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Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

October 7, 1955

Dr. H. D. Glass
Illinois State Geological Survey
Urbana, Illinois

Dear Herb:

Just got your reprint, "Differential Thermal Analysis of Coking Coals." It made very interesting reading, though you will note that I am more or less out of the coal technology work now, having returned to plant micropaleontology after resigning at the Bureau of Mines.

It seems to me that you have a very fine technique in your open-retort-D.T.A. (or whatever you call it) for small coking, with careful control and exact pyrometry. That, of course, is what it amounts to. Some of the Bureau of Mines people are trying to accomplish the same thing with specially designed small coking retorts (designed to take 50 grams or so of coal).

Best wishes and regards.

Yours sincerely,

AT
Alfred Traverse

AT:dty

Region V
Box LL, University Station
Grand Forks, North Dakota

September 24, 1954

Dr. Herbert D. Glass
Division of Clay Resources and Clay
Mineral Technology
Illinois Geological Survey
Urbana, Illinois

Dear Herb:

Your cooperation in giving me so much time and help during the recent visit to Urbana was very much appreciated. The A.I.B.S. meetings and the subsequent trip to some Florida swamps have temporarily relegated thoughts of D.T.A. to the back of my mind. However, as soon as possible I will get together the various data I said I would send on the samples you have run. In the meantime, if you are able to send me the duplicates of the thermal curves we used in our discussion, I hope you will do so. I think we can get some useful correlations from your work.

I now feel that I have a much clearer idea of the technique of D.T.A. you are using. I am convinced of the value of the method for coal analysis. But, as I discussed with you, I feel there is a serious need for calibration of values and for standardization of apparatus and techniques.

Thanks again for your help.

Very truly yours,



Alfred Traverse
Coal Technologist

ATraverse:vh

cc: Lankford
Region V
Traverse
File 625.1
C File

Region V
Box LL, University Station
Grand Forks, North Dakota

August 26, 1954

Dr. Herbert D. Glass
Illinois Geological Survey
Urbana, Illinois

AIR MAIL - SPECIAL DELIVERY

Dear Herb:

Your wire came a few minutes ago. I don't think I can rearrange the schedule at this point. The reason is that I have planned a field trip of about a week, in various swamp locations, after the meetings. That will be in cooperation with Dr. Spackman and some of his Penn. State crew. I am also planning to take a few days vacation en route back to Grand Forks. Yet I must be back by about Sept. 20.

So, the alternative to coming next week as planned would be to postpone the visit until some later time, probably next year. I was planning to be in Urbana through Sept. 1, so I should be able to see Jack Simon, although it is Herb Glass I am primarily interested in visiting!

As far as a room goes, I am not at all fussy, and I am sure that I can turn up a bed somewhere in Champaign-Urbana. In a note I sent you yesterday I wrote that a room on or near the campus would be ideal, if available.

If, all considered, you feel that it would be wise for me to cancel the Urbana visit, please wire me before Sunday at:

617 Lincoln Drive, Grand Forks

Very truly yours,



Alfred Traverse
Coal Technologist

ATraverse:vh

cc: Lankford
Region V
Traverse
File 625.1
C File

Region V
Box LL, University Station
Grand Forks, North Dakota

August 23, 1954

VIA AIR MAIL

Dr. Herbert Glass
Illinois Geological Survey
Urbana, Illinois

Dear Dr. Glass:

As I wrote Jack Simon some weeks ago, I am planning to spend about one full day with you in Urbana, hoping to confer with you about the differential thermal studies that you made of samples I sent several months ago, and also to absorb some general information about your techniques, etc.

Jack suggested in a letter of July 9 that the end of this month would be satisfactory for the visit, and I am planning to be with you next Monday afternoon, the 30th, and also on August 31, presuming that this is still o.k.

