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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.

Date: Fri, 15 Dec 1995 11:18:02 -0500 (EST)  
From: "Alfred Traverse" <traverse@ems.psu.edu>  
To: [sidash@scinet.weber.edu](mailto:sidash@scinet.weber.edu)  
Cc:  
Bcc:  
Subject: TH1, etc.  
X-NUPop-Charset: IBM 8-Bit

Dear Sid:

Yeah, it can be done, and if you can wait until we're back from CA in late Jan./early Feb., I'll move it up in priority and do it. Get back to me with a reminder then, tho' I'll also post it now. We'll be gone about a month, starting 26 Dec. We are planning to hug the Mexican border the whole way because of the weather.

According to his former colleagues at Lamont Doherty, whom I visited a couple of weeks ago, Bruce is more heavily into UFOs than ever, though Leo Hickey called a while ago and said that he heard Bruce say publicly at a scientific session recently that he is now a born again Christian and is giving up science for Christ. I suppose he will wind up in the looney bin.

Best to you and Shirley. Come see us when you head East. We will visit Utah some day too, as Betty needs to collect it.

As ever, Al. P. S. Hey, do me a favor. Send me an e-mail telling me if my "signature line" is now appearing at the bottom of my messages. Doesn't show here when I print a copy.

I just returned from a few interesting days in Saskatoon where I was the principal examiner for a PhD candidate; he passed. The temperature during the days was about -20 degrees F and there was snow every where. Boy it sure was nice to get back to the sunny south. The temperatures are in the 40s-50s here!

We've received your Christmas letter and hope that you can stop by here when you come west on your trip or perhaps on your return. What's the latest on Bruce? You sent me a copy of his '94 Christmas letter - is he still in that business with UFOs? On that note I'd better quit - best to you and yours!

Received: from cc.weber.edu (cc.weber.edu [137.190.1.2]) by pangaea.ems.psu.edu  
Received: from education.weber.edu (137.190.1.20)  
by cc.WEBER.EDU (PMDF V5.0-4 #7039) id <01HYPVGZGTXS8X2260@cc.WEBER.EDU> for  
traverse@ems.psu.edu; Tue, 12 Dec 1995 11:32:22 -0700 (MST)  
Received: from EDU-WEBER-EDUCATION/MERCURY by education.weber.edu  
(Mercury 1.11); Tue, 12 Dec 1995 11:32:25 -0700  
Received: from MERCURY by EDU-WEBER-EDUCATION (Mercury 1.11); Tue,  
12 Dec 1995 11:31:57 -0700  
Received: from styx.weber.edu by education.weber.edu (Mercury 1.11); Tue,  
12 Dec 1995 11:31:52 -0700  
Received: From EDU-WEBER-CENTRAL/WORKQUEUE by styx.weber.edu via Charon 3.4  
with IPX id 100.951212113107.256; Tue, 12 Dec 1995 11:32:08 -0700  
X-PMRqc: 1  
Date: 12 Dec 95 11:30:06 MST+1  
From: Sidney Ash <SIDASH@scinet.weber.edu>  
Subject: Sample TH1, etc. aka Thompson Creek/Douglas County/Riddle loc.  
To: traverse@ems.psu.edu  
Message-id: <MAILQUEUE-101.951212113006.480@scinet.weber.edu>  
X-Mailer: Pegasus Mail v2.3 (R5).  
Content-transfer-encoding: 7BIT  
Priority: normal  
Content-Type: text

Dear Al:

Just received your e-mail message. Glad that the reprints from BSIP arrived finally. Nothing that comes out of India surprises me so I merely shook my head when the two packages arrived!

In any case, the main reason for this message is to ask about the age of subject palynoflora; several months ago you indicated that you could give me its age - Late Jurassic or Early Cretaceous. Can you? The reason I am returning to this subject is that I plan to give a poster session on the associated plant megafossils at the IOP meetings in late June next year and a firm age for the flora would be invaluable. Furthermore if you can give me a firm age I'll include you as an author. See your e-mail message of 19 June '95 and my earlier message. Thanks.

I just returned from a few interesting days in Saskatoon where I was the external examiner for a PhD candidate; he passed. The temperature during the days was about -20 degrees F and there was snow every where. Boy it sure was nice to get back to the sunny south. The temperatures are in the 40s-50s here!

We've received your Christmas letter and hope that you can stop by here when you come west on your trip or perhaps on your return.

What's the latest on Bruce? You sent me a copy of his '93 Christmas letter - is he still in that business with UFOs?

On that note I'd better quit - best to you and yours!

----SID

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16 June, 1995

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408

Dear Sid:

Thanks for the reprint of the Tidwell & Ash paper on Early K ferns, and the fascinating clipping about certain religious practices. I guess I have already told you that a first cousin in British Columbia converted to that persuasion and tried to get a list our ancestors from me in order to "take care of them properly." I declined firmly and haven't heard from the dear lady since.

From the fern paper I learned that the ferns almost went out of the picture in the Permian. On what is that based? Visscher will be glad to hear that, as it will help him explain why the P/TR "event" that he has written so much about is not possessed of a "fern spike."

Come to think of it, the late Permian floras I've looked at contained few fern spores, but I hadn't thought much about it.

Yours very truly,

Alfred Traverse

P. S. I wrote this in Pittsburgh airport. A friend I was to meet at 1.00 won't arrive until 5:50.

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6 February, 1995

Dr. S. R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408-2507

Dear Sid:

Am answering your e-mail missive of 31 Jan. by snail mail because Betty is using the computer that is hooked up to e-mail for finishing touches on her dissertation work--the actual document (about 4 inches thick) was delivered to the committee earlier today.

About the reprints: 1. The Oregon Geology paper is interesting collateral reading for Tracie and me I love Fig. 5, as it makes it possible for me to imagine being there!; 2. The Black Forest Bed paper was all new to me--great A. arizonicum photos! 3. Paleoclimatic interpretation...wood structures.... tells me a lot of stuff about the abovementioned tree that I can use in the paleobotany course this very semester; ...Czekanowskia...paper very interesting, and I'll be sure to tell the little dears that it's not a ginkgophyte; The cycad leaf paper is a nice piece of work, but the last sentence of the abstract doesn't seem to me to scan; Fossil plants and the...boundary...is going to make Paul Olsen and our co-pupil, Sarah Fowell, squirm. It agrees with my interpretation of the worldwide palynological record, though SF does find evidence of an event in the Fundy Basin.

Re Thompson Creek--I haven't got time just now to go at that box--I have a list of ten important items, including the He-5 project, that must for the moment take priority. I'll get to it in due course and hope that you aren't inconvenienced.

Your news items were most interesting and poignant. Sounds oh, so familiar. If your administrators get desperate enough for your retirement they might give you a golden parachute, which was one of the inducements they offered me.

Will be in touch about He-5 as the project moves along.

All the best. Best wishes too to Shirley.

Yours very truly,

encl.:xerox

Alfred Traverse

Received: from cc.weber.edu by pangaea.ems.psu.edu  
(4.1/PSU\_ESSC/GEOSC-2.02) id AA05006; Tue, 31 Jan 95 22:35:39 EST  
Received: from cc.WEBER.EDU by cc.WEBER.EDU (PMDF V4.3-9 #7039)  
id <01HMICMW61408Y51JE@cc.WEBER.EDU>; Tue, 31 Jan 1995 20:35:23 -0700 (MST)  
Date: Tue, 31 Jan 1995 20:35:23 -0700 (MST)  
From: SIDASH@cc.weber.edu  
Subject: ANSWER TO EMAIL  
To: TRAVERSE@ems.psu.edu  
Message-Id: <01HMICMW7MZ68Y51JE@cc.WEBER.EDU>  
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Mime-Version: 1.0  
Content-Type: TEXT/PLAIN; CHARSET=US-ASCII  
Content-Transfer-Encoding: 7BIT

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January 31, 1995

Dear Al:

I sent you the reprint you requested several days ago and hope it has arrived by now together with some other reprints I neglected to send you earlier. Also, I enclosed the beginnings of a manuscript on the Thompson Creek flora (AKA Riddle Flora of Ward). In some ways the Thompson Creek stuff could be much more important/exciting than the Hells Canyon flora. I am anxious to learn the age of the Thompson Creek stuff-could you drop me a quick note by E-mail on that? I look forward to writing another paper or two. Its okey with me if you want to include Tracie on a new Hells Canyon paper.

In your snailmail letter you asked how I got the letter head on e-mail - no secret, I merely type it in just like on a snailmail letter.

I am not sure what will happen to me - in some ways they would like me to retire. This institution is facing a million dollar deficit although the State has a 200 million dollar surplus. The Republicans in the legislature want to give at least half of the surplus back to the people instead of using it to improve teachers salaries (now the lowest in the nation) and prepare the universities to accommodate the huge number of students now in high school who will enter college in about 3-4 years. Most of the universities in Utah have large deficits and all will face large numbers of forced retirements if the legislature doesn't forgive the deficit. In any case this institution would sure like to have my salary. But I don't know what I would do if I retired. Possibly I might be able to keep my lab and continue with my research, but no guarantees. I'm not anxious to retire, primarily because the longer I stay the better my retirement. Also, no one in my department wants to be the chaircreature (or is it chairperson?).

Yes, I would enjoy a joint trip to the New Brunswick Triassic. So many projects, and so little time.....

Give Betty our regards.

Cheers! Sid

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9 January, 1995

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408-2507

Dear Sid:

You e-mail letter of 4 Jan. arrived the day we were in the air between here and LA. We abandoned all pretense to rationality and went to the Rose Bowl. Actually, we went out on 28 Dec. and stayed a couple of days afterwards to see some of LA. We spent the 3rd at the LA Natural History Museum, across the street from USC. It has got to be the largest such Museum with absolutely no paleobotany.

I was just starting to send this to you by e-mail, when I noticed from your address card that I don't seem to have sent you any reprints in an age--is that possible? It's hard to send reprints by e-mail, so I guess I'll go with snailmail in this case.

I have a few questions and comments:

1. How do you get your letterhead onto your e-mail? Do you have to type it in each time? If not, how do you do it?
2. "Microflora" should be restricted to such items as the flora of the gut. "Palynoflora" is better.
3. Re the designation of the sample Tracie had as her unknown: are you saying it's not HE-5? That's what your label seems to say. If it's really HC-5, I want to change all of our records.
4. I think that Tracie's and my conclusions about her palynoflora were ok for the requirements of the course-- early Jurassic. If we were going to publish, I'd want to go back to Dorothy Guy-Ohlson and also do some of the literature over again, instead of just depending on Tracie's work. Do you have more samples of closely connected material that we could run? How does this connect with the other Idaho/Oregon project that we had on the back burner? In short, I think we should follow up on this on the strength of your feeling that it's publishable information, but I think that Jan. 95 is too soon. I am interested in working with you in using palynology to date exotic

terranes. I am an old hand at it. You may recall that I published on the dating of the Franciscan in California several decades ago, supporting by palynology that the "formation" was really a melange.

Now about retirement. I thought I had told you over the phone, but I must not have. The head was down here every few weeks for two years pleading with me to retire. The last time he came I told him about my great, great, great grandfather Chatterton, who apparently was born about 1794 and lived until 1905, continuing to practice his profession until he was 104. I told the head that he would probably be in a nursing home before I retired. About two weeks later I got a formal, three page letter from him, outlining all of my options. The one he wanted me to accept was option 2, which was to retire on 1 July.95. He offered some considerable financial inducements, which were persuasive to Betty but not to me, because I planned on getting full Soc. Sec. plus my PSU salary beginning in Sept. 95. Betty pointed out that I could have a stroke or something, and then where would be. But the second part of the option 2 was persuasive to me: if I took it, I was guaranteed continued use of my lab until at least 1 Jul. 98, and the possibility of giving the palynology course every year. If I refused this option, no such guarantee existed. All advisers said this was clear--they would take away my space. I accepted. I don't contemplate that it makes much difference, except that my pay will come from Soc. Sec. & SERS instead of from PSU.

I look forward to hearing from you. I also still think we should take a joint trip to the New Brunswick Triassic.

All the best to you and Shirley. We really enjoyed your yearly message, though I find it all hardly credible. How you get around! What an interesting life!

Yours very truly,

Alfred Traverse

encl.:reprints

Received: from cc.weber.edu by pangaea.ems.psu.edu  
(4.1/PSU\_ESSC/GEOLOGY-2.02) id AA28144; Wed, 4 Jan 95 22:22:01 EST  
Received: from cc.WEBER.EDU by cc.WEBER.EDU (PMDF V4.3-9 #7039)  
id <01HLGMAG582090NFQA@cc.WEBER.EDU>; Wed, 04 Jan 1995 20:21:43 -0700 (MST)  
Date: Wed, 04 Jan 1995 20:21:43 -0700 (MST)  
From: SIDASH@cc.weber.edu  
Subject: MICROFLORA BY SIDASH  
To: TRAVERSE@ems.psu.edu  
Message-Id: <01HLGMAG5RCY90NFQA@cc.WEBER.EDU>  
X-Vms-To: IN%"TRAVERSE@EMS.PSU.EDU"  
Mime-Version: 1.0  
Content-Type: TEXT/PLAIN; CHARSET=US-ASCII  
Content-Transfer-Encoding: 7BIT

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January 4, 1995

Dr. Alfred Traverse  
Department of Geosciences  
The Pennsylvania State University  
University Park, PA 16802

Dear Al:

Thanks for your recent letter reporting the interesting results of Tracie Sherry's analysis of sample HE5 (=HC5). The sample came from a different and lower locality than the nodule microflora locality but from the same formation across the river in Oregon. Sounds as if the new microflora is about the same age as the nodule flora. I think that these results are significant since so little is known about the age of the formation. Perhaps there isn't enough in the sample for a meaningful report - you'll have to be a judge of that, but I think it could be of interest to geologists working on the area, especially if you are certain of its age. The corals higher in the section above the nodules are Bajocian in age so if the new microflora is indeed Sinemurian in age or thereabouts that would mean that the Coon Hollow Formation extends over a rather long period of time. Do you think that you have enough material and are confident enough of the age for us to give a talk at a GSA meeting out here in the west? I could give the talk so it wouldn't be an expense for you. Deadlines are as follows: January 20 for the Rocky Mountain Section and January 30 for the Cordilleran Section in Fairbanks. Or perhaps we could wait until next year after you have run more material? Let me know what you think. Perhaps you could give me a call about this when you've had time to evaluate and/or cogitate.

Tracie's findings together with what you found in the nodules indicate, to me at least, the possibility of using palynomorphs to clarify the age and relationships of the Coon Hollow and other formations in the exotic terranes of western North America. As you know, these terranes are a hot topic in geology and it might be possible to get a grant to systematically sample the Coon Hollow and perhaps other formations in Hells Canyon and elsewhere for palynomorphs. But, if you are like me, you probably have many other projects to work on and one like I describe also might not be feasible or of much interest to you.

Whats this about you retiring? Will you be able to keep your lab and continue with your work after retirement? Although he says I can stay as long as I want to and that he is not trying to pressure me. the Dean of our college keeps asking me when I plan to retire!

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E-Mail: traverse@ems.psu.edu

19 December, 1994

Professor Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408

Dear Sid:

As usual, I report to you when a palynology student works on one of your samples as an "unknown." This semester a very nice young lady named Tracie Sherry worked on your He5, Coon Hollow Formation, Hells Canyon, Idaho. The raw sample had fragmentary cycadophyte leaflets on it. Ms. Sherry got plenty of spores, mostly not well preserved, and very carbonized. However, some specimens are well enough preserved for identification, and the student, independently came to conclusion that Liassic is the age--she ventured Sinemurian. I think she's in the right ballpark from studying her slides a few minutes.

Anything further we should do about this?

Do you have email? Would have been a quick way to send this out.

However, I also note that I haven't sent you any reprints in an age, so I enclose some, which is difficult with email.

Happy holidays and a great 1995, old friend. Please don't drop me. We greatly enjoyed your newsletter/card but are flabbergasted about how much you've managed to do!

Yours very truly,

Alfred Traverse

encl.:reprints

Department of Geology  
W E B E R S T A T E U N I V E R S I T Y

Ogden, Utah 84408-2507

U. S. A.

*Sidney Ash*

June 17, 1994

Dr. Robert A Fensome  
Geological Survey of Canada  
Atlantic Geoscience Centre  
Box 1006  
Dartmouth, Nova Scotia B2Y 4A2  
CANADA

Dear Mr. Fensome:

Thank you for letting me see the rock specimens that you collected from the Fownes Beach area of New Brunswick. I have carefully examined the plant fragments that occur on them. Unfortunately and as you surmised, the fragments are undiagnostic. They are merely fragments of carbonized wood, most of which appear to be water worn and have no stratigraphic or paleobotanical value. The matrix is so coarse that I really wouldn't expect to find any leaves in it, although there is always a slight chance that some hardy forms might be preserved in such material. On the other hand, the clay pebbles look good for pollen/spore analysis so I hope you have sent some of them to Al. What shall I do with the specimens? If you want the specimens back, I'll be happy to return them.. However, I really don't think they are worth the expense, darn it!

I am still interested in joining you and Al in the proposed project because leaves could very well occur in strata that has the same lithology as the pebbles in the specimens I just examined. Are there by chance any beds of greenish clay shale present in the sequence at Fownes Beach? They might very well be covered with soil/slope wash, etc., so they might not be obvious. In any case, that's the type of lithology that I would look for if were to search for leaves in the Fownes Beach area.

Sincerely yours

Sidney Ash, Chair and  
Professor of Geology

C: Al ✓

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7 February, 1994

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408

Dear Sid:

In case they didn't also send you word, I enclose a xerox of a letter I received about our paper.

I sure don't want to lose contact with you, old friend. I hope there will be future projects and visits.

For your amusement (?) I also enclose a xerox of the Xmas message we received from one of my other Triassic friends. Poor Bruce.

Best wishes and greetings to dear Shirley.

Yours very truly,

Alfred Traverse

enclosures

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3 January, 1993

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Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, UT 84408

28 April, 1993

Dear Sid:

This is just a quick report on the fact that for the upstart  
terrestrial palynology students got a sample from  
me. In this case it was Julie Brossi, and  
that student in the class and needed a lot  
of help. I assigned the same sample to another  
student who reported it barren. He was an even poorer student  
than I, and I didn't believe the result, and so put it back  
for this year. (The students draw lots for their

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408

Dear Sid:

Enclosed is a copy of the final, complete report of the Committee  
for Fossil Plants, so that you can see what happened to your very  
useful report. A considerably abbreviated version of the report  
will be published in Taxon. The complete version was circulated  
to the members of the committee, and other interested people,  
about 20 in all.

Thanks again, and all the best.

Yours very truly,

Alfred Traverse

encl: report

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3 January, 1993

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, UT 84408

Dear Sid:

This is just a quick report on the fact that for the umpteenth year one of my undergrad palynology students got a sample from Sid for his/her unknown. In this case it was Julie Bressi, and she was not the strongest student in the class and needed a lot of help. Last year I assigned the same sample to another student, who reported it barren. He was an even poorer student than Julie, and I didn't believe the result, and so put it back in the pot for this year. (The students draw lots for their samples.)

The sample was your Kil-b. Manzano Mts., NM, Kinney Clay Pit. Julie worked very diligently in the lab, and both Betty and I worked with her. The sample is indeed very impoverished as to density of specimens, and they are very poorly preserved. However, it does contain identifiable palynomorphs. I think it is a confirmation of the uniqueness of paleopalynology that this not very special undergrad, on the basis of one semester's instruction, was able to produce a fairly nice report, with the conclusion: "According to Table A, the rock sample...could have come from the Asselian Series of the Early Permian, or from the last stage of the Stephanian Series." She goes on to say that her best guess would be Stephanian C.

Have a great 1993 Greetings to Shirley.

Yours very truly,

Alfred Traverse

Department of Geology

W E B E R      S T A T E      U N I V E R S I T Y

Ogden, Utah      84408 - 2507

March 4, 1992

Dr. Alfred Traverse  
% Dr. F. Schaarschmidt  
Forschungsinstitut - Naturmuseum Senckenberg  
Senckenberganlage 25  
D-6000 Frankfurt a/M 1  
GERMANY

Dear Al:

Thanks for your letter of 20 February. After it arrived yesterday I called the editors of JP and was told that our ms had been sent to you at your address in Frankfurt on 22 February. I presume that it has arrived safely by now. If not, let me know and I'll make additional inquiries. The editors told me, by the way, that the sooner that they can get it back the sooner it will be published. From what they said it sounds as if it won't appear until sometime in 1993. Ugh! Perhaps we should have sent it to Palynology or some similar journal. Will you have time to work on the second ms for the Carnegie series while you are abroad?

