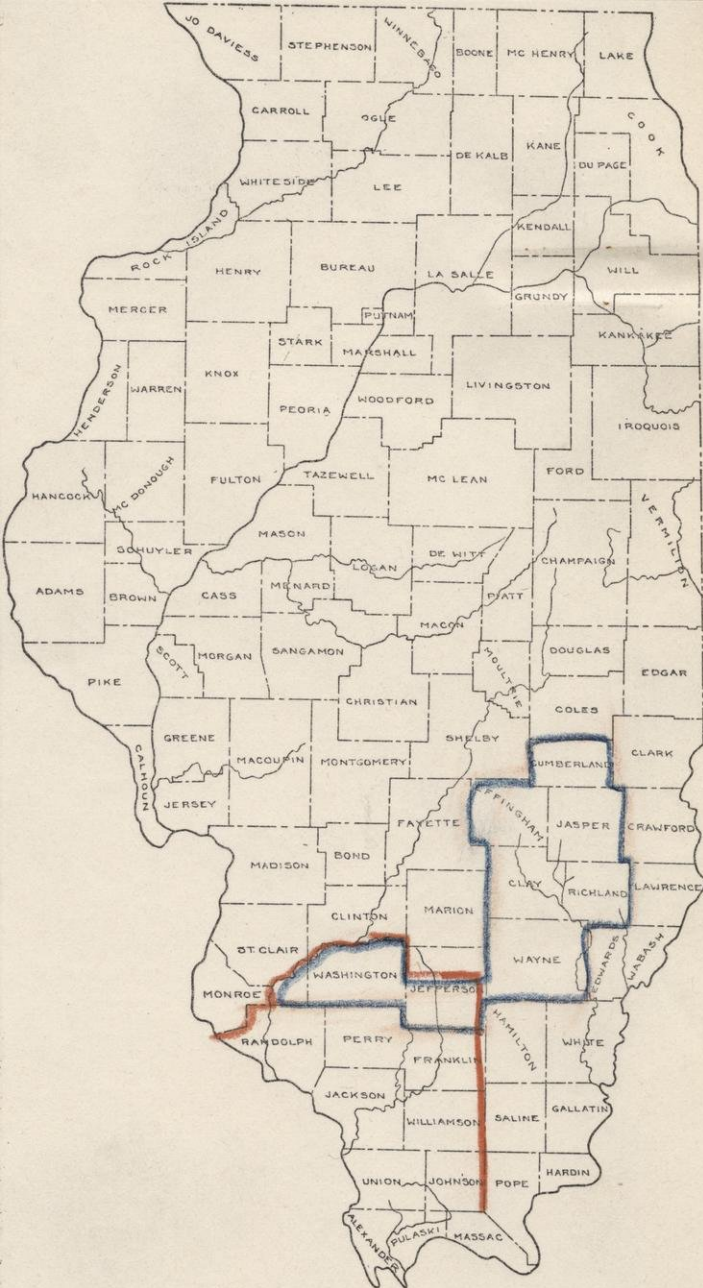
Dear Mr. Ekblaw:

In reply to your letters of the 17th and 27th I wish to thank you for your kindness in arranging about the car. You do not mention the date on which I am to report so presume it is to be June 19 as I mentioned some time ago. If this is not correct please advise me. I plan to ship down much of my outfit by express so I will not have so much to carry when I arrive.

Field trips are now over but I am still very busy with thesis students. I also hope to finish a paper I was working on last year but have been unable to touch in the meantime.

With best regards,

Very truly yours,



Scale:

100 Miles

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URBANA

May 14, 1930

Mr. F. T. Thwaites
Wisconsin Geol. & Nat. Hist. Survey
Madison, Wisconsin

Dear Thwaites:

In making plans for this season's work on Road Materials Survey, I find that we can give you your choice of two areas adjacent to the one that you completed last year. The one area, which is outlined in red on the inclosed map, is the area which was laid out for your work last year and will take you into the southern counties of the State where the margin of the Illinoian glacier crosses and where there may be more bedrock exposures. The second area, which lies mainly east of the area you completed last summer and which is outlined in blue, would give you a chance to study the relations of the Wisconsin outwash to the Illinoian drift and also a chance to study the physiography near the Wabash valley. I leave it entirely to your preference, if you have any choice between these two areas, and I should like to hear from you at the earliest possible date with regard to it.

The Road Materials project this year promises to be an extensive one as we shall have ten parties in the field.

I hope that you are recuperating from your operation and that you will be in fine trim to do a real season's work.

With best personal regards, I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

May 16, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

In reply to yours of the 14th I prefer the northern area, the one marked in blue on the map which you sent. I think that this will give me more glacial geology than the other district.

I am now feeling all right but must be careful to avoid undue strains for some time to come. This means that I will have to leave most of the augering and sledging to the assistant. In this connection would it be too much to ask for some other car than a truck? I am afraid of the severe jolts and jars of those vehicles. I have now been out on several expeditions and seem to be able to walk and climb all right although I will have to be careful about falls for some time more. My doctor assured me, however, that he thought there will be little danger of damage by next month. Nevertheless, as the place cannot be fixed again I desire to be on the safe side.

I was up to see the newly discovered pre-Cambrian quartzite monadnock in Adams County last week. It covers about a square mile and is being exploited for road material on a large scale. This week I take a class to the Forest Bed.

Very truly yours,

Geologist in charge of well records

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URBANA

January 27, 1931

Mr. F. T. Thwaites
Lecturer in Geology
University of Wisconsin
Madison, Wisconsin

Dear Thwaites:

I was very glad to receive the summary of your work in Illinois the past two seasons. I am sure that it will be quite satisfactory for the purpose for which it was prepared. It is a matter for your own judgment whether you will want to prepare any papers from it.

I was sorry that I could not attend the G. S. A. meeting at Toronto, as I should have liked to have visited the interglacial beds myself. I shall postpone that privilege until some later time.

The preparation of the maps and the final reports is not progressing rapidly but I hope that it will be accomplished in due time.

With best regards to you and Mrs. Thwaites, I remain

Cordially yours,

George C. Colwell
Geologist in Charge
Section of Engineering Geology

~~EDUCATIONAL SECTION~~
~~DON L. CARROLL, ASSOCIATE GEOLOGIST~~

STATE OF ILLINOIS
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URBANA

June 22, 1929

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I am pleased to inform you of your appointment for the summer as associate geologist and head of one of our parties in the investigation of road materials for the State's secondary highway system, under the general supervision of Dr. George E. Ekblaw, at a salary of \$225. a month and field expenses within the State. You will be provided with an assistant, a car, and accessory equipment. I should be glad if you will report at this office early in the afternoon of July 1.

Please write me your acceptance.

Very truly yours,

M. M. Leighton
Chief

June 25, 1929

Mr. M. M. Leighton, Chief,
Illinois State Geological Survey,
Urbana, Illinois

Dear Mr. Leighton: In reply to yours of the 22nd I will accept the position offered and will arrive in Urbana on the noon train on July 1 unless an accident should cause me to miss connections in Chicago.

Very truly yours,

Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

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URBANA

June 6, 1929

Mr. F. T. Thwaites
Geological and Natural History Survey
Madison, Wisconsin

My dear Thwaites:

I have your letter of June 4, and in reply I
desire to say that if you can let me know by June 11 that
will be satisfactory.

I realized that the salary which I mentioned
was probably considerably less than you had been receiving,
but it is the maximum that our appropriation for this work
will permit. However, I hope that this will be satisfactory
to you in case your other conditions will allow you to
consider the appointment. Upon receipt of favorable word
from you regarding your desire to accept the position as
outlined in my letter of May 29, I shall be glad to
recommend you to our Geological Board.

With personal regards, I am

Very truly yours,

M. M. Leighton
Chief

June 4, 1929

Mr. M. M. Leighton, Chief,
Illinois State Geological Survey,
Urbana, Illinois

Dear Mr. Leighton: I wish to thank you for the offer in your letter of May 29 reply to which was delayed on account of my having been out of town for a few days. I am much interested in the job you offer and the only thing which prevents immediate acceptance is that before your letter came I had started negotiations for another summer job with a higher salary. The salary you mention is considerably less than I had while the survey of northern Wisconsin was in progress. Could you please hold the matter open for a few days? If I do not hear from the other job this week I will undoubtedly take the position you offer. If you cannot hold the matter that long please let me know as I would rather take something which is certain than wait any longer on the other matter.

The new Highway Commission has not been appointed so that we do not know its attitude on road material surveys. However, there will be no work for me in the north this year at least.

Thanking you,

Very truly yours,

F. T. T.

Geologist

STATE OF ILLINOIS
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UNIVERSITY OF ILLINOIS CAMPUS

URBANA

May 29, 1929

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

My dear Thwaites:

I note from your recent letter that you may not be able to continue your glacial geology at the Wisconsin Survey and if this is true, I should like to inquire if you would be interested in having your name considered in connection with a summer position on our Survey.

At the suggestion of the State Highway Division for a geological study of the road building materials for secondary highways, I have outlined a two-season program which in effect will be something more than a road material study. Although adequate information on road materials is to be one of the primary objects, there is an equally important second object, namely: the study of the outwash conditions of the various ice sheets which invaded Illinois. In other words, the study is to be a scientific Pleistocene study as well as a road material study.

We will have four or five parties in the field, ^{all} ~~each~~ operating under the supervision of Dr. George E. Ekblaw who knows a great deal about the Pleistocene of the State as well as the bed rock stratigraphy. Would it be to your liking to be the head of one of these parties with an assistant and a Survey car? Since you have already had more Pleistocene experience than most of the other heads of parties that we will have, I would consider making your salary the maximum, namely: \$225 per month and expenses. The work would begin July 1, and could be closed when you need to begin your teaching.

I should appreciate an early reply for I shall soon be obliged to make my recommendations to our geological board.

With best wishes, I am

Very truly yours,

M. M. Leighton
Chief

June 13, 1929

Mr. M. M. Leighton, Chief,
Illinois Geological Survey,
Urbana, Illinois

Dear Mr. Leighton: In reply to yours of the 11th I will report in Urbana not later than noon on July 1. I will bring with me the same photographic apparatus I used last summer. I have made an extensive study of field photography the last two summers and now use Agfa roll film with filters in a Special Kodak. The films were kept in sealed tins and mailed in for development as soon as taken. I had very poor results with panchromatic films although MacClintock reports good work with them. I also have a larger camera for cut films but will probably need only the Kodak. I do not know just what the work in Illinois will require but suppose that if I bring anything which will not be needed it can be stored at Urbana for the summer. I have also provided my own drawing instruments, etc.

With best regards and thanks for the job,

Very truly yours,

F. T. T.

Geologist

DEPARTMENT OF
REGISTRATION AND EDUCATION
A.M. SHELTON, DIRECTOR
SPRINGFIELD

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URBANA

June 11, 1929

Mr. F. T. Thwaites
Geological & Natural History Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I am very glad to have your letter of June 8 and to know that you will accept the position I offered, subject to the action of our Geological Board. Please report July 1 in Urbana. It will be all right if you arrive on the noon train from Chicago. It will ^{be} quite all right if you wish to furnish your own photographic apparatus. We will supply the car and assistant. At present it looks like we have our assistantships filled, but I have not heard from one or two, and in case there should be a slip-up, I shall keep in mind the fact that one of your students might assist you.

Dr. Ekblaw and I are very glad, indeed, that you can take charge of one of the parties. We will all have a conference with the Highway Department before you enter the field.

With personal regards, I am

Very truly yours,

M. M. Leighton
Chief

DEPARTMENT OF
REGISTRATION AND EDUCATION
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STATE OF ILLINOIS
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URBANA

November 2, 1929

Mr. F. T. Thwaites
Wisconsin Geological Survey
Madison, Wisconsin

Dear Mr. Thwaites:

Herewith I am sending you the prints which
you desired and the titles to go with them. The
cost of these prints is \$2.66. If you will make out
a check to Duncan's for this and send it to us we will
see that it is turned over to them.

With best regards, I remain

Cordially yours,

George E. Ekblaw

Geologist
Section of Engineering
Geology

Nov. 5, 1929

Mr. G. E. Ekblaw,
Illinois State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: Yours of the 3rd with the photographs arrived yesterday and I wish to thank you very much for having them printed. Enclosed is a check for \$2.59 which on recomputing the amount, 37 prints at 7 cents each seems to be correct. I am also sending the envelope on which two different sums seem to be given through some mistake. If the amount is not correct please let me know.

Most of the pictures seem to be very good but one roll taken in Clinton County seems to have been exposed to moisture before developing. At least such is the usual cause of spots such as appear there. As the weather was very dry at that time I am positive that the trouble originated after the film left my hands, that is either in the mail or at the photographers. I had not seen any of these photos before so did not know that anything was wrong with them. The last picture of the season taken with a blue filter was shaken. I have experimented with the blue or G filter since my return home and have had good results with it.

Have just returned from what I trust is the last field trip of the season for the days are now so short that one cannot get very much done.

Very truly yours,

F. T. T.

Geologist

Oct. 26, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: I wish to thank you for your letter of the 18th in regard to work in Illinois next summer.

I am very busy this fall revising reading lists, reading myself, planning and going on field trips, and catching up on well record work so that I am very glad that I finished all reports while in the field.

With best regards,

Very truly yours,

F. T. T.

Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

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URBANA

October 18, 1929

Mr. F. T. Thwaites
Geological & Natural History Survey
Madison, Wisconsin

Dear Mr. Thwaites:

We have received your check list of the
photographs for which you wish prints, and we are
sending the negatives over to have them developed.

I am very glad to receive your acceptance
for a position next summer. This will give me some-
thing from which to start my plans for next year's
organization.

Dr. Brown checked in last week and is taking
up a position with the U. S. Soil Survey at Washington,
on November 1.

With best regards, I remain

Cordially yours,

George E. Ekblaw
Geologist
Section of Engineering
Geology



DEPARTMENT OF
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URBANA

October 5, 1929

Mr. F. T. Thwaites
Natural History & Geological Survey
Madison, Wisconsin

Dear Thwaites:

I am inclosing a list of the titles of the
photographs which you took this summer. If you will
check the ones ^{of} which you wish prints, we shall have
them taken and send you a bill for same as you request
it.

With best wishes, I am

Cordially yours,

George E. Ekblaw

Geologist
Section of Engineering
Geology

Oct. 16, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: Thank you for the list of photos enclosed in your letter of the 5th. I am returning it enclosed with 39 pictures checked. Ordinary 7 cent prints on glossy paper will be all right. Too bad one got lost; maybe it is around the office or mixed with somebody's photos.

I have talked with Mr. Bean about next summer and he says that he cannot take up the matter with the Highway Commission until after the first of the year. As I do not wish to ask you to hold your offer so long I will accept your offer of a position for next summer. Mr. Bean advises this as he thinks that the Commission may not authorize work in the unsettled northern portion of this state where no new construction will be needed for a long time.

We had a pleasant trip home and I am now busy with my work at the University. Just took my class of 25 on a trip to the pre-Cambrian area around Wausau.

With best wishes,

Very truly yours,

F. T. T.

Geologist

Jan. 8, 1931

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

I am enclosing summary of my work in Illinois which I think you asked for when I left. It is not all I could desire but Mrs. Thwaites was kind enough to proof it for me.

I went to Toronto and was very sorry to learn there that you were unable to attend the meeting. While there I visited the Toronto interglacial beds and although we were not able to stay long found them most instructive.

With regard to writing up the scientific results of the work in Illinois the only subjects which I think of are (a) Origin of drift or till plains, and (b) Effects of glacial floods on the valley walls. Both of these are treated in the summary and seem rather too short for the subject of a paper. However, if you feel that either or both would be of interest to others I will work up what material I have. I haven't checked the literature on the underfit rivers but possibly Davis covered this point years ago.

I have been busy finishing the paper on the Buried pre-Cambrian of Wisconsin but have the illustrations for a short note on the recent case of intercision at Two Creeks, Wisconsin.

This year I have only 15 in Physiography of the U. S. and four in Advanced Physiography.

With best regards,

Lecturer in Geology

NOTE: If remittance is incorrect, address division
and refer to Voucher No. 1414

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date September 26, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

August 16 to 30, 1930	- To statement herewith attached:	30.86
18 to 30	To statement herewith attached:	15.00
		<u>45.86</u>

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

NOTE: If remittance is incorrect, address division
and refer to Voucher No. -----

1404

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date September 24, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

September 1 to 10, 1930 - To statement herewith attached: 21.54

TO BE RETAINED BY PAYEE

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

NOTE: If remittance is incorrect, address division
and refer to Voucher No. 1302

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date September 3, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

August 1 to 15, 1930: To statement herewith attached: 23.47 (330 53049B)
26.47 (330 50691B)
50.88

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

(42611—50M—8-30) 7

TO BE RETAINED BY PAYEE



NOTE: If remittance is incorrect, address division
and refer to Voucher No. 1312

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date September 3, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

August 16 to 31, 1930: To statement herewith attached: 29.00

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

NOTE: If remittance is incorrect, address division 1366
and refer to Voucher No. -----

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department _____ Division _____
 Payable to Registration & Education Date State Geological Survey
F. T. Thwaites September 11, 1930
 Address State Geological Survey, Urbana, Illinois
 Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

September 1 to 11, 1930 — To statement herewith attached: 48.01

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

(42611—50M—8-30) 7

TO BE RETAINED BY PAYEE

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

If remittance is correct, address division
and refer to Voucher No. **1173**

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date August 5, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials Survey

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

July 16 - July 31, 1930 - To statement herewith attached

\$38.36

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

(41663—10M—7-30)



TO BE RETAINED BY PAYEE

NOTE: If remittance is incorrect, address division
and refer to Voucher No. **1032**

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date July 15, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

June 23 to 25, 1930 - To statement herewith attached:	1.75	(275 - 51145B)
20 to 30	23.07	(277 - 51147B)
	<u>24.82</u>	

TO BE RETAINED BY PAYEE

NOTE: If remittance is incorrect, address division
and refer to Voucher No. 1076

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date July 15, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

July 9 to 11, 1930 - To statement herewith attached: 33.00

NOTE: If remittance is incorrect, address division
and refer to Voucher No. -----

1000

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date July 3, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

June 19 to 26, 1930 - To statement herewith attached: \$30.66

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

If remittance is correct, address division
and refer to Voucher No. 1133

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration and Education Division State Geological Survey
Payable to F. T. Thwaites Date August 1, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials Survey

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

July 1 - July 15	To statement herewith attached	\$29.16
July 13 - July 14	To statement herewith attached	22.78

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.

NOTE: If remittance is incorrect, address division
and refer to Voucher No. 1276

Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department Registration & Education Division State Geological Survey
Payable to F. T. Thwaites Date August 19, 1930
Address State Geological Survey, Urbana, Illinois
Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

August 1 to 15, 1930 - To statement herewith attached: 30.12

REMITTANCE ENCLOSED

A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

OSCAR NELSON,
Auditor of Public Accounts.



Note—Freight bills and car lot shipments must show car initials and number.
All deductions and additions must be plainly shown.

If remittance is correct, address division
and refer to Voucher No.-----

1221

STATE OF ILLINOIS

MEMORANDUM FOR PAYEE

Department _____ Division _____
 Payable to Registration & Education Date State Geological Survey
F. T. Thwaites August 18, 1930
 Address State Geological Survey, Urbana, Illinois
 Payable from the appropriation for Road Materials

The accompanying warrant issued by the Auditor of Public Accounts, covers invoices with dates and amounts as follows:

July 16 to 31, 1930 - To statement herewith attached: 32.67(310 - 52564B)
 To statement herewith attached: 4.45(313 - 52567B)
37.12

REMITTANCE ENCLOSED
 A bankable warrant accompanies this memo. The name and address of the payee showing through the window. Do not discard the envelope until the warrant is removed.

(41663-10M-7-30)

OSCAR NELSON,
Auditor of Public Accounts.

Science Hall,

Nov. 14, 1930

Mr. W. C. Krumbein,
6704 Merrill Ave.,
Chicago, Illinois

Dear Mr. Krumbein:

In reply to yours of the 11th I do not think that all breaks in moraines should be classed as outlets of subglacial channels. They may or may not have been such at first. If they were you should find remnants of a fan of rather coarse gravels which had been deposited just outside the opening. Such an outlet which was not later used by waters from the retreating ice front might be found to slope down as followed back from the ice front. The drainage outlet just north of Prairie du Sac, Wisconsin, is apparently of this type although it debouches into a channel in the outwash plain and does not seem to be associated with any coarse gravels. I have seen several other such outlets through the Johnstown Moraine farther north. Where ponded waters later used an old outlet which discharged the waters from a tunnel in the ice they cut away the fan and deposited sand or fine gravel in the bottom of the break in the moraine. This fact has led to many disappointments on the Road Material Survey since they failed to understand the difference ^{between} drainage outlets used at the time of formation of the moraine and those which carried waters from later moraines. I have in mind one such outlet in Portage County, Wisconsin, which evidently carried water for a long time through the Johnstown Moraine from the outlet of a subglacial tunnel in the ice back of the Milton Moraine. At the crest of the Milton the slope is reversed and the channel descends toward its source.

I use as criteria, therefore, (a) reversal of slope, and (b) nature of deposit outside of and in the break ^{or} of the moraine.

In Cumberland County, Illinois, which I completed last summer, I think most, if not all, of the breaks were ^{also} used by waters from the ice front when it stood north of the Shelbyville Moraine. However, in one valley, Hurricane I think, there seemed to be nothing but the coarse gravel deposited when the ice front was nearby. The Embarrass valley showed terracing by waters from much farther north. Your work to the north would undoubtedly clear up these points.

In general I deprecate the use of too many technical ^{or} terms. I therefore, do not look with favor on the invention of more. It is possible that Woldstedt's book, Das Eiszeitalter, may discuss this point but I do not read German well enough to get much out of it.

My work in Wisconsin is off for good unless I can get any support through the University. I expect to go to Toronto and hope to see you among others of the Illinois Road Materials Survey group.

Very truly yours,

Mrs. Allie Stewart,
Box 265 Greenup.
phone 32

~~6 more copies Rept Invent 20 & 19~~

~~cancel insurance~~

~~see if E has ^{send copy} multiple glaucoma
get rest of separator. list who has
saw log of wood
see about 4 samples~~

~~postage 1.52~~

~~return 2 long stamps~~

~~service refs~~

~~auto report~~

~~Effingham test holes~~

W.L.O. Utteback
601 W High St Urbana
Picture and Survey Notes
site Oct 11, 30 mapping &

6704 Merrill Ave.,
Chicago, Illinois,
November 11, 1930.

Dear Mr. Thwaites:

I have been attempting to compile material on certain outwash features that I came across during my work on the Survey during these last two summers. The features are deposits of gravel that are associated with channels in moraines; the channels may either head up in the moraines as re-entrants, or they may cut entirely through the moraines.

Mr. Ekblaw refers to these channels as "sub-glacial channels", as you may recall, but I am not certain that they are sub-glacial. In your "Outline of Glacial Geology" (1927), you mention these channels on page 57, under the heading of Drainage Outlets. I have also found references to them in the literature on moraines, but so far I have found no critical discussion of their origin, or any definite term by which to distinguish them from channels due, say, to subsequent cutting by dammed waters.

The subject interests me as having possibilities for research, and I am accordingly taking the liberty of writing you about them. I wonder whether you know of any critical article such as I have mentioned, and also whether the term you use is of your own derivation, or whether it has already occurred in the literature as a standard name for these features.

I would sincerely appreciate any information you could give me on the subject, and I should be pleased to let you know the results of my further studies if it should prove a field open to further study.

Respectfully,

W. C. Krumbein

W. C. Krumbein.

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Clay County Farm Bureau

INCORPORATED

C. S. LOVE, Farm Adviser
GARNET SEFTON, Office Secretary

Phone 166

Office, Court House

Office Day, Saturday

LOUISVILLE, ILLINOIS

Oct. 6, 1930

COMMITTEEMEN

ZACK KESSLER, Ingraham
NOAH WALBORN, Louisville
M. B. DOW, Xenia
DALE GAMMON, Louisville
LEO LYBARGER, Noble

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

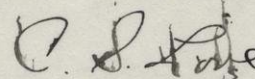
Dear Mr. Thwates:

I wish to thank you for the picture of the limestone train. This is appreciated very much.

Mr. F. W. Wascher, Effingham, Illinois, a representative of the Lehigh Stone Co. was the man who wanted a picture of the train.

If you have another picture I am sure he will appreciate it.

Very truly yours,



Farm Adviser

CSL:GS

Nov. 13, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois
Dear Mr. Ekblaw:

This is to say that I have not had time thus far to get at either the summary of my work in Illinois or any of the purely scientific results. I hope before long to be able to get at this. I have been finishing a paper on the concealed pre-Cambrian of Wisconsin which I hope to present at Toronto.

I sent a copy of the picture of the Winter quarry in Effingham County and just had a nice letter thanking me for it. Winter says they have now moved to a location 3 miles north and 1 mile east. He found they wanted \$1000 for the crusher at Neal but they secured one at Elgin for \$75. I also sent a copy of the picture of unloading the train of limestone in Clay County to G. S. Love, Louisville, County Farm Advisor. His reply says that Mr. F. W. Wascher, Effingham, Illinois, a representative of the Lehigh Stone Co. also would like a copy. If you have an extra print I would be pleased if you would send it to him.

I would like to know what kind of glue you use in mounting maps as we wish to do the same way.

Hoping to see you at Toronto,

Very truly yours,

M. G. WINTER & SON

WE DO ALL KINDS OF
ENGINE AND MACHINERY REPAIRING

ALTAMONT, ILL.

11/12/30

Mr. F. Thwaites,
Madison, Wis.

Dear Mr. Thwaites:

We received your letter of Sept,
29th. And are a little slow in answering it. We
thank you very much for your picture and the interest
you have taken in our work.

In regard to the machinery you had
located for us, wish to say that they only asked us
a \$1000 for the crusher. We located a crusher in
Elgin, Ill. with an 8 x 12 opening for \$75.00 in A-1
shape.

We have moved to a new location
3 miles north and 1 mile east. Should you ever happen
to be down our way again don't fail to look us up.

Hoping to hear from you again some-
time, and wishing you success, we are.

Yours very truly,

M. G. Winter & Son

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

BOARD OF NATURAL RESOURCES
AND CONSERVATION
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CHEMISTRY - WILLIAM A. NOYES
STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

September 24, 1930

Mr. F. T. Thwaites
Geological & Natural History Survey
Madison, Wisconsin

Dear Mr. Thwaites:

When I returned to the office from a trip in western Illinois last week, I found your letter of September 15 and the photographic prints awaiting me.

I was glad to learn that you arrived home safely and have got well into your winter's work.

We have searched for your pencil but have been unable to find it in the office or about the place. If it should turn up later I shall be certain to send it to you.

I wish to thank you for your copy of "Multiple Glaciation" which you sent me. I hope to get a chance to really examine this at no distant future time.

I am gratified to know that you had a pleasurable time with the Survey. I have realized all along that it was an intensive job and consequently had some disadvantages.

With best wishes to you and Mrs. Thwaites, I remain

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 23, 1930

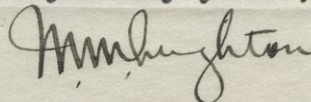
Mr. F. T. Thwaites
Geological and Natural History Survey
Madison, Wisconsin

Dear Mr. Thwaites:

I was very sorry that I was not able to be here at the time you closed your work. I hope, however, that you enjoyed your summer. I shall keep you in mind with regard to your wishes for employment next summer, but it is too early to say definitely now.

In regard to your undertaking work for Mr. E. C. Willis, the policy of the Survey is that no member of its staff shall do private consulting work in the State. I am sorry that it affects you but it is the only safe policy for our organization. For such work we usually recommend Professor U. S. Grant, Mr. L. A. Mylius, Professor J. J. Runner, University of Iowa, and Mr. Carl B. Anderson, but you handle the recommendations as you like.

Very truly yours,



Chief

Sept. 26, 1930

Mr. E. C. Willis,
402 Security Bldg.,
Davenport, Iowa

Dear Sir:

As I surmised information from Urbana is that there are no exceptions to the rule that ex-employees of the State Geological Survey are debarred from private practice in Illinois. I therefore cannot do any work for you. I recommend Prof. W. H. Twenhofel, Science Hall, Madison, Wisconsin to do this work if you desire to go ahead. His charge will probably be somewhat higher than mine but he has had more experience in the Mid-Continent oil fields.

Since writing you the first time I looked up the published information on the area. Most of the area under lease is shown on the map with Bulletin 38C of the Illinois State Geological Survey. You can obtain a copy by writing them at Urbana. Possibilities of oil and gas are discussed on page 88 and it is stated that there is evidence of a favorable structure near Cable. The discussion of oil possibilities, however, is far from adequate. I felt that detailed work in the field is needed to give a satisfactory opinion on the oil question in this territory but I do not feel that conditions are anywhere near as favorable as farther southeast in Illinois.