Very truly yours,



Alfred Traverse
Coal Technologist

ATraverse:vh

cc: JDLankford
Region V
ATraverse
File 625.1
C File

Dr. Frouse

Region V
Box 11, University Station
Grand Forks, North Dakota

October 12, 1953

Dr. Herbert D. Glass
Division of Clay Resources and Clay Mineral Technology
Illinois Geological Survey
Urbana, Illinois

Dear Dr. Glass:

Your letter of September 11 came while I was away, and this is the first opportunity I have had to write you about my reactions. It is certainly good to know that you have been able to do so much work with the samples I sent you, and it looks as though there may be an interesting story to tell. It seems to me that there is a good possibility of getting a profitable correlation between optical petrographic information, chemical analysis and your data. I think that your idea of a joint effort to understand the meaning of all our data is certainly sound.

As you know, I have petrographic and chemical information about the samples and would like to attempt correlation of the various sets of data. I think it would be essential for me to have the more complete report that you indicate is being prepared, before going very far with interpretation of your results. I am handicapped by the fact that I know relatively little about the precise meaning of the curves that are presented by differential thermal analysis specialists. I have read and heard papers about it and understand the basic techniques. But I have been especially disturbed by the fact that the curves I have seen have not shown the absolute scale for the vertical axis. You write of a peak of 23.5 cm. What in absolute terms, does the 23.5 cm. mean? Could you suggest the textbooks and other references that you regard as the most lucid? I think it is important that I expand my basic knowledge of the method of presenting results in order that I can be certain that I understand what is meant by your data. If you are planning to be at the Toronto meeting (GSA) next month, perhaps we can get together about this at that time.

There are a few things I would like to say about the preliminary qualitative data in your September 11 letter: Your comments on the petrographic varieties I sent were of great

Alvarez: dm
Region V
Lanford
Traverse
P110 625.1
C. P110

Alfred Alvarez
Coal Technologist

✓

Very truly yours,

Hoping to see you in Toronto, I am

In closing may I say that this looks very promising, and I think we should follow it up with a joint contribution when more data is available. We are looking forward to getting your report with the thermal curves and more detailed information.

It looks to me that collection of more samples in the substitutional part of the Tongue River member (Montana-Wyoming) should be undertaken in order to give us a better story on the trunk question. It seems to me that part of the investigation should perhaps wait until we have this petrographic-chemical-DTA study of the lignite in hand.

Your "guesses" on the petrographic composition of the samples 4 - 13 are astonishingly good and give some promise that DTA can be used in our work as a rapid analytical method.

interest, though you did not comment on Fusain and "Leontide" (samples 17 and 18). The chemical analysis of samples 14, 15 and 16 do not show nearly the volatile matter difference you results seem to show - does that mean that the kind of volatile matter is different, though the total amount is not strikingly different? Sample 15 was 49.72% volatile matter on the moisture and ash-free basis, sample 14 was 47.71%, and sample 16 was 47.54%. The optical features of these samples are so different that I was somewhat surprised by the small differences shown in conventional proximate analysis. Perhaps differential thermal analysis will detect qualitative chemical differences between the petrographic components that are not revealed by standard analytical techniques.

SEP 14 1953

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GRAND FORKS, NORTH DAKOTA



STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
121 NATURAL RESOURCES BUILDING
UNIVERSITY OF ILLINOIS CAMPUS
URBANA

September 11, 1953

Dr. Alfred Traverse
U. S. Bureau of Mines
Box LL, University Station
Grand Forks, North Dakota

Dear Dr. Traverse:

I have completed the preliminary thermal analyses for your samples and the results have been very encouraging. I believe we are now ready to correlate analytical data with the curves. If any data are available on chemical analyses, heating values, and petrographic composition, I am hoping we can make a very successful correlation.

The curves, for this initial discussion, can be described best in terms of loss of volatile constituents. Almost all are characterized by endothermic reactions representing loss of water between 100-200°C., and loss of "volatile matter" between 400-500°C. The amplitude of the peaks varies with the different samples. For lignite, air-drying for one day causes a decrease in the size of the water peak, and an increase in the size of the volatile peak.