Glad to hear that your tummy problems have been solved or are at least have gone into remission. Because of such problems, I have never had any desire to visit India. Hope the metal was worth it, all considered. Nice that your book is about finished.

All is well in our empty nest. Kathy-Ellen got married in October and is busy enjoying graduate school at the University of New Mexico where she is working on a MA in art history. She is specializing in modern American Indian art. It sounds to me that Kathleen has found her niche in academia as she is now talking about working on a doctorate! Randolph-Henry is finishing his sophomore year at Whittier College in California. He is uncertain about a major but seems to like sociology-philosophy, etc. Shirley is back with me after spending the fall quarter at Los Alamos National Lab in New Mexico where she had an internship and designed a computer program to search a gene bank for certain genes. Shirley decided that she didn't like a commuter marriage all that well, so she is now back working as a seasonal employee with IRS here in Ogden. We keep hoping that she will find a better job in this area or back in New Mexico.

Nothing particularly new with me - I keep trying to juggle research and my teaching duties and as a consequence don't do a very good job of either!

Hi Betty.

*Sig*  
*Ash*

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF VEGETICULTURE  
PALYMOLOGICAL LABORATORIES  
430 DEARBORN BUILDING  
UNIVERSITY PARK, PA 16802  
Phone: (814) 863-5410 Fax: (814) 863-7023

TO AT  
DATE 15. X. 91 TIME 10:40 a.m.

WHILE YOU WERE OUT

M. Sidney Ash  
Of \_\_\_\_\_  
Phone \_\_\_\_\_

TELEPHONED  PLEASE RETURN CALL   
CALLED TO SEE YOU  WILL CALL AGAIN   
RETURNED YOUR CALL  RUSH

MESSAGE info: (daughter  
married) - will  
get to stuff no paper  
soon. Will be in  
office Thurs. if you  
want to call him, but  
not necessary.  
Signed B.

The Standard Register Company

Yours very truly,

Alfred Trevisan

AT/te

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 DEIKE BUILDING  
UNIVERSITY PARK, PA 16802  
Phone: (814)863-3419; Fax: 814-863-7823

18 September, 1991

Dr. Sidney R. Ash  
Dept. of Geology  
Weber State University  
Ogden, UT 84408

Dear Sid:

Am moving along on the Thompson whatever paper. Could you, as your contribution, please come up with:

1. a geographic-location figure similar in scope to Fig. 1 of present in-press paper?
2. stratigraphic section showing location of sampled interval, per Fig. 2 of previous paper?
3. a paragraph or two of stuff about the terrane, blah-blah?

Hope you had a nice trip. Hope your respiratory equipment has repaired itself.

Best.

Yours very truly,

Alfred Traverse

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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Phone: (814)863-3419; Fax: 814-863-7823

28 August, 1991

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408-2507

Dear Sid:

Just a short note to say thanks again for the nice batch of fossils, all now labelled and put away for the paleobotany course in the spring of 1993. The *Glossopteris* specimen is especially nice. There is no doubt in my mind it comes from the same locality as did the not very prepossessing chunk Mary White gave me at the museum in Sydney. Incidentally, it might interest you that the matrix is absolutely devoid of palynomorphs. Big disappointment. I thought it would be full of *Protohaploxylinus*.

One of the students was around while I was unpacking the fossils and correctly observed that it would be nice if you had at least a little piece of some ginkgophyte. We have absolutely nothing.

All the best, and thanks again.

Yours very truly,

Alfred Traverse

Ash

P.S. Under separate cover I am sending you some Newark plant fossils for your class. I'll send chips fossils later. Sid



SIDNEY R. ASH  
Professor of Geology

8/16/91

Al —

Here is our little ms. Please take my suggestions with a grain of salt. I think it is great that you have done so much with this stuff. I'm looking forward to our second paper.

Also I'm enclosing some "news from Mormon

Alfred Traverse

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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Phone: (814)863-3419; Fax: 814-863-7823

14 August, 1991

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah

Dear Sid:

A while back an undergrad in my palynology class asked to do a special study project, and I gave her two Permian samples to work with, one from Saarland, one from New Mexico, namely from the famed Kinney clay pit! The "Ku" bit isn't her fault--she couldn't read my handwriting. She is not a particularly strong student, but she is good in the lab. So, one thing we did find out is the material in that particular sample is only fair. It was a slight surprise to find out that it has so many marine acritarchs.

I don't usually send you "C" papers, but I thought you might find this particular one interesting.

Yours very truly,



Alfred Traverse

encl

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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9 August, 1991

Dr. Sidney R. Ash  
Department of Geology  
Weber State University  
Ogden, Utah 84408

Dear Sid:

Here's the revised MS for your perusal. It's possible that the three reviews have resulted in some gremlins creeping in. Nevertheless, they have been very helpful. I have the original in hard copy, as well as on disk here. Let me know what to do when you get around to it.

Best regards, also to Shirley.

Yours very truly,

Alfred Traverse

encl

A1 —  
tongue this around anyway  
you please.

for p. 3

↓



**SIDNEY R. ASH**  
Professor of Geology

7/10/91

A1 —  
Here is the ms w/ my  
comments/suggest chgs/etc.  
do with them as you  
please.

if you want me to  
correct the references  
send them to me on  
a disk in Word Perfect.

if there is anything  
else I can do just  
let me know.

Hi Betty!

cheers

Sid

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 DEIKE BUILDING  
UNIVERSITY PARK, PA 16802  
Phone: (814)863-3419; Fax: 814-863-7823

23 June, 1991

Dr. Sidney R. Ash  
Dept. of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Here's a copy of my draft of the paper. We followed J of P rules for format, based on an earlier paper of yours. Please get your comments (or) me with instructions about submission--do I have to be a S.P. member? (I resigned a while back.)

I'm sending copies of the paper for comments to Bill Elsik (guru of fungal spores) and Dorothy Guy-Ohlson (world expert on Jurassic spores & pollen). Hope that's ok with you.

The Thompson Creek paper will be separate. I'd like to put it elsewhere, if you'll agree, but let's take care of HC first!

All the best.

Yours very truly,

Alfred Traverse

AT/et  
encl: MS



SIDNEY R. ASH  
Professor of Geology

5/15/91

Al —  
just a note to let  
you know that the  
slides and the copy of  
your talk arrived safely.  
I liked your talk.  
Actually, I think that the  
nodules occur just a  
few hundred feet below  
the Mid J invert.

I will send you the  
plant fossils you requested  
later this spring or in June.

I'm really busy with classes  
right now.

Cheers

Sid

P.S. Can you use any  
Glossopteris from Aust  
with reproductive  
devices?

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
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phone: 814-863-3419; fax: 814-863-7823

29 April, 1991

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

This is just a note to get something in writing, in case you just might need to be reminded, that you indicated you could send me some fossils for our paleobotany class. Cycadophytes, ginkgophytes and other gymnosperm pieces would be especially welcome, but some ferns would also be nice. Things such as Nilssonia, Ginkgoites, Equisetites, Phlebopteris, Otozamites, Dictyozamites, Hirmerella, Sphenobariera, whatever.

We are using Gastaldo's short course book ( U. Tenn. Studies in Geol. 15) as text for the course, and the students have all read your chapter. It would be nice if they could see that these things really exist!

Best.

Yours very truly,

Alfred Traverse

P.S. Your slides came, for which many thanks. Am having copies made and will then return. Also had slides made of figures from your HC paper.

AT/et

TO AT

DATE 25.X.90 TIME 11:15

WHILE YOU WERE OUT

M. Sid Ash

Of \_\_\_\_\_

Phone \_\_\_\_\_

TELEPHONED  PLEASE RETURN CALL

CALLED TO SEE YOU  WILL CALL AGAIN

RETURNED YOUR CALL  RUSH

MESSAGE Wistfully inquiring about  
TH-1, etc. that you "promised" for  
10 Oct. I told him about your mother,  
etc. He will call back next week.

Signed BT

The Standard Register Company

26-X-90

I called him - then  
it is TH 4

I told him get  
get at next noon

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
phone: 814-863-3419; fax: 814-865-3191

20 September, 1990

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

faxed to: 801-626-7930

Dear Sid:

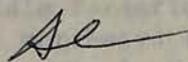
Partly this is to see if it works--I'm a big convert to fax.

But I did wonder about the data for sample TH3, which arrived at home a couple of days ago--also Riddle Fm.? as TH1 and TH2?

I'm going to use the three samples as my demo samples for the palynology class, which should get them processed by about 10 October. Given other emergencies around here, that is about the best we could do anyway.

Best.

Yours very truly,



Alfred Traverse

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

September 11, 1990

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

Thanks for your recent letter regarding the results of your palynological analysis of samples HC34 - HC37. Your results are very interesting and significant and I am looking forward to working with you on a report about them later this year. I will be submitting a new proposal to NSF in the spring so it would be very helpful if I could tell them that ~~my~~ report is in press or at least that it has been submitted to a journal at that time. Also we need to think of a parallel proposal that you could submit at the same time. Do you suppose it would be possible to finish the report by Christmas time?

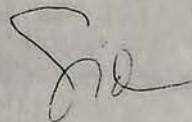
I am sending you, in a separate package, two new samples that I recently collected from southwestern Oregon for you to check for palynomorphs. The samples fit in with the HC samples as they also come from a <sup>an</sup>exotic terrane although it is different than the one that yielded the HC samples. Locality data for these samples is as follows:

Sample TH1 - Coaly? material from the Riddle Formation in a cut bank on the south side of Thompson Creek where a northward flowing creek joins Thompson Creek in the NW 1/4, SE 1/4, sec. 4, T. 30 S., R. 7 W., on the north side of Buck Mountain in southwestern Oregon. About 10 miles southwest of Winston. Upper Jurassic or Lower Cretaceous. Collected by S. Ash, 9/6/90.

Sample TH2 - Greenish siltstone? with numerous plant fossils from the Riddle Formation at locality TH1.

Would it be possible for Betty to process sample TH1 right away as we may wish to include the data (if there is any) in our report on the HC samples?

sincerely yours



P.S. I've sent the

Samples to your Huntington address

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84403-2507

June 11, 1990

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

I am sending you, in a separate package and at your business address, four new samples of limestone nodules that I recently collected from Hells Canyon for you to check for palynomorphs. These four samples came from approximately the same locality as the one that you examined earlier. I hope that some of them at least contain the same provocative fungal remains that you found in the nodule you examined earlier. Since the new localities are somewhat different I will give you the new locality data:

All the nodules came from the mudstone/sandstone unit of the Coon Hollow Formation of Jurassic age in Hells Canyon, Idaho, in the NW 1/4, SE 1/4, sec. 21, T. 27 N., R. 1 W., Gravepoint Quadrangle. The locality numbers are HC-34, 35, 36, 37. The other number on each sample is the elevation of the locality (in feet) above sea level.

I hope you can run these samples soon so I will know if I need to go get some more of them.

Enclosed with this letter are copies of two letters I recently sent to the organizer of a symposium that will be presented in May 1991. I hope you do not mind me proposing this joint presentation. By the way I sent you two samples of the rock from the Kinney Brick quarry way back on March 24, 1988. In your letter of 3 October 1989 you indicated that you were going to work them up but I guess you haven't had time to run them yet - at least you haven't mentioned any results. In case you can't readily put your hands on the letter here is the pertinent locality data:

K11 Kinney clay pit, Manzano Mts., New Mexico, Wild  
Cow Member of the Madera Formation, Upper  
Pennsylvanian or Lower Permian. (2 samples).

I also am curious about the samples of Mississippian shale I sent you on June 18, 1988. They are from localities U11 and U13. The man who guided me to the localities was asking about them the other day. If you have had a chance to run the samples I would appreciate knowing the results but if you haven't, I will understand.

Cheers!

Enclosures!

(2 letters to S.C. Lucas)

Go

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

June 8, 1990

Dr. Spencer G. Lucas  
New Mexico Museum of Natural History  
P.O. Box 7010  
Albuquerque, New Mexico 87194-7010

COPY

Dear Spence:

This is a postscript to my earlier letter. Since writing that one I have had some more thoughts on possible topics for the Kinney symposium. I don't know why I did not think to mention that Al Traverse and I are working on the palynomorphs from the Red Tanks unit in Carrizo Arroyo and we will have a report ready for publication this winter. Although we had other plans for its publication we would be willing to change them if you are interested. Alternatively we could prepare a report on the palynomorphs from the Kinney Quarry and compare that microflora with the Red Tanks microflora. Let us know if you are interested in any of these topics for the symposium.

Sincerely yours

Sidney Ash  
Professor of Geology

cc: Al Traverse

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

June 4, 1990

26 February, 1990

Dr. Spencer G. Lucas  
New Mexico Museum of Natural History  
P.O. Box 7010  
Albuquerque, New Mexico 87194-7010

COPY

Dear Spence:

During the GSA meetings in Jackson I learned of your plans for a symposium on the Kinney Quarry. The symposium sounds rather interesting. I am surprised that no one has done it before. I know that Charlie Read often spoke of compiling such a symposium and, I remember correctly, corresponded with Serge about one. But of course nothing came of it at the time. In any case, I have always had an interest in the quarry and its biota since I discovered it (on October 9, 1961) and brought it the attention of the scientific community. Thus, I would be prepared to give a few remarks about the early history of the work in the quarry and, if no one else is covering the topic, a few words on the geology of the locality.

If such a paper doesn't appeal to you Don Tidwell and I could give a one on the Red Tanks flora. We have started to put together a little paper on it so we could get one to you in time for the meeting in May.

Will you be giving a paper at MNA in September? I hope to finish one I started sometime ago on the Chinle and give it at the meeting.

I haven't forgot your request for the data on the K-Ar date for the Chinle but I can't seem to locate the report I got from the Kruger lab. As soon as I locate it I will send you the requested information.

Sincerely yours

Sidney Ash  
Professor of Geology

The Pennsylvania State University  
Department of Geosciences  
Palynological Laboratories  
435 Deike Building  
University Park, PA 16802  
phone: 814-863-3419  
fax: 814-865-3191

February, 1990  
26 February, 1990

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Betty and I looked into the question of "previous Hells Canyon samples." Please see my letter of 16 January, 1988, to you (you do archive all my letters, don't you?). Apparently in the absence of an answer to the P.S., we did discard the works as worthless. I note that none of the samples (Ya, Yb, F3) was HC 31. HC 31 is the only one that has as yet produced palynomorphs, and they were recognizable as such (but not identifiable) even before oxidation. We look forward to more samples--even more of HC 31 itself would be worth another try.

All the best.

Yours very truly,

Alfred Traverse

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
phone: 814-863-3419  
fax: 814-865-3191

9 February, 1990

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

How about another chunk of HC 31, please? Bill Elsik and I are now jawing about the fungal spores, and I should have another go at it.

What are the chances the sample is earliest Paleocene? The masses of wood, no proper pollen, and lots of fungal spores would go with bolide-winter? Hmm. Any shocked quartz? Iridium?

As ever,

Alfred Traverse

AT/et

TO AT

DATE 7-II-90 TIME 12:45

WHILE YOU WERE OUT

M. Sid Ash

of \_\_\_\_\_

Phone \_\_\_\_\_

- |                    |                                     |                    |                          |
|--------------------|-------------------------------------|--------------------|--------------------------|
| TELEPHONED         | <input checked="" type="checkbox"/> | PLEASE RETURN CALL | <input type="checkbox"/> |
| CALLED TO SEE YOU  | <input type="checkbox"/>            | WILL CALL AGAIN    | <input type="checkbox"/> |
| RETURNED YOUR CALL | <input type="checkbox"/>            | RUSH               | <input type="checkbox"/> |

MESSAGE No need to call back.  
Reminds you that the  
module from which  
HC-31 taken has  
flora w. no angiosperms

Signed BT →

The Standard Register Company

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fax: 814-865-3191

21 December, 1989

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Thanks for the note of 13 Nov. and the OF Rept. by Dubiel and Skipp. Some of the stuff might yield palynomorphs, but as you say, so what?

Betty and I have taken over processing of the organic-rich limestone by "marginal palynological" methods, and we do have some palynomorphs--more about that in January.

Best.

Yours very truly,

Alfred Traverse

AT/et



**SIDNEY R. ASH**  
Professor of Geology

11/13/89

Al-

Here is a copy of  
the open-file report  
that you asked about.  
The copy is an extra  
for your files.

So for the author  
of the rept has only  
found a few poorly  
preserved leaf/stem  
impressions in the strata

he examined. from the  
look of the chinle  
- that area I'd  
say you can just about  
write it off for  
paleomorph. To bad  
but really we've got  
more  
~~lots of~~ stuff already  
than we can ever  
finish I think.

cheer

Sid

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
(814)863-3419

INTEROFFICE CORRESPONDENCE

3 October, 1989

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

To: Babbie Snyder, 308 Mueller

Dear Sid:

In March, '88 (yours of 24-III-88) you sent me a box of samples (JM1-HE5-K11) which are working up to the top of the when-possible pile. In the box was also a neat-looking piece of Penn/Perm siltstone (Kinney Clay Pit, NM) which I'm going to get at right away, as part of my effort to complete a paper (or two\_ on the Red Tanks material. Many thanks!

It is very unfortunate that the Biology Dept. "forgot" to list palynology in the semester's course list. It meant I got only the geologists--6. So I'll only get 6 samples analysed free!

All the best. I miss you.

Yours very truly,

Alfred Traverse

AT/et

*File Ash*

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
(814)863-3419 or (814)865-6393

*file*

INTEROFFICE CORRESPONDENCE

10 April, 1988

Sydney R. Ash  
Department of Geology

Date: 26 May, 1988

From: A. Traverse, Professor of Palynology, 435 Deike

To: Debbie Snyder, 208 Mueller

This is with reference to the phone call about my desire to nominate a speaker for the 1988-89 seminar series. The man is Dr. Sydney R. Ash, Weber State College, Ogden, Utah. Dr. Ash is an outstanding paleobotanist, a world authority on Mesozoic plants, especially the Triassic vegetation of the Petrified Forest National Park and related areas. He is coming here in the Fall, the date being to some degree adjustable, depending on openings in the seminar schedule.

Thanks very much for passing this on to whomever gets the seminar-scheduling assignment.

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
(814)863-3419 or (814)865-6711

10 April, 1989

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Thanks for your very interesting letter of 3 April.

Sorry about the 200-million clanger. Of course, "about" is pretty fudgy. Next time I'll mention Charmorgia. There are more such bloopers, of course, in Paleopalynology. Jansonius has done a very unfair review that dwells unmercifully on them and doesn't mention the good features of the book.

I regard Kerp's choice of a name as unfortunate but would vote against it being regarded as a homonym. The names can be pronounced differently. Palynology is full of such--Punctatosporites and Punctatisporites, for example. That pair was deliberate and by the same author!

You did a super job re P-Tr possible boundaries for me. By all means try to sample sequences for me in Utah-Nevada, if possible. I noted (p. 237 of P.P. 515) that the very last paragraph of xeroxes you sent says, "In southwestern Nevada, the Permian Diablo Formation grades without apparent break into the Lower Triassic Candelaria Formation...." Hmmm.

I enclose xerox of latest student report on an Ash sample, AR 1-870 (now = T-870; PRC 3120), a Red Tanks, NM, sample. Fellow is from the other PRC (not pollen-residue-collection).

All the best, and greetings to Shirley.

Yours very truly,

Alfred Traverse

AT/et

Department of Geology

WEBER STATE COLLEGE

Ogden, Utah 84408-2507

April 3, 1989

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

Thanks a lot for sending in a letter of reference for me. I haven't seen it but I understand that it was very nice. Also I haven't heard the results of the competition yet. When I do I will let you know. We will certainly learn quite a bit about priorities around here when the results are announced.

Your request for a sequence that crosses the Permian/Triassic boundary is difficult to fulfill but there are several units in the Upper Permian and Lower Triassic that might extend across the boundary or at least come close to it. I have checked the Permian and Triassic correlation charts and paleotectonic atlases and have found a few sequences that might fit the bill but it will take some library research to determine if any of them actually is worth investigating in the field. The first Permian possibility that comes to mind is the Dewey Lake Redbeds in southeastern New Mexico. Others include the Quartermaster Formation in Oklahoma, the Pablo Formation in Nevada, the Granite Falls Limestone in western Washington, and the Cache Creek Group in Yukon Territory. Generally the units are said to be unfossiliferous and placed somewhere in the Upper Permian because of their stratigraphic position. I am enclosing some pages from USGS Prof. Paper 515 which describe the upper part of the Permian System in the Permian Basin and West Coast areas which might give you some additional ideas. There are also several Lower Triassic units that might go low enough for your purposes. For example in Utah we have the Woodside Formation and in Nevada there are the Candelaria and the Moenkopi formations. I'll bet that most of them have not been checked for palynomorphs. If you would like me to do so I'll try to sample some of the Utah and Nevada sequences later this year.