Very truly yours,

E. C. WILLIS
ATTORNEY AT LAW
402 SECURITY BUILDING
PHONE KEN. 4043
DAVENPORT, IOWA
Sept. 16, 1930.

F. T. Twhaites, Geologist,
Science Hall,
University of Wisconsin,
Madison, Wis.

Dear Sir:

Clients of mine have oil leases on approximately 1500 acres of land lying in the west half of Richland Grove Township and the East half of Preemption Township, Mercer County, Illinois. Richland Grove is Township 15 North of Range 1 West of the Fourth Principal Meridian. The leases lie principally in Sections 6, 17, 18, 21, 22, 27, 28, 29, of Richland Grove Township, and in Section 1, 12, and 36 of Preemption Township.

Preemption Township is Township 15 North of Range 2 West of the 5th Principal Meridian. Clients interests were ~~caroused~~ in obtaining these leases, due to the fact that for several months in the spring and early summer of this year representatives, of what they believe to be the Shell or some other large Oil Company, leased several acres in this vicinity, promising the lessors that they were going to drill on the leased land at once.

After procuring all the leases that they wanted or could get, these representatives of the Oil Companies left the community and have made no efforts to drill, and it is now apparent to everyone that they have no intention of drilling, but have merely tied the land up for a possible reserve, or to prevent others from drilling.

Seeing there is going to be no developement on the part of the large Oil Company lessors, my clients have decided to take some steps toward drilling, and in that they will need the services of an expert, practical Oil Geologist. The nearest producing field is in the Colmar-Plymouth field in McDonough County some 50 miles almost due south of the region my clients have leased where the oil is found in the Hoing sand which is found at the base of the Silurian System and the top of the Ordovician System. So you see my clients are put to it to drill quite blindly as the larger companies, which were very much interested in the leasing are not at all interested in the drilling.

We would like your best off-hand opinion and would like to know what would be your charges for looking the field over. You were referred to us by Mr. J. Egerer, Secretary of the Gray Well Drilling Company of Chicago and Milwaukee.

ECW:KS

Very truly yours,

E. C. Willis

Sept. 17, 1930

Mr. E. C. Willis,
402 Security Bldg.,
Davenport, Iowa

Dear Sir:

In reply to yours of the 16th I have done some geological work on the territory in Mercer County, Illinois about which you ask. I have examined the records of deep wells at Rock Island, Alledo, and other points not far distant. So far as I am aware none of these wells gave even a show of oil. The Chester sands which produce in the southern part of Illinois are absent in Mercer County. The only productive horizons are the Niagara limestone which may include the very spotted Hoing sand, and the "Trenton" limestone. The lower sandstones contain water. Although the existing information is not very favorable it must be realized that the geological formations of Mercer County are oil producing in a number of other places so that given a favorable "structure" or oil trap oil might very well be found. Field examination is the only way to tell if such a structure exists on the leases held by your clients.

My charge for a trip of a day or so is fifty (\$50.00) dollars a day. If the work takes longer, say a week or more, this charge will be reduced considerably. Living and travel expense, cost of maps, typing, and an assistant, if needed, will also be charged for. Time spent in traveling is included but not time spent at home in preparing a report.

However, I am not sure that I can undertake any private work in Illinois since for the last two summers I have been employed by the Illinois State Geological Survey. Their rules forbid ex-employees from engaging in private practice for some time after leaving the State service. I will write the Chief of the Survey and see if the fact that I did not work in the part of the State where your leases are is any reason for waiving this rule. If he will not permit me to work for your clients I will find someone else who can do this work. I will write you again when I hear from Urbana.

Very truly yours,

F. T. Thwaites

sept. 17, 1930

Dr. M. M., Leighton,
Chief, State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

Enclosed is copy of a letter and my reply which need no explanation.
I will greatly value your advice in the matter.

I was sorry not to see you when I checked out last Thursday. As
there seems to be no possibility of work in Wisconsin next summer would be
glad to hear of any opportunity with your Survey.

Very truly yours,

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 17, 1930

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

Mr. F. T. Thwaites
Geological and Natural History Survey
Madison, Wisconsin

Dear Mr. Thwaites:

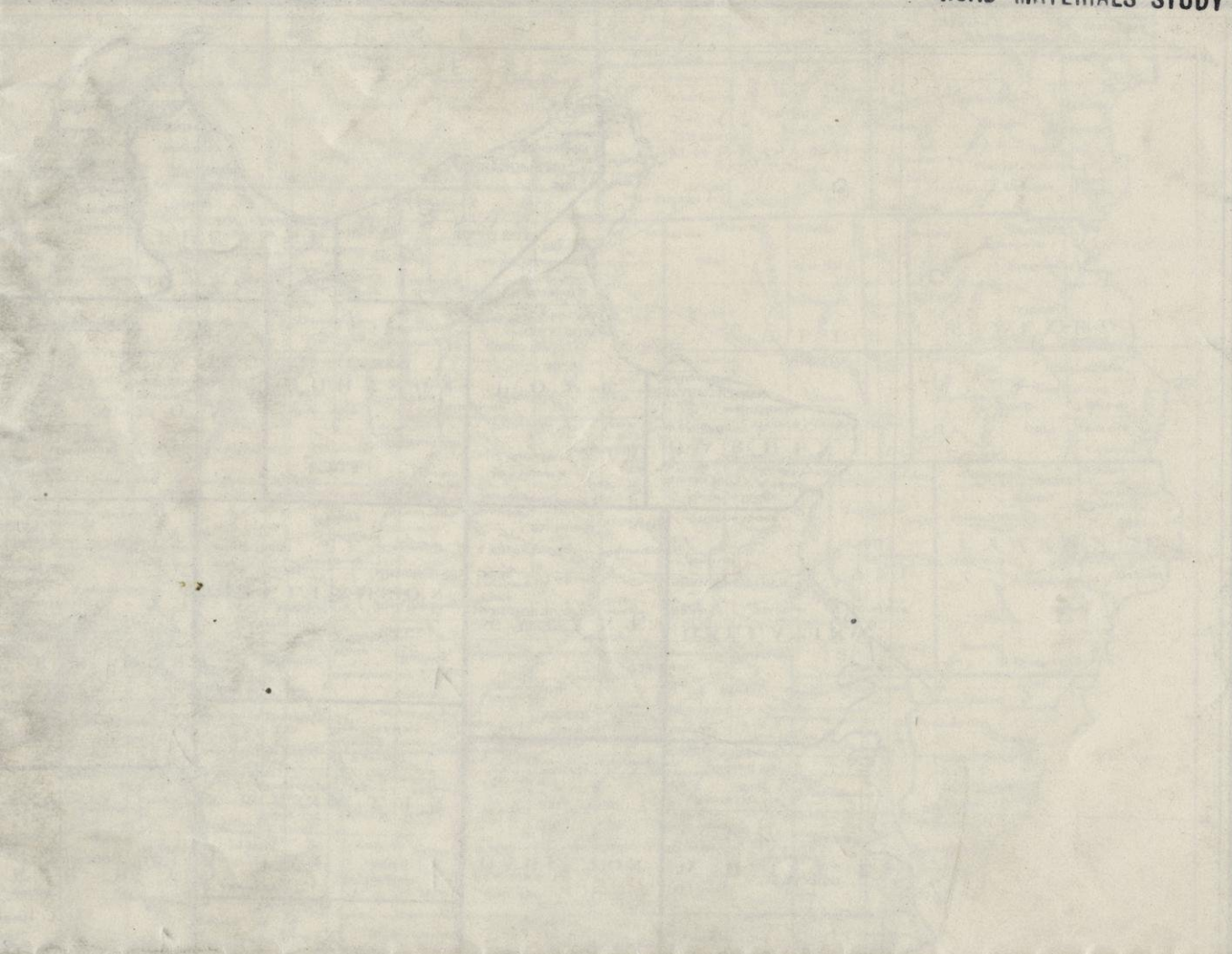
In the absence of Mr. Ekblaw, I wish to acknowledge receipt of your registered letter of September 15, containing one set of prints and negatives of Roll No. 8.

I am asking Omer to make careful search for your automatic pencil. If he is successful in locating it, I shall see that it is forwarded to you promptly.

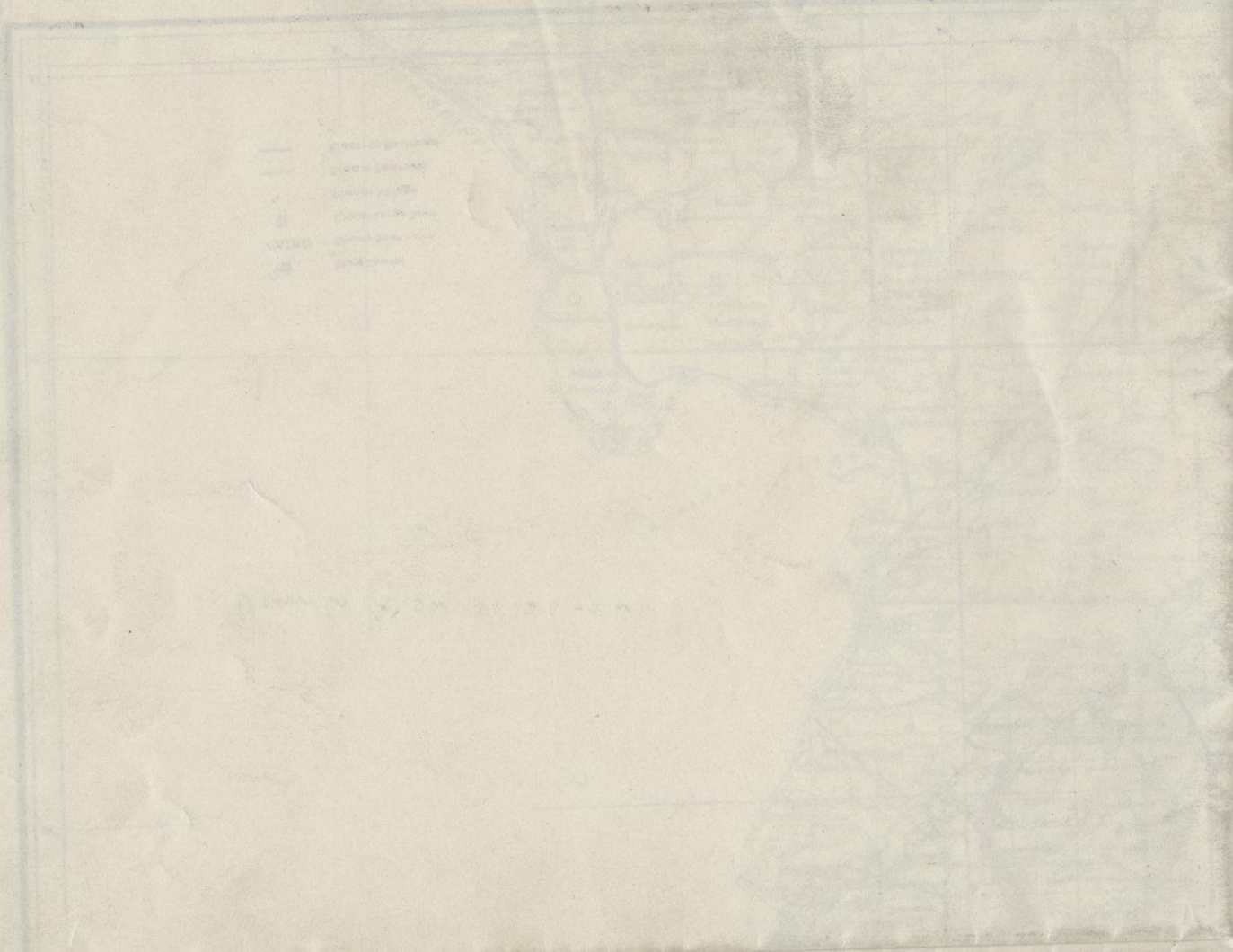
Yours very truly,

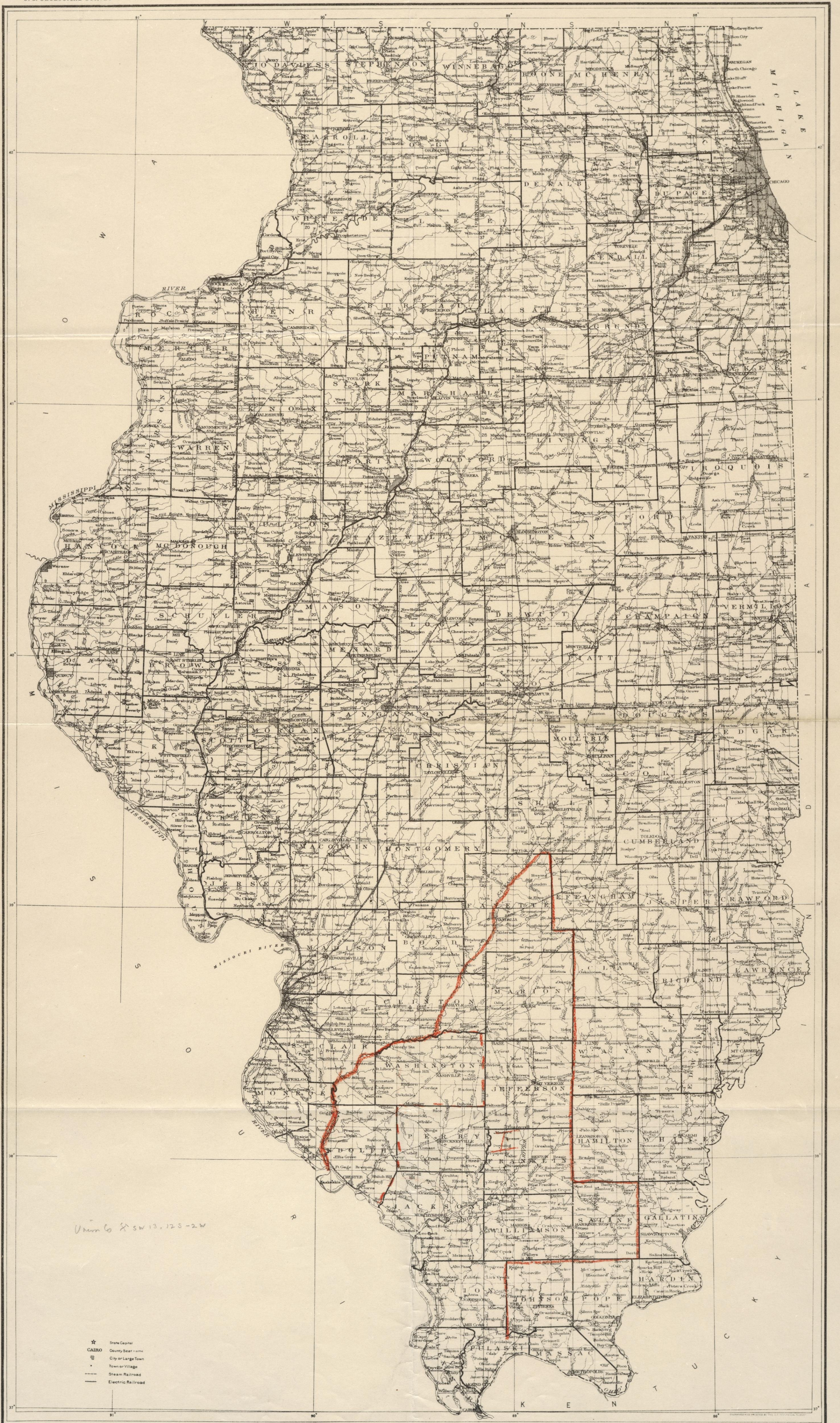
E. J. Myberg
Chief Clerk

STATE GEOLOGICAL SURVEY
 URBANA, ILLINOIS
 ROAD MATERIALS STUDY



put on township map.





Union Co. SW 13, 12S-2W

- ★ State Capital
- CAIRO County Seat name
- City or Large Town
- Town or Village
- Steam Railroad
- Electric Railroad



Suburban lot below County Club
Below cemetery at V
State Farm
Disrael creek - Rudolph Smith Farmer

Chas Jones

J. T. Goldsmith, Haver.

Judge R P Farrell - Canby

James Payne - Supt of Jeff. Co Mt. Vernon



Well on Herzog farm in sec. 23, T2N, R3W.
Clay and gravel 14 1/2 feet deep.

Well on Patermeyer farm in sec. 17,
T3N, R3W - gravel at depth of 20'. Examine
plain for more.

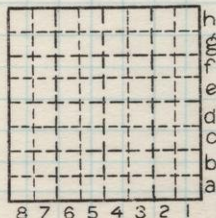
Western border of quad. - watch for
outcrops of N.E. beach bars f. (ls, ss, sh)

Examine drift ridges and hills for gravel.
Especially in vicinity of Keyport.

Date _____ T. _____ R. _____

Quad. Carlyle Part _____

County Clinton Index No. _____



DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M.M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

BOARD OF NATURAL RESOURCES
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ENGINEERING - JOHN W. ALVORD
CHEMISTRY - WILLIAM A. NOYES
STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 19, 1930

Mr. F. T. Thwaites
Hotel Litzelman
Newton, Illinois

Dear Mr. Thwaites:

I am enclosing herewith State Warrants for \$33.00,
\$24.82, \$38.36 and \$30.66, making a total of \$126.84.

Under separate cover we are sending you a supply
of manuscript paper.

Yours very truly,

E. J. Nyberg
Chief Clerk

Care Mrs. Allie Stewart,
Greenup, Illinois,
Sept. 3, 1930

Mr. George E. Ekblaw,
Hotel Raleigh,
Effingham, Illinois
Dear Mr. Ekblaw:

In reply to your telegram of this morning we are to meet you at the Raleigh on Friday morning. With this in mind we will come over, or else I will come alone, as early Friday morning as is possible. We have a good place for you to stay here in case you wish to remain over Friday night.

We are making good progress in this county but still have the slower part to do. Have one limestone and one gravel sample so far.

I will probably be able to take care of Mr. Phillips request either when we go down to Jasper County or early next week. Will write him soon. However, I have small hopes although it is in the area I outlined in my report as favorable for small gravel deposits.

Hoping to see you soon after you get this,

Very truly yours,

Associate Geologist

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

WESTERN UNION

SIGNS

DL = Day Letter

NM = Night Message

NL = Night Letter

LCO = Deferred Cable

NLT = Cable Night Letter

WLT = Week-End Letter

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.

Received at

AS Ck, 10.
Golconda, Ill, 945 A.M. 3,

F.T. THwaites, care Mrs Allie Stewart
Greenup, Ill.

Meet me plan to stay releigh hotel effingham thursday
night .

George E. Ekblaw.
1036 A.M.

Phone

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	FULL RATE
DAY LETTER	DEFERRED
NIGHT MESSAGE <input checked="" type="checkbox"/>	CABLE LETTER
NIGHT LETTER	WEEK END LETTER

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

NO.	CASH OR CHG.
CHECK	
TIME FILED	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Greenup, Ill. Sept 2 1930

To George E. Elsbland

Street and No. Western Union office

Place Golconda, Ill

Case Mrs. Allie Stewart Box Two six five Greenup
 stop were obliged to buy new battery before
 receiving your letter stop Old cell broken
 plates (all gone stop would have stalled on road
 soon stop absolutely impossible to get along
 without new battery stop cost ^{only} eight fifty
 Thwaiter

Box 265

Sender's address
for reference

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY
IS BY TELEGRAPH OR CABLE

32

Sender's telephone
number

ALL MESSAGES TAKEN BY THIS COMPANY ARE SUBJECT TO THE FOLLOWING TERMS:

To guard against mistakes or delays, the sender of a message should order it repeated, that is, telegraphed back to the originating office for comparison. For this, one-half the unrepeated message rate is charged in addition. Unless otherwise indicated on its face, this is an unrepeated message and paid for as such, in consideration whereof it is agreed between the sender of the message and this company as follows:

1. The company shall not be liable for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the unrepeated-message rate beyond the sum of five hundred dollars; nor for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the repeated-message rate beyond the sum of five thousand dollars, *unless specially valued*; nor in any case for delays arising from unavoidable interruption in the working of its lines; nor for errors in cipher or obscure messages.

2. In any event the company shall not be liable for damages for mistakes or delays in the transmission or delivery, or for the non-delivery, of any message, whether caused by the negligence of its servants or otherwise, beyond the sum of five thousand dollars, at which amount each message is deemed to be valued, unless a greater value is stated in writing by the sender thereof at the time the message is tendered for transmission, and unless the repeated-message rate is paid or agreed to be paid, and an additional charge equal to one-tenth of one percent of the amount by which such valuation shall exceed five thousand dollars.

3. The company is hereby made the agent of the sender, without liability, to forward this message over the lines of any other company when necessary to reach its destination.

4. Domestic messages and incoming cable messages will be delivered free within one-half mile of the company's office in towns of 5,000 population or less, and within one mile of such office in other cities or towns. Beyond these limits the company does not undertake to make delivery, but will, without liability, at the sender's request, as his agent and at his expense, endeavor to contract for him for such delivery at a reasonable price.

5. No responsibility attaches to this company concerning messages until the same are accepted at one of its transmitting offices; and if a message is sent to such office by one of the company's messengers, he acts for that purpose as the agent of the sender.

6. The company will not be liable for damages or statutory penalties in any case where the claim is not presented in writing within sixty days after the message is filed with the company for transmission.

7. It is agreed that in any action by the company to recover the tolls for any message or messages the prompt and correct transmission and delivery thereof shall be presumed, subject to rebuttal by competent evidence.

8. Special terms governing the transmission of messages according to their classes, as enumerated below, shall apply to messages in each of such respective classes in addition to all the foregoing terms.

9. No employee of the company is authorized to vary the foregoing.

THE WESTERN UNION TELEGRAPH COMPANY

INCORPORATED

NEWCOMB CARLTON, PRESIDENT

CLASSES OF SERVICE

TELEGRAMS

A night expedited service.

NIGHT MESSAGES

Accepted up to 2:00 A.M. at reduced rates to be sent during the night and delivered not earlier than the morning of the ensuing business day.

Night Messages may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such night messages at destination, postage prepaid.

DAY LETTERS

A deferred day service at rates lower than the standard telegram rates as follows: One and one-half times the standard night letter rate for the transmission of 50 words or less and one-fifth of the initial rates for each additional 10 words or less.

SPECIAL TERMS APPLYING TO DAY LETTERS:

In further consideration of the reduced rate for this special Day Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

A. Day Letters may be forwarded by the Telegraph Company as a deferred service and the transmission and delivery of such Day Letters is, in all respects, subordinate to the priority of transmission and delivery of regular telegrams.

B. This Day Letter is received subject to the express understanding and agreement that the Company does not undertake that a Day Letter shall be delivered on the day of its date absolutely, and at all events; but that the Company's obligation in this respect is subject to the condition that there shall remain sufficient time for the transmission and delivery of such Day Letter on the day of its date during regular office hours, subject to the priority of the transmission of regular telegrams under the conditions named above.

No employee of the Company is authorized to vary the foregoing.

NIGHT LETTERS

Accepted up to 2:00 A.M. for delivery on the morning of the ensuing business day, at rates still lower than standard night message rates, as follows: The stand-

ard telegram rate for 10 words shall be charged for the transmission of 50 words or less, and one-fifth of such standard telegram rate for 10 words shall be charged for each additional 10 words or less.

SPECIAL TERMS APPLYING TO NIGHT LETTERS:

In further consideration of the reduced rates for this special Night Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

Night Letters may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such Night Letters at destination, postage prepaid.

No employee of the Company is authorized to vary the foregoing.

FULL RATE CABLES

An expedited service throughout. Code language permitted.

DEFERRED HALF-RATE CABLES

Half-rate messages are subject to being deferred in favor of full rate messages for not exceeding 24 hours. Must be in language of country of origin or of destination, or in French. This class of service is in effect with most European countries and with various other countries throughout the world. Full particulars supplied on application at any Western Union Office.

CABLE LETTERS

For plain-language communications. The language of the country of destination may be employed, if the Cable Letter service is in operation to that country. Subject to delivery at the convenience of the Company within 24 hours if telegraphic delivery is selected. Delivery by mail beyond London will be made if a full mailing address is given and the words "Post London" are written after the destination. Rate is approximately one-third of the full rate; minimum 20 words.

WEEK-END LETTERS

Similar to Cable Letters except that they are accepted up to midnight Saturday for delivery Monday morning, if telegraphic delivery is selected. Rate is approximately one-quarter of the full rate; minimum 20 words.

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

August 30, 1930

Mr. F. T. Thwaites
General Delivery
Greenup, Illinois

Dear Mr. Thwaites:

I have your letter of August 28 and note what you have to say about the battery. As I said before, it will be up to you to carry it through or to get along with it.

I am having the cement sacks sent to you at Greenup, as you ask.

I note that you are planning to go back to Rattle Snake Den to study the stratigraphy there. We have just received a letter today from Mr. Phillips, County Superintendent of Highways at Olney, a copy of which I am enclosing. I wish that you would look into this matter if you can possibly find time to do so, if you have not already seen the locality where it occurs.

I note what you have to say regarding coming in on the night of the tenth and going home the next day. As it happens, I have to be in Chicago the tenth of September. It will suit me perfectly if you check in on the eleventh and I shall plan on that.

I am still hoping to get down to see you the latter part of next week, probably Friday, or Saturday, or Sunday. If I can possibly arrange it, I wish to be with you Friday and Saturday, or such portions of those days that I can spare.

Please wire your Greenup address to me in care of Western Union at Golconda, as I shall be there Wednesday.

Very truly yours,

George E. Ekblaw

Geologist in Charge
Section of Engineering Geology

Ed. A. Phillips
County Superintendent of Highways
Richland County, Olney
Illinois

Aug. 29, 1930

Geological Department
Urbana, Illinois

Dear Sirs:

About three weeks ago you had two men in this county making surveys, with the prospect of locating gravel pits.

I don't think they found any encouragement, except Claremont, Illinois, as to their examination. I was with them two afternoons. And we found so they say good prospects over in the East and South part of the county. Near Claremont, S. W.

Since the boys have left the county we have discovered what I think a good prospect on the State road No. 130 Two miles north of Olney. Where the hill was cut down for the grade a streak of gravel is showing up which is 2 ft. thick and about eight feet wide. At the foot of the hill. Some have been digging in to get gravel and sand. The gravel is there but it is not very large, but I think if it was tested out thoroughly we might find a good bed of gravel right on the highway. The farther one goes down the better the gravel shows up.

If it is not asking you too much I wish you would send some men down and investigate. This county is planning to build a system of gravel roads under the Motor Fuel Tax, and if we can find a gravel bed it will mean thousands of dollars to Richland County. And I think the location at Claremont was marked for farther investigation. Please let me hear from you in regard to this.

Just let me know and I will furnish you some help for investigation.

Yours truly,

Ed. A. Phillips

Hotel Raleigh,

Effingham, Illinois,

Sept. 1, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois
Dear Mr. Ekblaw:

After I had sealed the expense accounts I remembered that I had not written a report on the last two weeks work. During that time we finished Jasper County, finding only a little gravel in the Embarrass River bars and then completed Effingham County. The latter has been interesting in that we had considerable limestone and drift gravel as well as a lot of creek gravel. This county has shown more enterprise than any to the south and has surfaced a considerable amount of road with local material.

We move to Greenup in the morning and hope to hear from you ther.

I regret to say that we had to buy a new battery. One cell was cracked and the cost of fixing that would not have been justified by its condition. The battery cost \$8.50 so if only used 850 miles its cost would be a cent a mile. The car runs better and starts better than for a long time. Expect the trouble started when the battery carrier broke at Fairfield.

Shall we sample gravel pits which you did in 1920?

Hoping to see you soon,

Very truly yours,

Associate Geologist

Raleigh Hotel,

Effingham, Illinois,

Aug. 28, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois
Dear Mr. Ekblaw:

In reply to your last letter we took the car to a battery station and found that the battery is using too much water, a sign of age. It was loose in the carrier and had nearly broken the connection to the frame. One corner had also been slightly broken on a rock or bridge. It then picked up and was all right for two days but was down again this morning. If it is still down tomorrow will go for another test.

Please send me a dozen cement sacks to Greenup, General Delivery.
We will almost undoubtedly move Tuesday morning at latest.

I plan to put in part of the holiday in going back to Rattlesnake Den to try to clear up some of the stratigraphy.

We have found little commercial limestone in this county but quite a lot of good gravel as in northern Fayette County. Should we sample every pit or only those which are different? This is if the pits are close together?

Maps and reports are well along and I trust will all be finished when we come in. If weather holds I wish to come in on the night of the 10th and go home the next day.

Hope to see you soon and show you some of our finds.

Very truly yours,

Associate Geologist

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REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

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305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

URBANA

August 25, 1930

Mr. F. T. Thwaites
Raleigh Hotel
Effingham, Illinois

Dear Thwaites:

Your letter of August 24, addressed to Miss Nyberg, has been referred to me in her absence.