The pure petrographic constituents are extremely variable. Sample 15 has a volatile peak amplitude of 23.5 cm., sample 16 of 16.1 cm., and sample 14 of only 5.4 cm. Thus the attritus is much greater in intensity than the anthraxylon. I am assuming, therefore, that the larger size peaks in lignite are attrital types.

The curves fall into two groups. Samples 4, 8, and 11 seem to be higher in attritus. Samples 5, 6, 7, 9, 10, 12, and 13 should be xyloid types. Within the latter group, samples 5, 6, and 13 may be different than samples 7, 9, 10, and 12. Sample 6 shows a wood type curve when dried.

With more data the groups may become more precisely defined. I do not understand the relationship between rank and petrographic components nor the relationship between lignite and subbituminous coals.

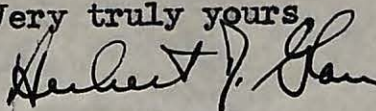
Dr. Alfred Traverse - page 2
September 11, 1953

The subbituminous coals have much larger volatile peaks and smaller water peaks than for lignite. All show different characteristics. Sample 3 shows an increase in volatile peak size, sample 1 a decrease, and sample 2 contains an additional exothermic reaction which I have only observed in subbituminous A coals and all high volatile coals. If these characteristics can be correlated with other data, a precise rank classification for these coals can be made. It would be interesting to see what the A coals would show.

On the basis of the data available, sample 2 should be highest in rank and sample 3 the lowest. This is based on the similarity of 2 with high-volatile coals and 3 with lignite.

I trust I haven't confused you too much and hope you can make more sense from the data than I have been able to. After I have tried to correlate the analytical data I will send you a complete report including copies of the thermal curves.

Very truly yours,



Herbert D. Glass
Associate Geologist
Division of Clay Resources and
Clay Mineral Technology

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STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
121 NATURAL RESOURCES BUILDING
UNIVERSITY OF ILLINOIS CAMPUS
URBANA

August 13, 1953

Dr. Alfred Traverse
United States Bureau of Mines
Box LL, University Station
Grand Forks, North Dakota

Dear Dr. Traverse:

The lignite samples arrived here in excellent condition. I have finally gotten over the effects of my vacation and have started the analyses.

I have decided to make at least three sets of thermal curves in order to see what effect the moisture content has on the shape of the curve. Runs will be made on fresh coal, air-dried one day, and air-dried for a sufficient time to permit equilibrium with the air. Do you have any suggestions as to time limit for the last category? Would a set of curves for oven-dried samples be of any value and if so, at what temperature should the samples be dried?

The results so far are very interesting, but I shall defer my many questions until I have completed all the samples. Do you have any heating value data on the samples? I would like to attempt a correlation between peak intensity and heating value.

Very truly yours,

Herbert D. Glass
Associate Geologist
Division of Clay Resources and
Clay Mineral Technology

Region V
Box LL, University Station
Grand Forks, North Dakota

July 8, 1953

Dr. Herbert D. Glass.
Associate Geologist
Division of Clay Resources & Clay Mineral Technology
Urbana, Illinois

Dear Dr. Glass:

The samples of coal which you requested for your work on differential thermal analysis are in the package to which this letter is attached. These samples have been selected by me with considerable care, in the light of our previous correspondence. All of the samples are from the Tongue River member of the Fort Union formation (Paleocene). I have included three samples of sub-bituminous coal of Tongue River age - this might show something of interest because the higher rank of the sub-bituminous coal is presumably not related to original composition. Data for the samples are listed on the attached chart.

Some additional comments on these samples are perhaps necessary. I think that the Fort Union coal region is covered about as well as possible with this number of samples. Within North Dakota, all of the principal petrographic types I now know of are included. Petrographic and chemical analyses are available here for the types I have sent you.

Sample No. 6 appeared to be all woody when collected. Comparison of it with No. 9, a sample of delivered coal from the same mine, might be interesting.