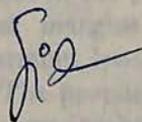
In Serge's letter you marked the paragraph about Kerp's Rhachiphyllum so I presume you want my comments on the matter. Briefly I agree with Serge and believe that Kerp's name is so close to Rhacophyllum that it will cause confusion.

Thanks for sending me a reprint your article "Plant evolution dances to a different beat". I enjoyed reading it very much. It certainly help put this concept into better perspective for me. Perhaps people will start using the terms Paleophytic, etc. more frequently now. I noted that you didn't list the Chinle cycad Charmorgia Ash (which is as similar to some living cycads as is Lyssoxylon) in table 1. Also the age of the Chinle and these fossils is probably about 225 my not 200 my!

I finally threw all caution to the wind and bought a copy of your book the other day. I'm glad I did so as it is so interesting and well done. I haven't read the whole thing yet but I have had dipped into it at various places and found it both readable and informative. You must be very proud of your book.

Thanks again for your letter of support.

Sincerely



the most closely related forms from the Guadalupe Series and its equivalents in the United States.

#### UPPER BOUNDARY OF INTERVAL D

The Permian age of most of the rocks assigned to interval D and to the Ochoa Series has been established by fossils found in the Rustler Formation in Culberson County, Tex. (Donegan and DeFord, 1950; Walter, 1953). No fossils have been reported from the Dewey Lake Redbeds. The last age assignment of the *Pierce Canyon Redbeds* by the U.S. Geological Survey, before the name was abandoned in favor of the Dewey Lake, was Permian or Triassic. The red-bed unit has traditionally been assigned a Permian age on the basis of physical stratigraphy: it is thought to overlie conformably the Rustler Formation and underlie unconformably the Dockum Group; it was apparently deposited in a large standing body of water, as were the underlying strata, and not in streams, as were the overlying beds. In the absence of information to the contrary, the red-bed unit is included in interval D although its age admittedly is not known.

Physical criteria can be used for distinguishing red beds included in the Permian from those of the Dockum Group (Adkins, 1924, p. 28; Adams, 1929, p. 1052; Miller, D. N., Jr., 1955), but the top of the Dewey Lake Redbeds is generally assigned on the basis of geophysical logs (for example, Roswell Geol. Soc., 1958; Van den Bark, 1957a, p. 111, and other reports in the same volume).

In some parts of the Permian basin region, interval D is unconformably overlain by Cretaceous or Cenozoic strata with slight to moderate angular discordance. In most parts of the region, rocks directly beneath this erosional surface are the Dewey Lake Redbeds; but in places they are the Rustler or Salado Formations.

#### THICKNESS TRENDS

Interval D is slightly more than 5,000 feet thick in the central part of the Delaware basin and more than 4,000 feet thick in a north-trending belt within the basin (fig. 16). The rocks thin to about 1,000 feet on the shelf areas and to about 1,500 feet in the Midland basin. Along the eroded edges of the sequence around the periphery of the Permian basin there is marked irregular thinning.

Local irregularities in thickness, as along the margins of the Central Basin platform and along the west and north margins of the Permian basin region, result from leaching of the more soluble beds. Local belts of thinning near the margins of the basin, as the east trending belt in west-central Reeves County, are areas eroded before deposition of Upper Triassic and Cre-

taceous strata (fig. 18). Irregular thickness along the southern part of the Central Basin platform is the result of both leaching and erosion.

The Tessey Limestone has a maximum thickness of about 1,000 feet in the Glass Mountains.

#### LITHOFACIES TRENDS

Units assigned to interval D are not described from enough boreholes to permit satisfactory reconstruction of lithofacies trends. In many areas, lithofacies are interpolated from the few available data; in some, data are too sparse to permit interpolation, and lithofacies for these areas are not shown (I-450, pl. 6, inset).

Interval D is composed mainly of evaporites, mostly anhydrite and halite. Halite is dominant north of the Delaware basin, where the Salado Formation makes up the bulk of the unit. Total thicknesses of salt are greatest, however, within the Delaware basin, but presence of the Castile Formation reduces the relative proportion of salt in the interval. Local differences in the proportion of salt, as along the north and east margins of the Delaware basin, reflect post-Permian leaching.

The proportion of carbonate rock to other types increases southwestward and southward, and the proportion of detrital rocks increases eastward and north-eastward.

Detrital rocks on the Eastern shelf include both sandstone and mudstone, but the sandstone is more abundant on the southern than on the northern part of the shelf. Sandstone is also moderately abundant along the eastern part of the south margin of the region.

Dolomite is not a major rock component of interval D except in the Tessey Limestone, which lies in and north of the Glass Mountains.

#### SOURCES AND ENVIRONMENTS

The greater part of interval D in the west Texas Permian basin region is clearly the product of the evaporation of sea water, somewhat modified by later events and processes. The sequence of strata in the interval records the increasing salinity and density of brine. Geochemical studies of brines indicate that an extremely large volume of water was evaporated.

The deposits accumulated in an interior basin connected to the ocean on the southwest or south by numerous inlets (Moore, G. W., 1960, p. 130) across a partially obstructing sill or barrier. The sill may have been a reef (King, P. B., 1942, p. 752, 759) on the seaward side of the near-margin deposits now preserved as the Tessey Limestone, or perhaps sand dunes

However, evidence in the form of conglomerates is not as abundant in interval B as in intervals A or C. Westward from the Antler orogenic belt, interval B consists of detrital rocks thrust an unknown distance from the west. The thickness of interval B in northwestern Nevada is uncertain, but it may well exceed thicknesses east of Antler orogenic belt. Volcanic rocks are confined to a belt along the west coast. Red beds at the base of the interval in southern Nevada persist a short distance westward into California, where marine limestone takes their place.

**PALEOTECTONIC IMPLICATIONS**

The threefold paleotectonic division of the West Coast region into miogeosyncline, tectonic land, and eugeosyncline seems as valid for Leonard time as it does for Wolfcamp time. However, relief on the Antler orogenic belt seems to have been more subdued during Leonard time, as suggested by the lack of large amounts of conglomerate of Leonard age. The presence of evaporites and red beds indicates that part of southern and eastern Nevada continued to be recurrently emergent during early Leonard time. The absence of interval B rocks in northwestern Washington might indicate Leonard uplift in the area or, more likely, might merely be due to lack of data. Late Leonard or early Guadalupe orogeny in northwestern Nevada is discussed under interval C-D.

**INTERVAL C-D**

**FORMATIONS INCLUDED AND UPPER BOUNDARY OF INTERVAL C-D**

Table 4 summarizes the formations included in interval C-D and the nature of the upper boundary chosen for the interval.

The upper 800 feet of Permian limestone (Fails, 1960, p. 1700) in the Carlin Canyon area of northern Nevada is assigned in this report to interval C-D. Erosion has removed an additional unknown thickness of higher Permian beds. The limestone in this area, in common with that in other formations assigned to interval C-D, contains many beds and nodules of chert but no phosphate.

In the Piñon Range of southwestern Elko County, Nev., rocks of Guadalupe age—chert-pebble conglomerate and limestone—lie disconformably on Mississippian strata. Because upper parts of the Permian beds are faulted and covered by Tertiary beds, the thickness cannot be estimated.

In southeastern Eureka County, coarse detrital rocks at Carbon Ridge and Tyrone Gap were assigned a Guadalupe age by Steele (1959, p. 112; oral commun., 1960) on the basis of fusulinids. This age

TABLE 4.—Formations and upper boundary of interval C-D in the West Coast region

Formation and location	Nature of upper boundary of interval C-D
<b>Northern Nevada:</b>	
Part of the <i>Carlin Canyon Formation</i> in the Carlin Canyon area of Elko County described by Fails (Fails, 1960, p. 1700).	Upper erosional contact of the formation.
Limestone and conglomerate in the Piñon Range of southwestern Elko County mapped by Smith and Ketner.	Indeterminate.
Detrital rocks in southeastern Eureka County described by Steele (1959).	Do.
Edna Mountain Formation.....	Upper contact of the formation.
Limestone and chert-pebble conglomerate in central Humboldt County described by Willden (written commun., 1958).	Indeterminate.
Koipato Formation.....	Upper contact of the formation or base of beds containing Triassic fossils.
Beds of Guadalupe age in White Pine County described by Knight (1956, p. 775).	Indeterminate.
Gerster Formation.....	Upper contact of formation.
<b>Southern Nevada:</b>	
<i>Pablo Formation</i> .....	Do.
<i>Diablo Formation</i> .....	Do.
<b>Southern California:</b>	
Uppermost part of the Bird Spring Formation.	Do.
Upper part of the Owens Valley Formation....	Do.
Upper part of the Fairview Valley Formation...	Do.
<b>Central California:</b>	
Limestone in Calaveras County.....	Indeterminate.
<b>Northern California:</b>	
<i>Nosoni Formation</i> .....	Upper contact of formation.
<i>Dekkas Andesite</i> .....	Do.
<i>Reeve Meta-andesite</i> .....	Do.
<i>Robinson Formation</i> .....	Do.
<b>Oregon:</b>	
Unnamed chert above Coyote Butte Formation.	Upper contact of chert.
Clover Creek Greenstone.....	Upper contact of formation.
<b>Idaho:</b>	
Lower part of Seven Devils Volcanics.....	Indeterminate.
<b>Washington:</b>	
Leach River Formation of Canada and limestone lenses in northwestern Washington described by Thompson, Wheeler, and Danner (1950).	Do.

assignment is tentatively accepted and used in this publication. The units are included in interval C-D.

The Edna Mountain Formation (Roberts and others, 1958, p. 2843) is assigned to interval C-D on the basis of brachiopods considered by J. Steele Williams to be approximately equivalent to those in the upper part of the Phosphoria Formation. The Edna Mountain Formation lies with angular unconformity on rocks ranging from Cambrian to Pennsylvanian. Permian deformation is indicated.

The Koipato Formation ranges from Guadalupe to Triassic age. Guadalupe age is indicated by the presence of *Helicoprion* and by the unconformable relation of the Koipato to the Havallah. Triassic age is indicated by an ammonite fauna near the top

of the formation (N. J. Silberling, oral commun., 1958). An indefinite thickness is assigned to interval C-D. The Koipato is part of a western sequence of upper Paleozoic rocks. It may have been emplaced by thrust faulting an unknown distance from the west (Roberts and others, 1958, p. 2846).

In southwestern Nevada the Pablo and Diablo Formations are assigned to interval C-D. The Diablo is considered to be Guadalupe on the basis of a fauna characteristic of the Phosphoria Formation (Ferguson and others, 1954). The Pablo Formation is assigned to interval C-D because it gradationally overlies the Diablo and is cut by pre-Triassic intrusive rocks (Ferguson and Cathcart, 1954).

In White Pine County, beds assigned a Guadalupe age by R. L. Knight (1956, p. 775) and the Gerster Formation (Steele, 1960, p. 93) are assigned to interval C-D.

In Inyo County, Calif., the uppermost part of the Bird Spring Formation contains fusulinids vaguely suggestive of Guadalupe age (McAllister, 1956).

The upper part of the Owens Valley Formation in Inyo County (Merriam, C. W., and Hall, 1957, p. 6) is assigned to interval C-D on the basis of a fauna including *Punctospirifer pulcher* (Meek) and *Spirifer pseudocameratus* (Girty), which are considered to be of Guadalupe age.

In San Bernardino County, Calif., the *Fairview Valley Formation* of Bowen (1954, p. 36) and the overlying Hodge Volcanic Formation are imprecisely dated, but some beds of Guadalupe age are probably included in the 16,000 feet of volcanic rock, conglomerate, and limestone constituting these formations. The uppermost part of the *Fairview Valley Formation* is tentatively assigned to interval C-D.

In Calaveras County, Calif., an isolated limestone fault block among Jurassic rocks contains fusulinids which, according to L. G. Henbest and R. C. Douglass, indicate Leonard and possibly Guadalupe age (Lorin Clark, oral commun., 1959).

In Shasta County, Calif., the Nosoni Formation (Thompson, M. L., and others, 1946, p. 23) and the overlying Dekkas Andesite (Albers and Robertson, 1961, p. 29) are assigned to interval C-D on the basis of fusulinids. The Dekkas interfingers with the underlying Nosoni according to Coogan (1957) and, in its upper part, with the Bully Hill Rhyolite and possibly with the Middle and Upper Triassic Pit Shale (Albers and Robertson, 1961, p. 26).

In northeastern California the Reeve Meta-andesite and overlying Robinson Formation are assigned to interval C-D. The Reeve contains fusulinids suggesting Guadalupe age (John Harbaugh, oral com-

mun., 1959). The Robinson Formation has been correlated with the Nosoni Formation (Girty, in Diller, 1908, p. 27), which is now thought to be of early Guadalupe age.

In Crook County, the Coyote Butte Formation is considered to be of Wolfcamp and Leonard age on the basis of fusulinids, but its brachiopods indicate the possible presence of Guadalupe beds (Cooper, G. A., 1957a, p. 13). Above the Coyote Butte and beneath Triassic beds is 900 feet of chert (John Harbaugh, oral commun., 1959) that may belong to interval C-D.

In eastern Oregon the Clover Creek Greenstone of Gilluly (1937) is assigned to interval C-D because it contains a Permian fauna and overlies the Elkhorn Ridge Argillite of Leonard age. As is commonly true with volcanic formations, exact thicknesses cannot be assigned specific epochs. The Clover Creek should probably be correlated with part of the Seven Devils Volcanics of eastern Oregon and western Idaho.

In western Idaho the Seven Devils Volcanics, mapped by Wagner (1945, p. 4) and by Cook (1954, p. 3), is partly of Permian age and partly of late Triassic age. This assignment is based on fossils collected in Adams County, Idaho, by R. S. Cannon and identified by J. S. Williams and S. W. Muller (written commun., to R. S. Cannon, 1939, 1942). Part of the collection indicates equivalence to the Phosphoria Formation, according to Williams, and therefore part of the enclosing rocks is assigned to interval C-D.

Correlation is difficult in most volcanic rocks; accordingly, not all rocks called Seven Devils and other formations such as the Casto Volcanics, correlated on the basis of lithology, may be properly assignable to interval C-D. Hence, only the localities where dating has been possible are indicated on the map of interval C-D.

The very late Permian fusulinid *Yabeina packardi* was found in a waterworn cobble from central Oregon and described by M. L. Thompson and H. E. Wheeler (1942, p. 702). Although the bedrock site from which the cobble originally came is unknown, it can be assumed to be near where the cobble was found. This site is shown on the map of interval C-D (I-450, pl. 5A).

Other fusulinids of very late Permian age have been reported from northwestern Washington (Thompson, M. L., and Wheeler, 1942, p. 703; Thompson, M. L., and others, 1950, p. 46, 48; W. R. Danner, written commun., 1959). They are in limestone lenses in thick sequences of otherwise undated siliceous sedimentary and volcanic rocks. The pale-

ontological reports on these fusulinids imply post-Guadalupe age.

In northeastern Washington, rocks of Guadalupe age have been reported by J. W. Skinner (written commun. to C. O. Dunbar, 1958). In the same general area, beds containing fusulinids of which the age according to Douglass is "probably late Leonard or possibly even younger" were reported by Siegfried Muessig (written commun., 1959). These beds are assigned to interval C-D. No thickness and few lithologic data are available.

#### THICKNESS AND LITHOFACIES TRENDS

Westward coarsening of detritus and the absence of occurrences in the vicinity of the Lander-Eureka County line indicate that interval C-D, like interval A, thins abruptly to the vanishing point against the east side of the Antler orogenic belt. Marine detrital and volcanic rocks of eastern Pershing County and vicinity west of the orogenic belt are of unknown but generally great thickness, probably exceeding the thickness of interval C-D east of the orogenic belt. Most of these rocks, according to Roberts and others (1958, p. 2849), were thrust an unknown distance from the west.

The Kaibab Limestone in southeastern Nevada is assigned to the Guadalupe Series by some geologists (Steele, 1959; McNair, 1951). However, following McKee's usage, the Kaibab is here assigned to interval B, and no rocks in southeastern Nevada are assigned to interval C-D.

Volcanic rocks extend as far as Idaho and central Nevada, much farther eastward than those of earlier intervals.

#### PALEOTECTONIC IMPLICATIONS

In Guadalupe and Ochoa time, as during earlier intervals, the West Coast region was divisible into miogeosyncline, tectonic land, and eugeosyncline, but there were important differences between major structures of these ages and those of the two preceding. The miogeosyncline persisted in northeastern Nevada and, perhaps for a time, in the southeastern part of the State. The trend of isopachs (I-450, pl. 5) suggests this; however, positive evidence of interval C-D in southeastern Nevada is not known. Rocks of interval B are directly overlain by Lower Triassic marine beds in southern Nevada, and if interval C-D once existed there, it has been eroded from a broad upwarp of late Guadalupe to earliest Triassic age.

The presence of extensive conglomerates of Guadalupe age near the east border of Eureka County

indicates that the Antler orogenic belt retained or regained considerable relief in Guadalupe and Ochoa time. However, by the end of the Permian it was probably reduced to a chain of low islands which may have persisted locally into Triassic time. Guadalupe marine sediments were deposited in an area in southwestern Nevada (the southern part of the Antler orogenic belt) which had formerly been elevated.

In late Leonard time or early Guadalupe time northwestern or north-central Nevada was the scene of a brief orogenic episode, in which the Havallah Formation of Pennsylvanian to Leonard age was deformed. This rock was later overlain with angular unconformity by the Koipato Formation of Guadalupe to Triassic age. Whether this orogenic event took place before or after the Havallah was thrust to its present location in north-central Nevada is uncertain (N. J. Silberling and R. J. Roberts, written commun., 1960).

Volcanism, which had been feeble during earlier Permian time, probably reached a maximum in Guadalupe and Ochoa time. Some areas in Nevada, California, Oregon, and Idaho received their first Permian volcanic deposits late in Permian time, and most of these volcanic rocks are thick and extensive.

#### TOTAL THICKNESS OF PERMIAN ROCKS

The thickness of the Permian System is accurately known in only a few areas. Available information indicates general thickening westward in eastern Nevada to a maximum of more than 9,000 feet, then an abrupt thinning against the Antler orogenic belt. West of the belt, accurate measurements of thickness are too few to establish trends. The thickness in the inferred eugeosyncline is probably as great as that in the miogeosyncline, or greater in places.

#### GEOLOGIC UNITS DIRECTLY ABOVE PERMIAN SYSTEM UNITS ABOVE THE PERMIAN

Lower Triassic rocks (interval A of the Triassic System) overlie the Permian in an arcuate belt extending from northeastern Nevada southwestward through central and southwestern Nevada and southeastern California and back eastward into southern Nevada.

Deposition may have continued without interruption from Permian to Triassic time in two places within the West Coast region. In southwestern Nevada, the Permian Diablo Formation grades without apparent break into the Lower Triassic Candelaria Formation, according to B. M. Page (oral commun., 1959). The two formations are separated by

THE PENNSYLVANIA STATE UNIVERSITY  
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1 March, 1989

Dr. Kevin P. Corbett  
Department of Geology  
Weber State College  
Ogden, UT 84408-2507

Yours very truly,

Dear Dr. Corbett:

Alfred Traverser

This is in response to yours of 17 February re Dr. Sidney R. Ash.

Dr. Ash is, without exaggeration, the top man in Triassic megafossil paleobotany in the world. His research has been of pivotal importance in understanding the evolution of Mesozoic vegetation, especially of the plants on Earth between 200-250 million years ago. His work has always been carefully done, well thought out, meticulously carried out in the field, and backed up with excellent laboratory investigation. It is hard to imagine that Weber State has many scientists who are relatively as well known and prominent as is Sid Ash. Just to take one example--the Petrified Forest National Park in Arizona and the Capitol Reef National Park in Utah both have relied heavily on Dr. Ash's paleobotanical expertise for the orientation materials they give visitors. Indeed, Dr. Ash wrote much of it, ("The Story Behind the Scenery"), at both parks).