I note what you say about staying at Effingham and moving to Greenup. I hope to visit you during the first week in September, probably the latter part of the week, but I shall let you know more definitely about this later. However, it will be desirable that you keep me informed precisely of your address.

I also wish to acknowledge your letter of August 15, in which you report briefly about your work in Richland, Clay, and Jasper counties. I presume that you received the Worthen Report on Jasper county which I asked Dr. Malott to send you.

In your letter to Miss Nyberg you comment that the storage battery in the car is no longer good, but you do not say what is wrong with it particularly. As you say that it becomes all right after the car runs awhile, I wonder if it could be that there is a "short" in the car which discharges your battery during the night. Have you had the acid content of the battery tested to make sure that it is up to standard? It will be desirable if you could get along without getting a new battery for this car. Without knowing more particulars about it, it may be that you can have it improved by inspection.

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

Hotel Raleigh,

Effingham, Illinois,

Aug. 24, 1930

Dr. G. A. Malott,
State Geological Survey,
Urbana, Illinois

Dear Dr. Malott:

I have been too busy to thank you for sending the copy of the Warr then report on Jasper County. It was of considerable help to us. I think we worked out the section somewhat differently than he did. I have found that faulting may mix one up so badly that it is almost impossible to be sure of anything. We found a small thrust fault in Clay County. We found no commercial limestone in Jasper and only one spot recommended for more exploration. Had a little river gravel on the Embarras. This county has been interesting with considerable limestone so far. The rest of the county will not show much, I fear.

We are glad it has turned cooler as the work goes better now but we have been unable to repeat our discovery in Wayne County!

When you pass through Urbana please ask Mr. Ekblaw for copies of the recent papers which I brought down, one on the Glover Bluff structure and one on the varved clay at Waupaca. Latter is in the area I was working on before Mr. Bean called off the work when he left the Highway Commission.

Very truly yours,

Associate Geologist

Raleigh Hotel,

Effingham, Illinois,

Aug. 24, 1930

Miss E. J. Nyberg,

Chief Clerk, State Geological Survey,

Urbana, Illinois

Dear Miss Nyberg:

In reply to yours of the 21st I wish to thank you for sending the tube and the paper. We bought a new Oldfield tire (Firestone) for \$6.00. I decided that inasmuch as you will undoubtedly be getting rid of this car soon it would not pay to buy a good tire. The Dayton blew out last evening as we were coming in from the field. I will bring it back for inspection. It wore badly from the start and only did 4121 miles.

We had much trouble in finding a place to stay here as this town depends mainly on tourists and students. As the college is in session student rooms were not available so we came here which may seem a little expensive but it seemed the only decent place we could find in the time available.

Our storage battery is now gone and we have to crank the car in the morning. It is all right after running a while. Shall we get along with it or buy another?

We plan to move to Greenup as noted on the last card on either the first or second of September but date for coming in to the office to check out is still uncertain. It will depend largely on when Mr. Ekblaw comes down not to mention possible delays from weather and the old car.

Very truly yours,

Associate Geologist

P.S. Please do not send any more expense checks as I now have enough to last until I get to Urbana.



DEPARTMENT OF
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SPRINGFIELD

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STATE GEOLOGICAL SURVEY DIVISION

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URBANA

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 21, 1930

Dr. F. T. Thwaites
General Delivery
Effingham, Illinois

Dear Dr. Thwaites:

We have a copy of the log of the well drilled near Newton last year so it will not be necessary for you to obtain a copy.

We have no more casings in stock and I suggest that you purchase one locally. A used tube is being sent you under separate cover to Effingham.

Yours very truly,

E. J. Ryberg

Chief Clerk

Hotel Litzelman,

Newton, Illinois

Aug. 20, 1930

Dear Miss Nyberg:

Thank you for the checks which arrived safely today. I will transfer them tomorrow. Had forgotten that the auto expense came through so slowly. Paper has not yet come.

We will leave here for Effingham either Friday afternoon or Saturday morning. Looked up rooms over there but did not decide definitely as it was so long in advance when we were there. Will send correct address when settled.

Out tires are getting bad. The new Dayton has a bad cut in the side which has begun to buldge in spite of a boot. A tire went bad today through a cut. Will find out just how bad it is in the morning. If you have another used casing and tube please send ^{them} ~~it~~ to me at Effingham.

Please find if they have the log of the oil test drilled here last winter. If not I can get it from the land owner.

Very truly yours,

Associate Geologist

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DEAN CHARLES M. THOMPSON

Aug. 15 1930

Dr. F. W. Thwaites.
Newton, Ill.

Dear Dr. Thwaites:

Herewith I am sending you the
separate containing Worthen's account of the Geology of Jasper
County. This is in accordance with instructions from Mr.
Ekblaw which I received yesterday.

Sincerely yours

Clyde A. Malott

Litzelman Hotel,

Newton, Illinois

Aug. 15, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

In reporting progress of the past two weeks you already know that we completed Richland County, did all of Clay County, and have now got a good start on Jasper County during this period. So far we have found a black slate horizon and a very thin limestone but that is all.

We found this town filled with a pipe line gang yesterday but today they seem to have thinned out for some reason. We have a good place to stay here.

Very truly yours,

F. T. Thwaites, Associate Geologist

Hotel Litzelman,

Newton, Illinois,

Aug. 15, 1930

Dear Miss Nyberg:

Thank you for the notebook paper and the tire both of which arrived safely. Sorry there was a misunderstanding about address as we were uncertain that we could get a place to stay in Flora.

Will you please send me here early in the week all of my expense checks which have thus far come in, something slightly over \$200 if I have it correctly. If you think best please register the letter. I will cash the checks at the local bank and get travellers checks for them which will easily carry me through the rest of the season.

I will need some more paper like this for reports soon but there is no rush about that.

Very truly yours,

F. T. Thwaites, Associate Geologist

Litzman Hotel

Newton, Illinois

Aug. 14, 1930

Mr. Clark R. Noe,

Box 305,

Olney, Illinois

Dear Mr. Noe:

On account of the rain of last night we were obliged to move here via Effingham and were therefore unable to stop to see you. I am very sorry that it happened this way but guess that we are all so glad it rained that nobody will mind!

I hope that you are feeling better. Will be able to talk thing over any evening that you care to come over after tomorrow night when we have to make out our expense accounts.

Mr. Ekblaw and I had an interesting visit to the mine.

I wish to thank you again for all that you have done for us.

Very truly yours,

F. T. Thwaites, Associate Geologist, State Geological
Survey

CLASS OF SERVICE

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NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

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Received at

12 WY X 13

URBANA ILL 1053A AUG 13 1930

F T THWAITES

GENERAL DELIVERY NEWTON ILL

USED CASING GOING FORWARD TODAY IF NOT SATISFACTORY SUGGEST YOU BUY
ONE LOCALLY

E J NYBERG

1118A

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
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URBANA

August 12, 1930

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

Mr. F. T. Thwaites
215 East Fifth Street
Flora, Illinois

Dear Mr. Thwaites:

I am sorry that you did not receive the notebook paper sent to you at Olney on August 4th. Another supply was rushed to you on August 9th. I am asking the hotel at Olney to return the package to this office.

I believe Mr. Ekblaw has written you regarding the second roll of pictures. The containers are being kept here for your return to the office.

Yours very truly,

E. J. Nyberg
Chief Clerk

CLASS OF SERVICE

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WESTERN
UNION

NEWCOMB CARLTON, PRESIDENT

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Received at

27A N 13

URBANA ILL 428PM AUG 11 1930

F T THWAITES

215 EAST FIFTH ST FLORA ILL

ARRIVING FLORA ILLINOIS CENTRAL 945 TUESDAY EVENING PLEASE RESERVE

COMFORTABLE ROOM

GEO E EKBLAW

501PM

215 East Fifth St.,

Flora, Illinois

Aug/ 7. 1930

Dear Miss Nyberg:

On July 30 I requested more notebook paper but none has arrived. I am now entirely out and will have to use the backs of sand and gravel and quarry sheets and then copy notes later. Possibly the request was lost with my expense accounts but more likely the paper was sent to Olney where our forwarding address was given as Urbana since we were uncertain whether we would stay here or at Louisville. Prompt shipment of paper to the above address will be greatly appreciated.

Very truly yours,

F. T. Thwaites, Associate Geologist

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REGISTRATION AND EDUCATION
A.M. SHELTON, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M.M. LEIGHTON, CHIEF

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, ~~Associate~~ GEOLOGIST

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305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

August 5, 1930

Mr. F. T. Thwaites
General Delivery
Flora, Illinois

Dear Thwaites:

I have your letter of July 31 in which you comment about your work in Richland County and intimate your intentions to move to Flora. I was duly interested in your report on Richland County.

The prints of the second roll of films which you sent in are herewith inclosed. They seem to be fairly good and I believe are the equal of the work that Coe did on the first roll. The photographer here took due care to number them, for which service he made an extra charge of ten cents. I believe that charge must have also included some special attention in developing.

I expect to visit you the early part of next week; probably either Tuesday or Wednesday, depending on what transportation schedules I can arrange. It may be that you will have to meet me at some station other than Flora. In view of my intended visit I hope that you will keep us duly informed if you should happen to move.

I was glad to learn that you found a good place at Olney. I hope that you have equal good luck in finding a place at Flora.

Cordially yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

Olney, Illinois,

Aug. 2, 1930

Postmaster,

Fairfield, Illinois

Dear Sir:

On July 26 I mailed two mailing tubes containing exposed films at your office paying first class postage on both. These were addressed to McVicar Photo Service, Madison, Wisconsin. Films which belonged to this State Geological Survey were being mailed in for development at my home. I am informed that the inside metal container from one of the tubes was lost in transit doubtless due to the dry weather causing the cover to unscrew. This container is about 4 by $1\frac{1}{4}$ inches with a screw cap. It contains one $2\frac{7}{8}$ " by $4\frac{7}{8}$ " Agfa film. Since not many such films or containers are usually in the mail it occurred to me that it ought not to be hard to trace this lost inside. It expect it fell out either in your office or on the train. Could you kindly do what you can to trace this shipment? Please address reply to me at State Geological Survey, Urbana, Illinois.

Very truly yours,

F. T. Thwaites, Associate Geologist, State
Geological Survey

Whitmoore Hotel Annex,

119 S. Elliott St.,

Olney, Illinois,

July 31, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

We moved to this location Sunday afternoon after finishing odds and ends of Wayne County on Saturday. So far it has proved a very good and cheap place to stay.

Richland County is now nearly done. We traced a coal-limestone horizon throughout most of the county but the trouble is that the limestone is mostly absent. Southeast of here they have up to 9 feet reported although it is very variable in thickness as well as in distribution. If total reserves reach 75,000 yards it is more than I expect. Today we spent with Mr. Phillips, the County Highway Superintendent, in checking alleged gravel locations. They were all no good whatever. I am afraid that this county will not come anywhere near to Wayne County in gravel. The supposed moraine in the northeastern part of the county turned into a range of rock hills when we really got to it!

We expect to move to Flora Monday morning. Have an address of a private house there but have had no chance to go over to engage rooms so far.

Very truly yours,

F. T. Thwaites, Associate Geologist

Whitmoor Hotel, 119 S. Elliott St.,
Olney, Illinois

July 30, 1930

Dear Miss Nyberg:

Enclosed please find expense accounts for second half of July. Please excuse oversight in not initialing Utterback's accounts. Thank you for the expense blanks and address cards.

I am out of ordinary notebook paper both with and without the legend at the bottom of the page. About a half inch thick will probably carry me through the rest of the season. Please send me either or both kinds as soon as possible as I am using some other sheets instead.

Have never heard from the second roll of pictures. List was sent with it in inner container. Please save the containers for me as they are my personal property.

Very truly yours,

F. T. Thwaites, Associate Geologist

Brown Hotel,
Fairfield, Illinois,
July 25, 1930

Mc Vicar Photo Service,
723 University Ave.,
Madison, Wisconsin

Dear Mr. McVicar:

After many trouble, in getting films developed in Urbana or Chicago I have obtained permission to send my films to you as I did with the Wisconsin Survey. I am mailing ~~two~~ films under separate cover. Roll numbers are given on outside containers. Please number films and place same numbers on the prints. Mrs. Thwaites will call for both negatives and prints whenever they are ready. If you write me in regard to anything please do not address me here as I am on the move constantly. I will pay for the work when I return or Mrs. Thwaites can pay you from time to time. On second thought I see that you need not number anything but the negatives as Mrs. Thwaites will number the prints before sending them to me.

Very truly yours,

F. T. Thwaites, Associate Geologist

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

DL = Day Letter
NM = Night Message
NL = Night Letter
LCO = Deferred Cable
CLT = Cable Letter
WLT = Week-End Letter

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.

Received at

19A M 10

LAWRENCEVILLE ILL 1257P JUL 24 1930

F T THWAITES

BROWN HOTEL FAIRFIELD ILL

MALOTTS DRIVING ME FAIRFIELD THIS EVENING PLEASE RESERVE COMFORTABLE
ROOM

GEORGE E EKBLAW

124P

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M.M. LEIGHTON, CHIEF

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, ~~ASSOCIATE~~ GEOLOGIST

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

July 22, 1930

Mr. F. T. Thwaites
Browns Hotel
Fairfield, Illinois

Dear Thwaites:

I have your letters of July 15 and 17 and note your comments about the car and the tires and other matters.

With regard to the air pipe from the cleaner to the carburetor, I believe that you should have it replaced. It is true that as a car gets older there are a number of repairs which increase the expense but any that may have more serious effects should be taken care of as soon as noted and thus expensive repairs may be avoided.

Under separate cover I am sending you a copy of the print of the Mt. Vernon Southwest Highway Project for your reference. With regard to photographs, I think that we shall try out Duncan's again this year without any special instructions and see what sort of developing work he does. Of course, we shall caution them to use care. His printing work seems to be as good or better than Coe's. You may send an identification list with the films, and if the photographer follows it, it will not be necessary to bother you further but it may be necessary that you keep a duplicate list of titles so that if they fail to note your instructions you can identify the prints.

In accordance with the telegram which I sent you, I hope to spend Friday with you in looking over Wayne County. I do not know just how I can arrange to meet you yet and shall not know until I see Malott on Thursday. As soon as I see him I shall wire you with regard to getting in touch with you.

Sincerely yours,

George E. Ekblaw
Geologist in Charge
Section of Engineering Geology

Brown Hotel,

Fairfield, Illinois

July 22, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

In reply to your telegram of this afternoon we had planned to move to Olney on Friday having completed the survey of this county. However, we will await you here as you desire.

This county shows little of interest. There is a small deposit of limestone about two miles north of here but that is all we have been able to find or to hear of. Several of the Worthen localities are almost undoubtedly described incorrectly in the report. One was all sandstone and another all alluvial bottom and sandstone or till bluffs. Think the township was given incorrectly in this case and that the locality is really the one we visited. I collected a series of chips from glacial boulders at the bottom of a big cut bank on the Little Wabash as I thought that they would show the make up of the erratics below the zone of weathering.

Hoping to see you when we can talk over these matters in more detail,

Very truly yours,

F. T. Thwaites, Associate Geologist

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Received at

19A M 16

URBANA ILL 323P JUL 22 1930

F T THWAITS

BROWN HOTEL FAIRFIELD ILL

AM PLANNING TO SPEND FRIDAY WITH YOU AT FAIRFIELD LETTER FOLLOWS

SHALL WIRE LATER IF NECESSARY

GEORGE E EKBLAW

342P



School of Mines and Metallurgy
UNIVERSITY OF MISSOURI
ROLLA

DEPARTMENT OF
GEOLOGY

July 19, 1930

Dr. F. T. Thwaites
Fairfield, Ill.

Dear Dr. Thwaites:-

I have just received your letter and wish to thank you for your comments on the basal Oneota contact.

As you doubtless know, I also am a bit unorthodox, and in spite of everything I have recently been able to get a few of my unorthodox ideas accepted, by the most unorthodox of all. I shall bear your statements in mind when I write up my discussion of the Cambro-Ordovician contact.

With many thanks,

Yours truly,

J. Bridge

$$\text{\$13,000,000} \times 50\% = \text{\$6,500,000}$$

Apportionment of Gasoline Tax to Counties on Basis of Automobile Fees Paid in.

County	Per Cent	Amount	County	Per Cent	Amount
Cook	37.63	\$2,445,950.00	Livingston	.78	\$50,700.00
Adams	1.09	70,850.00	Logan	.52	33,800.00
Alexander	.26	16,900.00	Macon	1.35	87,750.00
Bond	.26	16,900.00	Macoupin	.81	52,650.00
Boone	.31	20,150.00	Madison	2.01	130,650.00
Brown	.15	9,750.00	Marion	.60	39,000.00
Bureau	.84	54,600.00	Marshall	.25	16,250.00
Calhoun	.11	7,150.00	Mason	.35	22,750.00
Carroll	.40	26,000.00	Massac	.14	9,100.00
Cass	.33	21,450.00	McDonough	.56	36,400.00
Champaign	1.33	86,450.00	McHenry	.78	50,700.00
Christian	.70	45,500.00	McLean	1.41	91,650.00
Clark	.37	24,050.00	Menard	.22	14,300.00
Clay	.25	16,250.00	Mercer	.38	24,700.00
Clinton	.32	20,800.00	Monroe	.23	14,950.00
Coles	.64	41,600.00	Montgomery	.62	40,300.00
Crawford	.48	31,200.00	Morgan	.56	36,400.00
Cumberland	.17	11,050.00	Moultrie	.24	15,600.00
DeKalb	.73	47,450.00	Ogle	.63	40,950.00
DeWitt	.34	22,100.00	Peoria	2.16	140,400.00
Douglas	.36	23,400.00	Perry	.33	21,450.00
DuPage	1.37	89,050.00	Piatt	.33	21,450.00
Edgar	.50	32,500.00	Pike	.42	27,300.00
Edwards	.17	11,050.00	Pope	.07	4,550.00
Effingham	.33	21,450.00	Pulaski	.16	10,400.00
Fayette	.32	20,800.00	Putman	.11	7,150.00
Ford	.35	22,750.00	Randolph	.43	27,950.00
Franklin	.87	56,550.00	Richland	.26	16,900.00
Fulton	.85	55,250.00	Rock Island	1.57	102,050.00
Gallatin	.13	8,450.00	Saline	.49	31,850.00
Greene	.34	22,100.00	Sangamon	1.74	113,100.00
Grundy	.38	24,700.00	Schuyler	.22	14,300.00
Hamilton	.14	9,100.00	Scott	.17	11,050.00
Hancock	.58	37,700.00	Shelby	.47	30,550.00
Hardin	.05	3,250.00	Stark	.24	15,600.00
Henderson	.16	10,400.00	St. Clair	2.14	139,100.00
Henry	.95	61,750.00	Stephenson	.80	52,000.00
Iroquois	.73	47,450.00	Tazewell	.26	16,900.00
Jackson	.56	36,400.00	Union	.26	16,900.00
Jasper	.21	13,650.00	Vermilion	1.50	97,500.00
Jefferson	.44	28,600.00	Wabash	.24	15,600.00
Jersey	.18	11,700.00	Warren	.53	34,450.00
JoDaviess	.41	26,650.00	Wayne	.26	16,900.00
Johnson	.13	8,450.00	White	.27	17,550.00
Kane	2.11	137,150.00	Washington	.28	18,200.00
Kankakee	.81	52,650.00	Whiteside	.89	57,850.00
Kendall	.23	14,950.00	Will	1.67	108,550.00
Knox	.96	62,400.00	Williamson	.86	55,900.00
Lake	1.54	100,100.00	Winnebago	1.91	124,150.00
LaSalle	1.70	110,500.00	Woodford	.43	27,950.00
Lawrence	.41	26,650.00			
Lee	.68	44,200.00			
			TOTAL		\$6,500,000.00



AUTOMOBILE RECORD SHEET

Place	Date	Odo- Meter	Gasoline		Oil		Repairs, parts, tires, labor charges, etc.	
			Gal.	Cost	Qt.	Cost	Item	Cost
Abingdon	1929 May 1	11065	4*	.96		.25	1 Grease .20, 1 gal. cleaning gas .24	.44
Bushnell	2	11109	5	1.19		.50	Lock nut for rt.ft.wh.	.10
Astoria	3	11142	3	.75		.50		
Rushville	4	11195			4	1.00	Grease in speedometer	.60
Havana	5	11242	4					
Winchester	10	11321				.50		
Whitehall	11	11353	6	1.30				
Carrollton	12	11418	4	.88				
"	13	11513	5	1.10				
"	14	11563					Bolts and washers for	
"	15	11596	5	1.10		.50	end gate fasteners	.10
Jerseyville						.50	Recharge battery	1.50
"		11667	3	.69		.50		
"	16	11731					Casing	8.00
			39	8.97	4	1.00		10.74
		11065	5*	1.10			*Gas in tank	
							Total cost	23.36
		66634		7.87			Total cost per mile	3.5
							Miles per gal.gas	19.5
							Miles per quart oil	166.5
							operation cost = Total - repair	

Reported by

Car No.

Engine No.

License No.

Type Car

CASING RECORD

Casing			Mileage			Remarks
Make	Number	Location on car	Last total	For period	Grand total	
Perfection	All4039	Spare	None	None		Good
U.S.	1260312-0	R.Front	1165	666	1831	"
"	1313785-0	L.Front	1165	666	1831	"
"	1316117-0	L.Rear	1165	666	1831	"
"	1313829-0	R.Rear	1165	666	1831	"

GENERAL REMARKS

(2933-200-8-28)

No grease needed in differential 5/15/25

UNLOADED RECORD SHEET

INSTRUCTIONS FOR AUTOMOBILE RECORD SHEET

(See sample attached)

An accurate record is required by the Survey, in spite of the trouble involved, because it is necessary for us to demonstrate to State officials the economy of their use and their effectiveness, because an accurate record is desirable in determining when a car is beginning to deteriorate, and because a record is needed as a basis for determining proper appropriations to be sought and suitable allotments to be made for each field party.

Study of costs by each driver, and in the office, may suggest immediate overhauling or replacement of cars which are making bad records, and the office needs a complete record of important repairs and renewals to each car from year to year, as a guide to further repair work.

The record of tire casings will indicate whether they meet the guarantees of the makers, and will guide future purchases.

Speedometer reading should govern application of oil and grease at proper intervals.

1. On receiving a car, record the date, speedometer reading, amount of gasoline in the tank, and the number of each tire casing in service or in reserve. Note also that necessary tools are provided. Inquire as to time when oil and grease should be applied.

2. Subsequently, record in the appropriate column each purchase of gasoline and cylinder oil; and every expense for storage, labor, new parts, grease, kerosene, or other purpose; and record also place, date, and speedometer reading. Labor charges should specify the kind of work done. Place items for a single date on the same line if possible without crowding.

Record each casing change and repair on

the back of the record sheet but also place cost items, if any, on the front.

If speedometer stops during travel, record the fact, and make careful estimate of mileage until it is repaired. Take the first opportunity to fix it.

3. A record sheet must accompany each field expense account. It should include all bills incurred during the period of the account and agree as to auto expenditures in the account. While a single receipted bill with the account may cover storage or repairs on several dates, the items should be spread in their proper places on the auto record sheet.

The finished record sheet should show total for miles traveled, quantity and cost of gasoline and of oil, and for repair items. Gasoline in the tank should be deducted, and computation be made for miles per gallon of gasoline and per quart of oil; also for total cost per mile. The miles traveled by each tire casing during the period should be computed from speedometer readings and from estimates, if speedometer was out of order at any time. Unusual mileage per gallon, or repairs, or accidents should be explained on the back.

4. Initial data as to speedometer, gasoline on hand, and tire numbers should be entered on a new sheet before the finished sheet is sent to the office.

5. By special arrangement, the Ford Motor Company authorized all authorized Ford dealers to allow discounts on all parts sold, as per letter attached.

6. Field men are directed to observe all state and local traffic regulations. They will remember that the Survey's local reputation is in their keeping and may be injured by auto accidents due to careless or fast driving or by not keeping the cars clean and in good repair.

freight to S. prepaid

STATE GEOLOGICAL SURVEY DIVISION

Urbana, Illinois

INSTRUCTIONS TO FIELD MEN

Field men will please note the following and govern themselves accordingly: -

1. Address all mail to The Chief, State Geological Survey, Urbana.
2. Requests for supplies should be made in separate letters, and not included in letters reporting progress, or asking for instructions. This will insure prompt attention to such requests.
3. Postage cannot be included in expense accounts. When expense accounts are sent in, a statement should be attached showing amount of postage used to date, and stating what denomination stamps are desired in return.
4. All letters and packages sent to the field are numbered consecutively beginning with 1. If a number fails to reach you, notify the office promptly so the item can be traced.
5. Expense accounts may be sent in once or twice a month as desired. The account for the first 15 days of the month should be mailed as soon after the 15th as possible; that for the last half of the month on the first of the following month or as soon thereafter as possible.
6. Service reports on formal blanks provided for that purpose are to be sent in the first of each month. Occasional detailed reports semi-monthly or monthly, of field accomplishments and the status of field problems are requested, together with recommendations for furthering their solution, if such steps involve unusual procedure or extra cost.
7. In cases where it seems likely that a survey man may more easily obtain assistance and information by supplying certain publications to persons interested, it is permissible to request the Survey to send such persons complimentary copies of bulletins, reports of investigations, press bulletins, list of publications, and also paper copies of the base, geological, index, and county maps. Such offers, however, should be made sparingly, and in no case should they include farm maps, post office maps, and quadrangle maps.

8. If it becomes absolutely necessary to travel outside the State, notify the office in advance if possible, so that permission can be obtained from Springfield before the expense account covering the trip is sent through.

9. Address cards should be sent in promptly with dates far enough ahead to insure receiving supplies without unnecessary delay. Give your rooming house or hotel address whenever possible. Remember mail takes 24 hours to reach the office so that addresses for at least three days are necessary. Always go to Western Union for telegrams immediately upon arrival - also to the post office, in case your mail has been sent in care of general delivery.

10. Make note of any new shipping coal, fluorspar, or clay mines; sand and gravel pits; quarries; brick and tile, pottery, and cement plants; oil or water wells, obtaining name of operator and exact location by section, township, and range. Whenever possible, secure logs of wells drilled recently. If new exposures of geological formations come to your attention which may be of special interest to the Survey in some other line of work than yours, kindly report same.

*Do not
use samples*
11. When samples etc. are sent in to headquarters, a shipping notice should be mailed notifying that shipment has been made. Please send all shipments of samples by freight, either collect or prepaid. Express should not be used unless there is urgent need for the material.

12. The Survey has consistently followed the practice of withholding all new information of an economic nature until published. Field men are directed to jealously and diplomatically guard this policy. The privilege of using any Survey data in papers to be published outside of Survey bulletins or for presentation at meetings is to be arranged for in advance with the Chief.

STATE GEOLOGICAL SURVEY DIVISION

Instructions for making out automobile expense accounts

1. Automobile expense accounts are divided under two headings: "Supplies and Expenses" and "Repairs". Each of these subdivisions are made on separate sheets, in triplicate. "Supplies and Expenses" includes batteries, charging of same, licenses, fuses, fuse plugs, spark plugs, lights, water, gasoline, oil, grease, storage, casings and tubes, washing car, etc. "Repairs" includes repair work of all kinds. Only such items as cover actual break-down of parts should be included in this classification.
2. All expenditures - no matter how small - for automobiles must be accompanied by receipts. ✓
3. All receipts must be numbered and the numbers indicated on the expense sheet.
4. All automobile expenditures are listed in the "incidental" column. It is merely necessary to give the date of the receipt, the location, and then show the total in the "incidental" column. (See Samples No. 1 and 2). Receipts should show all details. If any item seems to demand an explanation, put it in the form of a footnote.
5. Purpose of the trip should be indicated the same as for ordinary traveling accounts.
6. "Headquarters" is the same as for ordinary traveling accounts.
7. Auto expense accounts must be initialed by the head of the party as in the case of ordinary traveling accounts.
8. All automobile accounts when submitted must be accompanied by an automobile record sheet. No accounts will be passed for payment unless the latter is sent with it. (See Sample No. 4). Casing record on back of sheet must be filled in properly.
9. Casings and tubes will be sent from Urbana. Make known your requests as far in advance as possible. If an emergency purchase becomes absolutely necessary, indicate on the receipt that such is the case.

STATE GEOLOGICAL SURVEY DIVISION

Hints for making out expense accounts

1. In column under transportation place initials of railroad under line following the description of the trip.

2., Under taxi, bus, and car items, do not write explanation in the item column, but state what conveyance was used, and in case explanation seems needed put it in the form of a footnote.

3. In the column for meals and lodging under location, do not add details, such as "B 27th to N 30th inclusive", but give name of town and number of sub-voucher which gives details. In this column use the abbreviations B. D. and S. H. is to be used for either hotel or boarding house receipts. (See Sample No. 3).