Samples numbered 4, 5, 17 and 18 are from a region of North Dakota, the lignite of which has been little investigated. It has a conspicuously low heating value, and there is some evidence that it is different in other respects. Samples numbered 8 through 13 are representative samples of delivered coal. These were taken from coal used in gasification "run 17" in August and September, 1951, here. The coal was stoker size, rescreened here to $3/8" \times 1\frac{1}{4}"$. Each original sample, taken by

periodic sampling of the coal used, consists of several 55 gallon drums of lignite. These were reduced in a large sample-divider to a few pounds of coal, which was crushed to $-1/8"$ and divided again in a small riffle sample-divider to produce the sample being sent to you.

Sample No. 18 is of "leonardite". This is a soft, earthy material believed by some to be a derivative of lignite through weathering. Not much is really known about it.

Numbers 14 through 17 are as nearly pure samples of the four petrographic constituent (according to Thiessen's system) as I can prepare. Numbers 14 through 16 are from a column about which we have much other information, chemical and petrographic.

Nearly all the samples have been crushed to $-1/8"$ size. I suggest that those which are not (especially Nos. 14 through 17) should be crushed in a mortar and mixed before you take your sample for analysis.

All of the samples have been carefully protected from moisture-loss since collection. Loss of moisture changes the nature of lignite markedly.

I am, of course, very eager to hear of the progress of your work. It may contribute to my own research.

Very truly yours,

AT
Alfred Traverse
Coal Technologist

ATraverse:dm
Att.

cc: Region V
Lankford
✓ Traverse
File 626.1
C. File

Sample of coal sent Dr. H. D. Glass, 8 July/1953

Sample No.	Nature of Sample	Date of Sample	Mine	Coal Bed	Location from which Sample was Taken	Comments
✓ 1	Sub-bituminous B coal <i>No "volatile peak" split</i>	6-12-53	Colstrip mine (Northern Pacific Railway), Colstrip, Rosebud County, Montana	Rosebud	S.E. $\frac{1}{4}$ of S.W. $\frac{1}{4}$ of Sec. 12 - T. 1N. - R. 41E.	Taken from a fresh face about 10 feet from the bottom of a 25 foot bed.
✓ 2	Sub-bituminous B (or C?) coal <i>Has "volatile peak" split</i>	6-11-53	Big Horn Coal Co. mine, near Sheridan, Sheridan County, Wyoming	Local name: "Master vein"	S.E. $\frac{1}{4}$ of Sec. 1 - T. 52N - R. 85W.	Collected from a fresh face: saw cuttings from a chain saw preparing "upper bed" for mining. Bed is about 5 feet thick.
✓ 3	Sub-bituminous C coal <i>Now: no split dry: split! (uda) 90°C over overnight (15 hrs.)</i>	6-11-53	Wyodak Mine, near Gillette, Campbell County, Wyoming	Smith-Roland	600 feet S. and 700 feet W. of N.E. corner of Sec. 28 - T. 50 N. - R. 71W.	Collected from a fresh face about 15 feet from bottom of the 80 foot bed of coal being mined.
✓ 4	Lignite	6-16-53	Knife River Coal Mining Co. Peerless Mine, Cascoyne, Bowman County, North Dakota	Harmon (also called Scranton)	Sec. 34 - T. 131N - R. 99W.	Collected from a fresh face about 6 feet from the bottom of the upper bench of the bed (called "upper bed"). The upper bench is about 10 feet thick and is separated from the lower bench by about 2 feet of clay.
-x 5	Lignite	6-16-53	Same as No. 4	Same as No. 4	Same as No. 4	Collected from a fresh face, about 7 feet from the bottom of the lower bench of the Harmon (called "lower bed"). The lower bench is about 15 - 20 feet thick. See also above comment.

Sample of coal sent Dr. H. D. Glass, 8 July/1953(cont'd.)