In the last couple of years, Ash's beautifully illustrated publication, "The Early Mesozoic Land Flora of the Northern Hemisphere" (dated 1986, but actually published in 1987) has been an outstanding contribution to explaining where today's plants came from. Last summer in Tasmania I met Dr. Heidi Anderson of South Africa, a famous paleobotanist, with whom Ash worked in Africa and who has a very high opinion of Sid's work on the Triassic plants that fascinate them both.

Because Sid Ash finds plant fossils in shales and sandstones containing few other fossils, he has been able to demonstrate more clearly than others the relative ("stratigraphic") position of rocks all over the Southwest. Along this line, Ash was one of the first to recognize the importance of looking at the microscopic plant remains in his rocks, and because Weber State has had no palynologist (a scientist who looks at such things), he has long had a close relationship with the Palynological Laboratories of Penn State University. Several Ph.D. students at Penn State have worked collaboratively with Dr. Ash. A recent

example is Dr. Ronald J. Litwin, now at U.S. Geological Survey, Reston, VA. Litwin's 1986 Ph.D. thesis on the Chinle Formation of Utah and Arizona was largely the result of Ash's pushing for Weber State-Penn State collaboration on rocks of the Southwest. We at Penn State are hoping for more such joint effort in the future.

In brief, you are fortunate to have a man of Sid Ash's prominence in Ogden, and he richly deserves any award Weber State could give him for his years of devoted service to that institution.

22 February, 1989

Dr. Sidney A. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84403

Yours very truly,

Dear Sid:

Alfred Traverse  
Professor of Palynology

See enclosed xerox of letter from my section, anywhere in North America (Mexico?) that crosses the Permian/Triassic boundary? Fully marine limestones, and the usual redbed, etc., bryozoans, don't count.

All the best,

AT/et

Yours very truly,

Alfred Traverse

AT/et  
encl

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(814)863-3419 or (814)865-6711

22 February, 1989

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

See enclosed xerox of letter from Mamay. Do you know of any section, anywhere in North America (Mexico?) that crosses the Permian/Triassic boundary? Fully marine, limestones, and the usual redbed, etc., bugaboos, don't count.

All the best.

Yours very truly,

Alfred Traverse

AT/et  
encl



WEBER STATE

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February 17, 1989

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park, Pennsylvania

20 February, 1989

Dear Dr. Traverse,

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

It will be a pleasure to write about your prowess, and it will not be necessary to embellish the truth at all! I refer, of course, to yours of 10 Feb. I'll take action when I hear.

Our winter has been very open, mostly mild, and practically devoid of ice and snow. It has been at least three years since I had to use my big snowplow enough to remember. This year I didn't even bother to put up the anti-deer fence around the yews, as the devils are browsing in the woods instead.

All the best.

Sincerely yours,

*Kevin V. Corbett*  
Kevin V. Corbett  
Assistant Professor

Yours very truly,

Alfred Traverse

AT/et



Department of Geology  
WEBER STATE COLLEGE  
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SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY

OGDEN, UTAH 84408-2507  
801-626-7139

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park, Pennsylvania 16802

February 17, 1989

Dear Dr. Traverse,

I am contacting you to request a letter of recommendation from you on behalf of Dr. Sidney Ash. Dr. Ash has been nominated for a faculty award for research by his colleagues in the Department of Geology. Specifically, the awards are intended for research covering the period 1987 through 1989. The criteria for selection are recognition beyond Weber State College and the influence of the research on the learning environment at Weber State. The committee which will review the supporting documentation and make the selection of award recipients is non-technical. Thus, if you will phrase your letter for a general, non-scientific audience it will be more effective. The deadline for submission of supporting documentation is March 7, 1989. I apologize for the short notice, but I was only advised of the time constraints a few days ago. If you can give this request your prompt attention I and Dr. Ash will be most grateful.

Sincerely yours,

Kevin P. Corbett  
Assistant Professor

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

February 10, 1989

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

One of my colleagues here at Weber State has nominated me for a research prize that this institution will be awarding later this spring. He will be writing you soon to ask you to send in a letter about my research. A letter of support from you would be especially impressive in my file so I hope you can send a strong letter with lots of lies in it about all my wonderful work and accomplishments in paleobotany. The prize is ten weeks off from teaching to do more research. It isn't much but every little bit helps. I am not sure if I actually have a chance to win as the competition is pretty stiff but it is worth a try. However, the last time they did this sort of thing the winner was a mechanic who had helped develop the snowmobile - that infernal machine which is used to terrorize wildlife and destroy the quite in the mountains!

I don't know if the winter has been as bad in Pennsylvania as it has been here but it sure has been rougher than usual here in Utah. The temperature has not been above freezing for over a week now and we haven't seen the ground since November as it has been covered with snow ever since then. It has been getting down to about 10 below zero every night for the last week or so. The winter has been particularly hard on the wildlife (deer, elk, moose, etc.) in the mountains so they keep coming down into town for munchies. The deer have just about munched the bushes in our garden down to just bare branches! Boy are we looking forward to spring.

Thanks in advance for your letter of lies!

*Chen*  
*Sid*

*Hi Betty*



**SIDNEY R. ASH**  
Professor of Geology

1 Feb '89

Al -

Just a quick note to let you know that I have forwarded your invoice to the paymaster. Hopefully you get a check - the mail eventually. Let me know if you don't get it in a couple of weeks.

glad to hear that Kues has okayed your project to publish the palynomorphs

of the Red Tank loc.  
I look forward to seeing  
your rept when it is  
published. if there is  
anything I can do to  
help let me know.

~~Cheers~~

Sid

Department of Geology

WEBER STATE COLLEGE

Ogden, Utah 84408-2507

November 9, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

After mailing my letter to you yesterday I started to pack up the samples I promised to send along and decided to send you some additional samples. The package which is actually being sent to TRAVSPORE, INC. contains just the three samples from Hells Canyon which I will pay for being analyzed. I am sending a second package to you at this address which contains the following samples:

Sample CA1 - as described in my previous letter. Some might call the unit Shinarump Conglomerate.

Sample CA<sup>5</sup> - as above.

Sample RA1 - from the Holbrook Member of the Moenkopi Formation of Middle Triassic age on the north side of Radar Mesa near Winslow, Arizona.

Sample SY1 - from the Morrison Formation of Late Triassic age at the Seismosaurus locality west of San Ysidro, New Mexico. Sample SY1 comes from a bed of sandy shale just below the ledge of sandstone that contains the dinosaur at the top of a cliff. Seismosaurus is the worlds largest dinosaur - it is still being excavated.

Sample SY2 - as above but about 30 feet below the dinosaur-bearing ledge about half way down the cliff.

Sample SY3 - as above but about 60 feet below the dinosaur-bearing ledge at the base of the cliff.

Although I would like to have a report on each sample eventually I would especially like to know about sample RA1 as soon as you have time to work on it. If the sample is productive it could serve as the basis of a paper as little is known about the palynoflora of the Moenkopi. An interesting tree fern occurs in this unit at Radar Mesa which I am presently describing.

*cheer*

*Sid*

Department of Geology

WEBER STATE COLLEGE

Ogden, Utah 84408-2507

November 8, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

I have sent a small package of samples to TRAVSPORE, INC as described in the enclosed letter. I will send a few more samples later. The package also contains two additional samples for use in your Penn State lab. When analyzed the two samples will hopefully elucidate the problem discussed in my letter of October 18, 1988 and your letter of 18 December, 1987. In any case the sample data is as follows:

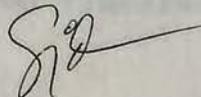
Sample CA-1 -- From the lower part of the Chinle Formation just above the Shinarump in what has been called the sandstone and shale member by Stewart (1972). The locality is about 200 yards west of the high bridge over the Little Colorado River at Cameron, Arizona. I may have sent you a sample from this locality already but I can't find any evidence that I did. ???

Sample CA-5 -- From the lower part of the Chinle Formation just above the Shinarump in what has been called the sandstone and shale member by Stewart (1972). The locality is at the north end of the low bridge over the Little Colorado River about 1/2 mile northeast of Cameron, Arizona. The locality is about 1/2 mile east of the locality that yielded sample CA-1. This locality was the source of the sample I sent you in the summer of 1987 that gave a Late Carnian age instead of the Middle Triassic Age as I had thought it would. I had not assigned a number to the sample when I sent it to you in the summer of 1987.

Sorry to hear of all the problems you are having with the new head of biology. It sounds to me as if she doesn't like you and wants to put you in your place. I wonder how long she will last? good luck with her.

Give my regards to Betty.

Sincerely yours



THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
(814)863-3419 or (814)865-6711

October 20, 1988

31 October, 1988

Dr. Alfred Traverse  
Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Thought I could follow your lead by enclosing a letter from me!

Please let me know the sample number for the sample ("Low Bridge"?), that we're talking about as to the suspect Karnian age. I would like to check that against the letter and my lab data to be sure all is in order--mixups do occur. However, your idea of running another sample is a good one--there's always a chance that a foulup occurred somewhere along the line. Remember the famous Mississippian sample we could never duplicate!

We were sorry you couldn't come, but you're always welcome here! This Fall you could have helped me stack firewood. The new head of biology is a "molecular" biologist and a potential problem, maybe even a DOB. She is threatening to eliminate my joint appointment, has fired me from the evolution course and might even stop the co-listing of my courses. In other words, you may lecture here under geological auspices, which is o.k.

Best to Shirley. Betty and I are fine, but still shuttling back and forth to Indiana and Michigan on a regular basis.

As ever.

Yours very truly,

Alfred Traverse

AT/et

Department of Geology

WEBER STATE COLLEGE

Ogden, Utah 84408-2507

October 20, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

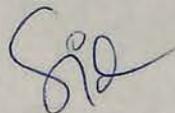
I hope the enclosed request for quotation is adequate. If you need further information regarding the samples please give me a call or drop me a note.

Last year on 18 December you wrote me about some of the samples I had sent you earlier and pointed out that one of the samples I had said was Middle Triassic was actually Late Carnian in age according to a pollen analysis. In August I checked the locality again and it is possible that the sample actually came from the Chinle but near the base in that area - it should be about the same as the palynoflora in sample CA1 which I think I sent you years ago. I am still surprised about the results of the analysis as it brings the base of the Chinle down awfully far. Also I am surprised that the palynoflora is so young. It just seems as if it should not have "Big Mac" in it. Therefore I will be sending you a new sample from the "Low Bridge" for you to run sometime or to give to some hapless student. (By the way the age of the Moenkopi is pretty well established on the basis of lots of vertebrates and marine fossils in the west. Also there is a profound unconformity between the two units.).

I am sorry that I wasn't able to visit you this fall. Perhaps I can get my ducks in order and re-schedule a visit next spring or fall. In the meantime I must concentrate on my local chores. More about the proposed trip later.

Hope that you and Betty are well and have recovered from your travels.

Sincerely yours



file as coming.  
Ash

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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(814)863-3419 or (814)865-6393

INTEROFFICE CORRESPONDENCE

Date: 29 June, 1988

To: E. D. Bellis, Acting Head, Dept. of Biology, 208 Mueller

From: A. Traverse, Professor of Palynology, 435 Deike

Re: Proposed Fall Semester seminar talk by Dr. S. R. Ash  
(Professor and Head of Dept. of Geology, Weber State College,  
Ogden, UT)

Sid Ash is the outstanding authority on Mesozoic floras of North America. Lately he has been working on such floras in Arctic Canada. I would like him to speak in the Biology seminar series in the early Fall on:

"Upper Triassic/Lower Jurassic flora of the High Arctic of Canada and its paleoclimatic implications"

In the transition period in your department I know it's difficult, but I need to know:

1. whether I can invite Dr. Ash;
2. which Tuesdays (assuming it will be Tuesday in the new regnum) are available in late September or October to early November. I can then phone Dr. Ash to negotiate.

AT/et

File Ash

THE PENNSYLVANIA STATE UNIVERSITY  
INTER-OFFICE CORRESPONDENCE

Date: July 1, 1988  
From: E. D. Bellis, Acting Head, Biology Department  
To: Dr. Al Traverse, 434 Deike

*E. D. Bellis*

I turned your request to bring in Dr. S. K. Ash this fall semester over to our seminar committee. This committee consists of Dr. Philip Hedrick, Dr. Carl Keener and Dr. F. M. Williams, it will be responsible for developing the 1988-89 academic year seminar program. I leave it up to the committee to decide whether they wish to bring in Dr. Ash. Dr. Hedrick is expected to arrive here, as a new appointment, in early August. Drs. Williams and Keener will be here most of the summer. Please contact them if you wish to provide further information.

The seminars will meet Tuesday at 3:30 p.m. in 8 Mueller Bldg.

cc: Philip Hedrick  
Carl Keener  
Linda Maxson  
F. M. Williams

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DEPARTMENT OF GEOSCIENCES  
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I N T E R O F F I C E C O R R E S P O N D E N C E

Date: 29 June, 1988

To: E. D. Bellis, Acting Head, Dept. of Biology, 208 Mueller

From: A. Traverse, Professor of Palynology, 435 Deike ~~A~~

Re: Proposed Fall Semester seminar talk by Dr. S. R. Ash  
(Professor and Head of Dept. of Geology, Weber State College,  
Ogden, UT)

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1. whether I can invite Dr. Ash;
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AT/et

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I N T E R O F F I C E C O R R E S P O N D E N C E

Date: 26 May, 1988

From: A. Traverse, Professor of Palynology, 435 Deike

To: *Dr. Koide*  
~~Debbie~~ Snyder, 208 Mueller

This is with reference to the phone call about my desire to nominate a speaker for the 1988-89 seminar series. The man is Dr. Sydney R. Ash, Weber State College, Ogden, Utah. Dr. Ash is an outstanding paleobotanist, a world authority on Mesozoic plants, especially the Triassic vegetation of the Petrified Forest National Park and related areas. He is coming here in the Fall, the date being to some degree adjustable, depending on openings in the seminar schedule.

Thanks very much for passing this on to whomever gets the seminar-scheduling assignment.

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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435 Deike Building  
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(814)863-3419 or (814)865-6393

26 May, 1988  
27 June, 1988

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Yours of 10 June in hand. The samples mentioned therein came a week or so ago. I wish 30 people took palynology so that we could get them all worked on quickly.

Some talented student will greatly appreciate making a few \$ by processing your Jurassic/K samples from Oregon in the fall. I do the microscopy, etc., of course.

For the seminar talk, let's go with your #1--"Upper Triassic/Lower Jurassic flora of the High Arctic of Canada and its paleoclimatic implications."

I am trying to pin down somebody in the Biology Department in order to get you slated for a particular time. The trouble is that we're between heads of that department, and nobody is willing to take responsibility.

All the best.

Yours very truly,

Alfred Traverse

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
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(814)863-3419 or (814)865-6393

26 May, 1988

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

We're digging out after our return from the most recent Mother-tending trip to the Midwest. Yours of 12 May was in the pile. Do you W-P those yourself? Nice.

Re your seminar talk: I believe that the Chinle flora talk would be just fine. Another possibility that had occurred to me is to take some aspect of your chapter in the Gastaldo 86 volume and expand it into a talk--"Where were late Mesozoic plants headed?" "Sanmiguelia and all that." etc.

However it would be nice to come up with both a title and a date asap, so that we are first in line. As a matter of fact, I'm going to nominate you today without title or date. The traditional day has always been Tuesday.

Best to you all.

Yours very truly,

Alfred Traverse

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

May 12, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

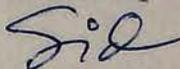
Dear Al

Thanks for your recent letter inviting me to give a seminar when I am in the east next fall. Yes, of course I will be happy to do so. However, I'm not sure if I can come up with anything new to say about the Chinle flora. I could give my old lecture on the Chinle flora if you think that would be of interest. Another possible topic would be the new flora I am working on in Oregon - but it is more of a geologic topic. Anyway we can talk about it later.

Brian J. Axsmith is a senior at a small community or state college someplace in the wilds of eastern Pennsylvania. He will graduate in December of this year. The reason I have brought him to your attention is that he is interested in the fossil plants in the Newark and has a little paper about a small Newark flora in press. Possibly you could get him interested in the palynology of some part of the Newark if you don't want to supervise a thesis dealing with plant megafossils from the Newark or what ever. His address is 344 Beech Street, Pottstown, Pennsylvania 19464 if you want to write him about this possibility. I spoke to him a few days ago about his paper and he indicated at that time that he might be interested in working on a graduate degree someplace. Yes, he did phone you sometime ago about the palynology at the new plant locality as you thought.

I wish we could join you in Australia in August but with Kathleen in college and Randy headed that way we just do not have the money for such a trip. Hope you and Betty have a great time there. Please give our regards to Geoff Playford and Mary when you are in Australia.

Sincerely

  
Sidney ASH

P.S. Brian's phone number is (215) 323-5783.

Department of Geology

WEBER STATE COLLEGE

Ogden, Utah 84408-2507

June 10, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

Under separate cover I am sending you a selection of samples for your use in class, etc. Locality data for the samples is given on the attached shipping list. Hope that at least some of them will be productive. I'm especially hopeful that the Precambrian sample will be productive for acritarchs.

During September I will do my collecting from the Upper Jurassic/Lower Cretaceous in Oregon and send you some samples from there for analysis at the rates you quoted me in your previous letter.

As for my seminar this fall I suggest we schedule it for the first or second week in October or possibly the last week in September - at this point my schedule is quite loose so I will fit it around whatever date you come up with. As to a topic/title I suggest one of the following:

1. Upper Triassic/Lower Jurassic flora of the High Arctic of Canada and its paleoclimatic implications.
2. Suspect floras of western North America.
3. Recent advances in the study of the Upper Triassic Chinle flora

I hope that one of these subjects piques your interest as I really would not feel comfortable with the topic ("Where were the Mesozoic plants headed") that you suggested - sorry - It is an intriguing topic, however, and perhaps I can do something with it at another time. At the present I just do not feel that I have enough of a grasp of the subject at this time to talk it without a lot of study. This summer I will not have much time for that as I must finish some of the many partially completed reports I have kicking around.

Hi Betty!

Sincerely

Sid

P.S. Yes, I do most of my  
correspondence, repts, etc on  
an AT&T P.C. I can imagine not having a PC now!

## SHIPPING LIST

Localities UI1a, b, c, UI3 are in the Mississippian strata on the northwest side of the Uinta Mountains in the Henrys Fork Coal Field. The strata are referred to the Manning Canyon Shale by some authors and the Doughnut Formation by others. There are several other coal localities in the field which I haven't visited because they are generally hard to get to. In 1950 Schemel described the palynomorphs from locality UI1a and I believe that the locality we looked for many years was in this coal field. It will be interesting to see if your analysis bears out my contention!

Locality UI1a - coal mines in Sols Canyon, Jessen Butte Quadrangle.  
Probably the locality from which Schemel (1950) got his palynoflora.

Locality UI1b - coaly shale about 100 feet above UI1a.

Locality UI1c - shale about 50 feet below UI1a.

Locality UI3 - coal mines on Coal Mine Hill.

### Precambrian

Locality UI4 - Red Pine Shale near the top of the Precambrian section in the Uinta mountains along Utah highway 43.

### References:

Doelling, H. H., 1972, Henrys Fork Coal Field, in Utah coal fields - eastern and northern Utah coal fields...:Utah Geol. Min. Survey Monograph Series 2, p. 355-378.

Schemel, M. P., 1950, Carboniferous plant spores from Daggett County, Utah: Jour. Paleo., v. 24, p. 232-241.

THE PENNSYLVANIA STATE UNIVERSITY  
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(814)863-3419 or (814)865-6393

27 April, 1988

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Thanks for yours of 14 April 1988. Mike Morales did send me a large box of rock--but it was all one huge (about 5 kg) sample of calcareous clay. I haven't run it yet, but don't have any high hopes for it. I wrote Mike with some gentle collecting tips, in the hope he'll look for some more and better samples.

We'll be in Australia most of August, but in the fall we will be around and very glad to see you. Could you give a seminar talk on a paleobotanical subject of biological interest? I could easily arrange it through Biology, and you'd get a modest honorarium.

Can you tell me more about Brian Axsmith? I find nothing in the file, though I do recall something--a phone call maybe?

All the best.