4. Do not write into the item column under incidentals long explanations such as "Baggage transfer Big Four to I. C." But simply say "Baggage", or if a longer item seems necessary put it in the form of a footnote.

5. Detailed purpose of the trip should always be indicated on expense accounts.

6. "Headquarters" means the place from which travel is paid. In the case of permanent employees who reside here, this means Urbana. In the case of temporary employees "Headquarters" is the town in Illinois from which travel is paid. Urbana is to be designated as "Headquarters" for U. S. Geological Survey employees engaged in cooperative work. Please note that expenses are not paid at "Headquarters" except in special cases.

7. All expense accounts must be initialed by the head of the party, this indicating general approval of the expenditures and of the form in which they are submitted.

8. All items of \$1.00 or over must be accompanied by receipts, except railroad fare. Pullman checks must be used for receipts. All receipts must be numbered, and number shown on yellow sheet, for example, R. #1.

9. All accounts must be made in triplicate. Make your accounts as neatly and legibly as possible. Accounts with errors will be returned for correction, which means a delay in their passage for payment.

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

July 18, 1930

BOARD OF NATURAL RESOURCES
AND CONSERVATION
M. F. WALSH, CHAIRMAN
GEOLOGY - EDSON S. BASTIN
BIOLOGY - WILLIAM TRELEASE
BOTANY - HENRY C. COWLES
ENGINEERING - JOHN W. ALVORD
CHEMISTRY - WILLIAM A. NOYES
STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

Mr. F. T. Thwaites
Browns Hotel
Fairfield, Illinois

Dear Mr. Thwaites:

It is customary for the head of each party to okeh his assistant's expense accounts. Will you kindly do this in the future in connection with Mr. Utterback's accounts.

Yours very truly,

E. J. Nyberg
Chief Clerk

As a rule, the identification sheets which accompany the sample, have been properly filled out with the exception of the location of the deposit. We would like this information in order to make our records complete and the identification slip should include the county, range, township, section and quarter section, and also the location of the deposit with respect to railroads or highways. The field man should also place his name on these slips along with his field report number.

Some of the pit run samples have been rather small. I would suggest that the men submit at least 75 pounds of the pit run material or approximately one cement sack full.

In case of the rock samples, if the quarry contains more than one type of rock, the sample should be large enough to permit us to make a wear test on each type. The sample then should contain at least thirty pieces $3\frac{1}{2}$ " in size from each type. The pieces should be as nearly cubical in shape as possible because from these thirty pieces we must obtain 50-1 to $1\frac{1}{2}$ " cubes for use in the tests. In some samples the pieces of rock were too thin to be of use. If the smaller pieces of rock are not available, it will be satisfactory to send in a smaller number of larger blocks.

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M.M. LEIGHTON, CHIEF

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, ~~ASSISTANT~~ GEOLOGIST

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

July 16, 1930

Mr. F. T. Thwaites
c/o Browns Hotel
Fairfield, Illinois

Dear Thwaites:

I am sending you under separate cover a mounted map of the Effingham highway strip. This is the last map of your set. We have just received ~~future~~ photographic prints for a highway strip southwest of Mt. Vernon. If you would care to have a copy of these prints for your information when writing your report, I shall be glad to send them to you. I am also sending you copies of Reports of Investigations Nos. 19 and 20. I am inclosing herewith a copy of an excerpt from a letter from Mr. Glover relating to samples and identification slips. You will please take note of this and follow his suggestions.

I am also sending you prints of the first film which you sent in. We sent these to Almer Coe & Company and upon return we had prints made from the negatives at Duncan's also. As far as I can see there is little difference between the quality of the work; if anything, I think Duncan's seems better as two of Coe's prints are spotted. On top of that Coe charges one cent more per print. In view of the fact that the quality of the work seems about the same and in view of Coe's excess charge, we have decided that we shall let Duncan do the work hereafter, provided, you agree that the difference does not warrant the trouble nor cost. We have no titles for these prints so that I would appreciate it if you would send us the titles sometime when you return them.

I wish to remind you again that you should send in address cards about four days before you expect to move from any place or at least send notice that you expect to move. We need four days' notice in order that mail from this office is not sent to you at a place where you have left as this necessitates forwarding and we have discovered by experience that we cannot rely on postmasters or lodging house keepers to forward mail. I also desire to have a few days' notice in order that I can take it into account when planning trips of visit. If you find that on account of weather or for other reasons you do not leave one place on the day that you notified us you would you can make the necessary change by telegraph. You may include on a single card both your own and your assistants name.

Mr. F. T. Thwaites
No. 2

I also wish to remind you again that you should take every possible care of the car and if there is even the slightest indication that something may be wrong with the engine or car you should have it inspected immediately. if You do not, serious trouble and expensive repairs may be incurred.

Cordially yours,

George E. Ekblaw

Brown Hotel,
Fairfield, Illinois
July 17, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

Yours of the 16th again crossed my semi-monthly report. Thank you for the maps and photos. I hardly think that a copy of the Mt. Vernon map would help. I saw it in the field and it is an area which is devoid of much interest. I could use it to correct boundaries of alluvial flats and hills but as I recollect there is not much of this in that map. However, if it is convenient I would not mind looking it over before I complete the map on which Utterback is now working.

I take it Mr. Glover's suggestions apply mainly to gravel samples. Guess I have been too short in location description having left that to the notes and reports. Will do better in the future but it must be realized that some thin bedded limestones will not give large pieces of rock.

With regard to the photographs I see that I will have much the same struggle as last year. The list was enclosed in the inner container with the film and contained explicit directions to be given to the photographer. Evidently this was not done. The directions were for the photographer to number the negatives before cutting up the roll. As I recall it Duncan charged double to do special work and then sent it to the wholesale developer who stuck some of the film together and reported the spoiled negatives as "lost." Coe was recommended by Dr. W. J. Mead who has had many years experience with photography. I know nothing of them myself. I will identify the prints and return them later. Please use your best judgment in this matter. If you prefer I can do all the identification here and then will not mail the lists. Please advise what you wish. I have not been taking many photographs but have taken much pains with the few I have.

If I notify the office four days in advance I can usually only give general delivery as an address in the next town. I will do this and then send another card with street address after we are settled. I asked Miss Nyberg for more address cards.

With regard to the car I have tried to take the same or better care of it than I would with my own car. The accident of Saturday was due to slipping of the distributor resulting in a very late spark. This was not picked up and Edwardsville despite a request to check the motor but was found after we got here by us. Evidently we blamed the heating, which was not bad at first too largely on the hot weather. Many cars I have had heated under

such extreme conditions. The 23 Buicks always fired after the spark was turned off if driven hard in warm weather and the Chevy did not do this so I was not alarmed. Too bad it happened and we will watch more carefully in the future. The tire which we scrapped yesterday had a tack in it and was going flat when we discarded it. In two places it was down to the last layer of cords so I thought it very unsafe to use it longer. It only cost 25 cents to fix the muffler but we really should replace the air pipe from the cleaner to the carburetor. The trouble is that an old car means a lot of expense if every little thing is fixed so one gets more or less careless. It is running fine now and making better gasoline mileage.

We may move to Olney as early as Friday of next week but cannot be sure as yet. This county does not show much of interest so far but we have one report of limestone which has not been checked as yet. We are trying to get through with reports before it turns too hot again.

Very truly yours,

F. T. Thwaites, Associate Geologist

Brown Hotel,

Fairfield, Illinois

July 15, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

This is to inform you that we reached Fairfield safely about 10 Sunday night. Monday morning started with another accident when the battery carrier broke. This once can be charged to age only as we are sure we did not hit anything. Today we struck one side of a broken-down bridge or rather a large culvert and this knocked off the muffler. So accidents seem to come in bunches! Otherwise work has been going well and we have a good start on Wayne County. I do not think we will find much road material there but today discovered a peculiar constriction of Horse Creek Valley which we will investigate more thoroughly tomorrow. I intend to scrap the much-worn rear tire in time to prevent a serious accident which might easily happen if we ran it until it blows out. The cords have worn nearly all the way through so that I think the decision is justified on the grounds of safety.

Very truly yours,

F. T. Thwaites, Associate Geologist

Brown Hotel,

Fairfield, Illinois

July 15, 1930

Miss Nyberg,

State Geological Survey,

Urbana, Illinois

Dear Miss Nyberg:

Enclosed please find some of the expense accounts for the first half of July.

Can you please send us some more address cards and more expense blanks as we have only 7 of these left.

Very truly yours,

F. T. Thwaites,

Associate Geologist

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

July 7, 1930

Mr. F. T. Thwaites
Washington Hotel
Nashville, Illinois

Dear Mr. Thwaites:

For your information I wish to advise you that
your account for personal expenses for the last half of
June totaled \$30.66 instead of \$33.06.

Yours very truly,

E. J. Hyberg
Chief Clerk

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

July 7, 1930

BOARD OF NATURAL RESOURCES
AND CONSERVATION
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CHEMISTRY - WILLIAM A. NOYES
STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

Mr. F. T. Thwaites
Washington Hotel
Nashville, Illinois

Dear Mr. Thwaites:

I am planning now on visiting you Saturday, July 12. I shall be with Foster at Marion on Friday, July 11, and I shall have him take me to Mt. Vernon Friday evening. I believe that we can make our connections best if you will plan to be there Friday evening and spend Friday night at Mt. Vernon. Then we can leave Mt. Vernon Saturday morning and drive westward.

Cordially yours,

George E. Eckelau
Geologist in Charge
Section of Engineering Geology

Washington Hotel,
Nashville, Illinois

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

Yours of June 30th crossed my montly report mailed this morning. We found no rooms in private houses in this town also no waterworks but this hotel is fairly good and reasonable in price.

In regard to ice direction I have been able to get no definite data. In Jefferson County we found a fossil in the till which I think is a Trenton coral. This would indicate a movement from the northwest. I have several times suggested a Kansan invasion from the northwest followed by an Illinoian advance from the north or northeast. Movement toward the west would be expected along the west side of the State. I have tried to look out for whatever glacial data I could see but have found little in the way of good drift exposures so far.

We can meet you at Mt. Vernon or wherever you wish. With regard to going over some of Jefferson County I thought that we might search again for some of Englemann's limestone localities. There is little of interest in glacial geology in the county. There is almost no sand or gravel in the drift. Some exposures of limestone and coal near the west line might be interesting and would not take long to visit. I went over the county fairly thoroughly and except for some of the limestone localities can think of little for which it would be worth while to go back again unless you specially desire to see the country yourself.

Thank you for the tentative schedule. It is just about what I had in mind as you will note that I planned to leave here about the 12th.

We visited the Radom limestone quarry today, the largest we have seen thus far. I think you would like to see it if you have not done so already. We are concentrating on the Shoal Creek limestone just now. At the present moment Utterback is busy checking the Englemann localities so as to eliminate the Byrne locations which have proven almost all mistakes in location. Guess maybe he got mixed on townships or counties.

Very truly yours,

Associate Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

SECTION OF ENGINEERING GEOLOGY
GEORGE E. EKBLAW, GEOLOGIST IN CHARGE

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

June 30, 1930

Mr. F. T. Thwaites
Washington Hotel
Nashville, Illinois

Dear Thwaites:

When I made a visit with Dr. Apfel last week I learned that he had discovered some data which point strongly to a lobe of Illinoian ice moving from the east and there are other data which support this view. I wish that in your work in southern Illinois you would be alert to observe any data that will serve to confirm or contradict this suggestion of a westward moving Illinoian lobe or partial lobe.

I expect to visit you sometime during the week of July 7-12, probably after having spent a day with Foster. As I am now planning it I shall have Foster take me to Mt. Vernon in the evening and shall expect you or your assistant to meet me there. As I have not gone over Jefferson County with you I am wondering whether we should plan on spending a little time there. Of course, I know the county in a sketchy way from my work in 1921, but if you have uncovered any interesting data there I think that I should like to look it over again with you. Otherwise, we could plan on going direct to Nashville and running over Washington County.

I am pretty sure that you are going to find some interesting things in Washington County and in the southeast corner of St. Clair County. I know that there are some morainic features in that county and in view of the phenomena I saw when I was with Apfel last week these features may become even more important in our interpretation of the glacial geology. I should like to have your opinion about the material in Jefferson County, especially as to whether you think it would be worth our time to spend a half day or day driving over the county. I do not know whether you made a copy of the tentative itinerary I made in planning your assignment this summer. It is as follows:- Jefferson County (remaining part) 1 week; Washington County (including SE. corner St. Clair) 2 weeks; Wayne County 2 weeks; Richland County 1 week; Clay County 1 1/2 week; Jasper 1 1/2 week; Effingham County 1 1/2 week; Cumberland County 1 week.

Cordially yours,

George E. Ekblaw

Washington Hotel,

Nashville, Ill.,

July 1, 1930

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

This is to inform you that we finished Jefferson County last Saturday afternoon and started at once on Washington County. Work is much more of a pleasure with the Chevrolet than it was with the Ford truck and is going along well. Utterback has proved a very satisfactory assistant.

Two things have been bothering me. First we have failed to find any trace of a large number of Engleman's limestone localities. Weller suggested that post-human aggradation of stream bottoms might account for many such failures. Another thing which occurs to me is that many of his outcrops were just "tumbling blocks" as he called them and were probably glacial float. In other cases I think locations were wrong and landmarks have been changed. Second, we find no trace whatever of many outcrops of limestone listed in this county by Byrne last year. Many such locations fall in open fields where no outcrop is possible. I do not recall where he got this information so can form no opinion as to the cause of the trouble. Any suggestions will be appreciated.

The report on the south half of Jefferson County is in rough draft and will be mailed to you at an early date. I do not think that this county will take long once we get the matter of the reported limestone localities out of the way.

Very truly yours,

Associate Geologist

MEMO TO DRIVERS OF STATE OWNED CARS

June 28, 1930

The following paragraph is being added to Revised Instructions to Travelers, State of Illinois, Section 8, Special Conveyance:

"When State owned automobiles are used, it will be necessary to submit with each expense account for gas and oil, speedometer readings for the period covered in the expense account."

This new ruling will be effective on expense accounts after July 1, 1930.

Please be guided accordingly.

M. M. Leighton, Chief

BOARD OF COMMISSIONERS

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GLENN FRANK, PRESIDENT

PRESIDENT OF THE UNIVERSITY OF WISCONSIN

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STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

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PRESIDENT OF THE WISCONSIN ACADEMY OF
SCIENCES, ARTS, AND LETTERS

State of Wisconsin

GEOLOGICAL AND NATURAL HISTORY
SURVEY

MADISON, WISCONSIN

E. F. BEAN

DIRECTOR OF SURVEY AND STATE GEOLOGIST
OFFICE, SCIENCE HALL

GEOLOGY DIVISION

H. R. ALDRICH

ASSISTANT STATE GEOLOGIST
OFFICE, SCIENCE HALL

NATURAL HISTORY DIVISION

E. A. BIRGE, IN CHARGE

C. JUDAY, BIOLOGIST
OFFICE, BIOLOGY BUILDING

SOIL SURVEY DIVISION

A. R. WHITSON, IN CHARGE
OFFICE, SOILS BUILDING

June 23, 1930

Mr. F.T.Thwaites
Hotel Emmerson
Mt. Vernon, Illinois

Dear Mr. Thwaites:

Am enclosing here with a blank form which must be filled out by all persons on the Survey pay roll. If the Medical Certificate on the last page can be filled out without too much inconvenience, this should be done by those who are new employees. All those who have been in the employ of the Survey for one season or more need not fill out this certificate. All of these applications should be returned to this office as promptly as possible.

Very truly yours,

WISCONSIN GEOLOGICAL SURVEY

By

E. F. Bean
4

EFB GH

Director

ALBERT FLESCH, PRES.

PHONE HARRISON 4108

CENTRAL CAMERA COMPANY

CAMERAS, KODAKS AND PHOTOGRAPHIC SUPPLIES

230 S. WABASH AVENUE, NEAR JACKSON BLVD.

CHICAGO, ILL.

SOLD TO F. T. Thwaites

DATE 9-12-29

* Illinois State Geological Survey

ORDER NO. _____

716 E. Main St., Mt. Vernon, Ill.

SHIPPED VIA _____

1	2 " Square filter
---	-------------------

P.P.& Ins.	2	10
		05

2 10

05

2 15

Paid	3	00
------	---	----

3 00

Refund	85
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85

Science Hall,

Madison, Wisconsin,

Sept. 19, 1929

Central Camera Co.,

230 S. Wabash Ave.,

Chicago, Illinois

Gentlemen: Please find attached the 2 in. square filter "C" which you mailed me last week. As mentioned in my letter from Mt. Vernon, Ill., where I was working, I used this for a few experimental pictures but will not be able to use it permanently because the holder for square filters is not satisfactory for field work. As mentioned then I desire to exchange this filter for a "C" in cell 1 5/16 inch diameter. As the cost of this is higher I am returning herewith the check for balance which you sent. Please let me know when I can expect the other style of filter. Please mail it to me at SCIENCE HALL, MADISON, WISCONSIN.

Very truly yours,

F. T. Thwaites,

Department of Geology,

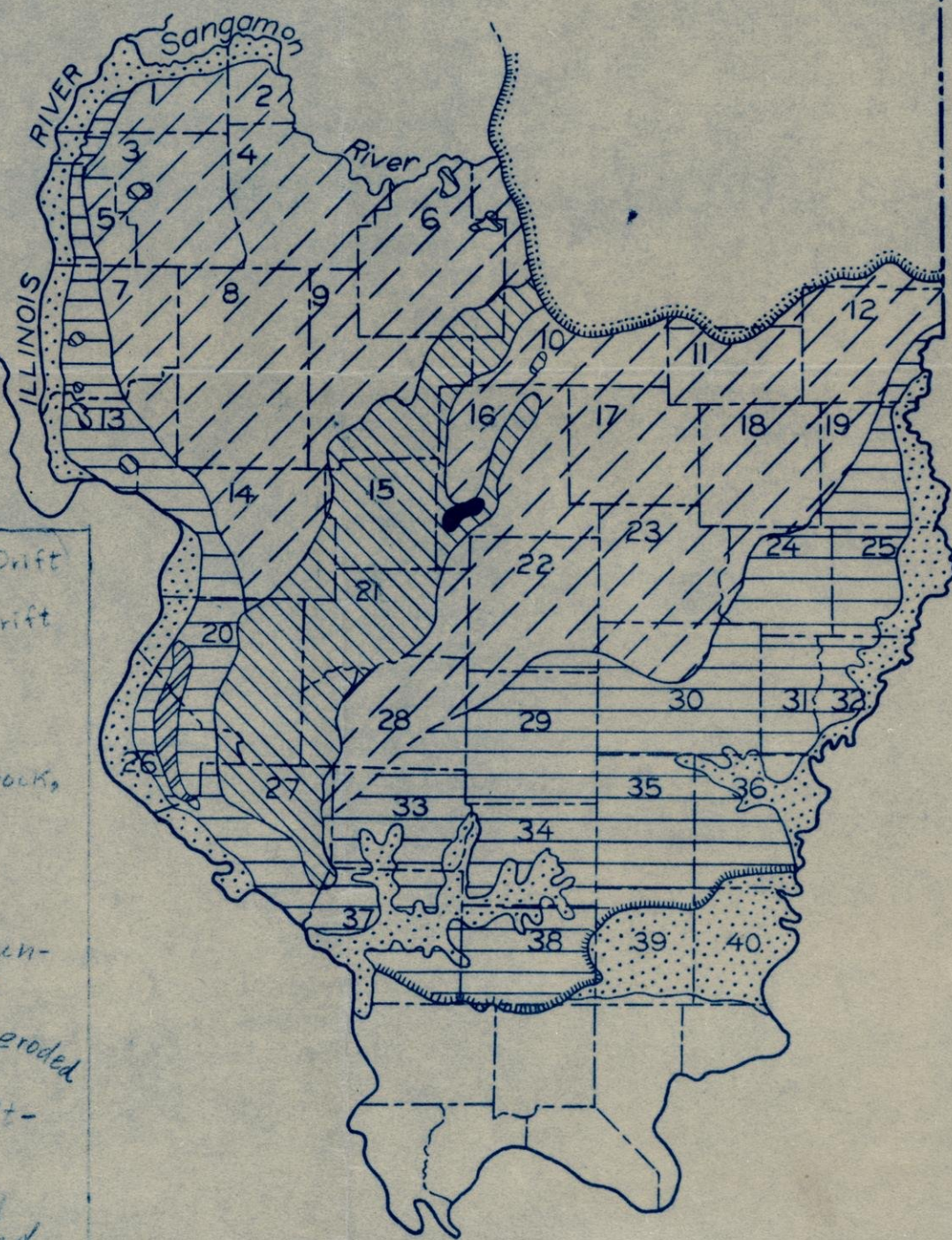
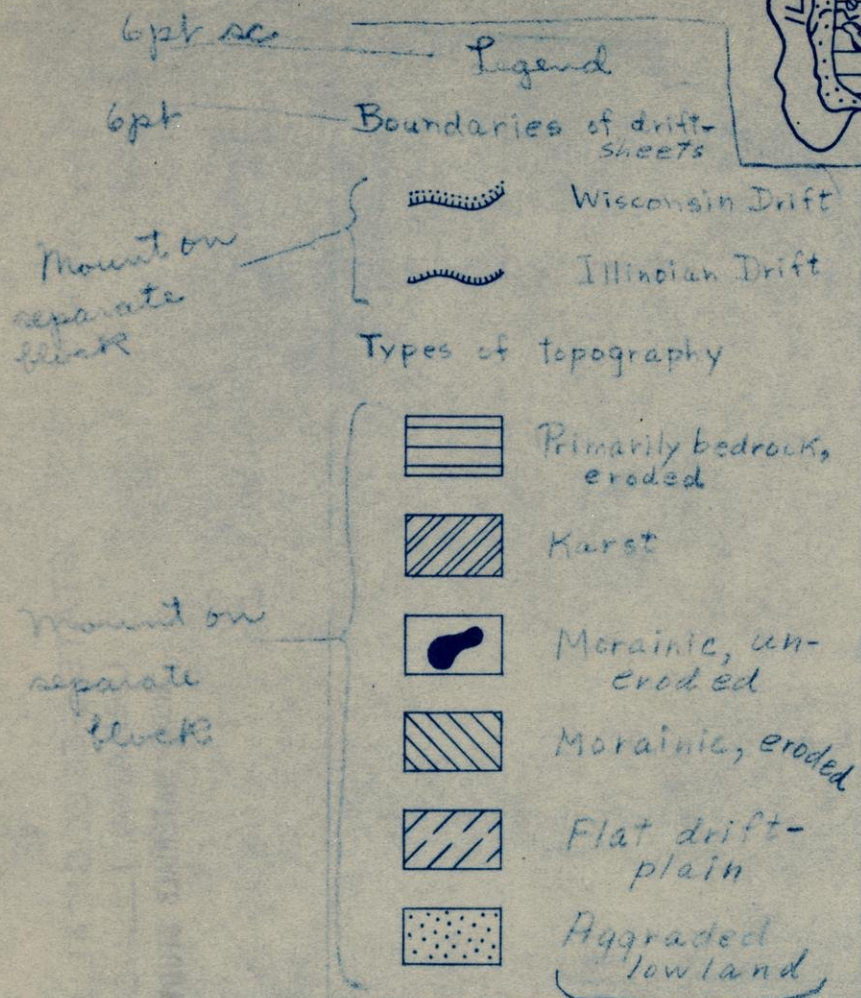
University of Wisconsin

STATE GEOLOGICAL SURVEY
URBANA, ILLINOIS
ROAD MATERIALS STUDY

10 0 10 20 30 40 50 Miles
Scale

Legend to be set up by printer.
Pencil boundary is only for guide in
mounting, showing slight on black-
it is not to be reproduced.

Reduce to 5 inches



Index to counties)

6 pt sc

1 Cass	9 Montgomery	17 Effingham	25 Lawrence	33 Perry
2 Menard	10 Shelby	18 Jasper	26 Monroe	34 Franklin
3 Morgan	11 Cumberland	19 Crawford	27 Randolph	35 Hamilton
4 Sangamon	12 Clark	20 St. Clair	28 Washington	36 White
5 Scott	13 Jersey	21 Clinton	29 Jefferson	37 Jackson
6 Christian	14 Madison	22 Marion	30 Wayne	38 Williamson
7 Greene	15 Bond	23 Clay	31 Edwards	39 Saline
8 Macoupin	16 Fayette	24 Richland	32 Wabash	40 Gallatin

6 pt
Set in 6 columns
of type if possible

8 pt { Fig. 1. Index map showing distribution of the topographic subdivisions in the area covered by the Illinoian drift-sheet

716 East Main St.,

Mt. Vernon, Illinois,

Sept. 14, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: In terminating my work on road material during the season of 1929 I wish to herewith submit (1) report on the north half of Jefferson County, (2) map of north half of Jefferson County, (3) map of eastern Clinton County, (4) map of Marion County, (5) map of eastern Fayette County, and (6) uncolored strip maps as follows: (a) two portions of St. Elmo quadrangle, (b) Centralia reservoir, (c) highway project east of Salem, (d) highway project south of Salem, and (e) highway project north of Mt. Vernon. Although these ^{strip} maps have not been colored the data on them has been transferred to the county maps. Within the areas on county maps where the topography has been surveyed no symbols for topography have been shown. The portion of Marion County covered by the Centralia quadrangle is also included as no. 7. No legends have been placed on the strip maps except a reference to the county maps for explanation.

During the last two weeks of the season the same kind of work was done as before. Clinton County was completed on Sept. 3 and Jefferson County was begun on the following day. Delays by rain caused us to finish only the north half of the latter county. Despite the conclusion of Mr. Payne, the County Highway Superintendent, that there is no road material in Jefferson County we made a rather thorough search along the roads. This work served to confirm his assertion. Work was ended at noon, Sept. 14 so as to allow of time to complete maps and reports.

I desire to make the following recommendations for future work.

First: It seems to me that the adoption of a uniform system of symbols and

abbreviations would be an immense help. Such a system has been used on the Wisconsin Survey since about 1910. Second: Quadrangle maps should be mounted in eight section each 5 by 8 inches. Then they could always be kept with cloth outside and yet opened with only one motion. Alden used this system many years ago. For that matter it is best to mount all maps with an EVEN number of sections both ways. Some of the earlier maps prepared for this season had the sections much too close together to fold well. Third: The technique of caring for photographs in the office would still bear much improvement. Service from Urbana is of good quality as far as developing and printing goes but is miserable as to speed and accuracy of identification. I do not know just what the fault is but the results are not at all satisfactory. Other recommendations as to tools and equipment of the cars were contained in my letter of Sept. 1.

In leaving the service of the Illinois State Geological Survey I wish to express my appreciation of the kindness and cooperation shown both by you and others at the office. I hope that our work will prove of value both to road building and to science and that those who come after us will appreciate the difficulties under which it was done, the miserable the inaccurate base maps, roads, the necessary haste, as well as other drawbacks to life in Little Egypt and will not judge too harshly any shortcomings which their more detailed work may discover.

Very truly yours,

Associate Geologist

Langenfeld Hotel,

Centralia, Illinois,

September 1, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: In response to your verbal request I am sending herewith summary of our work during the past calendar month. In that time we surveyed all but a small part of the district assigned to me in Fayette County, report on which is enclosed, and all of Marion County, and a small part of the portion of Clinton County which I am to cover. In all over 900 square miles were looked over in this time. It is evident that such speed did not permit of following every ravine on foot but it is believed that all the important sources of road material have been found and investigated in such detail as the means at our disposal permitted. Fayette County contains several important gravel deposits the true value of which can only be ascertained by much more thorough exploration than we could make such as test drilling. The limestone deposits of this region, however, are worth very little if anything. In Marion County two areas of good limestone were found and one where the rock is of inferior grade. No gravel was discovered. Exploration of the limestone deposits before development must include testpitting and blasting out of faces neither of which we could do. With our inaccurate base map it was hard to locate all the small spurs where quarries might be located but the general nature of the deposits has been definitely ascertained. No good road material has as yet been found in Clinton County.

We expect to leave here for Mount Vernon in a few days but will let you know the date more definitely as soon as we finish our part of Clinton County.

In connection with this summary I would like to suggest that the garden spade with which we were furnished, however useful for its original purpose, has been of no good to us. I suggest that the scoop shovel also be exchanged for a real long-handled shovel and the spade also. Moreover, I suggest that a real pointed ditch-

diggers pick be substituted for one of the little coal-miners picks. An oak bar say a 2x4, as long as will fit in the box would often be useful in extracating the truck from holes in the so-called roads. The geological hammers might very well have longer handles although that is not as important as the foregoing points. A crowbar would also be very useful in getting our limestone samples, in fact it is impossible to sample some ledges without one. Please do no be offended at these suggestions but try to do a little digging in this hard ground after the dry weather and you will soon find why they were made! Another handy thing would be a few of the slip-on chains which you can put on while stuck in a mud-hole. Sometimes when the pairs of wheels are tilted in opposite directions the brakes set and you get stuck. Otherwise the Ford has worked well.