Sample No.	Nature of Sample	Date of Sample	Mine	Coal Bed	Location from which Sample was Taken	Comments
WD - X 6	Lignite	6-16-53	Dakota Briquets and Tar Products Inc. mine, near Dickinson, Stark County, North Dakota	Probably "E" or "F"	N.E. 1/4 of Sec. 17 - T. 139 N. - R. 95W.	Collected from a fresh surface at the top of the bed. The bed was about 8 feet thick where sampled.
X 7	Lignite	6-17-53	Truax-Traer Dakota Star Mine, near Hasen, Mercer County, North Dakota	Boula-Zap	S.E. 1/4 of Sec. 18 - T. 145 N. - R. 86W.	Sample collected from a fresh face, about 6 feet from the bottom of the bed, which was about 15 feet thick where sampled.
A 8	Lignite	Aug. - Sept. 1951	Paukol-Noonan mine, Divide County, North Dakota	Noonan	-	Representative sample taken by periodic sampling of coal used in gasification "run 17" at the Grand Forks station.
W X 9	Lignite	Same as No. 8	Dakota Briquets and Tar Products Inc. mine, near Dickinson, Stark County, North Dakota	Probably "E" or "F"	-	Same as No. 8.
X 10	Lignite	Same as No. 8	Dakota Collieries mine, Zap, Mercer County, North Dakota	Boula-Zap	-	Same as No. 8.

Sample of coal sent Dr. H. D. Glass, 8 July/1953 (cont'd.)

Sample No.	Nature of Sample	Date of Sample	Mine	Coal Bed	Location from which Sample was Taken	Comments
o * 11	Lignite	Aug.- Sept. 1951	Western Dominion Mines, Ltd., Bienfait mine, Bienfait Sas- katchewan, Canada	?	-	Same as No. 8.
x 12	Lignite	Same as No. 11	Knife River Coal Mining Co. Beulah mine, Beulah, Mercer County, North Dakota	Beulah- Zap	-	Same as No. 8.
- x 13	Lignite	Same as No. 11	Truax-Truax Min- ing Mine, Burke County, North Dakota	Moohan	-	Same as No. 8.
14	Lignite- petrographic analysis: 100% anthracylon (wood)	7-11-51	Dakota Collier- ies mine, Zap, Mercer County, North Dakota	Beulah- Zap	S.W. $\frac{1}{4}$ of S.W. $\frac{1}{4}$ of Sec. 32 - T. 14 $\frac{1}{2}$ N. - R. 86W.	Part of a column sample col- lected by Robert Kilman. The column is designated ND - M - 1 - 51 in our petro- graphic laboratory. The coal bed was 12 feet thick at place sampled. This sample is from about 3 feet 10 inches from the bottom of the bed and is represented by thin sections 23-2; 23-3; 23-4 from the column.

-3-

o - sent to E. Doucette, Penn. State,

also

Sample of coal sent Dr. H. D. Glass, 8 July/1953 (cont'd.)

Sample no.	Nature of Sample	Date of Sample	Mine	Coal Bed	Location from which Sample was Taken	Comments
15	Lignite-petrographic analysis: over 80% translucent attritus	Same as No. 14	Same as No. 14	Same as No. 14	Same as No. 14	Same as No. 14, but sample is from about 3 feet 8 inches from the bottom of the bed and is represented by thin-section 24-5 from the column.
16	Lignite-petrographic analysis: almost 90% opaque attritus	Same as No. 14	Same as No. 14	Same as No. 14	Same as No. 14	Same as No. 14, but sample is from about 5 feet 4 inches from the bottom of the bed and is represented by thin-section 18-3 from the column.
17	Lignite - fusain	6-16-53	Knife River Coal Mining Co. Fearless Mine, Cassoyno, Bowman County, North Dakota	Harmon	Sec. 34 - T. 131 N. - R. 99W.	Collected from fresh surfaces in the mine. See comments for Nos. 4 and 5.
18	Lignite? "leonardite"	Same as No. 17	Same as No. 17	?	Same as No. 17	Collected from a fresh face. The "leonardite" bed is about 6 feet thick and is about 12 - 14 feet above the upper bench of the Harmon, separated from it by clay. This sample came from about 3 feet from bottom of "leonardite" bed. See also comment for Nos. 4, 5 and 17.