Yours very truly,

Alfred Traverse

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
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(814)863-3419 or (814)865-6393

20 April, 1988

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

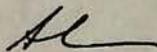
Dear Sid:

From my vast source of SRA unprocessed samples I used two a while back as demos for a processing lab and in that way got 'em done: "Heiberg Fm., Ellesmere Island--TRH2", and "Chinle in Mon't. Valley." Apparently the latter little bag was in same box as the Heiberg sample. Does that mean that the "Mon't. Valley" sample is probably the one in your letter of 19 November, '85 ("2 mi. N of Owl Rock", etc.)? The bag says only as reported above. I'd like to get my data straight. Is it Utah or Arizona? (I'll report on these samples as soon as I hear.)

If you ever get even minor funding, try to sneak a few dollars for palynological analysis in. I can hire students who have had my course to do some of the lab work, but it takes a few \$.

Best.

Yours very truly,



Alfred Traverse

AT/et

AT-

I'm sure the sample marked  
Mon't Valley came from Monument<sup>4</sup>  
Valley, Arizona 2 mi n of owl rock.  
It was in a road cut. I thought that  
you and Ron collected there also when  
we went through that area. should be Carnian  
in age.

At this point I'm more interested in the

T2 H<sub>2</sub> sample as I'm trying to finish a  
rept on the Heberg flora.

I have funding for pollen analysis  
in my grant if I need it. How much  
do you charge? How do we arrange the  
transfer of funds do you suppose?

Cheer

Sid-

P.S. Hi Elizabeth (Betty <sup>3</sup> I mean)



SIDNEY R. ASH  
Professor of Geology

4/14/88

Dear Al -

Thank you for your recent letter. I'll look forward to hearing about my samples later.

Mike Morales tells me that he is sending you some samples from the Moenkopi and Aton Chico formations for <sup>palyno.</sup> analysis. I hope you can push his samples along quickly so that he will be encouraged to send you some more samples. I really think the Lower/Middle

Triassic is your best bet  
to get an <sup>NSF</sup> funded project.

My proposal to study the  
? Jurassic/Lower Cret. stuff in  
Oregon was funded! So  
I'll be coming east in  
the fall to look at the  
Jurassic collections in the  
Nat Mus that came from  
Oregon & Calif. I'll try to  
arrange my itinerary so  
that I can visit with  
you folks.

By the way I talked to  
Brian Axsmith the other day.  
He is looking for a graduate  
program in paleobotany. Perhaps  
he would come to Penn State if you  
encouraged him to? <sup>clearly</sup> sid

1 April, '88

File # Ash  
Correspondence

re these Sid Ash residues & slides (from demos for 423: see your maceration book, samples "ATA" & "ATB", Sept., 1987)

I assigned T and PRC numbers, assuming you have more raw sample to assign T# to. However, I don't know Ash details (i.e. his numbers, correspondence relating to, etc., and am not positive re exact age).

So, please check entries in T and PRC books, add details as needed.

I can make geog. and strat. cards for those files when I am sure of age. Let me know.

Dear Sid:

Got yours of 24 March and look forward to the samples coming. We'll get at them as soon as possible. What with praps for the Int. Bot. Congress in Aug. I'm not sure, but if sounds important, and I like what you're doing with your plants again! I guess I told you that I am teaching a preliminary course now, and I'll be up to Boston early next week!

3086

3086:ATA

3087

3088

All the best,

Very truly,

David Sanger

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
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March 24, 1988

30 March, 1988

Dr. Alfred Traverse  
Department of Geosciences  
University  
Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid: I am sending you a few samples for analysis.

Got yours of 24 March and look forward to the samples coming. We'll get at them "as soon as possible." What with preps for the Int. Palynol. Congress in Australia and ongoing problems regarding our mothers, it probably will be a while, but it sounds important, and I'd like seeing my name in lights with yours again! I guess I told you that I am teaching a paleobotany course now, and I'll be up to Czekanowskia next week!

All the best.

Yours very truly,

Alfred Traverse

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408-2507

March 24, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

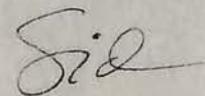
Dear Al

Under separate cover I am sending you a few samples for analysis.  
Locality data is as follows:

Sample Number	Description
ST984 JM1	Johnny M Mine, Ambrosia Lake area, New Mexico, Westwater Canyon Member of the Morrison Formation of Late Jurassic age.
HF5	Pittsburg Landing, Hells Canyon, Idaho, Coon Hollow Formation, ?Jurassic.
KI1	Kinney clay pit, Manzano Mts., New Mexico, Wild Cow Member of the Madera Formation, Upper Pennsylvanian or Lower Permian. (2 samples).

If sample JM1 has a palynoflora and if you are interested we will have the makings of a joint paper because the unit contains abundant specimens of Czekanowskia and a conifer of some kind. This little flora is significant because as far as I can determine Czekanowskia has never been described from North America. I won't be in a position to describe the megafossils until late this summer so there is no big rush for you to analyze the sample. I would envision either a by-line for you "with notes on the palynomorphs by A. Traverse" or joint authorship of an article entitled "Plant megafossils and palynomorphs from the.....by Ash and Traverse." Let me know what you think about all this sometime.

Cheers



THE PENNSYLVANIA STATE UNIVERSITY  
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SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY

FEBRUARY 12, 1988

12 February, 1988

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Yours of 8 February in hand--let's do follow up on that Moenkopi sample. Could be interesting per your letter.

Despite appearances, pick a super sample from the Hells Canyon area and let's run it--I have had some luck with such things. I wrote a paper on it, "Marginal Palynology." In the future you might consider putting a few \$ into your proposals for "palynological analysis", so that I could pay students to process the stuff and PSU for use of facilities.

It would be great if you and Shirley could visit us as threatened in this letter! Maybe you could help me plot out a proposal along the lines you suggest--Moenkopi & Santa Rosa.

Best.

Yours very truly,

Alfred Traverse

AT/et

A FOUNDATION FOR THE FUTURE



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY

OGDEN, UTAH 84408-2507  
801-626-7139

February 8, 1988

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al

Thanks for your belated Christmas letter and your previous notes and letters which I never got around to answering for one reason or another. Sounds as if your life is even more hectic than ours. Congratulations on surviving!

In your letter of 18 December you noted that the "Middle Triassic Moenkopi" sample I sent you last summer contains a late Carnian palynoflora and wondered about the inconsistency. Well I'm puzzled too. The geology of the locality seemed fairly clear at the time that I collected the sample but I suppose that I may have sampled a block of Chinle that has slumped down to the level of the Moenkopi. The age of the Moenkopi seems to be pretty well settled according to the vertebrate paleontologists as it contains more than just a couple of toenails! (See Mike Morales' article in the journal of the Ariz.-Nev. Acad. Sci. which I sent you the other day.) So it should contain a Middle Triassic flora and if it doesn't then that is news. If the sample came from a slump block at the low bridge, however, I would have expected it to contain a basal Chinle palynoflora not an upper one. The other possibility is that somehow I miss-labeled my samples and the one in question actually came from the upper part of the Chinle in the Petrified Forest. I'll have to check the locality next summer and possibly resample it if I am sure it isn't in a slump block. The more I think about it the more I doubt that it came from a slump block. Anyway we'll have to wait until next summer to see what the facts actually are. Whatever the solution your student has done a good job on the unknown. Is he going to go on in palynology with you?

Speaking of students, have you considered trying to get Brian Axsmith (Pottstown) to come to Penn State. He tells me that you have agreed to run some Newark samples for him. Although he seems to be quite interested in paleobotany you might be able to get him to switch over to palynology.



A FOUNDATION FOR THE FUTURE

Hunt Institute for Botanical Documentation

I have applied to NSF for a grant to study the Middle Jurassic/Lower Cretaceous flora of Hells Canyon in Oregon. It doesn't seem that my work on the Chinle flora is exciting enough to warrant support from them so I've decided to extend my interests upward and westward! Unfortunately the strata in Hells Canyon are so metamorphosed that they do not contain any cuticles and probably don't contain identifiable palynomorphs. Nevertheless, the leaves are pretty well preserved and identifiable and I should be able to date the enclosing rocks when I have obtained a bigger collection. (I sampled up there a few years ago when the geologists thought the flora was Triassic in age - when it turned out to be anything but Triassic I lost interest until now). If my proposal is funded I will have to study the Jurassic floras stored at the National Museum so perhaps Shirley and I can accept your invitation one of these days. I probably won't hear the results of my proposal until May or June so don't hold your breath.

I think you should consider working on the Lower and Middle Triassic palynofloras in the Moenkopi (see Morales article) and on the Anton Chico Formation (basal Santa Rosa) in eastern New Mexico (see the article by Lucas and Hunt in the same issue of the Jour.). Dick Scott's technician reported a palynoflora in the Moenkopi in Capitol Reef Nat. Park which I find hard to believe since the strata at the locality are typical redbeds. ??? It is possible that she is correct but I wonder. A good Moenkopi palynoflora would be so interesting and important that NSF might give you some money to study it.

Hope to see you two one of these days soon.

Cheers

Sid

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
PALYNOLOGICAL LABORATORIES  
435 Deike Building  
University Park, PA 16802  
(814)863-3419 or (814)865-6393

18 December, 1987

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Reference is to your handwritten letter of 2 July 1987 from PFNP. You sent me per it a sample of "Moenkapi Fm...Middle Triassic age according to the vertebrates...from...at the 'low bridge' over the Little Colo. River at Cameron, Ariz."

One of our better students had it as "unknown no. 11" in my just finished palynology course. I enclose a xerox of his excellent paper. As you see, the sample yielded a Chinle-like flora, in fact including forms that RJL thought late Carnian (especially noteworthy is the new taxon "**Big Mac**" of RJL).

Does this mean that the sample outcrop was really not Moenkapi, or that the Moenkapi/Chinle difference is time-transgressive? If so, what of the "vertebrate evidence?" (two and a half teeth and a footprint?). I really do want to keep a hand-in with you, despite funding and other problems.

Best to all Ashes for the holidays and 1988!

Yours very truly,

Alfred Traverse

AT/et  
encl: report  
cc: R.J. Litwin

P.S. Another student was issued your sample Tr H4, Heiberg Fm. near top, east of Buchanan Lake, Axel Heiberg Island. Unfortunately this sample contained organics but no recognizable palynomorphs.

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17 November, 1987

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Miscellaneous palynological report #8963!

You may recall (see your letter to me of 18 Oct. 83) sending me a sample of "Kirtland Formation, near Kimbeto, New Mexico." In 1986 I had a student in my palynology course try it and she reported "abundant organic material, no palynomorphs." From the look of the sample, I doubted this result, so we (August, 87) ran it carefully again. Unfortunately we corroborated the student's finding--there are "ghosty", unidentifiable palynomorphs (except a few that are recognizable as bisaccates but couldn't be further identified), but nothing more. I suspect weathering. The same rock from a core, fresh road cut, or stream bed would probably be productive. More later about various other samples from you.

If you have any more hot ideas of a project that could support a student here, let me know.

Best regards and to Shirley too, please.

Yours very truly,

Alfred Traverse

AT/et

7/2/87

Dear Al

The other day I sent you a sample from the Moenkapi fm for you to check for pollen and spores. I hope it has arrived by now. It should be of Middle Triassic age according to the vertebrates. The sample came from a locality that is about at the "low" bridge over the Little Colo. River at Cannon, Arizona.

Mike Morlan tells me he has some samples from the base of the Santa Rosa ss ~ eastern N.M. which should also be of Mid. Triassic age. I have asked him to send them on to you for study. Perhaps if you called him at the Museum of North. Arizona (geol. dept.) it might expedite him doing so.

Perhaps you could do enough preliminary work on Middle Triassic spores/pollen to justify another <sup>NSF</sup> grant. From what Ron tells me he seems to very busy with Cret. stuff so his Triassic work is going to be slow coming out. I am hoping he will limit the scope of his Triassic work to the ~~top~~ <sup>top</sup> of the lower part of the system, at least for now and let you work on the other material.

In case why don't you run this stuff when you have time. Let me know if you need more.

I am working at Pet Nat Park until about 16 July when I'll return to

Ogden to teach Summer School for a month. Randy is with me and seem to be enjoying himself. Shirley and Kathleen are in Ogden where Shirley is going to school and Kathleen is working part time.

Best to you + Betty

Pig Ash

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(814)863-3419 or (814)865-6393

27 April, 1987

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Presumably you saw the kudo for Sid Ash in Geos 16:1:7 (1987). I basked in the reflected glory: "Gee, I know him"!

The pollen in Eureka Sound samples that I have studied is so overwhelmingly taxodiad (many taxa--must have been a taxodiad heaven) that I can hardly conceive what it must have been like.

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

-AT/et

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30 March, 1987

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Just finally got around to reading the three reprints you sent a while back. I had fun following your arguments that the "obvious" cycadioid is a cycad. Enjoyed seeing my words of wisdom re Potoniesporites et al. in print. Endured Schizoneura (ha!). Sphenopsids are a bore.

Are we drifting apart, old buddy? I wouldn't like that, as I have really enjoyed our contacts.

Best to you and Shirley.

*Alfred* *about -* *Al!*  
Alfred Traverse  
Professor of Palynology

AT/et

19 September, 1986

30 September, 1986

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Dear Sid:

The (bleak) results from recent batch of samples from Nevada are enclosed. The carbonate predominance is interesting. I suspect that if one could come up with cores from somebody, we might do some good. Failing that, a big construction project is our only hope of better outcrop.

Well, this is no help for the proposal, and I need to get cracking on one right away. Please send me ideas asap.

All the best.

Yours very truly,

Yours very truly,

Alfred Traverse  
Professor of Palynology

Alfred Traverse  
Professor of Palynology

AT/et

AT/et

encl: sample results

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408

16 September, 1986  
19 September, 1986

Dr. Sidney R. Ash  
Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Dear Sid:

Yours of 2 Sept., and now the samples, are safely in hand. The samples, as you say, look pretty marginal. We'll give 'em a good shot, tho'.  
CU The six samples are in HF, etc. A student is helping with processing. Which reminds me--any chance you have a few \$ still in the till, that would otherwise go down the chute, that could pay him? Not to worry if there isn't but I thought it worth asking. I'm paying him out of our personal funds.  
I, someday, you were going to look at the Nevada Triassic that is down in southern NV (there is such, isn't there?).

Best. More news soon.

I am glad I got to know Rock, as he ranks among the 2-3 weirdest characters I've ever met. When I visited him, every square foot of his house was crissed with fossils. When he died, I was told by a mutual friend that his son, having no respect for what his father did, threw out everything, sealing the great stacks of uncollected fossils.  
Yours very truly, vastly published monographs for WANDA PAPP.

A man who would know all about this situation would be Brother Nicholas Sullivan, who was at one time with the Philadelphia as a geologist. He has not been there for years, even sure he's still alive, but he was close to Rock and could fill you in. I would say, call the geology dept. at LaSalle and play dumb, asking about Brother Nicholas Sullivan (he left under some sort of cloud). If they won't help, try (long since retired) John B. Penny, also in care of LaSalle College. He might be AT/et  
P.S. If there were such \$, I'd bill you on stationary of my pocket people corporation ("Travspore Inc."). at character in their history.

Best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408

16 September, 1986

September 2, 1986

Dr. Alfred Traverse  
Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Al:  
Dear Sid:

I've just got back from my last bit of traveling and I now have a few  
Yours of 2 Sept., and now the samples, are safely in hand. The samples,  
as you say, look pretty marginal. We'll give 'em a good shot, tho'.  
CU4 looks possible, but I've been fooled before--both ways. We'll see.  
We're already at it because of urgency.

I was surprised that the samples come from northern Nevada. I  
thought, somehow, you were going to look at the Nevada Triassic that is  
down in southern NV (there is such, isn't there?).

I am glad I got to know Bock, as he ranks among the 2-3 weirdest  
characters I've ever met. When I visited him, every square foot of his  
house was crammed with fossils. When he died, I was told by a mutual friend  
that his son, having no respect for what his father did, threw out everything,  
selling the great stacks of unsold copies of Bock's privately published  
monographs for waste paper.

A man who would know all about this situation would be Brother Nicholas  
Sullivan, who was at one time with LaSalle College in Philadelphia as a  
geologist. He has not been there for many years, and I'm not even sure  
he's still alive, but he was close to Bock and could fill you in. I would say,  
call the geology dept. at LaSalle and play dumb, asking about Brother Nicholas  
Sullivan (he left under some sort of cloud). If they won't help, try (long  
since retired) John S. Penny, also in care of LaSalle College. He might be  
able to shed light on the whereabouts of Brother Nicholas. The latter is  
the key to the situation. If he is deceased, I can only hope that Penny  
could help directly. Another possibility would be to visit North Wales  
(it's a turn in the road) personally and just ask around. Even now people  
are bound to remember the greatest character in their history.

Best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408

September 2, 1986

Dr. Alfred Traverse  
Department of Geosciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

I've just got back from my last bit of traveling and I now have a few samples to send you from the continental Upper Triassic of Nevada. The samples are in a separate package with a copy of this letter. Their lithology doesn't look a bit good to me for spores and pollen. Also I didn't see a hint of anything organic in any of the rocks that I looked at. Nevertheless, I am sending the samples along anyway in hopes that they will be productive. It sure would be significant if any of them contained something useful. The locality data for these samples (such as they are) is on the attached sheet of paper.

It is obvious why so little is known about the continental Upper Triassic of Nevada. Its because the strata occur in low rolling hills and in the broad intervening valleys which are generally covered with soil, talus and/or a thick layer of alluvium. Consequently exposures are few and far between and to make matters worse they consist for the most part of red sandstone and siltstone with small amounts of greenish, reddish and brownish shale. Although I did not see all the areas mapped as Upper Triassic I hit most of them and believe that I collected a fair sample of the lithologies that are exposed. I suppose that the valleys may be underlain by softer mudstones which might be productive but until someone does some extensive trenching we will never know. In the meantime you can check out the samples I collected and then we can decide where to go from there.

As you prophesied, I was disappointed with the Bock collection at the Academy of Sciences. I do not know if you are aware of it or not but the bulk of Bock's collection is not there and the people at the Academy have no idea where it might be. Do you happen to know where Bock's son Eric lives or if anyone has ever tried to contact him about its disposition? I looked up Bock's obituary (copy enclosed) in case it would say where his son lived but as you can see it doesn't. It does contain some interesting personal information that I did not know, however.

Let me know what you find in the samples...

cheers!

Sid

LOCALITY DATA

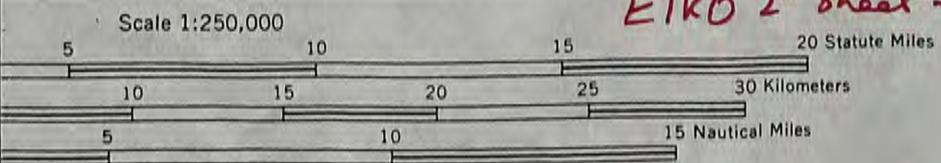
- CU1 -- Red and greenish shale and sandstone at west end of roadcut on north side of U.S. Highway 93 about 1/2 mile east of Currie, Nevada. NW1/4, sec. 34, T. 6 S., R. 64 E.
- CU2 -- Red and white sandstone and greenish shale exposed at places on the southwest sides of low hills about six miles north of Currie and about one mile east of U.S. Highway 93. Center sec. 31, T. 5 S., R. 64 E.
- CU3 -- Red sandstone and greenish sandstone and greenish shale exposed in a west facing cliff about 1/2 mile north of Currie. Sec. 27, T. 6 S., R. 64 E.
- CU4 -- Hard greenish mudstone discontinuously exposed in the floor of a broad valley about 3 and 1/2 miles east of U.S. Highway 93. East half, sec. 8, T. 5 S., R. 64 E.
- CU5 -- Gray, platy limestone discontinuously exposed about one mile north of locality CU4 in the floor of the same broad valley. East half, sec. 5, T. 5 S., R. 64 E.
- CU6 -- Brownish shale and sandstone exposed on the west side of sandstone quarry about 100 yards south of locality CU3. Sec. 27, T. 6 S., R. 64 E.



67 115'00" R. 62 E. 68 R. 63 E. 69 45' R. 64 E. 70 R. 65 E. 71 R. 66 E. 30'

ELY 53 MI.