If not convenient to come down again I know of nothing important at present. I think I have evidence of a structure southeast of Centralia for we have a westward dip in one outcrop but test drilling would be needed to check this fact.

Very truly yours,

F. T. T.

Associate Geologist

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 10, 1929

Mr. F. T. Thwaites
716 East Main
Mt. Vernon, Illinois

Dear Thwaites:

Mr. Workman informs me that you studied the samples of an oil test well near Leaf River in Ogle County, Illinois. This well is located in the Oregon quadrangle, a report on which we are preparing for publication. The log of the Leaf River oil test appears to be the best record--in fact the only good record we have in the quadrangle--and we should like to publish this if it can be released. We note that the log is marked confidential and we wonder if you could arrange to have this released for our publication. The well was drilled by A. C. Phillips.

Cordially yours,

George E. Ekblaw
George E. Ekblaw, Geologist
Section of Engineering Geology

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 10, 1929

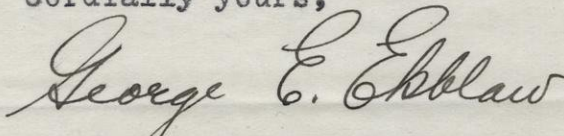
Mr. F. T. Thwaites
716 East Main Street
Mt. Vernon, Illinois

Dear Mr. Thwaites:

I was glad to receive your reports on the eastern Clinton and Marion counties. I have not yet read them in detail but I feel confident that they will be satisfactory for the immediate purpose.

In view of the facts that few localities are important and that I am already acquainted with the general terrain in which you have been working I shall follow your advice and not plan to make a trip to visit you this week. I shall be looking forward to talking things over with you next Monday.

Cordially yours,



George E. Ekblaw, Geologist
Section of Engineering Geology

Eakin Hotel,

Vandalia, Ill.

Aug. 14, 1929

Mr. E. T. Apfel,
2020 N. Walnut St.,
Shelbyville, Ill.

Dear Apfel: We have now finished our part of Fayette County and are planning on leaving here for Centralia on either Friday or Saturday morning. I spoke to them about the room and that will be reserved for you. We have been considerably delayed by rain and suppose that you also have been.

I had a letter saying that the Triax tripods have been sent to Urbana and hope that you get yours all right.

Hoping to see you again before our parties get too far apart,

Sincerely,

744

Eakin Hotel,
Vandalia, Ill.,
Aug. 14, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: We have now finished our part of Fayette Co. with the exception of a couple of hills west of Patoka which we plan to reach tomorrow. The limestone on Little Hickory near Old Loogatee fizzled out right where we left it. The rock on Dismal is mainly a firm sandstone but we took a sample from near the old quarry. We did find a couple of sand lenses in the till south of Vandalia but that was all. I seriously doubt the higher terraces along the Kaskaskia. The first draft of the report is done.

Another batch of photos with negatives came which had been injured in mailing. On thinking the matter over wouldnt it be better to send to films to Madison for developing and printing. I could get them done "special" there for half of what Duncan charges and more promptly besides which they know about numbering the films and whatever else I want. If it is all right to send this work out of the state I will do so.

We plan on leaving here either Friday or Saturday and going to Centralia. I will write for more paper when I get settled there.

Very truly yours,

F. T. T.

Associate Geologist

Private

ILLINOIS STATE GEOLOGICAL SURVEY
SUGGESTIONS AND INSTRUCTIONS TO NEW MEN UNDERTAKING
DETAILED QUADRANGLE STUDIES

I. Introduction

Reconnaissance studies have been essentially completed in Illinois and the geologic studies of quadrangles in which we are now seriously engaged, are a part of the Survey's effort to search the State for the detailed information now demanded by the specialized industries of our complex civilization.

It has been our experience in carrying on this part of the Survey's program that new men feel unfamiliar with the aims and administrative procedure of the Survey, as well as the geological problems which are now claiming the Survey's attention. The State auspices of the Survey require a careful accounting of all expenditures and use of equipment, and the activities of the Survey require a complete file of information and a systematic procedure in obtaining and preparing the data for the files and for publication.

It is believed that this memorandum will answer some of the questions raised by the above requirements, will economize time and effort expended in compliance with them, will produce a more complete and comprehensive report and geologic map of each quadrangle studied, will permit the Survey to render better service in giving information to the industries, and will advance the solution of our state-wide geologic problems. It has been most gratifying to note the splendid manner in which new appointees have endeavored to fit into the routine

of the Survey, have very generally made themselves a part of the Survey family, have applied their own technical training and initiative to the geologic problems they face, and have endeavored to look at their problems from a practical as well as purely scientific point of view.

The Survey acknowledges this cooperative attitude and invites suggestions toward perfecting the plan which is herein outlined for our quadrangle studies.

II. Preparation for the Field

Securing Equipment and Supplies

All equipment and supplies are to be secured from the Chief Clerk. These include cars, instruments, carrying bags, notebooks, maps, cameras, sacks for samples, expense books and blanks, office supplies, et cetera.

Expense records - You will also obtain from the Chief Clerk information as to what sort of automobile and personal expense records are to be kept. Three weeks should be allowed for reimbursement after submitting expense accounts.

Maps - For most parts of the State Photolithographic copies of topographic maps on the scale of 1:48,000 are generally satisfactory. If larger scaled maps are desired, enlargements will be made, upon request to the Chief Clerk.

Several copies of the map of an area are usually needed: one for the field, a second for a headquarters map upon which will be recorded the progress of mapping from day to day, a third for a headquarters map showing daily traverse and position of reference points, and a fourth to be reserved for an error map showing corrections of topog-

raphy and culture. Please notify the Chief Clerk in advance regarding how many maps you want mounted and how you want them cut to fold.

The working map may be dissected and mounted on cloth to be carried in the hand or bag, or mounted on notebook paper to be carried in the notebook, as preferred. If a 1:48,000 map is used, a quarter township will go conveniently on a page; if a 1:62,500, one-half township.

Before going to the field be sure that the Survey's system of enumeration for each township in a county is put on the maps in order that locations may be given according to the Survey's method (p.6). This is necessary in order that data in notebooks of various geologists may be located according to a uniform system and reference to them may be facilitated.

Notebooks - The Survey prefers loose-leaf notebooks, which it provides at your summer headquarters. You should also use a large binder of the same type, so that you may keep the larger part of your notes at headquarters and not carry them about the field.

Preliminary gathering of data at the Survey Office

The Survey usually possesses a certain amount of information, partly published and partly unpublished, about each quadrangle and this should be obtained before the party goes to the field. You may wish to take a small selected library with you to the field. If so, secure from the Chief Clerk a small carrier for the protection of the volumes. Consult the index in the Survey's List of Publications for published material, and obtain from the Technical Files Clerk unpublished data, such as well logs, mine notes, and portions of manuscripts, and publications which are out of print, such as the Worthen reports, of which excerpts are available. Confer with the Chief or

section heads regarding previous work which has been done in and adjacent to the area.

III. Field Work

General Information

Headquarters - It is generally advisable in quadrangle work to make field headquarters at a private house rather than at a hotel. In small towns, however, a hotel may provide the most satisfactory headquarters and may not be more expensive than a good room in a large town. It is generally possible to obtain quarters at \$20 per month or less. Headquarters should be close to the area of mapping.

Relations to the public - It is to the advantage of the Survey to have warm friends in the area where field work has been done. It is important that inquiries in regard to your work be answered courteously and to the satisfaction of the inquirer. Contact should be made with mine operators, clay workers, quarrymen, drillers, etc., residing in the area or operating some deposit in the area. Usually local information of much value can be secured from such contacts and particularly in respect to the economic resources.

Contact with Survey office - All field parties are expected to maintain close contact with the Survey office. Tentative field addresses for the receipt of telegrams should be handed the Chief Clerk before departure for the field, and complete residence, mail and telephone addresses should be forwarded to the office as soon as headquarters are established.

Holidays, Leaves of Absence, etc. - You may follow your own preference in observing legal holidays, but the Survey must be informed of any change of address to facilitate the transmission of important communications. Leaves of absence from regular work should, of course,

be arranged for any illness reported. Saturday afternoons are not regarded as holidays in the field and work on Sundays is not ordinarily favored.

Monthly reports - Forms for monthly service reports should be obtained from the office, filled out and mailed to the Chief promptly after the close of each month. These constitute the Survey's record of employment and the amount of time to be charged against the project. The report blank contains a diagram on which the progress of mapping may be indicated. The area mapped during the previous month should be hachured in pencil, the current month in ink.

Automobiles - All Survey cars should have the Survey name painted on them according to the form provided by the Chief Clerk. If, for any reason, this is not done before going to the field, it should be done as soon as possible after reaching the field. It identifies the Survey organization in the area, is a protection to the car and the equipment, and usually affords admission to property without question.

Repairs should be made promptly, and attention should be given to the appearance and effective operation of the car. Water in the battery, air in the tires, grease in the differential, transmission, and bearings, and tightening of loose bolts are matters that should have watchful attention. The cost records which you are requested to keep are very important. In most instances private garages are found to be more convenient and economical than public garages.

Accidents must be reported immediately to the Chief. Claims for damages should be referred to the Chief, and full explanations provided him.

The use of private automobiles on the mileage basis may be granted by special arrangement if a Survey car is not available.

Information to the Press - It is desirable that the local newspapers be given two or three news items regarding the work during the field season. Experience suggests that such items be prepared in writing by the geologist in charge and that they contain information of interest to the community without committing the Survey to any statement of policy. Clippings or copy of items should be sent to the office.

Confidential Information - It is very important that all economic information should be transmitted in writing, across the Chief's desk. Premature information on structures favorable for oil accumulation and other economic data should be avoided.

The Survey annually receives official detailed production data for all mineral products in the State, and hence you need not seek such information. No production figures are to be quoted unless they are totals for more than two operators.

Occasionally citizens possess geologic information, such as well logs, which they wish kept confidential. The Survey strictly honors their requests.

Taking Notes - Needless to say but important nevertheless, the prime requisites are that notes should be legible and that they should be complete in regard to all pertinent data. As a recorder of scientific information you should not attempt to "carry information in your head". A note in the notebook is worth two in the fog of one's memory.

Abbreviations - It should be borne in mind that the field notes will be probably consulted by persons other than the author, and therefore only common abbreviations should be used. A list of such abbreviations is herewith appended.

The Survey's Method of Locating Points - For locating points in notebook descriptions the Survey uses a coordinate system in which the townships of a county are numbered systematically according to the basic numbers in the Survey files. Assuming a location in Champaign County, Township number 8, and section number 9, the index number to the section would be 0809. Locations in sections are made by coordinates of $1/64$ of a section, each side of a section being divided into eight units. In other words, each forty acre-tract of a standard section is divided into four squares of ten acres each; these units are numbered and lettered as shown in figure 1; the location of point A would be given as 0809.7b; Point B, 0809.3h. It will be observed that the intercepts are read first on the x axis, using numerals, then on the

Date _____	T. _____	R. _____
Quad. _____	Part _____	
County _____	Index No. _____	

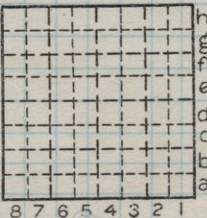


Figure 1
vertical or y axis, using letters.

It is emphasized that the reference numbers do not indicate exact positions. Outcrops are to be located precisely on the map and the index numbers are to be regarded as of assistance in identifying these points on the map. The notes should contain, in addition to the index number, additional information by which the outcrop will be more precisely located, as for example: so many feet from a school house or bridge or fork of two streams, et cetera.

The Survey provides notebook paper with location chart and blank form at the bottom of the page for giving the location (See Fig. 1). This permits only those notes on a page that pertain to a given section,

and requires that each note be preceded in the margin by the appropriate decimal index number.

Listing of Problems and Questions - It is desirable that you make a list of the active problems and questions that arise during the course of your work, and that you add to this list any information that contributes to their solution of these problems and any reference to notes that concern them. These problems should be all cleared as far as possible by field work before the end of the season.

Stratigraphy

Mapping - Most geologists prefer to spend at least one day in a rapid reconnaissance of the territory with an idea of learning something about the roads, the general "lay" of the land, the number and general character of outcrops, et cetera. It will then be possible to plan a systematic mapping. It is important that so far as possible mapping be advanced systematically and in compact areas so that there will be no tag ends and isolated unmapped areas to be finished up at the end of the season.

Because of the general mantle of Quaternary materials in the State, outcrop maps should be made for most quadrangles. However, there are areas in the Ozarks of southern Illinois, in northwestern Illinois, and elsewhere where the outcrops are so numerous that mapping the limits of the outcrops is not necessary.

The boundaries of outcrops and of geologic formations are to be drawn in the field. You should also place on the map as much detail as possible with a view of making it increasingly serviceable as the study progresses and also of having as large a mass of data as possible for preparing the final map.

It should be kept in mind that engravers require boundaries for guidance even where lines of contact are not definitely established and are not to be shown on the engraved map.

The headquarters copy of the field map should be kept up-to-date and available for inspection at any time. If there are not enough rainy days on which this work can be done, take a half-day off when necessary to bring it up-to-date.

Description of stratigraphic sections - The most important sort of observation and the one having the greatest permanent value is the detailed description of a stratigraphic section. Stratigraphic sections are best described by a sketch showing the relationships from the grass roots downward. Graphic notations greatly enhance a simple list of beds eventhough the important portion of the section makes up but a small part of the whole interval represented in the sketch.

Every stratigraphic section should be accompanied by notations in regard to the estimated or otherwise determined altitude of some definite horizon marker in the observed section. These notations should be made systematically.

Lateral variations in stratigraphy from place to place, involving unconformities, correlations, and lithologic changes, may be matters of observation or of interpretation. Your attack on problems involving these points should not be postponed until "some more convenient time", certainly not until the report is written. The section should be carefully described on the ground.

The degree of excellence of the record of a stratigraphic section usually determines the character of the final report and the value of the contribution to the Survey's fund of information. It is important, therefore, that the notations and diagrams be complete

CHART TO ILLUSTRATE THE DESCRIPTION OF WELL CUTTINGS

Kind of rock	Prominent modifying characteristics	Color	Size of grain	Minor characteristics	Additional
Sandstone	argillaceous calcareous dolomitic cherty carbonaceous bituminous glauconitic	color	$\frac{1}{16}$ mm. } very fine $\frac{1}{8}$ mm. } $\frac{1}{4}$ mm. } fine $\frac{1}{2}$ mm. } medium 1 mm. } coarse 2 mm. } very coarse	rounding (& frosting): round, subround, subangular, angular secondary crystals porosity - cementation: incoherent, friable, compact prominent grains: mica, feldspar secondary minerals	lamination geodes, druses concretions weathering caved material personal opinion
(Siltstone) Shale	sandy calcareous dolomitic carbonaceous bituminous glauconitic	color		firmness tough brittle weak plasticity prominent grains mica secondary minerals	lamination concretions caved material personal opinion
Limestone Dolomite	argillaceous silty sandy cherty siliceous bituminous oolitic glauconitic	color	(dense) <i>lithographic</i> grain: very finely- finely- medium- coarsely- very coarsely- crystalline granular	porosity compact porous vesicular fossils secondary minerals	lamination geodes, druses concretions weathering caved material personal opinion

and easily interpreted.

Compiling a standard columnar section - There should be a determined effort to obtain a standard columnar section of the outcropping rocks of the area. When this is finally accomplished, the various sections used in its compilation should be designated in the notes. Until the standard section is compiled, each section observed should be measured in detail. After it is compiled and the general succession is known, sections can be described by reference to the standard section to a great extent, although any differences should be carefully noted and particularly excellent sections should be adequately described.

Important graphic sections as, for example, sections used in the compilation of the columnar section or sections in which unusual or critical stratigraphic successions are exposed or which includes beds of economic importance, should be inked in, and colored if desired.

Description of sedimentary rocks - It is recommended that in describing sedimentary rocks, the Survey's schedule, proposed by L. E. Workman should be followed in general. Copies of this can be obtained by applying to the Chief Clerk. It is also recommended that reference be made to "Schedule for Field Description of Sedimentary Rocks", prepared by the Sedimentation Committee of the National Research Council as a guide for describing sedimentary rocks.

Physiographic Studies

Your report should contain an adequate treatment of the physiographic features of the area. This is an important phase of the assignment not to be overlooked. If possible, a map showing the topography of the bedrock and its relations to the present surface should be made for quadrangles in which drift covers the rock.

Collections

Fossil Collections - Each man should number his fossil collections by consecutive stations, irrespective of the limits of the area he is studying. This means that the collections made by one man will be numbered consecutively, possibly through a series of years. In addition to its individual collection number, each station should be designated by its location index number. Such collections should be duly referred to in the notes. It is suggested that those who are unaccustomed to making systematic fossil collections should consult with the Survey's paleontologist, Dr. J. Marvin Weller. Collections of all kinds are the property of the Survey unless officially released.

Discovery of localities where good collections of animal and plant fossils and coal balls may be made should be noted and, at the close of the season, forwarded to Drs. Weller and Noé.

Rock collections for examination and analysis - These should be labeled with station and index number as it appears in the notebook and on the map. Collections should not ordinarily be made for analysis that will involve considerable expense unless the matter has been taken up with the Chief. Notes should contain a careful description of the bedrock samples collected and a statement of the purpose for which they were collected.

Logs of drill-holes and shafts, and diamond-drill cores - Logs of as many reliable drill-holes as possible should be collected; these should be copied from written records if possible, but oral records may be satisfactory. Each well or shaft should be carefully recorded and the elevation of the surface should be determined. The care to be used in determining locations and altitudes depends upon

a number of considerations, as will be pointed out in another place, and if careful leveling is required, prepare for Mr. G. F. Moulton, Geologist in charge of Oil and Gas Section, a memorandum indicating the localities at which such levels are desired.

If diamond-drill cores are available, or if splits may be made so that the Survey can share in the core, or if core drilling is going on in the area or will soon be undertaken, collection boxes may be obtained by writing the office. If there is any question about the advisability of collecting cores, please communicate with the Chief. The Survey will pay freight charges. Express charges are usually too high, unless the shipment is very urgent.

If deep-well drilling is in process in the area, Mr. L. E. Workman, who looks after subsurface data, should be notified, and an attempt should be made to have the driller save well cuttings, as prescribed after conference with Mr. Workman, and keep a written record. The Survey supplies sample sacks and well-log books free of charge and will pay express on the cuttings.

Corrections in the Topographic Maps

Although every effort has been made to have the topographic maps accurate, it occasionally happens that small areas in a quadrangle are not correctly mapped. This is not always the fault of the topographers, because the detailed traverse necessary to obtain requisite data, especially in wooded tracts, would increase the cost of mapping beyond the allotment. Where such errors are discovered, and are not too numerous or concern too large areas, the following procedure should be followed.

1. Sketch the topography correctly and indicate the geologic data on the sketch. These sketches will be included as corrections

on the contour map published with your report.

2. Indicate on a special field map that you have for this purpose the areas in which the topographic errors occur and note the character of the error. This map should be submitted to the Chief at the end of the season for copying and forwarding to the U. S. Geological Survey.

3. If the engraved map of the quadrangle has not been published, notification and information concerning the errors should be sent to the Chief as soon as possible, in order that the areas can be correctly remapped before the engraved map is printed.

If the errors are numerous and concern large areas, the Chief should be notified, in order that steps can be taken for a topographic party to revise the map.

Corrections or revisions in the mapping of culture, such as roads, town limits, houses, subdivisions, etc., and of drainage can be usually made without much difficulty, but they should be noted and included on the corrected map.

Photographs

An adequate list of photographs of discreetly chosen subjects should be available for the report. Photographs of both geologic and scenic features should be taken; the Survey is especially short on scenic photographs. Please send your films to the office to be developed and printed and accompany them with your instructions. The plan of postponing the taking of all photographs until the close of the field season is not usually wise, on account of the weather hazard.

Progress Reports and Field Conferences

Progress reports - Progress reports should be sent to the

Chief at frequent intervals, not oftener than weekly nor more seldom than monthly.

Field Conferences - During the field season, new quadrangle geologists should plan for field conferences on (1) bedrock stratigraphy and coals; (2) Quaternary stratigraphy and Physiography; and (3) economic geology of non-fuel products. Usually, Dr. G. H. Cady should be called upon for (1); Dr. M. M. Leighton for (2); and Mr. J. E. Lamar for (3). Accounts of such conferences should be sent to the Chief.

Conferences with men who are working adjacent or near-by areas are encouraged.

Examination of Type Sections - If in the course of the field work, it appears desirable to visit type sections, located within the State or immediately adjacent to the State, this may be done provided the Chief is notified a few days in advance. Such inspections are encouraged for the sake of the valuable background that they afford. Travel outside the State, other than just across the line, requires special permission.

Economic Geology

The term economic geology is used here in the broad sense to include data on the possible economic mineral products or deposits of the area and data which may have a bearing on engineering projects now being undertaken or soon to be undertaken in the area.

Coal - If coal beds are present in the area, consult with Dr. G. H. Cady regarding those features which should be included in an economic report of them and the advisability of sampling them for analysis. It may be that the Survey already possesses adequate chemical data.

Petroleum Resources - Data pertaining to petroleum resources should also be gathered. For the purpose of reaching conclusions regarding possible occurrence of favorable structures, it is desirable to determine the structure with a considerable degree of precision. Locations and elevations should be obtained for as many points as possible, especially outcrops whose stratigraphic position is recognizable and wells, whether drilled for water, for oil, or for coal exploration, which penetrate pre-Pleistocene rocks and for which logs can be obtained. In case of regions where there are many outcrops it is not desirable to run elevations on an excessive number of points in one area, and judgment should be exercised in choosing points as well distributed as possible for running levels and for affording control on a structure contour map.

First the hand-level or barometer should be used for vertical control and traverses should be paced between points shown on the topographic maps for horizontal control. Then, if a structure favorable for oil is indicated, the planetable and alidade should be employed as a more refined method to check and amplify the less accurate determination of structure. The latter will be performed under the direction of Mr. G. F. Moulton, in charge of oil and gas studies, who should be notified as soon as practicable. He should be provided with a list of all points, adequately described, whose elevations are to be determined by planetable and alidade. Where structural datum points are relatively closely spaced, as in wells, outcrops, quarries, mines etc., say 25 or more to the square mile, it is desirable that a special map be prepared by the use of planetable and alidade on a scale of 2,000 feet to the inch or larger.

For purposes of filing, planetable sheets should be properly

labeled as to location (township, range, county), scale of map, names of instrument man and rodman, date of field work, and number of traverse notebook. Township and county boundaries should be indicated. Features like roads, streams, etc., that will aid in the future location of datum points in the field should be sketched in on the map. In the remarks column in the notes, a description of bench marks such as culvert, floor or bridge, step of building, ledge of rock, etc., should be given wherever convenient. Cross reference between notes and maps should be made. In the case of datum points on rock strata, a clear and unmistakable description of points used should be given in the geological field notes so that someone will be able to return later and find the points whose elevation has been determined.

When logs are collected, locations of the wells should also be included and elevations should be run. In areas where coal has been mined, detailed structure of the coal may be obtained for mines in which levels have been run. In planning underground work to obtain stratigraphic and economic information, it would be desirable to make observations on dips and faults at the same time with a view to making structure contour maps. In the case of mines for which levels have not been run, reliable information concerning the dips of the coal stratum in the mined area can usually be obtained from the mine superintendent or engineer, whose knowledge is based on the behavior of the coal cars and on the drainage of the mine. For the purpose of making a structure contour map of the mined area, these estimated grades should be entered on a copy of the mine map when they are received.

Non-Fuel Products - The Survey has a special section devoted to the investigation of non-fuel products of the State. In the geologic mapping of quadrangles and the preparation of reports, these mineral

products often do not receive full justice. There are five equally important principal points of interest, bearing on the value of a non-metallic mineral deposit, which are only partially outlined as follows:

A mineral deposit is not valuable unless it can be profitably worked. If a deposit is to be profitably worked it is necessary that the overburden can be easily and cheaply removed, or that the deposit be suited to mining. The deposit should also be so located as to be free from flooding by streams and should not interfere with town property.

In considering a deposit which is to be developed for local consumption only, it is not generally necessary to consider transportation facilities. These are supplied by wagons and trucks. A deposit which is to be worked for wider distribution, however, should generally be located within half a mile of a railroad. The country intervening between the deposit and the railroad should be sufficiently level to permit the building of a spur at a reasonable cost.

If it seems that there is a market for the product, and that it can be obtained economically, a thorough sampling is desirable. Samples should be representative of the deposit. If there be several kinds of material in the same deposit, take a sample of each kind. Samples should include within the sample sack a container bearing a label giving by township, range, and section the location of the site from which the sample was taken and indicating for what the sample is to be tested and what proportion of the general exposure it represents. This information is of interest to the man who tests the sample and is highly desirable in preventing the loss or misidentification of a sample. In every case the sample should be of fresh, unweathered,

unmodified material. Weathered samples, particularly of shales and clays, are likely to be misleading. If there will be a number of bulky samples, it is advisable to let them accumulate and make a lot shipment by freight; small samples may be shipped by express.

It is desirable to estimate carefully the amount of material available in a deposit. The reserve offered by a particular area is a very important point involved in its commercial development. Estimates on reserves should indicate the amount and character of the overburden as well as the amount of mineral available.

Although a determination of potential markets is not specifically within the province of a geologist, any data indicating what may be done with the mineral after it is quarried or mined, what is the likelihood of ready sale, and what price may be expected, are very valuable adjuncts to a report on a given site and its possibilities.

Limestone - Outcrops of limestone less than five feet thick are not generally quarriable except for supplying local demands. About one foot of overburden can be removed to secure one foot of stone and still leave a profit from quarrying operations. Samples are of two sorts, namely those for physical analysis and those for chemical analysis. The taking of either should be done only after consultation with Mr. Lamar.

Sand and Gravel - A sand and gravel sample should weigh about fifty pounds. It may be taken by digging a trench down the face of the deposit to expose fresh gravel and obtaining an equal amount from each point of the entire trench. The sample should be collected on a piece of canvas at the base of the cut, and then quartered down to the requisite fifty-pound sample. About half a foot of overburden can be economically removed for one foot of sand and gravel.

Molding Sand - Molding sand may be sampled in the same way as sand and gravel. The amount of overburden which can be removed economically is about the same as for sand and gravel. In describing potential molding sand deposits, note the size and shape of grain and the approximate amount of clay present. Calcium carbonate is generally to be avoided in molding sand.

Clay - Little can be told from a field examination of a clay or shale deposit. Laboratory and burning tests of clays and shales are expensive; consequently only those deposits which show good promise should be sampled for analysis. It is suggested that sampling of clay deposits be left until after the field conference with Mr. Lamar. Clay containing calcium carbonate, marcasite, pyrite, or considerable amounts of organic material is not generally valuable. About one foot of overburden can profitably be removed for one foot of good clay. If the overburden is heavy it may be feasible to mine the clay. Considerations of mining possibilities should include the character of the roof, the thickness of the clay, and inclination and configuration of the bed.

Ocher - Ocher is clay impregnated with red, brown, or yellow iron oxide. It should be free from grit or sand which may necessitate washing before the product is marketable. Ocher deposits less than two feet thick are probably not of commercial importance. Deposits may be either mined or quarried. About three feet of overburden can be removed for one foot of ocher.

Building Stone - Granular limestones, colored limestones, or limestones with irregular stylolitic or clay veinings are of considerable interest for interior decoration purposes. The stone should be free from incipient fractures and should be in beds at least three

feet thick. About two feet of overburden can be removed for one foot of stone. Truck haulage to railroads is possible if the haul is not too long and roads are good. Stone in beds of even and uniform texture may also be valuable for exterior construction purposes.

Cement Materials - Associated beds of limestone and shale containing less than four per cent of magnesium carbonate are potentially of value as cement materials. The material should exist in the ratio of about one foot of shale to three feet of limestone.

Visiting non-metallic industries

If your quadrangle possesses non-metallic industries in operation a great deal can be learned about the potential value of the non-metallic deposits by visiting and becoming thoroughly acquainted with the industries. In general you will be well received, particularly if you make clear your desire to learn about the industry. It is suggested that you first introduce yourself to the official in charge, who will likely save you time and put you in touch with the intelligence behind the operation. The geology of the quarry or mine exposure should be studied thoroughly. Often one sizable quarry will reveal data not seen in the outcrops of your quadrangle. Descriptions of the plant and its operation are to be written at the plant, and then submitted to someone who will be able to perfect it. This will save time later and make your work more exact.

Concluding the field work

Before concluding the field work, the mapping should tie in with adjacent maps or you should be prepared to justify your points of difference. In case the points of difference are equivocal, the new map should be made to agree with the old, but a statement should

be given the Chief.