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STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
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UNIVERSITY OF ILLINOIS CAMPUS
URBANA

May 18, 1953

RECEIVED

MAY 20 1953

U. S. Bureau of Mines
Grand Forks, North Dakota

Dr. Alfred Traverse
Coal Technologist
U. S. Bureau of Mines
Box LL, University Station
Grand Forks, North Dakota

Dear Dr. Traverse:

I am entirely in agreement with your suggestion that the thermal work be coordinated with your investigations as closely as possible. A thermal study of known petrographic types should furnish an excellent graphic picture of the variations in lignite from your area. I will be looking forward to receiving the samples by mid-June.

I have made some thermal curves of various brown-coals in an attempt to find the transition to lignite. The results have been very encouraging as the curves of brown-coal do not resemble peat or lignite, but are transitional to lignite. I have not as yet found any transition from peat to brown-coal. However, I should like to know how an attrital lignite differs from an xyloid type before I draw any conclusions as to the coalification sequence.

Very truly yours,

Herbert D. Glass
Associate Geologist
Division of Clay Resources and
Clay Mineral Technology

Region V
Box 11, University Station
Grand Forks, North Dakota

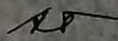
May 13, 1953

Dr. Herbert D. Glass
Associate Geologist
Division of Clay Resources and Clay Mineral Tech.
State Geological Survey Division
University of Illinois Campus
Urbana, Illinois

Dear Dr. Glass:

Re yours of May 5: Two dozen samples, in all, should give a reasonably good picture of the North Dakota lignite field. As I pointed out previously, the lignite of this region is relatively uniform, and if you want a wide range of types of lignitic coal, you will have to go into other regions for samples. However, I think there is an excellent chance of getting an interesting story from such variation of petrographic types as we do have. Naturally, I am anxious that such work as you are able to do should be coordinated with my investigations as closely as possible. I am going into the field on June 5 with one of my aims the collection of samples for this work. The samples should be in your hands by mid-June. Is that soon enough, or would you like samples of the mine-product coal that I have on hand, immediately?

Very truly yours,



Alfred Traverse
Coal Technologist

AT:dm

cc: Region V
Lankford
✓ Traverse
File 626.2
C. File

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May 5, 1953

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MAY 7 1953

U. S. Bureau of Mines
Grand Forks, North Dakota

Dr. Alfred Traverse
Coal Technologist
United States Bureau of Mines
Box LL, University Station
Grand Forks, North Dakota

Dear Dr. Traverse:

Although it is very tempting to undertake a study of all types of lignitic coals, I am afraid that such a project would not be feasible at this time. The number of thermal analyses made on low-rank coals is so meager that it seems advisable to first make a general survey of lignites in order to discover whether the method shows promise for more refined studies.

I would therefore prefer to study the run-of-mine samples from the North Dakota mines and then, if more data are needed, a more extensive program of petrographic and thermal analyses of selected samples can be considered.

The time element is important in thermal analysis and I can make only two runs a day. Would two dozen samples give a fair representation of the lignite types? For run-of-mine samples five to ten grams is sufficient; the exact amount is not important as the sample holder uses only 0.5 gram.

It would also be interesting if you could prepare about six relatively pure components. The smallest amount should be a bit over 0.5 gram, but I would prefer one gram to be on the safe side.

Do you think that it would be wise to preserve the original bed moisture? Then we could have a check on whether differences exist between fresh and air-dried samples. I leave the decision to you as it involves careful packing of samples.

Thanking you for your cooperation,

Very truly yours,

Herbert D. Glass
Associate Geologist
Division of Clay Resources and
Clay Mineral Technology

Region V
Box 11, University Station
Grand Forks, North Dakota

April 24, 1953

Dr. Herbert D. Glass
Associate Geologist
Illinois Geological Survey
University of Illinois Campus
Urbana, Illinois

Dear Dr. Glass:

It was very interesting to hear more about your work with differential thermal analysis of coal. Your paper at the Boston meetings was most stimulating, and were it not for the fact that it immediately preceded mine on the program would doubtless have made an even greater impression on me. I am ready to give you any assistance I can in getting the samples you need for your work.