*EIKO 2° sheet*



CONTOUR INTERVAL 200 FEET  
 MINOR CONTOURS AT 100 FOOT INTERVALS

TRANSVERSE MERCATOR PROJECTION

INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 11

LOCATION DIAGRAM

OREGON NK 11-4 ADEL	JORDAN VALLEY NK 11-5	IDAHO TWIN FALLS NK 11-6
VIA NK 11-7	MC DERMITT NK 11-8	NK 11-9 WELLS
NK 11-10 LOVELOCK	WINHEMUCC NEVADA NK 11-11	ELKO NK 11-12
RENO NJ 11-1	NJ 11-2 MILLET	NJ 11-3 ELV

CONTINUED FROM AN 1800 MILE CARTERLY FOR THE

LOCALITY DATA

- CU1 -- Red and greenish shale and sandstone at west end of roadcut on north side of U.S. Highway 93 about 1/2 mile east of Currie, Nevada. NW1/4, sec. 34, T. 6 S., R. 64 E.
- CU2 -- Red and white sandstone and greenish shale exposed at places on the southwest sides of low hills about six miles north of Currie and about one mile east of U.S. Highway 93. Center sec. 31, T. 5 S., R. 64 E.
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- CU5 -- Gray, platy limestone discontinuously exposed about one mile north of locality CU4 in the floor of the same broad valley. East half, sec. 5, T. 5 S., R. 64 E.
- CU6 -- Brownish shale and sandstone exposed on the west side of sandstone quarry about 100 yards south of locality CU3. Sec. 27, T. 6 S., R. 64 E.

2 December, 1985

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Five samples from Chinle, Burro Canyon Fm. (?), and Canadian Arctic arrived in 100% good order. I suppose a letter about it will also come one of these days. Ye gods, do I have a stack of projects to work on!

My paper at the Williamsburg meeting went well. The field trip to Taylorville-Richmond Basins was marred by the torrential rains the area had had that week. But still fun. There were neat cycadophytes in the Taylorville.

Whhops--at this point yours of 19 Nov. arrived, with explanations. The two SW samples had slips of paper in them (not in your hand?), but they were almost illegible, so the letter helped. The Blanding, Utah, sample looks very organic.

Interesting to hear about Geoff N.'s son! Also, I enjoyed your comments about Wilson's and Taylor's books. Mostly it is a matter of them both being oriented to structurally preserved fossils--Hickey would write quite a different book! Another thing is that you've never played as part of the in-group in paleobotany, which is a botanical club with very tight membership rules.

Yes, I knew about Bruce & Paul's paper--I should have done what Paul did--reorganize Bruce's thesis stuff and see that it got published!

I really did wonder about the High Arctic trip, and am glad to hear details. Must have been a great experience, and I'm glad that Hank could go along.

Thanks for writing so fully, and keep in touch. All the best for the holiday season to you all!

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

P.S. Happy Birthday!--a little late.



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY

OGDEN, UTAH 84408  
801-626-6207

November 19, 1985

Dr. Alfred Traverse  
Palynological Laboratories  
Deike Building  
The Pennsylvania State University  
University Park, Pennsylvania 16802

Dear Al:

Thanks for your letter of 23 October. The samples I promised to send you in my earlier letter were finally sent off a few days ago and should arrive shortly if they haven't arrived by the time you receive this letter. Some locality data is given with each sample but the data for two of them is expanded here:

Chinle Fm. (near base - probably Shinarump Mbr.) in green shale in road cut on north side of U.S. Highway 163 about 8 miles northwest of Kayenta, Arizona and about 2 miles north of Owl Rock.

Burro Canyon Fm. (Lower Cretaceous), most probably. Possibly upper part of the Morrison Fm. - this needs to be field checked. Gray shale in road cut on north side of U.S. Highway 191 about 6 miles north of Blanding, Utah. Tschuty's Professional Paper 1281 should be useful for identification of the palynomorphs if the sample is from the Burro Canyon.

The samples from the Heiberg are Norian, Rhaetian or possibly Lias in age. The exact locality that the samples came from is difficult to describe because there are few named landmarks in the High Arctic and also the area is not sectionized. I could pinpoint the localities on a map if you really need that information. Geoff Norris' son was a field assistant for a graduate student who was working on the stratigraphy of the Heiberg while I was on Ellesmere and he collected some samples from the Heiberg for his father. I don't know that Geoff has any particular plans to work on the palynomorphs of the Heiberg but I don't know that for sure. Nevertheless, it might be useful to work up these samples in case they are Norian - then Ron would have some more material to compare with the palynomorphs in the Norian part of the Chinle.

Yes, it does seem odd that Lupe and Silberling ignore the palynological record - and also that of the vertebrates as well. Now you know how I feel when I look at the paleobotanical books by Wilson and Taylor and see that they have almost completely ignored my work on the Chinle flora. And in some cases have gone back to earlier work which I disproved. Perhaps it is because my work isn't worthwhile. In the case of Lupe and Silberling they seem to have had a preconceived notion the way the formations should correlate and were not going to let the facts deter them! When word of Ron's talk at Flagstaff gets back to them perhaps they will have second thoughts about their correlations. In my opinion they are way off in their correlations as they have moved the Chinle upward somewhat so that upper part extends into the Lower Jurassic. We can't say whether or

not it extends into the Jurassic since we have no data on that part of the section. However, the data that you and Ron have come up with certainly indicate that the Monitor Butte and the lower part of the Petrified Forest Member are Carnian. This is also confirmed by the vertebrates. I just wish that the plant megafossils were of some use here but so far I haven't recognized any species that occur outside of North America. Anyway I think that their paper calls for a rebuttal when we get a little more data together on the subject. And after Ron finishes his thesis!

Were you aware that Bruce and Paul Olsen have a paper in press about the biostratigraphy of the Newark Supergroup and early Mesozoic provinciality? It is scheduled to be published in Mexico with several other Triassic papers, including one of my own. If I see a copy before you do I'll let you have a Xerox.

I guess I have never told you much about my trip to the High Arctic so I'll do so now. The trip didn't just come up. Actually Jim Basinger (Saskatoon) and I had talked about the possibility of my working on the Heiberg flora for several years ever since I heard about it from him and Dave Dilcher. The trip had to wait until I got back from South Africa and got settled in, however. My brother Hank came along as my unpaid assistant since he isn't gainfully employed anymore. He was quite eager to see that part of the world. Hank had never been able to do much traveling outside of the U.S.A. while he was working with the government. We tried to get him to visit us in Australia and in South Africa but he just couldn't afford the necessary time or expense when we were there. So perhaps the Ellesmere trip made up some of what he missed earlier. I had hoped to take Randy with us also but there just wouldn't have been room for him on the chopper that we had to use. Also he was a bit young for such a rough experience. Jim and I are talking about going back during the summer of 1987; if we do I'll probably take him along on that trip. We collected some nice material from five localities on both Ellesmere and Axel Heiberg Islands. A bit of scrappy material had been collected from the Heiberg Formation years ago and later identified by Wayne Fry in an obscure Canadian Geological Survey report. I do not think that any other paleobotanist is aware of the flora. Although, strictly speaking, I won't be the first to report on the flora it will still be interesting to work on and important to describe as it is the most northerly of the known Upper Triassic/Lower Jurassic floras both now as well as when the plants were alive. The plants are mainly represented by impressions but there is cuticle on some specimens. The flora is not large - only about a dozen species and some of them are represented by only one specimen. I plan to do a little report on the flora for "Science" or "Nature" during the coming holidays.

Thanks for sending me a copy of your new NSF proposal. It sure looks good and I hope it is awarded. I'll have to get busy on one of my own pretty soon!

Best wishes to you and Betty.

Sincerely

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408  
October 9, 1985

Dr. Alfred Traverse  
Department of Geosciences  
Boike Building  
Pennsylvania State University  
University Park, Pennsylvania 16802  
23 October, 1985

Dr. Sidney R. Ash  
Department of Geology  
Weber State College  
Ogden, UT 84408

Dear Sid:

Many thanks for yours of 9 October, and all the news it contained.  
I agree heartily that my substitute on the trip is more decorative.

Ron is in DC today with all the chips on the table. Meanwhile I have  
a phone call this a.m. from the Chairman of the Geology Program pressuring  
me to get Ron finished--he's over the limit of semesters, etc., etc.

Yes, I want to continue to be involved and to cooperate with you.

Your idea of searching for the T-J boundary, the work in Nevada, etc., etc.,  
all sound good. I would add for the long run the possibility of finding  
productive zones that would tie in with marine rocks of correlative age.  
Also--the cooperative study of Eagle Mills and Dockum materials ought to be  
rewarding. The Eagle Mills seems to be much more like the Newark Basins than  
like the Dockum, despite proximity of the latter. Eagle Mills, of course,  
is concrete evidence of rifting--what impact did this have on sedimentation  
in the Dockum/Chinle complex?

I look forward to getting the additional samples, though they haven't  
come yet.

I have read the pertinent parts of the Lupe and Silberling paper and  
must say that they are wrong about imprecision in the palynological correla-  
tion with Europe, although their placing of their stage boundaries is not  
wildly different from our own--right? It is odd that they just don't think  
palynology is worth even a direct quote! They seem at least to have read  
Ash!

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

Department of Geology  
WEBER STATE COLLEGE  
Ogden, Utah 84408  
October 9, 1985

Dr. Alfred Traverse  
Department of Geosciences  
Deike Building  
Pennsylvania State University  
University Park, Pennsylvania 16802

Dear Al:

It was certainly nice that Ron was able to come out west last month. I was sorry that you didn't have time to come along also as it would have pleasant to talk to you again about our projects, etc. Actually it wasn't so bad having Becky with us instead of you -- and besides that she's much prettier! In any case I think that Ron made good use of his time while he was out west as he was able to collect samples at critical places and his talk at Flagstaff was well received. I think that he made a good impression on the folks there and your reputation was at least indirectly enhanced. If the samples he collected are productive they should be very helpful in establishing the Carnian/Norian boundary in the Petrified Forest and possibly at Ghost Ranch. I know that you are nervous about him completing his dissertation on time but from what he said on the trip I don't think that you have to worry no matter how much he collected. I really feel that the new samples will make his dissertation that much better and more complete. Also they may provide important data we can use in a paper on the Carnian/Norian boundary.

By the way it seems to me that Ron's most significant contribution is his recognition of the Carnian/Norian boundary in the Chinle. (Could it also be present in the Dockum?) After he is finished with his dissertation the three of us should put together a little paper on that subject as it should be of some interest.

Now that Ron is on the home stretch with his dissertation I think we should start to think about where we go next - that is, do you want to continue working on the Chinle palynomorphs after he leaves for new and better things? I suppose that your answer depends, at least in part, on your new proposal being funded. In my opinion there is a lot more that can be done with the Chinle palynomorphs. It seems to me that possibilities for future research could include:

1. a search for the Triassic/Jurassic boundary in the Southwest,
2. an expansion of the research which has been done into southern Nevada and northeastern Nevada,
3. an attempt to locate the Carnian/Norian boundary outside the Petrified Forest,

4. a continuation of the work that you have started in the Park, refining what has been learned so far about the biostratigraphy of the palynomorphs and correlating the results with the vertebrate and plant megafossil localities there.

Ron did indicate to me that he might be interested in continuing to work on the Chinle after he graduates but that he would respect your feelings in the matter. It seems to me that you and I should sit down together after the dust settles after Ron moves on and you hear about your proposal (By the way how about sending me a copy or is it just like the one that was eventually turned down?) and discuss possible courses of action. Perhaps we could get together when and if I make that long promised trip east to look at the Newark plants in the Smithsonian.

Recently I received a reprint of an article which revises the age of the main body of the Chinle. A copy of the reprint is enclosed so you can see what has been done. The authors ignore almost completely our biostratigraphic efforts as well as that of the vertebrate paleontologists. When Ron finishes his work I think we must reply to this article. Let me know what you think after you have had time to read it.

I'll be sending you a few more samples for you to examine in the next several days - I'll give you the localities at that time.

It was good to talk to you earlier today. I don't think that there is much more I can add to what I said either on the phone or elsewhere in this letter. Although I should say that say that I am sorry that you will not be able to make a contribution to the Triassic volume that the Museum of Northern Arizona will be publishing in the next year or so. A paper from you on the Dockum palynofloras would certainly be of interest to a lot of people. But you know your limitations, as far as time goes, *better* than I do.

with best wishes to you and Betty

Sid

*Sid*

*P.S. Please give the extra copy of the reprint to Ron - Thankx -*

1 August, 1985

Dr. Sidney R. Ash  
Department of Geology & Geogaphy  
Weber State College  
Orden, UT 84408

Dear Sid:

The trip to ye Arctic surprised me--had you any warning of it?  
(Ha!) I long for details eventually. Lucky fellow. Poor Duck Choi  
never got to go to his own localities up there. Thanks for the neat  
card.

You sure live at a fast pace! Randy to Yellowknife, etc! Wow!  
(I have first cousins in Yellowknife.)

Hope you got some Tr/Jr shale samples for me.

Best to Shirley.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

6/14/85

Ron

I'll have to make this brief as I'm trying to get away for a field trip to northern Idaho where some Tertiary plants occur. By separate cover (package) I am sending you the following samples for your use:

1. Shinarump #1 mine - Utah
2. Sediments with new dinosaur at Pet. Forest NP; about 50 ft below Black Forest Tuff Bed. - the chert.  
My loc. PF29.
3. Sediments in upper part of chert - Devil's playground <sup>1</sup> above hoodoo ss  
My loc. PF28.
4. <sup>beds below</sup> ~~from~~ possible sarsilla ss in Devil's playground  
My loc. PF30.
5. from ? 1st ~~ss~~ flattops ss bed in the area of southern flattops. My loc. PF27.

I can't find a copy of Proctor's rept on the silverleaf district around the dept. The college library copy is bound with about three other rept's so it is <sup>impractical</sup> ~~impossible~~ to send in the mail. I'll do more looking when I get back ~~and~~ I might be able to find a loose copy <sup>for you.</sup> Alternatively you might consider buying one from the Utah Geol. Survey, 606 Blackhawk Way, S. L. C. 84108. It is still available @ \$5.00 plus \$2.00 postage.

I'll call you after I get back from Idaho late next week -

Cheer

Ed Ash



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY  
OGDEN, UTAH 84408  
801-829-8207

April 5, 1985

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences

17 April, 1985

Dr. Sidney R. Ash to University  
Department of Geology & Geography  
Weber State College Penna. 15802  
Ogden, UT 84408

Dear Al:

Dear Sid: nice of you to send me that advertisement about the glass  
decoration with the picture of Monument Valley in it. However, if  
I could have more use for it.  
Thanks for yours of 5 April. I think I would buy myself a computer.  
I think I would have more use for it.

Re Equisetosporites: this seems to me to be a natural for Carmen  
Moy (skilled SEM-TEM person) and me to tackle with you. I hope you'll  
got that route instead of TNT, as the latter gent has enough bears by the  
tail already!

I think it would be very interesting if such  
a study was made of the spore that I found in those little conifer-  
By very odd coincidence, the same day I heard from you, R.J. got a  
letter from Stan Pocock, asking for Equisetosporites material, as he  
wants to work on it. (He thinks it's--hold your hat--related to the Acan-  
thaceae!--crazy!. The resemblance he notes is convergent evolution.)

before I write to Tom and suggest such a study, I wanted to see how  
you Ron and I have talked and argued about E. for a while, as I have  
problems believing the range of morphology that seem to grade into each  
other. I am with involving him is that he might feel that he could also  
work with impunity on other spores and pollen in the Triassic out here.  
Best. Let me know your thoughts and or recommendations on this.

Best wishes to you and Betty.

Yours very truly,  
Sincerely yours,

Alfred Traverse  
Professor of Palynology  
Professor of Geology

AT/et  
cc: C. Moy, R.J. Litwin

SRA/ld



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
DEPARTMENT OF GEOLOGY

OGDEN, UTAH 84408  
801-626-6207

April 5, 1985

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penna. 15802

Dear Al:

It was nice of you to send me that advertisement about the glass decoration with the picture of Monument Valley in it. However, if I could afford something like that I would buy myself a computer. I think I would have more use for it.

I notice that Tom Taylor has been publishing occasional articles with some of his students on the ultra structure of some spores and pollen grains. I think it would be very interesting if such a study was made of the spore that I found in those little coniferous cones so many years ago. As you may recall Daugherty originally referred them to Equisetosporites and later Scott transferred it to Ephedra. At one of my localities they occur in great abundance and perhaps would be suitably preserved for ultra study studies. But before I write to Tom and suggest such a study, I wanted to see how you felt about me involving him in this. If you, of course, are interested in such a study, then I will not approach him. Another possible problem with involving him is that he might feel that he could also work with impunity on other spores and pollen in the Triassic out here. Please let me know your thoughts and or recommendations on this.

Best wishes to you and Betty.

*cheers!*

Sincerely yours,

Sidney R. Ash  
Professor of Geology

SRA/ld

# KEYSTONE LODGE

3/7/85

Al:

Although this isn't quite  
in your line perhaps you'll  
want a copy anyway. (The  
extra copy is for Ron).

Hope you haven't had a  
stroke over the Mike Fisher/Bob  
Dunay affair. I've written to  
the Pet. Forest about it - no  
reply yet

don't let them grind you  
down —

Sid Ash

# KEYSTONE LODGE

12/10/84

Dear Al

A little rept that Don Tidwell and I wrote is about ready to go to the Bot. Gazette. Before I send it along I'd like you to see what we said you <sup>said</sup> about your analysis of the palynomorphs associated w/ the fossil. (In case you've forgotten what you said I'm enclosing a copy of the rept. you wrote about the palynoflora.)

I'm enclosing a copy of the entire rept (except for the figures) so you can see how/where your information will go. If you want to take the time to review that is fine. Your material is on pages

648.

Happy holidays!

Sid Ash

P.S. I'm hoping to send this

to the Gazette around 1 Jan '85.

PENNSYLVANIA STATE UNIVERSITY

DEANS BUILDING

UNIVERSITY PARK, PENNSYLVANIA 16802

Dr. Sidney Ash  
Visiting Professor  
c/o Patrician  
C/O Holbrook

Dear Dr. Ash,

Good to hear  
going success  
Interested in

Barren

FWG CXC  
FWR CXC  
FLL CXC  
FAL CXC  
FAC CXC  
FAD CXC  
FAS CXC  
FAT CXC  
FAU CXC  
FAV CXC  
FAW CXC  
FAX CXC

As you on  
part of the s  
samples that  
name. Accord  
purified por  
might be use  
Other loc

the entire of  
below the Painted Desert, on a Ketchikan Point  
grained; that was a sampling mistake on my part  
part of Long's vertebrae I would give - results. At  
the possibly, however, it appears that  
Southwestern may might be

the entire of  
the entire of  
the entire of

TO AT

DATE 27 Aug '84 TIME 4:50 p.m.

WHILE YOU WERE OUT

M. Sid Ash

of \_\_\_\_\_

Phone \_\_\_\_\_

- TELEPHONED  PLEASE RETURN CALL
- CALLED TO SEE YOU  WILL CALL AGAIN
- RETURNED YOUR CALL  RUSH

MESSAGE (Labor Day  
will try home) - need  
Jurassic loc. near DC -  
must collect sept., as  
soon to be flooded =>

Signed BT

The Standard Register Company

later - 11 - Sept. 84  
called to  
say's visit  
happen

O free: Ash

# THE PENNSYLVANIA STATE UNIVERSITY

DEIKE BUILDING  
UNIVERSITY PARK, PENNSYLVANIA 16802

Ron Litwin  
College of Earth and Mineral Sciences  
Department of Geosciences  
Palynological Laboratories

Area Code 814  
863-3419

Dr. Sidney Ash  
Visiting Researcher (Weber State)  
c/o Petrified Forest National Park  
CPO Holbrook, Arizona 86028

August 9, 1984

Dear Dr. Ash,

Good to talk with you again! I hope your field summer is going successfully in the Park. The upper Chinle samples you were interested in are now finished, and their status listed below:

Barren

FWG	CRCG7
FWH	CRCG8
FWI	CRCG9
FWJ	CRCG10
FWK	CRCG11
FWL	CRCG12
FWM	PFPD
FWN	PFM1
FWO	PFM2
FWP	PFM3
FWP <sub>1</sub>	PFPD1-1

Palyniferous

PFPD1-2	PFPD1-5 ( <i>just above Sonsela, it's blank</i> )
PFPD1-3	RM1
PFPD1-4	Mv1-1
CH1	
CH2	
HJ1	
HC1	
RM2	

As you can see, things don't look too promising for the upper part of the section so far. I intend to retest any of the barren samples that have visible organics, but I may be kicking a dead horse. According to my notes, the Flattops samples are lower Petrified Forest Member, but you indicated that you thought they might be upper Chinle (well, above the Sonsela at least).