Advance notice of your intention to return to the office should be given the Chief in order that conferences may be arranged for. Before leaving the office after the season, copies of all new logs should be left with the Technical Files Clerk, arrangements should be completed with the Chief regarding identification of fossils and analyses of laboratory samples, a copy of the geologic map should be made and submitted to the Chief, and an outline of your report prepared for the Chief's acceptance, after discussing with your field conferees those parts of it in which they would be interested.

Writing the Report

Before undertaking the writing of the report, please obtain from the Chief Clerk, a copy of "Instructions and suggestions for writing quadrangle reports".

M. M. Leighton

Chief

130 East Madison, St.,

Vandalia, Illinois

Mr. H. M. Leighton, Chief,
Illinois State Geological Survey,
Urbana, Illinois

Dear Mr. Leighton: In accordance with your instructions we are herewith reporting a slight accident to our car No. 14. The damage was very slight and was due to a car with Missouri No. 5-717 cutting in too close in front of us without warning. The left front fender and left front hub cap were slightly bent. Byrne was driving and the accident took place on highway 11, about 4 miles east of Vandalia at about 5:45 P. M. today. I am enclosing extra copy of this statement for the insurance agents, Burton and Trelease on Green St. if you think it desirable to send it to them, I do not think that the other party will make any claim.

Very truly yours,

Associate Geologist

130 East Madison St.,

Vandalia, Ill.

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw:

In reply to yours of the 30th the screens came today and I wish to thank you for sending them. I don't quite remember the specifications for the pebbles for Krumbein but think that they were to be taken from fresh till of different ages.

We have been making fair progress in spite of heat and very rough country but have to date seen no more road material which could profitably be exploited. We have quite a few outcrops of thin limestones but scarcely any gravel. We are aiming to finish the country north of Route 11 first but it will take the rest of this week.

I have heard nothing of the tripods for Krumbein and Apfel but hope they will come soon.

Hoping to have a visit from you soon,

Very truly yours,

Associate Geologist

STATE GEOLOGICAL SURVEY

Urbana, Illinois

M. M. Leighton, Chief

July 30, 1929

Mr. F. T. Thwaites
130 E. Madison St.
Vandalia, Illinois

Dear Mr. Thwaites:

Under separate cover we are sending you the set of screens about which I spoke to you. The small screen is for your use when collecting pebbles for Mr. Krumbein and the larger screens are for use in getting pebble counts.

I trust that you are having no undue difficulties in persuming your work.

Cordially yours,

George E. Ekblaw

Geologist, Section
Engineering Geology

STATE GEOLOGICAL SURVEY
URBANA, ILLINOIS
M. M. Leighton, Chief

July 31, 1929

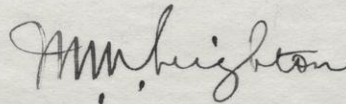
Mr. F. T. Thwaites
130 E. Madison St.
Vandalia, Illinois

My dear Thwaites:

Your letter reporting a slight accident to car No. 14 was received. Thank you for writing me so promptly.

I am returning the carbon of your letter which you enclosed for the information of Burton and Trelease in case I felt it desirable to send it to them. I understand that the policy which you took out was a personal policy and one which does not concern the Geological Survey.

Very truly yours,

A handwritten signature in cursive script, reading "M. M. Leighton".

Chief

Eakin Hotel,

Vandalia, Illinois,

Aug. 4, 1929

Mr. E. T. Apfel,

2020 S. Walnut St.,

Shelbyville, Illinois

Dear Apfel: I have been meaning to write you ever since we got to the field but the heat has been so trying that I just couldn't get to it. I brought down with me a copy of my outline of glacial geology and photographic directions for I had hoped to see you while working along our common boundary. We have almost finished a heathenish bit of country north of Route 11 and east of the Kaskaskia. In this we have taken just one sample of gravel and none of limestone. The thickest layer of the latter is about five feet but under very heavy cover. We did not find any gravel at all until yesterday. I find no evidence of any Wisconsin gravels along the Kaskaskia, only sand and silt. All our gravel is under heavy cover of till and most of the outcrops are cemented by calcite.

Thank you for the voucher for the rent in Urbana. Please tell Mr. Ekblaw when he comes that we had to move back to the Eakin as the other place was unsatisfactory in several respects. We hope to finish Fayette County, that is our part of it, by the end of the week. How I can get the Outline to you I don't know but could leave it at this hotel for you to get when you come down this way although I would like very much to get a chance to have a conference over common problems along our boundary.

It was very lonely at Urbana after you had left!

With best regards to both of your party,

Sincerely,

Associate geologist

W

STATE GEOLOGICAL SURVEY

Urbana, Illinois

M. M. Leighton, Chief

August 2, 1929

Mr. F. T. Thwaites
130 E. Madison St.
Vandalia, Illinois

Dear Mr. Thwaites:

I am planning on making a visit with you next week. I expect to spend Tuesday and Wednesday with Brown and Apfel at Shelbyville and hope to be able to make connections so that I can leave Pana on the I. C. train at 4:44 Wednesday evening, arriving in Vandalia at 5:37 P.M. If I can ^{not} make this I shall endeavor to catch the morning train Thursday, getting in Vandalia at 7:05 A.M. Please make necessary hotel arrangements for me. If you are not going to be at Vandalia at that time, wire ^{or write} me in care of Mr. Apfel, 2020 S. Walnut St., Shelbyville. If anything disrupts my plan I shall notify you accordingly.

Under separate cover we are sending you 2 pick-point hammers for your hard-rock work. Please return the one pick-point hammer which you have in your party.

Cordially yours,

George E. Ekblaw

Geologist, Section
Engineering Geology

Eakin Hotel,

Vandalia, Illinois

Mr. E. T. Apfel, 2020 N. Walnut St.,
Shelbyville, Illinois

Dear Apfel: My letter of yesterday crossed your postcard of the same date. I'm afraid I havnt done as much office work as you have but the hot weather put a crimp in many good intentions. We are staying at this hotel since we have a real bath with hot water and a clean place free from mosquitoes all for \$5.25 each a week which I regard as all right. We stayed at a hourse for 2.65 a week but it had the above disadvantages besides which the people were rather queer. We will probably finish wat we can profitably reach from here about the end of the present week.

Were over in your area today to see the largest developed gravel deposit in Fayette County, the pit on the State Prison Farm near Vera. We wanted to compare it with some undeveloped deposits we have found. The County Commissioner says we have visited most of the known deposits already but suppose we will have to go over a lot of places where he says there is nothing. Spent most of the afternoon with a native who insisted on our digging in lots of hopeless places.

Hoping to see you soon,

Sincerely,

Eakin Hotel,

Vandalia, Illinois,

Aug. 6, 1929

Dr. Paul MacClintock,
Illinois State Geological Survey,
Urbana, Illinois

Dear MacClintock: I wish to thank you for the suggestions in your letter of July 28 which was forwarded to me. I think of one other, namely the use of the blue filter to increase contrasts between yellows and blues or grays. I am considering buying such a filter to use in this country for I find that the K2 filter which I used so well in the north makes the drift entirely too light a tone. Without a filter results are not entirely satisfactory. Apfel told me that the K2 works well with non-color-sensitive plates for drift exposures. I am getting my usual good results with Agfa for distant views but the photographer complained of over exposure as usual. I have been cutting exposures to about half of those used in the north.

We have found a number of exposures of pre-Illinoian drift including instances of boulders dragged along by the Illinoian. Some of these suggested a western rather than a Labradorian drift but havnt seen enough to be certain. We couldnt find the locality at the center of Sec. 1, 7N-2E; possibly it is now grown over. The place described is a private road leading down to a stream. We found a good exposure near the middle of the East line of same section.. We have found several deltas below Illinoian till whose origin is still unknown.

Very truly yours,

Personal

Eakin Hotel,

Vandalia, Illinois,

Aug. 6, 1929

Dear Mr. McVicar: I have heard nothing from the two tripods which I ordered two weeks ago Saturday and would like to know what has become of them. They were to be sent to the ^{geological survey} office at Urbana to be forwarded from there but if you write me in regard to the matter I will be at this place the rest of the week.

Very truly yours,

personal

Eakin Hotel,

Vandalia, Illinois,

Aug. 9, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: Tonight I received a package of negatives and prints in a large envelope which had been folded in the mail. Please caution the clerks never to send the negatives and in no case to send prints in a large envelope which is certain to be folded. Prints should either be included with a letter or better put between ^dcarboards. There is no use in my taking pains to get good photographs if the results including negatives which I never need here are to be exposed to such unnecessary risks of destruction. I will add that it is hard for me to identify the prints here for the list has been sent to Urbana with the film. If the photographer fails to number the films in each roll please have the clerks keep the list with each batch of negatives until I return.

We eliminated a lot of ground today and still found a gravel deposit 12 feet thick which had not been reported, although I am afraid it is very sandy.

Apfel and Holmes ate supper with us. They expect to come down here about as we leave.

Please tell the clerk that I have sent new address cards giving my address at Eakin Hotel, Vandalia.

Very truly yours,

Associate Geologist

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
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URBANA

August 26, 1929

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Mr. F. T. Thwaites
Langenfeld Hotel
Centralia, Illinois

Dear Mr. Thwaites:

I am sending prints and explanation
sheets to you for rolls No. 6 and 7. Kindly mark
for identification.

Very truly yours,

Alma R. Eich

Technical Files Clerk

STATE GEOLOGICAL SURVEY

Urbana, Illinois

M..M. Leighton, Chief

August 3, 1929

Mr. F. T. Thwaites
130 E. Madison St.
Vandalia, Illinois

Dear Mr. Thwaites:

I am sending you the first set of prints
made from the second roll of your films.

Supplementing my letter of yesterday I wish
to add that I intend to spend Monday with W. C. Krumbein,
1510 - 10th St., Charleston; Tuesday with E. T. Apfel,
2020 So. Walnut St., Shelbyville; and Wednesday with
I. C. Brown, 110 E. Adams St., Taylorville. Please let
me know at any one of these places if you will not be
in Vandalia Thursday, August 8. If you are going to
be at Vandalia you need not notify me further but
make tentative hotel arrangements for me Wednesday night.
If I do not get in on the 5:37 train Wednesday evening
I hope to arrive on the 7:05 Thursday morning. As I
wrote you before, if my plans are changed I shall notify
by wire.

Cordially yours,

George E. Ekblaw
Geologist, Section
Engineering Geology

STATE GEOLOGICAL SURVEY DIVISION
305 Ceramics Bldg.
Urbana, Illinois

August 15, 1929

Mr. F. T. Thwaites
General Delivery
Centralia, Illinois

Dear Mr. Thwaites:

I was glad to receive your letter of August 14 reporting on your progress to date. I was somewhat surprised to learn that you were still at Vandalia, inasmuch as I gathered when I visited you last week that you expected to finish Fayette County in two or three days.

With regard to the shipments of negatives and prints, I have made inquiries and learn that the negatives were sent you under misunderstanding on the part of several of our clerical force. This misunderstanding has been entirely cleared up and hereafter nothing but the prints with the proper identifications should be sent you. I have also called to the attention of the boys that the negatives and prints were bent and injured so that hereafter they will take pains to send them under good cover. I do not know but what it might be a good thing if you should send your films to Madison, but until I can get a chance to discuss this with Dr. Leighton I think that you had better continue to follow the present scheme.

I wish to call to your attention that we have been at a loss for the last few days as to where to address you. When you sent in your last card you distinctly specified August 10 as the last date at which you would be at Vandalia, and as this date coincided with the impression of your intentions which I gained last week, we assumed that you had left Vandalia and for some reason we had failed to receive notice of your change of address. It is vitally important that we have accurate knowledge of your location every day if possible, and if you find that your announced plans are changed, you should notify us accordingly. I was glad to note in your last letter that you gave us due notice of your intentions to move from Vandalia to Centralia. This plan to let us know a few days before you actually move is advisable so that we do not send parcels, letters containing your checks, and other important mail to a station from which you have departed. Through bitter experience we have learned that the post office clerks are far from reliable in forwarding mail, even when you leave a forwarding address, and of course it is necessary to send additional postage to forward parcel post material.

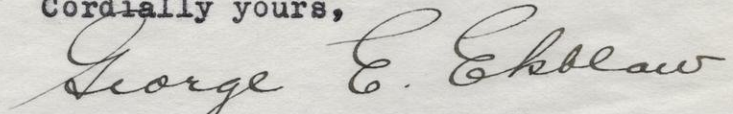
You may be interested to know that the tripods which you ordered for Krumbein and Apfel have arrived. We have sent one to Krumbein according to your instructions, and we shall send the other

F. T. Thwaites
No. 2

one to Apfel as soon as we learn his location. In your letter of August 9, you told me that Apfel and Holmes expected to arrive at Vandalia about the time you were planning to leave and we assumed that your date of departure was about August 10. Consequently, we have been at a loss also to know just precisely where Apfel and Holmes are - whether they are at Shelbyville or Vandalia.

With hope that you will continue your successful work, I remain

Cordially yours,

A handwritten signature in cursive script, reading "George E. Ekblaw". The signature is written in dark ink and is positioned above the typed name and title.

Geologist
Section of Engineering Geology

Langenfeld Hotel,

Centralia, Illinois,

Aug. 21, 1929

Miss Nyberg,

State Geological Survey,

Urbana, Illinois,

Dear Miss Nyberg: Please send me:

(1) about half an inch thick of plain typewriter paper such as this letter is written on.

(2) somewhat less than the above amount of notebook paper with red line and index plat on it.

Please note correct spelling of name of our hotel as given above

I will send some more films to be developed as I understand that the negatives and prints will henceforth be handled in the way I desire.

Very truly yours,

F. T. T.

Associate Geologist

Shelbyville, Ill.
August 18, 1929.

Dear Thwaites:

Your note of the 14th received. We are moving to Vandalia tomorrow, and have wired for the room for which you arranged. Our time of leaving was so uncertain that I did not have time to write after we learned when we could get away.

Our truck came today. It is like yours, and I think we shall like it better than the sedan for the work we are doing. It only has 253 miles on it, so we will have to break it in.

The boy who drove the car down also brought the Triax tripod. Thank you for your trouble in getting this for me.

I am looking forward to seeing you again before we leave the field, which will probably be three weeks from today. Please let me know your address and phone number.

Sincerely

Earl T. Appel

Mr. F. T. Thwaites,
Centralia, Illinois.

Eakin Hotel,
Vandalia, Ill.



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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 20, 1929

Mr. F. T. Thwaites
Dangerfeld Hotel
Centralia, Illinois

Dear Mr. Thwaites:

I expect to spend Friday with you, either arriving by train from Vandalia Thursday evening or Friday morning, or it is possible that Apfel will drive me down Thursday evening.

With best regards,

Yours very truly,

George E. Ekblaw

George E. Ekblaw

Langenfeld Hotel,

Centralia, Illinois,

Aug. 21, 1929

Mr. E. T. Apfel,

Eakin Hotel,

Vandalia, Illinois

Dear Apfel: I was very glad to get yours of the 18th and to hear that you have moved to our former "diggings". Our truck ought to be named "Teddy" since it is a Rough Rider. We have to keep at least two bags of rock in the back end to avoid tossing things out! Am glad to hear that you have the tripod and am sorry it took so long to get it.

Ekblaw is coming to us on Friday and I understand that he will be with you the day before. If so I advise against riding three in a seat in the truck. I am just getting over an injury to my arm due to this the last time he was here.

We have good rooms here at same cost as Vandalia but they are right on the railroad where I can look down the stacks of the engines. But we get so tired that a trainload of lowing cattle which parked much of one night under my window failed to awaken me!

If you dont get a chance to run down here some Sunday we will come up to Vandalia. If convenient for you may run up this coming Sunday although we really should work all day on Fayette County reports. My wife came down to visit me last Sunday being lucky to get very low excursion rates.

With regards to Holmes,

Sincerely,

Langenfeld Hotel,

Centralia, Illinois,

Aug. 21, 1929

Central Camera Co.,

Chicago, Illinois

Gentlemen: Enclosed please find Post Office order for \$3.00.

Please send me at above address if within 10 days (otherwise care of State Geological Survey, Urbana, Illinois,) one blue contrast filter in cell (10" glass) 1 5/16 inch diameter. This is one of the tricolor set of Wratten filters, A, I think but am not sure. Please return any balance in stamps. I am basing the order on price of \$2.85 paid last year.

Very truly yours,

F. T. Thwaites,

Associate Geologist,

Illinois State Geological Survey

2 A. R. E.

I trust that you will not think that I am too fussy about these matters but the above method has been used by me for the two past years in Wisconsin with the result that trouble to me in the field is much reduced and danger of loss or damage to photographs is minimized. I take pride in taking only good pictures insofar as light conditions will permit at the time of visit. I need rather prompt returns on photographs so that if some unforeseen accident does occur I may possibly have a chance to return and take the picture over again should it be an important part of the record. I will greatly appreciate your cooperation in helping me with this work. I blame myself for not having left written instructions.

Very truly yours,

Associate Geologist

Langenfeldt Hotel,

Centralia, Illinois,

Aug. 25, 1929

Miss Alma, R. Eich,
Technical Files Clerk,
State Geological Survey,
Urbana, Illinois

Dear Miss Eich: Yours of yesterday with enclosures arrived this morning. I am sorry to say that your office still does not understand how to take care of these photographs. Two thirds of those sent are not mine but were taken with another camera by someone else. I am returning them so that you can send them to the proper person.

Please have the photographer number every ~~print~~ negative before the roll is cut apart. This can be done on the edge where it will not show in the prints. It can be done either with any kind of ink or with soft pencil. The number of the roll need not be shown but if possible the numbers should start with No. 1 of each roll. If, as sometimes happens, the photographer numbers the wrong way of the roll it still is possible to identify the prints in the office because the titles will fit only with numbers reversed. Using the numbered negatives please identify and label them with the data given on the identification list and then mail the prints to me in an ordinary envelope with cardboards cut to just fit it on both sides. Larger envelopes are not needed and are apt to be folded or crushed in mailing.

I am returning enclosed all my prints and negatives. The latter were sent out contrary to instructions and some were slightly damaged in mailing due to improper care. Please send no more negatives as I have no possible use for them here. I have suggested examining one negative with a hand lens to see if the fuzzyness is due to moving of the tripod by wind or to a poor print. If the latter you might have another copy printed.

716 East Main St.,

Mt. Vernon, Illinois,

Sept. 9, 1929

Urbana-Lincoln Hotel,

Urbana, Illinois

Gentlemen: Please reserve room with bath for two persons for this coming Sunday night, September 15. My wife is driving down from Madison, Wisconsin, to meet me at the Urbana-Lincoln and I do not know which of us will arrive first.

Very truly yours,

F. T. Thwaites,

Associate Geologist,

Illinois State Geological Survey

Central Camera Company

A. FLESCH, PRES.

ESTABLISHED 1899

CAMERAS, KODAKS, LENSES
AND PHOTOGRAPHIC SUPPLIES

230 SOUTH WABASH AVE.
NEAR JACKSON BLVD.
~~112 SOUTH WABASH AVENUE~~
CHICAGO, ILLINOIS

Aug. 23, 1929.

Mr. F. T. Thwaites,
Langenfield Hotel,
Centralia, Illinois.

Dear Sir:

We thank you for your order of the 21st, with
remittance of \$3.00.

We are sorry to say our stock of the filters,
such as you order, is exhausted right now, and we are
awaiting a supply from factory within a few days. Just
as soon as it arrives we will make immediate delivery
to you.

Very truly yours,
CENTRAL CAMERA COMPANY.

VI.

716 East Main St.,

Mt. Vernon, Illinois,

Sept. 9, 1929

Central Camera Company,

230 South Wabash Ave.,

Chicago, Illinois

Gentlemen: In reply to yours of Aug. 23 I have not received the filter ordered in my letter of the 21st. I very much desire to try out the blue filter of the tricolor set (C, I think) on some features which I want to get while I am in this part of the country. Now I leave the field Saturday noon and if I do not get the filter before that it will not be of any use this season. If you do not have a filter of this kind in a 1 5/16 inch cell please let me have a two inch square filter to try with the option of exchanging it after this week for one in a cell which I prefer. I have a holder for the square filters although I much prefer the other kind in the field. If you can send the filter at once please address me here but AFTER SEPT. 14 MY ADDRESS IS SCIENCE HALL, MADISON, WISCONSIN.

Very truly yours,

F. T. Thwaites,

Associate Geologist,

Illinois State Geological Survey

716 East Main St.,

Mt. Vernon, Illinois,

Sept. 8, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: Enclosed please find reports on the road materials of eastern Clinton and Marion Counties. Trust they will be satisfactory. I have probably been quite conservative in my estimates of utility but think that this is justified in view of conversations with local highway superintendents. Funds seem to be so limited that purchase of crushing machinery by counties seems to be a long way in the future.

With regard to a conference we have already visited the best limestone deposit in the county and found it of no value on account of thinness and heavy cover. Also visited another locality where there is nothing. Two other reports remain to be checked up after which we can only run roads and see if something more turns up. I doubt that you would see anything new if you came down but we would be glad to have you come if you desire to. I ordered a filter from the Central Camera Co., Chicago, to be sent care of the office but have not yet seen it. If we do not see you this coming week will do so at Urbana a week from Monday.

Very truly yours,

Associate Geologist

Langenfeld Hotel,

Centralia, Ill.,

Sept. 3, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: We finished Clinton County today after interviewing Mr. Goldsmith, the County Superintendent, and putting down some 10 foot holes on hilltops. We decided that there is no definite evidence of gravel cores in the hills east of the Kaskaskia. Some ravines are over 15 feet deep in these hills and no gravel is shown. Some natives appear to have the idea that there is gravel but they have evidently been misled by washing of silt in ravines. I did not think the county worth any more time in view of the discouraging results of the holes and ravines. They have been on the lookout for gravel in wells but have had no results east of the river.

When I made the suggestions with reference to changes in equipment I did not mean that I wanted any change made now. We can, of course, get along as we have been doing but I merely suggested that another season it might be worth while to consider our experience in outfitting other parties.

We will probably move to Mount Vernon on Thursday, certainly not later than Friday so please address us there General Delivery for the present.

Very truly yours,

F. T. T.

Associate Geologist

Langenfeld Hotel,

Centralia, Illinois,

Sept. 5, 1929

Mr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Mr. Ekblaw: In reply to yours of the 3rd we are moving to Mt. Vernon tomorrow to 716 East Main St. We were over yesterday and located a good room in a new and modern house.

In regard to a conference I know of nothing important unless I learn of something from the County Superintendent. From what I saw yesterday and along the border plus notes from your former survey the most we can expect is some thin limestone layers. We are losing some time this morning on account of rain and a broken shock absorber but in any case it is almost impossible to finish Jefferson County before the end of next week. I will leave the edge of what I do squared up as well as possible. Unless you especially desire to come down, therefore, there does not seem any special need to come but if you wish to do so it will be all right. I will report at the office on the morning of the 16th. New address cards are being sent.

Very truly yours,

Associate Geologist



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STATE GEOLOGICAL SURVEY DIVISION

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UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 3, 1929

Mr. F. T. Thwaites
Langenfeld Hotel
Centralia, Illinois

Dear Thwaites:

I was glad to get your letter of September 1 summarizing your work during August and offering suggestions for equipment. Suggestions with regard to equipment are especially welcome and next year we shall act on the experiences we gain this past summer.

Unless you have some special reason why I should come before, I shall plan on spending a day with you some time during the second week of September. I think possibly either the 11th or 13th might be set as tentative dates. I should be glad to hear from you giving me your opinion as to whether you desire another conference or whether you think another conference is advisable.

Cordially yours,

George E. Ekblaw, Geologist
Section of Engineering Geology

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 27, 1929

Mr. F. T. Thwaites
Langenfeldt Hotel
Centralia, Illinois

Dear Mr. Thwaites:

I received your letter of August 25, 1929 and the enclosed snapshots. I am very sorry to have troubled you to identify them but since they were not autographed or numbered, it was impossible to identify them accurately. Prints from two rolls were mailed to you yesterday, but I am sure that this will be unnecessary in the future.

I hope that this has not been too great an inconvenience to you, and I sincerely appreciate your kindness.

Very truly yours,

Alma R. Eich

Technical Files Clerk

Langenfeld Hotel,

Centralia, Ill.,

Sept. 1, 1929

Miss Alma R. Eich,
Technical Files Clerk,
State Geological Survey,
Urbana, Illinois

Dear Miss Eich: I am returning enclosed the prints from roll No. 8 and wish to thank you for straightening out the matter for me. I will wish to get personal prints from some of these later.

The dark shadows along the edges of some of the pictures are due to a lens hood of my own invention. This is fitted rather closely and sometimes gets put on crooked shading the edge of the picture. Light leaks make light streaks and spots on the prints. We are getting much better results from Duncan than Byrne gets from the photographer here and he uses the same methods and materials that I do.

Very truly yours,

F. T. T.

Associate Geologist

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 29, 1929

Mr. F. T. Thwaites
Langenfeldt Hotel
Centralia, Illinois

Dear Mr. Thwaites:

Enclosed are prints of roll No. 8. Please notice that light has been let in on the left side of numbers 1855, 1856, 1859, and 1860. These were the first four pictures of the roll. Possibly there is a fault in your kodak as the same shading shows in the negatives.

Very truly yours,

Alma R. Eich

Technical Files Clerk

P. S. Mr. Duncan says that print No. 1831 is stained because of a defect in the film and this shading cannot be cleared.

Are

Aug. 4, 1929

Dear Thwaites:

Expected to drive down your way today, but had too much to do in the way of office work as it has not rained enough for us to keep entirely up to date.

Ekblaw expects to be here on Tuesday, with Brown on Wednesday, and I am hoping that we can see you with him later in the week. Let us know where you live, how long you expect to be there, and what kind of a place it is to stay in. We may be coming down that way in ten days or so, to work our part of Fayette county.

Regards from Holmes and me to both you and Byrne.

Earl T. Apfel,
2020 N. Walnut,
Shelbyville, Ill.

No phone in our house, but a wire will reach us--sometime.

THIS SIDE OF CARD IS FOR ADDRESS



Mr. F. T. Thwaites,

Vandalia,

Gen. Del.

Illinois.

DEPARTMENT OF
REGISTRATION AND EDUCATION
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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

August 24, 1929

Mr. F. T. Thwaites
Langenfeld Hotel
Centralia, Illinois

Dear Mr. Thwaites:

I am enclosing prints from rolls Nos. 3, 4, and 5 and title and explanatory sheets. Will you kindly identify the prints, mark the identification on the back, and then return to me so that I can index and file the negatives and prints as soon as possible.

I shall sincerely appreciate your attention in this matter.

Very truly yours,

Alma R. Eich

Technical Files Clerk

Eakin Hotel,
Vandalia, Ill.,
August 23, 1929.

Dear Thwaites:

It will be convenient for us if you wish to, and can, run up this coming Sunday. It will be less of a trip with your car than with ours which is still on reduced speed because of its recent advent, otherwise, I should like very much to drive down to Centralia. We may do that later, however.

Ekblaw was with us yesterday. We rode three in the seat, and as he was in the middle, and the day was one of real summer temperature, I think the starch was out of his collar somewhat before we let him get off in town at about 5:20. We had a good day, and enjoyed his visit. I suppose today will be the same kind of day for him with you.

We are comfortable at this hotel, and the trains are near enough to satisfy any curiosity we might have as to what is down their stacks without our being able to look in them.

You were fortunate in having your wife with you even for a short visit. They do not seem to run excursions from Syracuse that my wife is interested in, especially with the baby.

We will be in town Sunday, and expect you up, though that of course places you under no obligation to us in your plans. But we will be glad to see you.

Sincerely,

Earl T. Apple

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

August 22, 1929

Mr. F. T. Thwaites
Langenfeld Hotel
Centralia, Illinois

Dear Mr. Thwaites:

In the absence of Miss Nyberg, who is on her vacation, I am replying to your letter of August 21.

Under separate cover, I am sending you the desired amount of typewriter paper and notebook paper. I am sorry that the notebook paper with the index plat has not yet come from the printer's, but I am sending the plain in its stead, trusting that it will help out until the other comes, at which time I shall send you some.

We have noted the correct spelling of your hotel and hope that no mail has gone astray because of any errors we might have made in writing it before this.

Precaution will be taken with your films when they are sent in and I believe you will need have no worry for them in the future.

Very sincerely,

Margaret Curtis Mayer

Secretary

The Urbana - Lincoln is on Route 10 going toward Danville. It is on Green Street which is the main street from Champaign to Urbana and goes through the University grounds.

The Survey office is on Goodwin Street. It is just one block east on Green from the campus (where there is a slight offset in the street) then turn north.

- o Roll 4, all
- o Roll 5, 3, 4 (2 copies) 6
- Roll 6, 5, 6 (2 copies)
- Roll 7 all.