As you know, my work is concentrated on the lignite of the Fort Union coal region. It would be interesting to test a wide variety of American lignitic coal, but I shall be able to provide samples only for this general region. American Eocene lignite could be obtained easily, for example, from the mines operating in Texas. Lignite of presumed Oligocene age, from Vermont, has been studied by various people, including me. Dr. Elso S. Barghoorn, of the Biological Laboratories, Harvard University, would doubtless supply you with small samples of this coal, the Brandon lignite. Miocene lignites are common in Europe, and samples could be obtained of these also. Dr. Cady probably help you get samples of the European brown coals.

The commercially mined coal in this region is nearly all Paleocene (Fort Union formation). At this time I could provide only run-of-mine lignite from a selection of North Dakota mines. It seems to me, however, that the sort of study you are making could be integrated with petrographic studies, and I would like to suggest that later this year I could collect samples for your use and mine. Two interesting possibilities are suggested; first, I'd like to collect relatively pure samples of the primary petrographic components of lignite (anthraxylon

or primarily woody, attritus, and fusain) for study. As you suggest, study of different petrographic types of lignite, within the same bed, would be perhaps significant. These types differ more in lignite than they do in higher rank coal.

Also, I'd like to collect coal from closely correlated beds in Montana, one lignite and one subbituminous. It seems to me that the difference between two coals of the same member of the same formation, one lignite, the other sub-bituminous, might be most interesting. What happens in converting lignite to subbituminous coal?

It would be possible to prepare rather small quantities of relatively pure petrographic components from run-of-mine coal. I would be glad to attempt this for the run-of-mine samples I have available. What is the smallest quantity of coal you can use for differential thermal analysis?


I don't know very much about the amount of labor involved in running one D. T. A. test. Naturally, this is an important factor in determining how many samples I should send you. If the task of analysis is relatively simple, I would send a relatively large number of samples in order to have checks and to test a number of samples of related nature. Please advise me about this factor.

To summarize:

1. I can provide samples only from this general region.
2. At this time I have run-of-mine samples available from a number of North Dakota mines. Small samples of relatively "petrographically pure" lignite could be prepared from this run-of-mine coal.
3. I plan to collect samples of lignite later this year which would be carefully selected and located, hence would be better for this sort of study.
4. I should have information about the amount of coal necessary for a test and how much time is involved in making tests.

I am looking forward to hearing from you.

Very truly yours,


Alfred Traverse
Coal Technologist

AT:dm

cc: Mr. Lankford
Region V
File - 626.1
Dr. Traverse
C. File

STATE OF ILLINOIS
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UNIVERSITY OF ILLINOIS CAMPUS
URBANA

April 7, 1953

APR - 3 1953

U. S. Bureau of Mines
Grand Forks, North Dakota

Dr. Alfred Traverse
United States Bureau of Mines
Box LL, University Station
Grand Forks, North Dakota

Dear Dr. Traverse:

An investigation of the rank of coal by means of differential thermal analysis has shown that the higher ranks of coal can be precisely differentiated by this method. However, the few samples of lignite which were available for analysis showed a high degree of variation and in some cases showed residual lignin and cellulose. Dr. G. H. Cady has suggested that I write to you in the hope that you may be able to furnish me with some lignite samples so that I may extend the research to include the lower rank coals.

In this respect I must rely on your intimate knowledge of lignite in deciding what types of materials would yield the most significant data. It would, perhaps, be interesting to test the differences between woody and attrital types, and any other suggestions you may have would be welcome. It is my belief that a classification of lignite may be possible by means of thermal analysis, which means precise selection of samples. I am sure that you can decide better than I whether such an idea is feasible.

Any assistance forthcoming will be gratefully appreciated and, naturally, all results will be made available to you.

Very truly yours,

Herbert D. Glass
Associate Geologist
Division of Clay Resources and
Clay Mineral Technology