Other localities may be palyniferous; I'm not convinced that the entire upper section is barren. For example, the sample collected below the Painted Desert Inn at Katchina Point was too fine-grained; that was a sampling mistake on my part. Perhaps sampling near Dr. Long's vertebrate sites would give us positive results. At the moment, however, it appears that the late Triassic rocks in southwestern Utah might be the most promising.

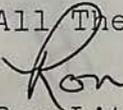
The airline travel (quoted by the travel agent for two week maximum stay) will be about \$370.00 round trip- I shopped around a good bit for the best deal. If we can arrange my arrival and departure on a Tuesday or Wednesday I can get these cheaper rates. The dates I gave the travel agent were September 18-October 2, only

as a ballpark estimate. If you have a definite set of dates, I'll confirm the price and book the flight. Another advantage to this package is the flexible destination- I can fly roundtrip to Salt Lake City or Albuquerque (for the same price), fly into Albuquerque and out of Salt Lake, or vice versa. I'm sure these arrangements will fit our itinerary. Flights to/from Lost Wages are prohibitive, and the old \$99.00 gambler's special doesn't seem to be around anymore. One travel agent said they don't book for junkets any longer because some of the flights were "too dangerous". How comforting.

I'm continuing with the samples and will keep you informed of the results. The Radar Mesa and Mi Vida localities both appear to be Carnian at this point, but I'll do a detailed study of them and get that out to you between samples. Also, I'm binding a copy of the thesis for you and making a xerox for the Park's files. They will get a copy of the slides as well (yours are enclosed here). I will send all that ASAP.

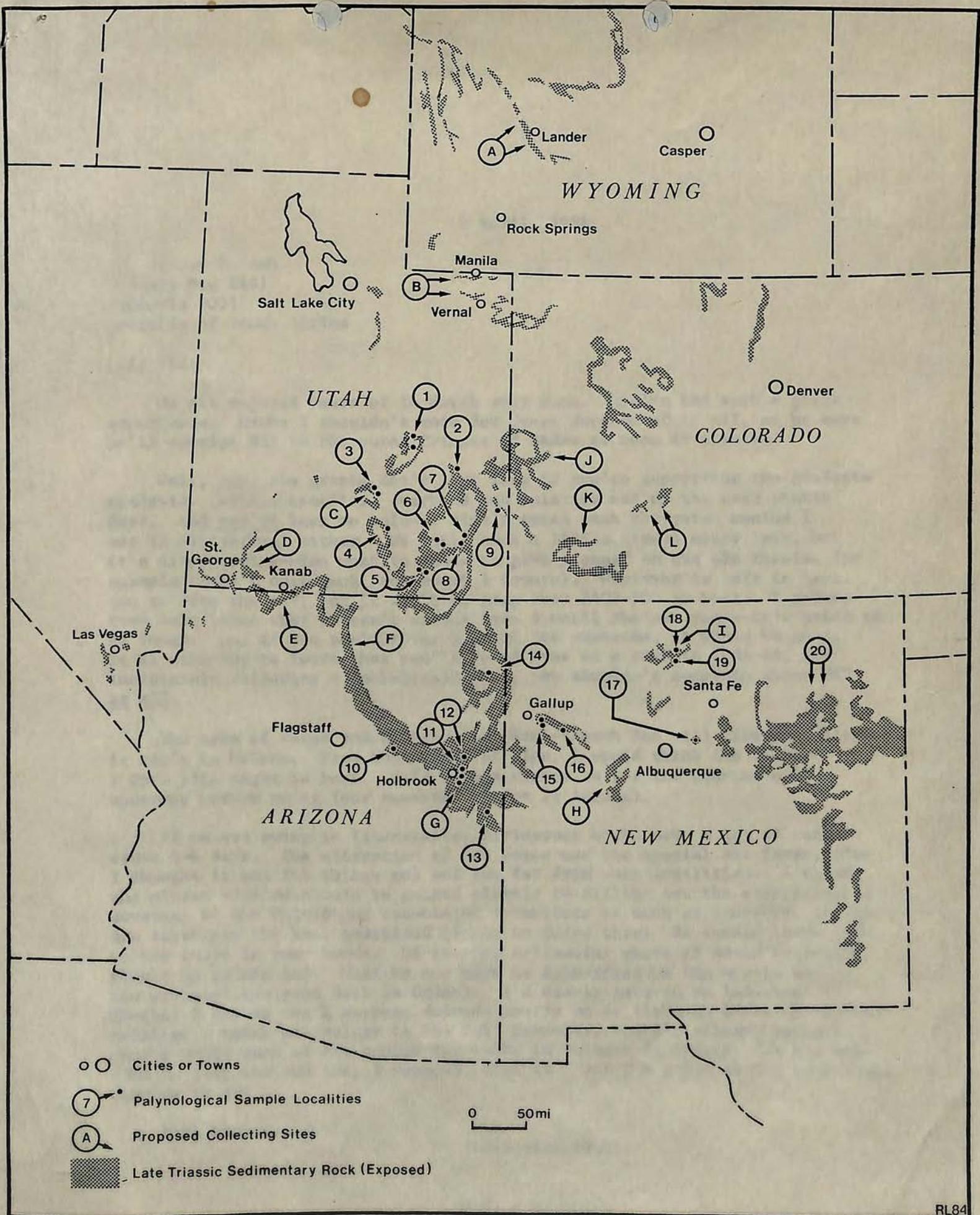
Oh yes, almost forgot- do you remember the new PFPN director's name?

All The Best,

  
Ron Litwin

P.S. Please send the calendar dates soon, so I can book a cheap flight. If you think we need more than two weeks, please let me know.

P.P.S. My best to your family.



9 April, 1984

Dr. Sidney R. Ash  
Private Bag X101  
Pretoria 0001  
Republic of South Africa

Dear Sid:

We all enjoyed yours of 18 March very much. You've had such a great experience. Maybe I shouldn't vote for Jesse Jackson after all, as he says he'll consign RSA to the outer fringes of Hades as soon as elected.

Well, yes, the grants don't last long if you're supporting two graduate students. Fringe benefits, overhead and salaries eat up the cash pretty fast. And you've been on hold--I didn't spend much the seven months I was in Switzerland either. We still have a little travel money left, but it's disappearing--Ron went to NEGSA to give a paper on the MSc thesis, for example (didn't cost much, but every \$ counts). Whatever is left in Sept. can go into the pot, but it won't be more than \$400-500 at best. I gather from John Lance that we can't expect more \$ until the new year--it's going to be rough. So, if you could cover some of the expenses, it would be good. It is stunning to learn that you'll be as free as a bird in 1984-85, and immediately following a sabbatical! Man, you shouldn't complain about WSU at all.

The sets of dates you mention are fine--though Ron will miss some classes, it can't be helped. From that point of view, I would think the 24 Sept.-7 Oct. plan might be best. He'd have a chance to get the courses well underway before going (our semester begins 20 August).

If we can swing it financially, flying oot would make a lot of sense--saves 5-6 days. The attraction of Las Vegas was the special air fares, plus I thought it was (as things go) not too far from some localities. I think the places visited should be geared closely to filling out the stratigraphic coverage of the Chinle and associated formations as much as possible, and you are certainly the best qualified person to judge that! We should leave ourselves fully in your hands. Of course, collecting where it would help you should be an aim too. What we now have is summarized on the map in our new proposal (on your desk in Ogden). I'd dearly love to be involved. Whether I can or not I suppose depends mostly on \$, although there is another problem: I teach palynology in the Fall Semester, and I'm already going to miss a whole week of the course for 6-IPC in Calgary in August. It may come down to just you and Ron, I suppose, drat it. But I'm going to try to arrange somehow to go!

Best wishes.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: R.J. Litwin

22 March, 1984

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

When you get back, this latest proposal in the series will be on your desk. We will need to be in touch re R.J.L.'s Ph.D. dissertation work--to arrange the additional field trip.

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

cc: S.R. Ash in South Africa

encl: copy of new NSF Triassic-Jurassic proposal

Proctoria, S.A.

March 18, 1984

Dear Al

Thanks for your letter of 29 Feb. I didn't realize that you'd ~~already~~ <sup>almost</sup> run through your grant again and had to reapply. I'll really have to get busy when I get back to Ogden <sup>to catch up.</sup> I've requested release from all teaching and administrative duties all next school year so I can work full time on the project. So I should be able to make some real progress before my grant expires. (This <sup>release</sup> has been agreed to by the authorities at WSC).

~~Of~~ Of course I'll be happy to help with Ron's (and your's?) field expenses this fall. It will only be a matter of sorting out the red tape to do so. Perhaps I can hire you two as consultants. Anyway I'll look into the mechanism when I get back to the USA - June/July.

Although we don't need to set up a ~~definite~~ <sup>firm</sup> schedule now it looks as if late September ~~might~~ <sup>would</sup> be best for me, say Sept 17-30 or Sept 24-Oct 7. Or a little earlier say Sept 10-24. Or some combination <sup>of the above.</sup> How would such dates fit your schedule? Any <sup>dates</sup> better than others? Once again we can wait until we return to figure this out.

There are so many areas we could work <sup>in</sup> that it is hard to decide which <sup>would</sup> be best - perhaps we could start <sup>no one</sup> in Salt Lake City <sup>if you fly out.</sup> It would probably be as cheap as Las Vegas. Or do you prefer to drive out? And meet in Denver say?

Did I tell you that I've located the Lamy site near Santa Fe, N.M. You could probably collect a suite of samples there if you wanted one. Found the site last fall.

Everything is fine with us. We're still working - the sun, and enjoying the good life. I just got back a few days ago from 8 days in the field collecting from the Mottaus Fin (top of) and the Permian strata south of here. One of the

Since we visited near Thomas' Waterfall locality. The kids are busy with school and seem to be learning a lot. They sure have to work harder <sup>now</sup> than they did in Ogden. As soon as the Term is over (13 April) we leave on a tour to the Okavango swamp for ~~or~~ 10 days. ~~After~~ A few days after we get back we'll go to Kruger National Park and vicinity for a week or so. Then we'll go to Cape Town! By that time we'll be broke and we'll have to come back to the USA. We'll probably stay in New Mexico and Arizona until Aug 1 when we'll have to return to (ugh) Ogden.

We haven't been to Bloemfontein yet so I haven't had an opportunity to look up your friend there. Hope to do it when we go to Cape Town.  
 Congratulations on your new grandchild

Love  
 Sid

SEAL THE TWO SIDE FLAPS FIRST, THEN THIS ONE - VERSEEL EERS DIE TWEË SYKLAPPE, DAN HIERDIE EEN  
 TO OPEN, CUT THIS FLAP FIRST

ENCLOSURES ARE NOT PERMITTED INSUITINGS WORD NIE TOEGELAAT NIE

SENDER'S NAME AND ADDRESS VAN AFSENDER

Gay Bsk  
 Private Bag X101  
 Pretoria 0001  
 South Africa

SECOND FOLD - TWEËDE VOU

TO AAN

Dr Al Traverso  
 College of Earth & Mineral Sciences  
 Pennsylvania State University  
 University Park  
 Pennsylvania 16802  
 U.S.A.



Programme  
 Program



29 February, 1984

Dr. Sidney R. Ash  
Botanical Research Institute  
Private Bag X101  
Pretoria 0001  
Rep. of South Africa

Dear Sid:

Lack of communication surely doesn't mean I've forgotten you all-- just overwhelmed with all sorts of things. We'll soon send xerox of our latest proposal. Lance says it can't possibly be funded until Oct. or Nov. I think it's imperative that you and Litwin (and I?-- would be nice but probably not essential) get the additional field work done anyhow. Lance and I are hoping that you'll be able to help with Ron's expenses, because there surely won't be much hope from this end until our new grant comes in, if it does. Meanwhile, ol' Sid has all that cash....

Carmen Moy had to have more brain surgery in connection with her stroke, but she's apparently going to be o.k.

Traverses have a new (the first) granddaughter, Anna T., born 18 January!

All the best to Shirley, Kathy and Randy..

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

6 January, 1984

Dr. Sidney R. Ash  
Botanical Research Institute  
Private Bag X101  
Pretoria 0001  
Rep. of South Africa

Dear Sid:

Betty and I loved the Aloe card and devoured the long and interesting letter. Your kids have surely seen the world! The image of them in school uniforms greatly amuses me. The ease with which you all slipped into life in SA is astonishing.

Yesterday Ron Litwin and I split up the two boxes of samples you sent on different occasions months ago--he finally got all the corrections, etc., done on his thesis-paper and passed (barely) the Ph.D. candidacy. So now he's off and running on the Ph.D-work-proper. We look forward to the spot of additional field work later in the year.

Carmen Tavera had a sort of cerebral hemorrhage in December and had brain surgery. She is recovering, and her letters sound normal, but it's been a wild experience for her in a French hospital! She says she still sees double, etc. She and her new husband had just arrived in France for his sabbatical.

Ediger also passed (somewhat better) his candidacy and is banging away on the Richmond Basin.

I'm trying to get ready for historical geology for Spring Semester (130 students). Terrible job (have to convert from 10-week term to 15-week semester, etc.)

My textbook project goes pretty slowly. But we keep banging away on it.

We (Betty, Celia and I) went to Michigan to my mother's for Christmas, then to Indianapolis to visit Betty's parents. All the oldsters are fine. We had an accident in Michigan on the ice--nobody hurt. Car severely damaged but drivable.

Thanks so much for writing so fully--keep us informed. My friend, Joey Coetzee (palynologist): Dr. Johanna A. Coetzee, Institute for Environmental Sciences, University of the O.F.S. Bloemfontein 9300, says in her Christmas card to be sure to urge you to look her up. Could you?

Yours very truly,

Alfred Traverse  
Professor of Palynology

Dec 11, 1983

P.S. The worst problem we have had so far is with the TV. They only have 3 stations, 2 of which are in native languages. The other is in African, half in English. Also they only broadcast from 5:30 PM - 11:30 PM. Many of the English language programs from the USA - such as Dallas, Monday at a time, etc. Few British programs to our great disappointment.

Dear Al and Betty

Well here we are getting ready to celebrate Christmas in the sun once again! We arrived in South Africa on Nov 2 after a stop at Disney World and another at Rome. Since then we have been getting "settled in" for our stay here in Pretoria. We have rented an unfurnished house about 1/2 mile from the Bot. Inst. and have bought a 1979 VW rabbit (called a golf here). We have entered our kids in private schools but they don't start until the middle of January. Actually Kathy - Ellen <sup>was</sup> at the last two weeks of the term which just ended. That way she got acquainted with some of her school-mates and the way the school runs. She seemed to enjoy it very much except for the fact they don't allow make-up and ear rings and the girls have to wear uniforms. Randy will also have to wear a uniform and learn to play cricket.

We have been overwhelmed by the hospitality shown us by every one. A strong contrast to our reception in Australia. We are continually being invited out for meals - swimming - parties. I have swam more in the last 4 weeks than I have in the previous 4 years! The Andersons let us stay with them for about 2 1/2 weeks until we moved into our house and loaned us a car until we bought one.

I'm just getting started on my research. I'll work on the gringos in the Upper Triassic Motteno fm. They are abundant and well preserved at some localities. Tomorrow we go in the field to collect more and then Shirley, the kids and I will continue on to Durban where we will spend the weekend of Dec. 16-18 laying on the beach. After that we'll be back here for the holidays.

Shirley hasn't had any trouble here and Kathy-Ellen's classmates think it wonderful that she is part Amer. Ind. Of course we have just moved in English-speaking circles so things might be different otherwise. We'll see how things go when we try to integrate <sup>the</sup> beach at Durban. Actually from what we've seen there seems to be good will between the races here, in spite of the ruler that governs the country. More later

We only had to buy a small amount of furniture, etc. as our new friends have loaned us most of what we needed.

But perhaps the Spanish thought the same thing before the Pueblo Revolt - 1680 - New Mexico!!

fs #

24 October, 1983

Professor Sidney R. Ash  
c/o Dr. John Anderson  
Botanical Research Institute  
Private Bag x101  
Pretoria 0001, South Africa

Dear Sid:

This is in response to your several-incremental handwritten item of about 18 October, 1983. (Thank God your handwriting is so legible--I never have any trouble with it. Funny, from a distance, it doesn't look legible!)

I look forward to getting the samples promised:

4 Triassic  
16 Lower Permian  
2 Upper Cretaceous

The Triassic samples will be turned over to RL, who has now defended his MS thesis ("paper"). You are getting a bound copy. We will send it to RPP. The Lower Permian samples will await completion of other projects. The Cretaceous sample is a welcome addition to the "unknown" supply for my palynology class, but won't now be issued until Fall of 1984.

The meeting in Mexico sounds very good--BUT one can only do just so much and 6 IPC and AASP alone will shoot my wad for '84, and there are other smaller meetings I may attend.

Good news re contracts at PFPN and NMMNH. But don't eliminate all time for the SRA-RL-AT trip!

Ron and I are giving a paper on part of his MS at the Harvard Forest meeting (NE Paleobotanists annual informal session) next week. He is also presenting a paper of wider scope at NEGSA in March '84.

Best to Shirley. Hope all goes well in SA.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

10/18/83

Dear Al

I'm sending you under separate cover a few more samples for analysis. They include 4 samples from the Triassic as follows:

- ✓ PF17 - Pet. Frost Nat Park. A so called lake deposit in the Sonella Bed of the Pet. Frost Mbr of the Chinle. SE 1/4, sec. 36, T. 18 N., R. 24 E.
- PF18 - Pet Frost Nat. Park. About 50 ft below Black Forest Bed in the upper part of the Chinle, SE 1/4, SE 1/4, sec. 34, T. 20 N., R. 24 E.
- RM1 - Radar Mesa NW of Winslow, Ariz. Just below caprock. Maybe shinarump Mbr of the Chinle OR top of Moenkapi Fm.
- RM2 - Radar Mesa. About 100 ft below caprock. Probably Moqui Mbr of the Chinle.

Samples to P.J.V. 5-1-84

Also I'm sending you 16 samples which bracket the Red Tank ~~at~~ sample you ran for me a few weeks ago. They are assigned locality AR1. The sample you ran for me previously is AR1-1. It is duplicated by sample ~~at~~ AR1-12 which is in ~~the~~ <sup>package with</sup> the other samples.

Note added  
man! Just in case you want something different I'm also enclosing a sample of Upper Cret stuff which looks good. It comes from the Kirtland Fm near Kimbeto, N.M.

We expect to be back from A. - time for  
the GIPC and IOP meetings - Calgary but I do  
not plan at this time to give a talk at either  
although I may change my mind on this. Another  
meeting I wish to attend is the III Congress  
of Latin American Paleontology which will be held  
near Mexico City from 15-18 October. I probably will  
give a paper there. But then we will have to fit  
our field trip into the time between the August and Oct  
meetings. Since writing the above I've received  
an invitation to give a paper on the Triassic  
flora of the USA. In case you haven't <sup>received</sup> an  
invite or circular I am enclosing an extra  
copy. Or perhaps we could give a joint paper  
or papers at the meetings.

It appears as if I will be offered contracts to  
work at the Petrified Forest and here at the Museum of  
Nat. History next summer. So it looks as if I'll have  
a busy time again next summer.

We leave here on Friday (10/21) for Florida  
where we'll visit friends and Disney World then on  
Rome for a few days and eventually we'll get  
to S.A. on November 2.

Best wishes to you and Betty. Say hi  
to Ron and his wife. More ~~later~~ later.