Roll 4	July 31, 1930	0.99
Roll 5	Aug 19, 1930	0.99
Roll 6	Aug 30, 1930	0.99
Roll 7	Aug 3	0.99

CREDIT MEMO

Date September 11, 19 30To F. T. ThwaitesState Geological SurveyUrbana, Ill.

For Insurance as follows:



BURTON & TRELEASE

REAL ESTATE, INSURANCE

617 EAST GREEN STREET

CHAMPAIGN, ILL.

COMPANY	POLICY NUMBER	CANCELLATION AUDIT OR ENDORSEMENT	KIND OF INSURANCE	AMOUNT	OLD RATE	NEW RATE	RETURN PREMIUM	
Indemn.	CA504559	Cancellation	P. L. P. D.	5-10-5			\$9.92	

Order Given to

Order Given by

Policy Date 6-19-30Cancellation Date 9-11-30

Remarks:

INVOICE



BURTON & TRELEASE

REAL ESTATE, INSURANCE

617 EAST GREEN STREET

CHAMPAIGN, ILL.

Date June 19, 19 30To F. T. ThwaitesState Geological Survey OfficeUrbana, Illinois

EXPIRATION	POLICY NUMBER	COMPANY	PROPERTY COVERED	KIND OF INSURANCE	AMOUNT	RATE	PREMIUM DUE	
6-19-31	CA504559	Indemn.	Chevrolet Roadster	P. L. P. D.	5-10-5		\$16.00	
Order Given to				Order Given by				
				Mortgagee				
				Remarks <u>1 yr. policy</u>				

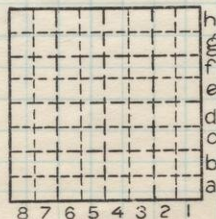


Gravel in Illinois around Kewanee?

Date _____ T. _____ R. _____

Quad. _____ Part _____

County Williamson Index No. _____



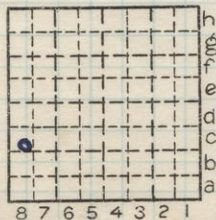


.8c Abandoned strip mine. Is at edge of water filling hole.

Date _____ T. _____ R. _____

Quad. _____ Part _____

County Williamson Index No. 0713



ILLINOIS STATE GEOLOGICAL SURVEY
SUGGESTIONS AND INSTRUCTIONS TO NEW MEN UNDERTAKING
DETAILED QUADRANGLE STUDIES

I. Introduction

Reconnaissance studies have been essentially completed in Illinois and the geologic studies of quadrangles in which we are now seriously engaged, are a part of the Survey's effort to search the State for the detailed information now demanded by the specialized industries of our complex civilization.

It has been our experience in carrying on this part of the Survey's program that new men feel unfamiliar with the aims and administrative procedure of the Survey, as well as the geological problems which are now claiming the Survey's attention. The State auspices of the Survey require a careful accounting of all expenditures and use of equipment, and the activities of the Survey require a complete file of information and a systematic procedure in obtaining and preparing the data for the files and for publication.

It is believed that this memorandum will answer some of the questions raised by the above requirements, will economize time and effort expended in compliance with them, will produce a more complete and comprehensive report and geologic map of each quadrangle studied, will permit the Survey to render better service in giving information to the industries, and will advance the solution of our state-wide geologic problems. It has been most gratifying to note the splendid manner in which new appointees have endeavored to fit into the routine

of the Survey, have very generally made themselves a part of the Survey family, have applied their own technical training and initiative to the geologic problems they face, and have endeavored to look at their problems from a practical as well as purely scientific point of view.

The Survey acknowledges this cooperative attitude and invites suggestions toward perfecting the plan which is herein outlined for our quadrangle studies.

II. Preparation for the Field

Securing Equipment and Supplies

All equipment and supplies are to be secured from the Chief Clerk. These include cars, instruments, carrying bags, notebooks, maps, cameras, sacks for samples, expense books and blanks, office supplies, et cetera.

Expense records - You will also obtain from the Chief Clerk information as to what sort of automobile and personal expense records are to be kept. Three weeks should be allowed for reimbursement after submitting expense accounts.

Maps - For most parts of the State Photolithographic copies of topographic maps on the scale of 1:48,000 are generally satisfactory. If larger scaled maps are desired, enlargements will be made, upon request to the Chief Clerk.

Several copies of the map of an area are usually needed: one for the field, a second for a headquarters map upon which will be recorded the progress of mapping from day to day, a third for a headquarters map showing daily traverse and position of reference points, and a fourth to be reserved for an error map showing corrections of topog-

raphy and culture. Please notify the Chief Clerk in advance regarding how many maps you want mounted and how you want them cut to fold.

The working map may be dissected and mounted on cloth to be carried in the hand or bag, or mounted on notebook paper to be carried in the notebook, as preferred. If a 1:48,000 map is used, a quarter township will go conveniently on a page; if a 1:62,500, one-half township.

Before going to the field be sure that the Survey's system of enumeration for each township in a county is put on the maps in order that locations may be given according to the Survey's method (p.6). This is necessary in order that data in notebooks of various geologists may be located according to a uniform system and reference to them may be facilitated.

Notebooks - The Survey prefers loose-leaf notebooks, which it provides at your summer headquarters. You should also use a large binder of the same type, so that you may keep the larger part of your notes at headquarters and not carry them about the field.

Preliminary gathering of data at the Survey Office

The Survey usually possesses a certain amount of information, partly published and partly unpublished, about each quadrangle and this should be obtained before the party goes to the field. You may wish to take a small selected library with you to the field. If so, secure from the Chief Clerk a small carrier for the protection of the volumes. Consult the index in the Survey's List of Publications for published material, and obtain from the Technical Files Clerk unpublished data, such as well logs, mine notes, and portions of manuscripts, and publications which are out of print, such as the Worthen reports, of which excerpts are available. Confer with the Chief or

section heads regarding previous work which has been done in and adjacent to the area.

III. Field Work

General Information

Headquarters - It is generally advisable in quadrangle work to make field headquarters at a private house rather than at a hotel. In small towns, however, a hotel may provide the most satisfactory headquarters and may not be more expensive than a good room in a large town. It is generally possible to obtain quarters at \$20 per month or less. Headquarters should be close to the area of mapping.

Relations to the public - It is to the advantage of the Survey to have warm friends in the area where field work has been done. It is important that inquiries in regard to your work be answered courteously and to the satisfaction of the inquirer. Contact should be made with mine operators, clay workers, quarrymen, drillers, etc., residing in the area or operating some deposit in the area. Usually local information of much value can be secured from such contacts and particularly in respect to the economic resources.

Contact with Survey office - All field parties are expected to maintain close contact with the Survey office. Tentative field addresses for the receipt of telegrams should be handed the Chief Clerk before departure for the field, and complete residence, mail and telephone addresses should be forwarded to the office as soon as headquarters are established.

Holidays, Leaves of Absence, etc. - You may follow your own preference in observing legal holidays, but the Survey must be informed of any change of address to facilitate the transmission of important communications. Leaves of absence from regular work should, of course,

be arranged for and any illness reported. Saturday afternoons are not regarded as holidays in the field and work on Sundays is not ordinarily favored.

Monthly reports - Forms for monthly service reports should be obtained from the office, filled out and mailed to the Chief promptly after the close of each month. These constitute the Survey's record of employment and the amount of time to be charged against the project. The report blank contains a diagram on which the progress of mapping may be indicated. The area mapped during the previous month should be hachured in pencil, the current month in ink.

Automobiles - All Survey cars should have the Survey name painted on them according to the form provided by the Chief Clerk. If, for any reason, this is not done before going to the field, it should be done as soon as possible after reaching the field. It identifies the Survey organization in the area, is a protection to the car and the equipment, and usually affords admission to property without question.

Repairs should be made promptly, and attention should be given to the appearance and effective operation of the car. Water in the battery, air in the tires, grease in the differential, transmission, and bearings, and tightening of loose bolts are matters that should have watchful attention. The cost records which you are requested to keep are very important. In most instances private garages are found to be more convenient and economical than public garages.

Accidents must be reported immediately to the Chief. Claims for damages should be referred to the Chief, and full explanations provided him.

The use of private automobiles on the mileage basis may be granted by special arrangement if a Survey car is not available.

Information to the Press - It is desirable that the local newspapers be given two or three news items regarding the work during the field season. Experience suggests that such items be prepared in writing by the geologist in charge and that they contain information of interest to the community without committing the Survey to any statement of policy. Clippings or copy of items should be sent to the office.

Confidential Information - It is very important that all economic information should be transmitted in writing, across the Chief's desk. Premature information on structures favorable for oil accumulation and other economic data should be avoided.

The Survey annually receives official detailed production data for all mineral products in the State, and hence you need not seek such information. No production figures are to be quoted unless they are totals for more than two operators.

Occasionally citizens possess geologic information, such as well logs, which they wish kept confidential. The Survey strictly honors their requests.

Taking Notes - Needless to say but important nevertheless, the prime requisites are that notes should be legible and that they should be complete in regard to all pertinent data. As a recorder of scientific information you should not attempt to "carry information in your head". A note in the notebook is worth two in the fog of one's memory.

Abbreviations - It should be borne in mind that the field notes will be probably consulted by persons other than the author, and therefore only common abbreviations should be used. A list of such abbreviations is herewith appended,

The Survey's Method of Locating Points - For locating points in notebook descriptions the Survey uses a coordinate system in which the townships of a county are numbered systematically according to the basic numbers in the Survey files. Assuming a location in Champaign County, Township number 8, and section number 9, the index number to the section would be 0809. Locations in sections are made by coordinates of $1/64$ of a section, each side of a section being divided into eight units. In other words, each forty acre-tract of a standard section is divided into four squares of ten acres each; these units are numbered and lettered as shown in figure 1; the location of point A would be given as 0809.7b; Point B, 0809.3h. It will be observed that the intercepts are read first on the x axis, using numerals, then on the

Date _____	T. _____	R. _____
Quad. _____	Part _____	
County _____	Index No. _____	

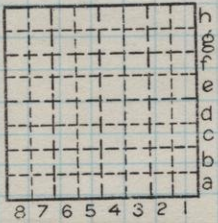


Figure 1
vertical or y axis, using letters.

It is emphasized that the reference numbers do not indicate exact positions. Outcrops are to be located precisely on the map and the index numbers are to be regarded as of assistance in identifying these points on the map. The notes should contain, in addition to the index number, additional information by which the outcrop will be more precisely located, as for example: so many feet from a school house or bridge or fork of two streams, et cetera.

The Survey provides notebook paper with location chart and blank form at the bottom of the page for giving the location (See Fig. 1). This permits only those notes on a page that pertain to a given section,

and requires that each note be preceded in the margin by the appropriate decimal index number.

Listing of Problems and Questions - It is desirable that you make a list of the active problems and questions that arise during the course of your work, and that you add to this list any information that contributes to their solution of these problems and any reference to notes that concern them. These problems should be all cleared as far as possible by field work before the end of the season.

Stratigraphy

Mapping - Most geologists prefer to spend at least one day in a rapid reconnaissance of the territory with an idea of learning something about the roads, the general "lay" of the land, the number and general character of outcrops, et cetera. It will then be possible to plan a systematic mapping. It is important that so far as possible mapping be advanced systematically and in compact areas so that there will be no tag ends and isolated unmapped areas to be finished up at the end of the season.

Because of the general mantle of Quaternary materials in the State, outcrop maps should be made for most quadrangles. However, there are areas in the Ozarks of southern Illinois, in northwestern Illinois, and elsewhere where the outcrops are so numerous that mapping the limits of the outcrops is not necessary.

The boundaries of outcrops and of geologic formations are to be drawn in the field. You should also place on the map as much detail as possible with a view of making it increasingly serviceable as the study progresses and also of having as large a mass of data as possible for preparing the final map.

It should be kept in mind that engravers require boundaries for guidance even where lines of contact are not definitely established and are not to be shown on the engraved map.

The headquarters copy of the field map should be kept up-to-date and available for inspection at any time. If there are not enough rainy days on which this work can be done, take a half-day off when necessary to bring it up-to-date.

Description of stratigraphic sections - The most important sort of observation and the one having the greatest permanent value is the detailed description of a stratigraphic section. Stratigraphic sections are best described by a sketch showing the relationships from the grass roots downward. Graphic notations greatly enhance a simple list of beds eventhough the important portion of the section makes up but a small part of the whole interval represented in the sketch.

Every stratigraphic section should be accompanied by notations in regard to the estimated or otherwise determined altitude of some definite horizon marker in the observed section. These notations should be made systematically.

Lateral variations in stratigraphy from place to place, involving unconformities, correlations, and lithologic changes, may be matters of observation or of interpretation. Your attack on problems involving these points should not be postponed until "some more convenient time", certainly not until the report is written. The section should be carefully described on the ground.

The degree of excellence of the record of a stratigraphic section usually determines the character of the final report and the value of the contribution to the Survey's fund of information. It is important, therefore, that the notations and diagrams be complete

and easily interpreted.

Compiling a standard columnar section - There should be a determined effort to obtain a standard columnar section of the outcropping rocks of the area. When this is finally accomplished, the various sections used in its compilation should be designated in the notes. Until the standard section is compiled, each section observed should be measured in detail. After it is compiled and the general succession is known, sections can be described by reference to the standard section to a great extent, although any differences should be carefully noted and particularly excellent sections should be adequately described.

Important graphic sections as, for example, sections used in the compilation of the columnar section or sections in which unusual or critical stratigraphic successions are exposed or which includes beds of economic importance, should be inked in, and colored if desired.

Description of sedimentary rocks - It is recommended that in describing sedimentary rocks, the Survey's schedule, proposed by L. E. Workman should be followed in general. Copies of this can be obtained by applying to the Chief Clerk. It is also recommended that reference be made to "Schedule for Field Description of Sedimentary Rocks", prepared by the Sedimentation Committee of the National Research Council as a guide for describing sedimentary rocks.

Physiographic Studies

Your report should contain an adequate treatment of the physiographic features of the area. This is an important phase of the assignment not to be overlooked. If possible, a map showing the topography of the bedrock and its relations to the present surface should be made for quadrangles in which drift covers the rock.

Collections

Fossil Collections - Each man should number his fossil collections by consecutive stations, irrespective of the limits of the area he is studying. This means that the collections made by one man will be numbered consecutively, possibly through a series of years. In addition to its individual collection number, each station should be designated by its location index number. Such collections should be duly referred to in the notes. It is suggested that those who are unaccustomed to making systematic fossil collections should consult with the Survey's paleontologist, Dr. J. Marvin Weller. Collections of all kinds are the property of the Survey unless officially released.

Discovery of localities where good collections of animal and plant fossils and coal balls may be made should be noted and, at the close of the season, forwarded to Drs. Weller and Noé.

Rock collections for examination and analysis - These should be labeled with station and index number as it appears in the notebook and on the map. Collections should not ordinarily be made for analysis that will involve considerable expense unless the matter has been taken up with the Chief. Notes should contain a careful description of the bedrock samples collected and a statement of the purpose for which they were collected.

Logs of drill-holes and shafts, and diamond-drill cores - Logs of as many reliable drill-holes as possible should be collected; these should be copied from written records if possible, but oral records may be satisfactory. Each well or shaft should be carefully recorded and the elevation of the surface should be determined. The care to be used in determining locations and altitudes depends upon

a number of considerations, as will be pointed out in another place, and if careful leveling is required, prepare for Mr. G. F. Moulton, Geologist in charge of Oil and Gas Section, a memorandum indicating the localities at which such levels are desired.

If diamond-drill cores are available, or if splits may be made so that the Survey can share in the core, or if core drilling is going on in the area or will soon be undertaken, collection boxes may be obtained by writing the office. If there is any question about the advisability of collecting cores, please communicate with the Chief. The Survey will pay freight charges. Express charges are usually too high, unless the shipment is very urgent.

If deep-well drilling is in process in the area, Mr. L. E. Workman, who looks after subsurface data, should be notified, and an attempt should be made to have the driller save well cuttings, as prescribed after conference with Mr. Workman, and keep a written record. The Survey supplies sample sacks and well-log books free of charge and will pay express on the cuttings.

Corrections in the Topographic Maps

Although every effort has been made to have the topographic maps accurate, it occasionally happens that small areas in a quadrangle are not correctly mapped. This is not always the fault of the topographers, because the detailed traverse necessary to obtain requisite data, especially in wooded tracts, would increase the cost of mapping beyond the allotment. Where such errors are discovered, and are not too numerous or concern too large areas, the following procedure should be followed.

1. Sketch the topography correctly and indicate the geologic data on the sketch. These sketches will be included as corrections

on the contour map published with your report.

2. Indicate on a special field map that you have for this purpose the areas in which the topographic errors occur and note the character of the error. This map should be submitted to the Chief at the end of the season for copying and forwarding to the U. S. Geological Survey.

3. If the engraved map of the quadrangle has not been published, notification and information concerning the errors should be sent to the Chief as soon as possible, in order that the areas can be correctly remapped before the engraved map is printed.

If the errors are numerous and concern large areas, the Chief should be notified, in order that steps can be taken for a topographic party to revise the map.

Corrections or revisions in the mapping of culture, such as roads, town limits, houses, subdivisions, etc., and of drainage can be usually made without much difficulty, but they should be noted and included on the corrected map.

Photographs

An adequate list of photographs of discreetly chosen subjects should be available for the report. Photographs of both geologic and scenic features should be taken; the Survey is especially short on scenic photographs. Please send your films to the office to be developed and printed and accompany them with your instructions. The plan of postponing the taking of all photographs until the close of the field season is not usually wise, on account of the weather hazard.

Progress Reports and Field Conferences

Progress reports - Progress reports should be sent to the

Chief at frequent intervals, not oftener than weekly nor more seldom than monthly.

Field Conferences - During the field season, new quadrangle geologists should plan for field conferences on (1) bedrock stratigraphy and coals; (2) Quaternary stratigraphy and Physiography; and (3) economic geology of non-fuel products. Usually, Dr. G. H. Cady should be called upon for (1); Dr. M. M. Leighton for (2); and Mr. J. E. Lamar for (3). Accounts of such conferences should be sent to the Chief.

Conferences with men who are working adjacent or near-by areas are encouraged.

Examination of Type Sections - If in the course of the field work, it appears desirable to visit type sections, located within the State or immediately adjacent to the State, this may be done provided the Chief is notified a few days in advance. Such inspections are encouraged for the sake of the valuable background that they afford. Travel outside the State, other than just across the line, requires special permission.

Economic Geology

The term economic geology is used here in the broad sense to include data on the possible economic mineral products or deposits of the area and data which may have a bearing on engineering projects now being undertaken or soon to be undertaken in the area.

Coal - If coal beds are present in the area, consult with Dr. G. H. Cady regarding those features which should be included in an economic report of them and the advisability of sampling them for analysis. It may be that the Survey already possesses adequate chemical data.

Petroleum Resources - Data pertaining to petroleum resources should also be gathered. For the purpose of reaching conclusions regarding possible occurrence of favorable structures, it is desirable to determine the structure with a considerable degree of precision. Locations and elevations should be obtained for as many points as possible, especially outcrops whose stratigraphic position is recognizable and wells, whether drilled for water, for oil, or for coal exploration, which penetrate pre-Pleistocene rocks and for which logs can be obtained. In case of regions where there are many outcrops it is not desirable to run elevations on an excessive number of points in one area, and judgment should be exercised in choosing points as well distributed as possible for running levels and for affording control on a structure contour map.

First the hand-level or barometer should be used for vertical control and traverses should be paced between points shown on the topographic maps for horizontal control. Then, if a structure favorable for oil is indicated, the planetable and alidade should be employed as a more refined method to check and amplify the less accurate determination of structure. The latter will be performed under the direction of Mr. G. F. Moulton, in charge of oil and gas studies, who should be notified as soon as practicable. He should be provided with a list of all points, adequately described, whose elevations are to be determined by planetable and alidade. Where structural datum points are relatively closely spaced, as in wells, outcrops, quarries, mines etc., say 25 or more to the square mile, it is desirable that a special map be prepared by the use of planetable and alidade on a scale of 2,000 feet to the inch or larger.

For purposes of filing, planetable sheets should be properly

labeled as to location (township, range, county), scale of map, names of instrument man and rodman, date of field work, and number of traverse notebook. Township and county boundaries should be indicated. Features like roads, streams, etc., that will aid in the future location of datum points in the field should be sketched in on the map. In the remarks column in the notes, a description of bench marks such as culvert, floor or bridge, step of building, ledge of rock, etc., should be given wherever convenient. Cross reference between notes and maps should be made. In the case of datum points on rock strata, a clear and unmistakable description of points used should be given in the geological field notes so that someone will be able to return later and find the points whose elevation has been determined.

When logs are collected, locations of the wells should also be included and elevations should be run. In areas where coal has been mined, detailed structure of the coal may be obtained for mines in which levels have been run. In planning underground work to obtain stratigraphic and economic information, it would be desirable to make observations on dips and faults at the same time with a view to making structure contour maps. In the case of mines for which levels have not been run, reliable information concerning the dips of the coal stratum in the mined area can usually be obtained from the mine superintendent or engineer, whose knowledge is based on the behavior of the coal cars and on the drainage of the mine. For the purpose of making a structure contour map of the mined area, these estimated grades should be entered on a copy of the mine map when they are received.

Non-Fuel Products - The Survey has a special section devoted to the investigation of non-fuel products of the State. In the geologic mapping of quadrangles and the preparation of reports, these mineral

products often do not receive full justice. There are five equally important principal points of interest, bearing on the value of a non-metallic mineral deposit, which are only partially outlined as follows:

A mineral deposit is not valuable unless it can be profitably worked. If a deposit is to be profitably worked it is necessary that the overburden can be easily and cheaply removed, or that the deposit be suited to mining. The deposit should also be so located as to be free from flooding by streams and should not interfere with town property.

In considering a deposit which is to be developed for local consumption only, it is not generally necessary to consider transportation facilities. These are supplied by wagons and trucks. A deposit which is to be worked for wider distribution, however, should generally be located within half a mile of a railroad. The country intervening between the deposit and the railroad should be sufficiently level to permit the building of a spur at a reasonable cost.

If it seems that there is a market for the product, and that it can be obtained economically, a thorough sampling is desirable. Samples should be representative of the deposit. If there be several kinds of material in the same deposit, take a sample of each kind. Samples should include within the sample sack a container bearing a label giving by township, range, and section the location of the site from which the sample was taken and indicating for what the sample is to be tested and what proportion of the general exposure it represents. This information is of interest to the man who tests the sample and is highly desirable in preventing the loss or misidentification of a sample. In every case the sample should be of fresh, unweathered,

unmodified material. Weathered samples, particularly of shales and clays, are likely to be misleading. If there will be a number of bulky samples, it is advisable to let them accumulate and make a lot shipment by freight; small samples may be shipped by express.

It is desirable to estimate carefully the amount of material available in a deposit. The reserve offered by a particular area is a very important point involved in its commercial development. Estimates on reserves should indicate the amount and character of the overburden as well as the amount of mineral available.

Although a determination of potential markets is not specifically within the province of a geologist, any data indicating what may be done with the mineral after it is quarried or mined, what is the likelihood of ready sale, and what price may be expected, are very valuable adjuncts to a report on a given site and its possibilities.

Limestone - Outcrops of limestone less than five feet thick are not generally quarriable except for supplying local demands. About one foot of overburden can be removed to secure one foot of stone and still leave a profit from quarrying operations. Samples are of two sorts, namely those for physical analysis and those for chemical analysis. The taking of either should be done only after consultation with Mr. Lamar.

Sand and Gravel - A sand and gravel sample should weigh about fifty pounds. It may be taken by digging a trench down the face of the deposit to expose fresh gravel and obtaining an equal amount from each point of the entire trench. The sample should be collected on a piece of canvas at the base of the cut, and then quartered down to the requisite fifty-pound sample. About half a foot of overburden can be economically removed for one foot of sand and gravel.

Molding Sand - Molding sand may be sampled in the same way as sand and gravel. The amount of overburden which can be removed economically is about the same as for sand and gravel. In describing potential molding sand deposits, note the size and shape of grain and the approximate amount of clay present. Calcium carbonate is generally to be avoided in molding sand.

Clay - Little can be told from a field examination of a clay or shale deposit. Laboratory and burning tests of clays and shales are expensive; consequently only those deposits which show good promise should be sampled for analysis. It is suggested that sampling of clay deposits be left until after the field conference with Mr. Lamar. Clay containing calcium carbonate, marcasite, pyrite, or considerable amounts of organic material is not generally valuable. About one foot of overburden can profitably be removed for one foot of good clay. If the overburden is heavy it may be feasible to mine the clay. Considerations of mining possibilities should include the character of the roof, the thickness of the clay, and inclination and configuration of the bed.

Ocher - Ocher is clay impregnated with red, brown, or yellow iron oxide. It should be free from grit or sand which may necessitate washing before the product is marketable. Ocher deposits less than two feet thick are probably not of commercial importance. Deposits may be either mined or quarried. About three feet of overburden can be removed for one foot of ocher.

Building Stone - Granular limestones, colored limestones, or limestones with irregular stylolitic or clay veinings are of considerable interest for interior decoration purposes. The stone should be free from incipient fractures and should be in beds at least three

feet thick. About two feet of overburden can be removed for one foot of stone. Truck haulage to railroads is possible if the haul is not too long and roads are good. Stone in beds of even and uniform texture may also be valuable for exterior construction purposes.

Cement Materials - Associated beds of limestone and shale containing less than four per cent of magnesium carbonate are potentially of value as cement materials. The material should exist in the ratio of about one foot of shale to three feet of limestone.

Visiting non-metallic industries

If your quadrangle possesses non-metallic industries in operation a great deal can be learned about the potential value of the non-metallic deposits by visiting and becoming thoroughly acquainted with the industries. In general you will be well received, particularly if you make clear your desire to learn about the industry. It is suggested that you first introduce yourself to the official in charge, who will likely save you time and put you in touch with the intelligence behind the operation. The geology of the quarry or mine exposure should be studied thoroughly. Often one sizable quarry will reveal data not seen in the outcrops of your quadrangle. Descriptions of the plant and its operation are to be written at the plant, and then submitted to someone who will be able to perfect it. This will save time later and make your work more exact.

Concluding the field work

Before concluding the field work, the mapping should tie in with adjacent maps or you should be prepared to justify your points of difference. In case the points of difference are equivocal, the new map should be made to agree with the old, but a statement should

be given the Chief.

Advance notice of your intention to return to the office should be given the Chief in order that conferences may be arranged for. Before leaving the office after the season, copies of all new logs should be left with the Technical Files Clerk, arrangements should be completed with the Chief regarding identification of fossils and analyses of laboratory samples, a copy of the geologic map should be made and submitted to the Chief, and an outline of your report prepared for the Chief's acceptance, after discussing with your field conferees those parts of it in which they would be interested.

Writing the Report

Before undertaking the writing of the report, please obtain from the Chief Clerk, a copy of "Instructions and suggestions for writing quadrangle reports".

M. M. Leighton

Chief



Express checks

105 M1, 678,300 Effingham hotel. June 20

301 Emmeron " 21

302 shell sta mt V " 23

303 Emmeron " 25

304 " 27

305 automotive service " 28

306 Pearl Williams Ashby " "

307 standard Oil, Nashville Tenn

308 Kichhofer motor Co " 10

309 Washgr Hotel " 11

310 Emmeron 12

311 Central Chev. Co Fairfield 14

312 S.O. Co. Ind " 16

313 Central Chev Co " 24

314 S.O. Co. Fla Ocala 28

315 " " 30

316 Haywood, Florida Aug 9

317 1st Nat bank Nashville " 14

318 Leigelson Hotel Newton " 18

319 Newton Motor Co " 14

205 N1, 288,280 Washington Hotel, Nashville July 11

281 " " "

282 Edmund Chevrolet Edison 14

283 Bryn Hotel Paup 28

284 " " "

285 Brooks Motor Co. Florida Aug 12

286

287

288

289

July 1 FTT per. 33.06 auto 23.07 rep. 1.75 U 22.85

15 33.00^x 29.16^x 22.78^x 51.94^x31 38.36^x 32.67^x 4.45^x 37.05^x 371.2^xAug 15 30.12^x 28.47^x 22.41^x 27.65^x31 29.60^x 30.86^x 15.00^x 28.95^xSept 1 48.01^x 21.54^x

O. E. Rabenack - W. Supt of Highway. Nashville
Mrs. A. E. Golden 215 E 5th St, Flora
Hogwicks cafe

E. Phillipps - Olney - W. Supt. of Highway
Clark R. Noel - Box 305, Olney 227R
Munday Richland Coal Co.

W. E. Dayton, Rattennake Den

V. Vandyke - Louisville
J. S. Reed, CIPS mattoon

1st Nat Bank of Chi

B 2267634 Newton - Hotel Aug 22

5 Raleigh " Affy " 26

6 Effingham bank " 30

7 " Raleigh Sept 2

8 greenup filling station

9 " bank Sept 10

Geo T Austin - Co. Supt 422 Virginia Ave. Effingham
N of Texas station W of track

John Becker - 5 m N of greenup ash at bank

6565/1

1866. ✓ Marion 1635. 1b. Dalls of Shiloh Fork
 1867. ✓ " 1622. 6c Washed out bridge with
 sandstone bluffs beyond.
- 1868 Marion 1633. 6a Ridge topography,
 probably rock controlled
- 1869 Marion 1629. 1a. View from hill over
 wooded and eroded lowland.
- 1870 Marion 1514. 1a. Rolling topography of S.E.
 Marion Co.
1871. ✓ Marion 1212. 8a. View at Odin over level
 ground moraine
1872. Marion 1520. 5a. Rolling rock topography.
1873. Marion 1336. 1h Limestone in creek bed
 showing dome.
1874. Clinton 1001. 7b Shaley limestone in bed
 of Crooked Creek
1875. ✓ Clinton 0102. 3c Watson Springs
- 1876 " 1114. 8d Ridges rising from drift plain
- 1877 " 0817. 6d Gully on Corcoran Hill show-
 ing loess & silted
1878. Clinton View S. E. from Corcoran Hill
1879. ✓ Jefferson 0103. 4a Rock hill & drift plain to right
1880. ✓ " 0712. 6h Post-glacial ravine in drift
 mantled topography
1881. Jefferson 0134. 4b Drift plain with slopes of
 rock hills across valley.
1882. Jefferson 0814. 3h Rock hills across valley

1883 Jefferson 0823.3h Drift overlying shale & sandstone with fault

1884 Jefferson 0814.3a Drift on shale & sandstone showing gumbotil on shale where poor drainage

1885. ✓ Jefferson 0821.1a. Hill country W. of Bluford

1886 ✓ { Jefferson 0821.8e Panorama view of post glacial

1887. ✓ { valley in sides of rock hills

1888. Jefferson 0723.4b valley on grounds of Mt. Vernon Country Club.

1889 ✓ Jefferson 0823.3h R.R. cut. C filter

+ 45 - 5 sec. looking SW. Experimental photo

89

15

6

lost

90

39

for FOT

- 1833 Fayette 1711.8h Old quarry in creek bed
 1834 ✓ " 1712.4d Landslide in new cut
 on route 142 looking N.
- 1835 ✓ Marion 0809.8 f. Old limestone quarry
 near Omega
1836. Marion 0235.6 h. Moraine(?) topography
 1837. ✓ Fayette 1527.8 d Valley of Hickory Creek
1838. Fayette 1712.4e Closeup of south cut
 showing silt, till, and gravel.
1839. ✓ Marion 0809.5 d Limestone ledge - Baker,
 Thwaites, Byrne
- 1840 ✓ Marion 0315.8a Hill rising from general
 level of drift plain
- 1841 ✓ Fayette 2228.4d View from ridge of drift.
- 1842 ✓ " 1712.4d Landslide in N. cut looking
 W. Route 142
1843. ✓ Fayette 0914.1f Oxidized top of pre-Illinoian
 drift showing shove by Illinoian ice
- 1844 Fayette 0928.2h Drift overlying Penn.
 shales. St. Elmo brick pit.
- 1845 ✓ Fayette 0122.4f Bluffs of the Kaskaskia
- 1846 ✓ " 0132.6c. Kaskaskia R.
1847. ✓ " 0727.7b Sawyer gravel pit
- 1848 ✓ " 0911.1b Illinoian till with gravel
 lens at contact with pre-Illinoian
 till which contains calcite
- 1849 Fayette 0813.8h Weathered till with
 sand boulder.

- 1850 Fayette 0125.1a Oxidized till ~~over~~
lying on weathered gravels which
rest on fresh till with sand balls.
- 1851 Fayette 0122.3a Valley of Fanny Branch
- 1852 " 0810.8c Cut in loess, grindstiel
and pebbly sand at right
- 1853 ✓ Fayette 0822.5h Valley of Wolf Creek show-
ing pseudo-terracing on spurs.
- 1854 Fayette 0727.7b Ravine west of Sawyer
gravel pit.
- 1855 Marion 0132.1d Panorama showing
valley sides and bottom land, with
#1856
- 1856 Marion 0132.1d Panorama with #1855
- 1857 ✓ " 1309.6f Limestone ledge,
Raccoon Creek. E blow at right.
- 1858 Marion 1304.36 Limestone ledge, Crooked Creek
- 1859 " 0124.4c Rock controlled topography
- 1860 " 0912.1e Eroded drift plain,
cut in loess & silttil
- 1861 Marion 0936.3b Loess on silttil. No
filter
- 1862 Marion 0936.3b Loess on silttil. K₂ filter.
- 1863 " 1603.2g Penn. sandstone in road cut.
- 1864 Last why?
- 1865 Marion 1636.7b Eroded drift along I.C.
R.R. cut.

1801. Jagerwell Co. 26 N.-3 W. 30.2b Wisconsin till
overlying Peorian loess
- 1802 Jagerwell 26 N.-3 W. 30.2b Langdon loess
with soil zone at top.
1803. ✓ Jagerwell 26 N.-3 W. 30.2b Original Peorian
locality from R. R. track. Men standing at
tops of two loess deposits
- 1804 Vermillion Co. 1916.2h. Thrust fault in
Pennsylvanian shales
- 1805 Vermillion Co. 1909.2d. Outcrop of
Penn. limestone beneath till - looking north
1806. Woodford. T. 26 N., R. 1 E. 09.5h.
Carbonaceous bands in top of Langdon
loess. T-road south from State Highway #8,
4½ miles west of El Paso, East of Panther Creek
1807. Vermillion 1916.2h. Faulting in Penn. shales
near Muncie.
- 1808 ✓ Vermillion 1916.2f Group at Artesian test hole:
Ekblaw, Krumbein, Thwaites, Endicott, Brown, Apfel.
1809. Fayette 1401.5f Gravel & till on bank of stream.
- 1810 ✓ Fayette 1401.5f Some hardened joints in fresh till.
- 1811 ✓ Fayette 0824.7d Valley of Moccasin Creek looking S.W.
- 1812 " 0812.1h Laminated silt overlying
probably pre-Illinoian till
- 1813 ✓ Fayette 1413.4f Thwaites & Byrne putting
down test hole
- 1814 ✓ Fayette 1413.4f Eroded drift plain from
top of same.

- 1815 ✓ Fayette 1121.6d Gravel pit on state farm
showing calcite cementation
1816. Fayette 1517.8g Cut in reddish sandy till
- 1817 " 1413.4f Looking west from same at
other hills
- 1818 ✓ Fayette 1125.5a View across Kaskaskia
bottoms with State Farm Hill in distance
1819. ✓ Clinton 0833.4b Looking E of S at hills
Panorama view from Boston Hill with 1821,
1822 (1820).
1820. ✓ Clinton 0833.4b Panorama from Boston
Hill with (1819) 1821, 1822.
1821. ✓ Clinton 0833.4b Panorama with 1819, 1822
- 1822 ✓ " 0833.4b " " 1819, 1821
- 1823 Jefferson 0607.8h View of drift plain from
rock hill
- 1824 Jefferson 0606.8h Edge of drift plain and
alluvial flat.
- 1825 ✓ Jefferson 0316.7d Faulted gravel, silt, & till
- 1826 " 0316.7d " " " " "
- 1827 " 0321.8h Coal layer in till
1828. " 0613.2a Peat & sand " "
- 1829 " 0218.7c Rock Ridge topography
- 1830 ✓ " 0204.2h " " " "
- 1831 Marion 0113.2g View N.W. from rock hill
1832. " 0315.6f " from hill over plain
to S.W.

LIST OF THOSE ALREADY SENT

INQUIRY, 1931

Alden, W. C., U. S. Geological Survey, Washington, D. C.
 Allen, Victor T., 221 N. Grand Blvd., St. Louis, Missouri
 Antevs, Ernst, 28 Beacon Avenue, Auburn, Maine
 Apfel, Earl, Syracuse University, Syracuse, New York
 Atwood, W. W., Clark University, Worcester, Massachusetts
 Bevan, Arthur C., Virginia Geological Survey, Charlottesville, Va.
 Blackwelder, Eliot, Stanford University, Palo Alto, California
 Bretz, J. Harlan, University of Chicago, Chicago, Illinois
 Brown, T. C., Fitchburg, Massachusetts
 Burwash, E. M. J., Geological Survey, Toronto, Canada
 Capps, Stephen R., U. S. Geological Survey, Washington, D. C.
 Carman, J. Ernest, Ohio State University, Columbus, Ohio
 Chadwick, G. H., Catskill, New York
 Coleman, A. P., Royal Ontario Museum, Toronto, Canada
 Condra, G. E., University of Nebraska, Lincoln, Nebraska
 Crosby, Irving B. (Prof.) 6 Beacon Street, Boston, Mass.
 Flint, Richard Foster, Yale University, New Haven, Connecticut
 Fryxell, F. M., Augustana College, Rock Island
 Gill, James R., Rochester, New York
 Hobbs, W. H., University of Michigan, Ann Arbor, Michigan
 Johnston, W. A., Department of Mines, Canadian Geological Survey, Ottawa
 Kay, G. F., University of Iowa, Iowa City, Iowa
 Kindle, E. M., Victoria Memorial Museum, Ottawa, Canada
 Lane, Alfred C., Tufts College, Massachusetts
 Leverett, Frank, 1724 S. University Avenue, Ann Arbor, Michigan
 Lougee, R. J., Dartmouth College, Hanover, New Hampshire
 MacClintock, Paul, Princeton University, Princeton, New Jersey
 Malott, Clyde A., University of Indiana, Bloomington, Indiana
 Matthes, F. E., U. S. Geological Survey, Washington, D. C.
 Moseley, John, Dept. of Geology, Harvard University, Cambridge, Mass.
 Perkins, Edward H., Colby College, Waterville, Maine
 Petty, J. J., University of South Carolina, Columbia, S.C.
 Reeds, Chester A., American Museum of Natural History, New York City
 Rothrock, E. P., State Geologist, Vermillion, South Dakota
 Sardeson, F. P., University of Minnesota, Minneapolis, Minnesota
 Sayles, Robert W., Chestnut Hill, 263 Hammond Street, Massachusetts
 Schoewe, Walter, University of Kansas, Lawrence, Kansas
 Sellards, E. H., Bureau of Economic Geology, Austin, Texas
 Shipton, W. D., Washington University, St. Louis, Missouri
 Simpson, H. E., University of North Dakota, Grand Forks, N.D.
 Taber, Stephen, State Geologist, Columbia, South Carolina
 Taylor, F. B., 420 Downing Avenue, Ft. Wayne, Indiana
 Theis, C. V., University of Cincinnati, Cincinnati, Ohio
 Thwaites, F. T., Wisconsin Natural History Survey, Madison, Wisconsin
 Von Engel, O. D., Ithaca, New York
 Warthin, A. S., Jr., Vassar College, Poughkeepsie, New York
 Wentworth, C. K., Washington University, St. Louis, Missouri
 Westgate, Lewis G., Ohio Wesleyan University, Delaware, Ohio
 Whitnall, Harold O., Hamilton, New York

July 22, 1931

Dr. M. M. Leighton,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

In reply to yours of July 15 the field season of 1930 was spent on your survey and I presume that Dr. Ekblaw will furnish the summary of that work.

In Wisconsin I had Mr. L. R. Wilson of the Biology Department work on the Two Creeks Forest Bed for his masters thesis. He has completed a report for publication in the Transactions of the Wisconsin Academy and now plans to continue the work for his doctors thesis. He found that the Forest Bed has a very immature soil profile with practically no leaching. The trees include spruce, jackpine, birch, and others, all but the first found as pollen.

Fungi, mites, beetle excavations, lichens, mosses (19 species), and mollusks (7 species) make up the rest of the list. The history of this life checks verywell the geological evidence. The forest suffered poor growing conditions for the last 20 years of its life but the trees were still standing if not alive when the Late Wisconsin ice overwhelmed them. New exposures of the Bed were discovered which show the effect of glacial shove in a remarkable way.

Mr. Karl S. Kurtenacker wrote his bachelor thesis on the outlet of Glacial Lake Oshkosh. He could find no evidence of tilting of the beaches of either the early or later pahse of this lake.

Mr. E. E. Wilson tabulated the screen analyses made by the Wisconsin road material survey dividing them as to origin of deposit and type of rock which predominates in the deposit. The results were not as striking as I had hoped for but I think that the origin of deposit has probably not always been determined correctly.

My personal observations were limited to trips with these and other students and were therefore very slight.

Dec. 14, 1931

Dr. M. M. Leighton, Chief,
State Geological Survey,
Urbana, Illinois

If absent can be given to Dr. Ekblaw

Dear Dr. Leighton:

I was sorry not to be able to join you in the opening of the new laboratories but it was quite impossible to get away now.

I am now busy writing my new text of glacial geology. This will be illustrated with block diagrams and line drawings to save expense. I intend to have it done by the photographic mimeograph process.

In this connection I was wondering if anyone had ever made any map showing the distribution of loess in this country. If so I have never seen one. If you know of such a map would be greatly pleased to loan of it.

You will not recognize the new text as having been written by the same person as the old one you have. Discussion of the several drifts will follow modern ideas as expressed by Dr. Kay and you. Attention will be given to the new ideas first put forward in this country by Flint on stagnation of the ice sheet. I have evolved theories to explain this and criteria for its recognition. I would like to get the ideas of others on some of these subjects before getting them in print but the manuscript is so large that I simply cannot ask anyone else to read over even portions of it.

Last summer I managed to get in two weeks field work on glacial geology in Wisconsin. Probably the present well known condition of business will prevent this during 1932. I was wondering if there is any chance for work on your Survey?

I promised the sponsors of the Cross Section of the Central United States which was prepared for the Fifth Annual Field Conference of the Kansas Geological Society that I would call your attention to the fact that they have extra copies still available. None were distributed free and although I was one of the contributors I had to purchase a copy. The section just touches the northwestern tip of Illinois. Copies may be procured from the Kansas Geological Society, Union National Bank Bldg, Wichita, Kansas for \$5.00

Had you heard of the arrival of Thomas Turville Thwaites at our home on August 21? He is now quite a boy and already has been on his first field trip (through which he slept). He now wants to join us in the study during the evening rather than go to sleep. so the glacial geology text is somewhat delayed at times.

Very truly yours,

Lecturer in Geology

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
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URBANA

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

June 10, 1931

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

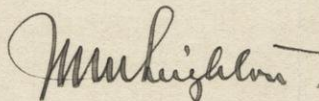
Dear Mr. Thwaites:

I have your letter of June 5 and
am glad to send you, under separate cover, with the
compliments of the Geological Survey Report of In-
vestigations No. 9, by Dr. Bevan.

I note your plans on staying home
and sincerely hope that you have a pleasant and profit-
able summer. I guess you are not passing up anything
this summer. However, I shall be glad to hear from you
any time you care to write.

With best personal regards, I am

Cordially yours,



Chief

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

July 15, 1931

Dr. F. T. Thwaites
Wisconsin Natural History Survey
Madison, Wisconsin

My dear Dr. Thwaites:

Professor W. H. Twenhofel, Chairman of the Committee on Sedimentation of the National Research Council, has again requested me to serve on his committee to report on the studies which have been carried on during 1930 on glacial sediments in North America, regardless of age.

This includes either sediments made by the ice itself, by waters associated with the ice sheet, by icebergs or other forms of ice, and by winds whose work is or was influenced by glacial conditions. Structures of deformation produced by glacial or quasi-glacial agencies and secondary changes made by weathering are also subjects to be included, but naturally distinction should be drawn between glaciation and glacial sediments.

I am wondering if you would be good enough to write me regarding any such work that you have been carrying on during the past year. In case you are not ready to state your interpretation, I should appreciate a brief statement regarding your problem and any other information you desire to give. The report will probably be published some time this year by the National Research Council.

It is important that this report should include the results of every worker on glacial sediments in North America. I should appreciate it if you would send me names of such workers of whom you may know additional to those on the enclosed list, to whom inquiries have been already addressed.

Can you conveniently send me your report by August first? I shall greatly appreciate it.

Thanking you and with best wishes, I am

Yours very truly,

M. M. Leighton
Chief

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

December 23, 1931

Mr. F. T. Thwaites
Lecturer in Geology
The University of Wisconsin
Madison, Wisconsin

Dear Mr. Thwaites:

Thank you for your kind letter of December 14. I regret that it was not possible for you to be present at the opening of our new Mineral Research Laboratories on December 9th. The dedication program was an outstanding success.

I am indeed interested to hear that you are working on your new text of glacial geology which includes modern ideas and theory. I am sorry, but I do not know of any map adequately showing the distribution of loess in this country.

I regret, but at the present time I cannot definitely say whether or not there will be any opportunity for you to work for the Illinois State Geological Survey next summer, but I shall be glad to keep you in mind.

Thank you for calling to our attention the fact that there are extra copies available of the Cross Section of the Central United States which was prepared by the Fifth Annual Field Conference of the Kansas Geological Society.

Congratulations on the arrival of Thomas Turville Thwaites at your home. I am sure that he must be quite a fine boy and will soon be of great help to you on your field trips.

With kind personal regards and with best wishes for a Merry Christmas and a Happy New Year, I am

Very truly yours,

M. M. Leighton
-Chief

May 29, 1933

Dr. George E. Ekblaw,
State Geological Survey,
Urbana, Illinois

Dear Ekblaw:

If wishes were (to be up to date) aeroplanes I would be only too happy to be with you on June 3 but as they are not I regret that time does not suffice. Besides in these days of cuts in salary, defaulted bonds, delinquent mortgages, then more cuts, more defaults, and so on ad infinitum one must think not twice but several times before undertaking a long journey.

I shall never forget my association with the Illinois Survey in those last years of prosperity. Often my mind goes back to some of the things I saw along those thousands of miles of roads down in Egypt, things which were "different" and are looked back upon as glimpses of another world. I think, too, upon the things I learned but most often upon my associates in the work and the many kindnesses which were shown me. The bitterness is gone now from the recollection of those millions of bumps, the mud holes, the scorching winds, and those stifling nights which were only partially alleviated by the ever-faithful electric fan. My mind does not go back to those things of itself and it is with pleasure and pride that I look back upon my part in a great project.

When working last year in New York State I drove over to Syracuse and spent a weekend seeing the Finger Lakes with Holmes. Apol was to come out but failed us at the last minute.

One of my students this year is J. M. Trefethen who was at Urbana last year and knows Utterback and others.

Enclosed is all the contribution I can afford in these trying times.

Please express to Dr. Loughton my regrets at being unable to come.

If the Congress trip for glacial geology materializes I hope to see you then even if unable to go on the trip myself.

With best regards to both Mrs. Ekblaw and yourself from both of us,

Sincerely,

Urbana, Illinois
May 17, 1933

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

Dear Thwaites:

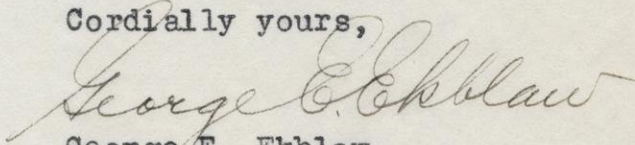
I believe that you will be interested to know that in celebration of the fact that on June 3 Dr. Leighton completes his tenth year as Chief of the Illinois State Geological Survey, we are planning for that evening an informal dinner and party which all present and past members of the staff who have served under him - and their wives, husbands, sweethearts, or special friends, as the case may be - may attend. Would you like to join us and can you arrange to do so? If so, we would be glad to have you here. Please let me know what your plans in regard to the matter are so we can make the necessary arrangements for you. The party will be held at Newman Foundation, corner of Sixth Street and Armory Avenue, Champaign, at 6:30 p.m., Saturday evening, June 3, 1933, and the dinner will be \$1.00 per plate ("Dutch treat," no other charges).

In recognition of the success which Dr. Leighton has achieved as Chief and as a token of the esteem in which we hold him, the present staff is planning to present him with some appropriate gift, and if perchance you would like to participate in this, you may send any contribution you wish. However, do not feel that you need do so - this is an invitation to our party, not a solicitation for funds. We just want to give you the chance if you feel like doing it.

The important thing is for you to decide whether you are coming and then to let me know what your decision is - at once.

Hoping to see you June 3, and with best regards,

Cordially yours,


George E. Ekblaw

P.S. We are trying to surprise Dr. Leighton on this occasion so we ask you to please use caution that no report of it reach him directly or indirectly.

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
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URBANA

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

March 13, 1933

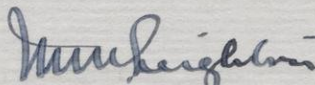
Dr. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

Dear Dr. Thwaites:

Replying to your letter of February 9:

I agree with you that we should not tie ourselves down to any certain number of Wisconsin sub-stages. I believe, however, that we now have the earliest ones properly aligned, and that my present proposed classification permits the addition of any younger divisions that further field study may reveal.

Cordially yours,


Chief

Stratigraphic Synopsis of LaSalle Region

Pleistocene system

Eldoran series

Recent interglacial (?) deposits

Wisconsin glacial drift

Mankato drift

Cary drift

Tazewell drift

Iowan drift

) Peorian loess

Centralian series

Sangamon interglacial deposits

Illinoian glacial drift

Ottumwan series

Yarmouth interglacial deposits

Kansan glacial drift

Grandian series

Aftonian interglacial deposits

Nebraskan glacial drift

Pennsylvanian system

Unclassified beds

Little Vermilion cyclothem

LaSalle cyclothem

LaSalle limestone

Hall cyclothem

Hicks cyclothem

Turner cyclothem

Coal No. 8

Gimlet cyclothem

Lonsdale limestone

Sparland cyclothem

Coal No. 7

Brereton cyclothem

Coal No. 6

Streator coal

Vermilionville sandstone

St. David cyclothem

Horizon Coal No. 5

Waupecan conglomerate

Sumnum cyclothem

Hanover limestone

Horizon of Coal No. 4

Pleasantview sandstone

Liverpool cyclothem

Purinton shale

Oak Grove marine member

Francis Creek shale

Coal No. 2

Lowell clays

Ordovician system

Galena dolomite

Platteville limestone

St. Peter sandstone

Shakopee dolomite

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

March 24, 1933

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

Dear Dr. Thwaites:

I have received your kind letter of March 23rd and thank you for advising me of Professor L. W. Ploger of Syracuse University, Syracuse, New York, doing some glacial sedimentation work. I am adding his name to my list.

I deeply regret that things are not going so well and sincerely hope that it will not be as bad as it is rumored.

With kind regards,

Sincerely yours,

M. M. Leighton
Chief

March 23, 1933

Dr. M. M. Leighton, Chief,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

Reply to your circular letter of March 8 is enclosed on
separate sheet.

While in New York State last summer I spent three and a half days with
Prof. L. W. Floger of Syracuse University, Syracuse, New York. He has been
mapping the Catteraugus quadrangle with special attention to new interpretations
of the glacial features. I feel that his name should be on your list.

Thank you for the letter about the subdivision of the Wisconsin.
All work on the glacial geology text is now called off but the blueprint
preliminary edition of the illustrations is now finished and I will try to send
you a complimentary copy at an early date.

The future looks worse than ever to us here with lots of disturbing
rumors afloat. The best that can be hoped for will be bad enough!

Hoping that you are no worse off,

Sincerely,

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

March 8, 1933

Dr. F. T. Thwaites
Wisconsin Natural History Survey
Madison, Wisconsin

Dear Dr. Thwaites:

Professor W. H. Twenhofel, Chairman of the Committee on Sedimentation of the National Research Council, has again asked me to serve on his committee to report on the glacial sediments in North America, regardless of age.

This includes sediments made by the ice itself, by waters associated with the ice sheet, by icebergs or other forms of ice, and by winds whose work is or was influenced by glacial conditions. Structures of deformation produced by glacial or quasi-glacial agencies and secondary changes made by weathering are also subjects to be included, but naturally distinction should be drawn between glaciation and glacial sedimentation.

Will you be good enough to submit a brief report on any work you have done or studies you have made on this general subject during the past year? I shall greatly appreciate it if you can have your statement in my hands not later than March 25.

It is important that this report include the results of every worker on glacial sediments in North America. I am enclosing herewith a list of the names of men to whom inquiries have already been addressed. If you know of any one who has conducted studies of this nature and whose name does not appear on the enclosed list, I should greatly appreciate your advising me promptly so that our report may be complete.

Very truly yours,

M. M. Leighton

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF

305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

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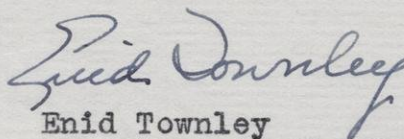
November 14, 1932

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

Dear Mr. Thwaites:

Your letter of November 8 and the enclosures of advance blueprint copies of the maps for your proposed text of glacial geology were received during Dr. Leighton's absence from the office. Upon his return the first part of next week, your letter will be brought to his attention.

Very truly yours,



Enid Townley
Assistant to the Chief

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

May 26, 1932

Dr. F. T. Thwaites
Wisconsin Natural History Survey
Madison, Wisconsin

Dear Dr. Thwaites :

Professor W. H. Twenhofel, Chairman of the Committee on Sedimentation of the National Research Council, has again asked me to serve on his committee to report on the glacial sediments in North America, regardless of age.

This includes sediments made by the ice itself, by waters associated with the ice sheet, by icebergs or other forms of ice, and by winds whose work is or was influenced by glacial conditions. Structures of deformation produced by glacial or quasi-glacial agencies and secondary changes made by weathering are also subjects to be included, but naturally distinction should be drawn between glaciation and glacial sedimentation.

Will you be good enough to submit a brief report on any work you have done or studies you have made on this general subject during the past year? Dr. Twenhofel is preparing a final report which is to embrace the work of the last two years. Most of the data covering the year 1930-31 have been assembled, but if you have any information not previously reported for that year will you please include it with your report for the past year, 1931-32. I shall greatly appreciate it if you can have your statement in my hands not later than June 10th.

It is important that this report include the results of every worker on glacial sediments in North America. I am enclosing herewith a list of the names of men to whom inquiries have already been addressed. If you know of any one who has conducted studies of this nature and whose name does not appear on the enclosed list, I should greatly appreciate your advising me promptly so that our report may be complete.

Thanking you, I am

Yours very truly,

M. M. Leighton

Science Hall, Madison, Wis.

June 20, 1932

Dr. M. M., Leighton, Chief,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

In reply to yours of June 14 I hardly think that we are sure enough of the present classification of the glacial drifts to discriminate with certainty between interglacial and intraglacial deposits. I put the Two Creeks deposits in the subinterval between the third and fourth substages of the Wisconsin stage. I think you use somewhat different terminology in Illinois. Nevertheless, I am confident that no such simple tripartate division of the Wisconsin as that formerly used (Early, Middle, and Late) is enough. I think that I outlined my suggested subdivision in a former letter. To be sure the intervals seem to represent longer times than do any of the subintervals but the Two Creeks subinterval was a time when the ice certainly left the United States.

Dr. Leith wants me to have my new glacial geology printed and not mimeographed but work as we could it is still not done and I leave here in a week. Wish I could talk over the illustrations with you, that is those which I have done since I sent you some. Will try to send you advance blue prints and hope that my bold suggestions do not shock you too greatly! At least there will be something concrete to shoot at when they are out!

Wilson's paper should be out some time this month but as both of us will be in the field cannot promise a copy until fall,

Sincerely,

DEPARTMENT OF
REGISTRATION AND EDUCATION
M. F. WALSH, DIRECTOR
SPRINGFIELD

STATE OF ILLINOIS
STATE GEOLOGICAL SURVEY DIVISION

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STATE UNIVERSITY
DEAN CHARLES M. THOMPSON

June 14, 1932

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

My dear Thwaites:

In your summary statement on the "Two
Creeks Interglacial Forest Bed", for the report on the
study on glacial sediments for the National Research
Council, which you sent me, you used the term "inter-
glacial". I am wondering if this should not be "intra-
glacial". Do you know the age of the under lying drift?
Isn't it Middle Wisconsin?

I am Hoping that you are having a fine summer,

Cordially yours,

M. M. Leighton
Chief

Nov. 13, 1933

Dr. M. M. Leighton, Chief,
State Geological Survey,
Urbana, Illinois

Dear Dr. Leighton:

Probably you will remember that I mentioned the possibility of writing up the "underfit" rivers of southern Illinois with their huge meander scars. I think that you then offered to send me the needed maps. As I cannot find these maps in our library I would like very much to take advantage of this offer. So far as I can recall, there are good examples of this phenomenon near Newton and above Vandalia but probably there are others.

We all thought that the first Tri-State Field Conference was a great success and hope that we can do as well next year.

Very truly yours,

F. T. Thwaites