Sid

P.S. In case you need to contact me before I write  
again I'll be at the following address:

% Dr John Anderson  
Botanical Research Institute  
Private Bag X101  
Pretoria 0001  
South Africa

Samples from Carrizo Arroyo  
 Locality ARI

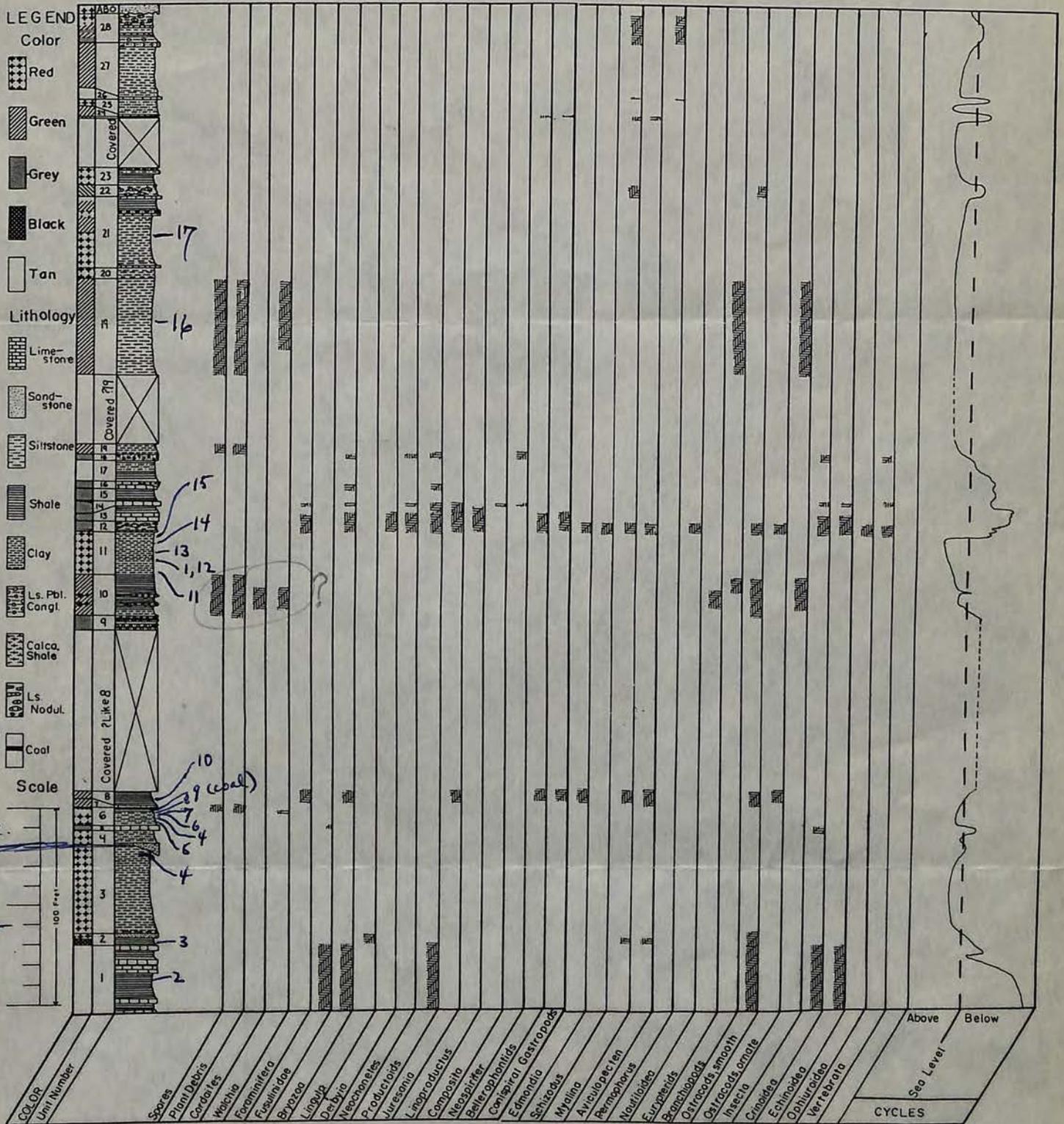


Figure 2. The Red Tanks section at Carrizo Arroyo, showing major lithological units and distribution of important fossils.

Section from: Kues and Kietzke, 1976, Paleo. Soc. Trans. of the Red Tanks Mbr., Madera Fm. near Lucero Mesa, N.M. Geol. Soc. Special Pub. 6, p. 102-108.

1 September, 1983

Dr. Sidney R. Ash  
2502 Thomas Ave.  
Durango, CO 81301

Dear Sid:

Thanks for yours of 22 August. The plague warning was duly noted and chuckled over! Thanks for the neat photo of the lizard-on-the-log. It's posted.

The info about encroachment on "our territory" is interesting. Ron's M.Sc. thesis will do us good as a stake-claimer (will be published if accepted), but we should push on to higher stratigraphic ground, too. The proposed Flagstaff meeting sounds like fun. We could also offer a paper for 6 IPC Calgary (Aug.-Sept. 1984)?

Glad you liked (?) my mini-MS re=Red Tanks palynoflora (do not call it "microflora", please). As I said in my letter, it would be good to have the additional Permian material you said in a previous letter could be forthcoming. I'd like to see us follow through on that.

Best to the family.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

August 22, 1983

Dear Al

Thanks for your recent letter with the comments on the microflora in the Red Tanks mbr from New Mexico. I have plugged the data into the myss and it is almost already to go. Don Tidwell still has to write a paragraph or two comparing our fossil with a couple of European forms. When I get his part integrated in the myss I'll send it to you so you can see what we did w/ your data.

Interest in the Chinle Fm in this Park continues to build. A woman from U of Color. and her husband from the USGS has started working on the fm here and intend to bring some students w/ them next year - working on sedimentology of the fm apparently. Also the dept of paleo at Berkeley have a big ~~project~~ NSF funded project in mind now which will also involve students. Mainly they are interested in vertebrate paleo but they too want to involve students in the project. I keep reminding them of our joint project w/ the pollen/spores etc. but if we don't protect our selves by getting something out on the pollen/spores in the next few years we may find <sup>someone</sup> encroaching on our territory.

The head of the geology dept at the Museum of Northern Arizona (Flagstaff) is talking about having a Symposium on the Triassic of North America in a year or two. I think that would be an excellent time to present some of our finds on the pollen/spore of the PFNP. I'll let you know more about this when things begin to yell.

I've found a plant locality about 30 feet below the black forest ss bed which looks like it might also have pollen/spores. Will send you a sample later.

We'll move over to Albuq. in two weeks and stay there until the middle of October. Use our Durango address if you write. Sid ASG

Another possible logic for the NA TZ Symposium would be the Te/Tur boundary as suggested by the pollen/spores

**NOTICE**

**NOTICE**

**NOTICE**

# **PLAGUE**

Public health authorities have determined that Bubonic Plague is present in rodents, rabbits and their predators in Petrified Forest National Park.

**Plague** is a bacterial disease transmitted from infected rodents to man and other animals by the bite of an infected flea or by handling infected animals.

**Symptoms** are: sudden onset, rapid rise in temperature (usually reaching 103-104° F), headache, nausea, weakness, pain and frequently a swelling in the limbs, groin or underarms.

**Plague is curable if diagnosed early.**

## **What you should do:**

1. Don't handle sick or dead animals.
2. Prevent pets from roaming loose. Pets picking up infected fleas then transporting them to humans is one of the common ways of contracting the disease.
3. Insure that your pets are dusted with flea powder at least weekly.
4. Avoid exposure to rodent burrows and fleas.
5. In case of illness (see symptoms above) report to a physician immediately.

*To learn more about Bubonic Plague and its prevention, contact your county health department or the Vector Control Program, Arizona Department of Health Services, 255-1200.*

**NOTICE**

**NOTICE**

**NOTICE**

S. R. Ash

PS Form 3811, July 1982

● **SENDER:** Complete Items 1, 2, 3, and 4.  
Add your address in the "RETURN TO"  
space on reverse.

**(CONSULT POSTMASTER FOR FEES)**

1. The following service is requested (check one).
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(The restricted delivery fee is charged in addition to the return receipt fee.)

TOTAL \$ \_\_\_\_\_

3. **ARTICLE ADDRESSED TO:**  
S. R. Ash  
Petrified Forest Nat. Park  
Arizona 86028

4. **TYPE OF SERVICE:**

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<input checked="" type="checkbox"/> CERTIFIED	<input type="checkbox"/> COD
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7442346653

(Always obtain signature of addressee or agent)

I have received the article described above.

**SIGNATURE**  Addressee  Authorized agent

*A. Bennett*

5. **DATE OF DELIVERY**



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7. **UNABLE TO DELIVER BECAUSE:**

7a. **EMPLOYEE'S INITIALS**  
*[Signature]*

RETURN RECEIPT

★ GPO: 1982-378-593

Dear Al

they are paying  
me for this  
work so I  
am obligated  
to spend most  
of July + August  
here.

Here I am back in the Petrified Forest again. I'm trying to work out the plant biostratigraphy of the Park this trip by measuring sections at key places and then I'll tie-in all the plant localities including palynological samples localities. When I've got it sorted out I'll send you a copy of my report/cross section or whatever I end up with at the end of August.

We moved out of our home in Ogden on July 1 and turned ~~the~~ <sup>it</sup> over to a rental agent who had a family ready to move into it when we moved out. Shirley and the kids are in Durango with Shirley's mother. Next week they'll join me here in the Park. Somehow I'll break away from here long enough to go to the Bot Soc meetings in August. In September I'll do some consulting with the N.M. Museum of Natural History - I'll help them collect fossil plants and set up exhibits. Then in October we go to So. Africa.

It has sure helped my hectic schedule this summer to postpone our collecting trip until next year. I suggest we think about doing the collecting in late August/early September if your schedules will allow it or perhaps <sup>early</sup> October (if I get my NSF grant as promised). In the mean time I think Ron will have enough to do with the material he has. Before we go collecting next summer we need to know if any of the lithologies in the upper part of the Chinle will yield any useful material so I suggest that Ron examine all of the samples from the Owl Rock/Church Rock/Upper Petrified Forest Member of the Chinle. If he can let me

before the end of August I could collect more of the  
productive lithologies - if any!

Did you receive the box of samples I sent you a  
couple of weeks ago? They included several from the upper  
part of the Chinde and some limestone from the Abajo's  
ss.

How are you coming on the list of diagnostic  
pollen/spores from the Permian (Red Tanks) locality.  
Don Tidwell and I plan to send off the report before  
I go to South Africa. So we'd appreciate a list,  
however brief, for inclusion in the rept. while I'm  
in Albany in Sept. I'll try to collect a suite of  
samples through the whole fossiliferous section  
in the Red Tank for you, to mess around with.  
(and Betty?)

The last 3 weeks have sure been hectic. I'm  
not sure if I'll ever move again once we get back  
to Ogden! Next time I think I'll turn the horse  
down instead of moving all things!

Cheers

Sid

P.S. You can send the list of Permian microfossils  
to me here at the Park:

Petrified Forest National Park  
Arizona 86028.

What's this I read about Carmen going to France  
with a new husband and name?

I suggest that the following samples be run first  
as they are from the upper part of the Chile, etc.:

PFPD # 28 - see p. 2 of Arizona section

FWN # 14 - see p. 1 of New Mexico section

FWA # 13 p. 1

FWM # 12 p. 1

FWG # 7 p. 1

FWH # 8 p. 1

FWI # 9 p. 1

FWJ # 10 p. 1

FWK # 11 p. 2

FWO # 15 p. 2

FWP # 16 p. 2

FWP' # 17 p. 2

CRGG8 # 42 - see p. 1 of Utah section

9 # 43

10 # 44

11 # 45

12 # 46



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

June 22, 1983

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penn. 16802

Dear Al,

Under separate cover I am sending you some samples for you to check for palynomorphs as follows:

- CH1 - Clay Hills, Red House Cliffs, southeast Utah. Middle part of Chinle Formation probably equivalent to Upper Petrified Forest Mbr. On the road (Utah 263) to Halls Crossing, Utah. Collected by S. Ash, June, 1983.
- CH2 - Uppermost Part of the Chinle Formation on the road to Halls Crossing, SE Utah. At Indian Ruins. Collected by S. Ash, 1983.
- WC5 - Monitor Butte member of the Chinle Formation. White Canyon area, Southeast Utah. About 500 feet east of locality WC4 which yielded so many nice specimens of Phleboteris smithii. Collected by S. Ash, and Russ Dubiel, June 1983.
- AC1 - Poleo Sandstone Member of the Chinle Formation. Arroyo del Cobre, New Mexico. Northern New Mexico. Collected by S. Ash and others in the past.
- HJ1 - Upper part of the Chinle Formation (about 60 ft. below the Wingate SS) at the Hey Joe Mine on the Colorado River north of the Bowknot Bend, Utah. Collected by Russ Dubiel, 1982.
- EI1 - Heiberg Formation of Late Triassic age Ellesmere Island. Collected by Jim Basinger, 1982.  
(Jurassic?)
- HC1 - Limestone in the Navajo Sandstone on the road to Halls Crossing. Collected by S. Ash, 1983.
- AZ1 - Lowermost part of Chinle Fm., Azul Creek, New Mexico south of Thoreau. Collected by S. Ash, 1965?

By the way we are leaving Ogden on July 1 (or earlier if we can get organized!) I'll be at the Petrified Forest until about August 31 when I'll go to Albuquerque. My permanent address during July - September will be:  
2502 Thomas Avenue Durango, Colorado 81301.

In haste -

Sid  
Ash

31 May, 1983

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Finally--the famous sample list is enclosed. Now for that pesky Pennsylvanian-Permian sample.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
encl

as copy.

Randy, Kathleen  
Shirley

6908  
801-626-6908  
801-399-5285  
1341 Henderson Jr.  
Ogden  
74404

Dr. Sidney R. Ash  
~~Geology Department~~  
~~Fort Hays Kansas State College~~ Ogden  
~~Fort Hays, Kansas~~

as of fall, 1970

~~Geology~~ Department of *Geology & Geography*  
Weber State College  
Ogden, Utah 84408

23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37

8 April, 1983

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Many thanks for the Goodies! I'll send the biblios to my guy in Frankfurt (Schaarschmidt). I'll order a copy of the map. I'll give Ron his copy of A.H., etc. (Did you notice the palynological boo-boo on p. 26? Only one specimen of Alisporites sp. pollen grain is depicted, no spores.)

I leave tomorrow for a few days collecting in Richmond Basin. Next time you come, we'll take you to some decent fossils!

All the best,

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

9/1/83

Al—

Here are a couple of bibliographies which contain a number of references on the Pet. Forest. Does not include articles in Arizona Highways, etc.

Also I'm enclosing a list of the publications of the N.M. Geol Soc — the map you asked about is listed there.

Tell Ron that I received the revision of my figure sometime ago. It looks fine and my mss is on the way to Palaeontology.

Please give Ron one copy of the <sup>enclosed</sup> Arizona Highways

Cheers

More later

Sid  
ASL

18 March, 1983

Dr. Sidney R. Ash  
Department of Geology & Geogaphy  
Weber State College  
Ogden, UT 84408

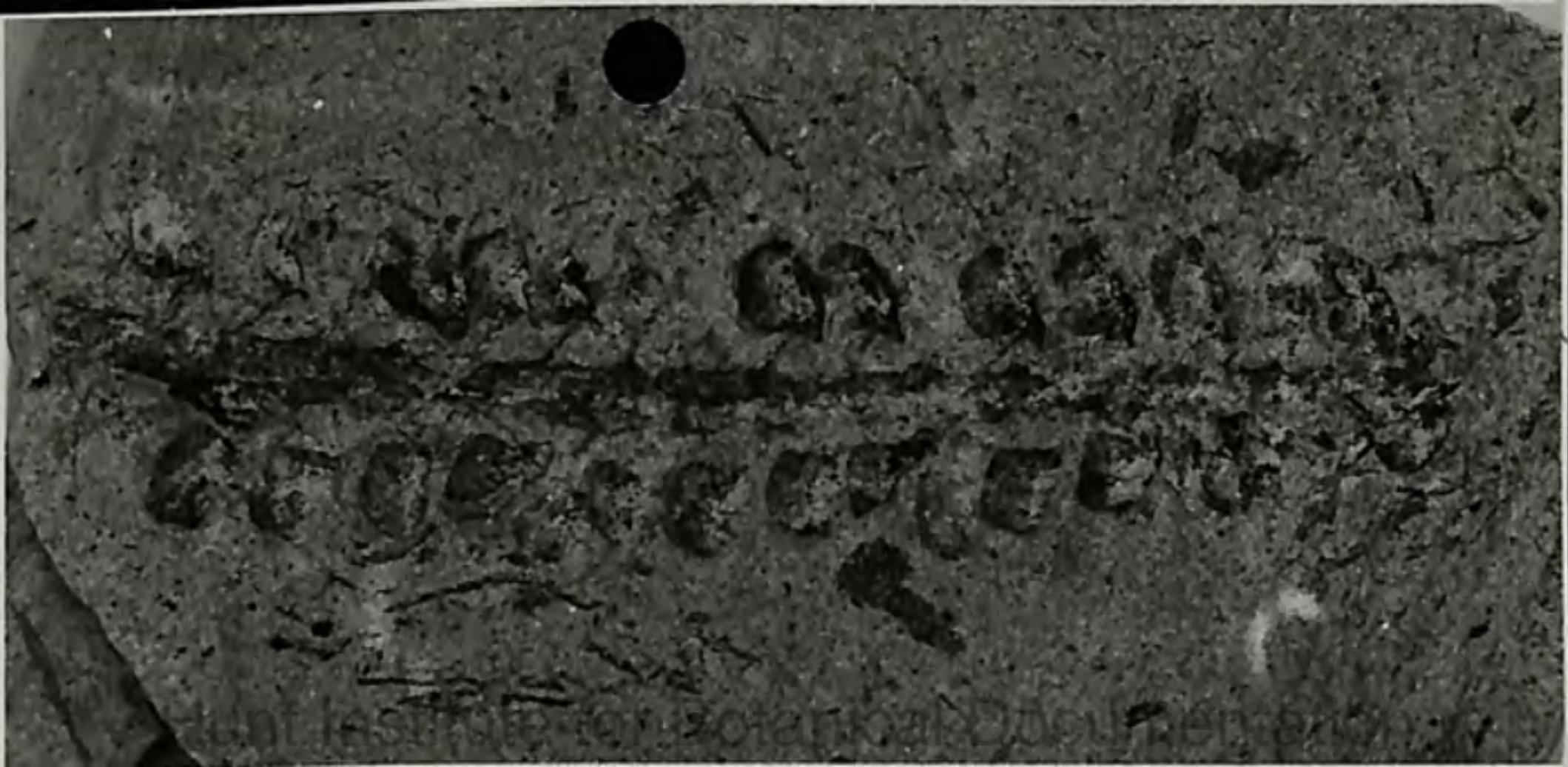
Dear Sid:

One of my colleagues in Germany asked me to send him a "list of geological and paleontological publications about Petrified Forest National Park. Is there such a thing? If you have such a, could you send me a xerox?

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et





# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

March 10, 1983

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penna. 16802

Dear Al:

It was good to talk to you the other day and to discuss our summer field work. As requested I am enclosing a proposed itinerary. I wasn't sure how long you wanted to spend in the field on this trip. As you can see <sup>from</sup> ~~the~~ ~~schedule~~ we would spend about two weeks together in the field before the meetings at Grand Forks. In my opinion we would make a very significant contribution if we could locate the Upper Triassic/Lower Jurassic boundary at several localities on the Colorado Plateau. Thus the most ~~significant~~ <sup>important</sup> part of the trip would be an attempt to collect fossiliferous material from strata adjacent to that boundary in southern Utah and northern Arizona. At present I am busy going through the literature searching for productive strata in the appropriate places. Also I have written to some of my friends to see if they know of any drab shales in the Plateau. If something turns up it may be necessary to modify the middle part of the itinerary.

The proposed itinerary could be shortened by eliminating the trip to the Ghost Ranch area. The section in that area is not directly relevant to our present project except that we might learn how the strata in that area correlate with the classic Chinle of the Petrified Forest. Another part of the trip which could be deleted would be the time we would spend collecting at Fort Wingate in the Gallup area. Ron tells me that he has not been able to find any specimens of Cynepteris within in situ sporangia. It's possible that if we spent a day collecting at the site which previously yielded fertile samples of the fossil, that we could find some and then we would have complete knowledge of the spores of all the Chinle ferns. We could also save a day or two later on during the trip by not going through the Uinta Mountains. That portion of the trip is of marginal interest to our project. It would allow us to collect samples of the Chinle in the Uinta Mountains which is poorly correlated. While there we could also collect from the Mississippian rocks on the north side of the mountains—rocks that I believe were the source of the sample Fred May gave you which yielded such a beautiful Mississippian microflora.

Page

Dr. Alfred Traverse  
University Park, Penna. 16802

March 10, 1983

I would hope that you and Ron could review the samples we have collected and determine if we need more from the lower part of the Chinle Section. If we don't I think we should concentrate on the upper part of the section as outlined above.

I'm enclosing ~~a~~ photograph of a possible reproductive structure which was recently found in southeastern Utah. I thought sure the "ribbed sacks" would contain lots of pollen grains but three transfers I have made ~~to~~ show just a few poorly preserved grains. Smaller versions of these structures from New Mexico contain abundant Pityosporites.

I just talked to John Lance and he tells me that my proposal has been funded. It looks as if I will be busy with other fun and games this summer so he has agreed to delay funding the project until October. It was sure gratifying to learn that some people have such confidence in my work!

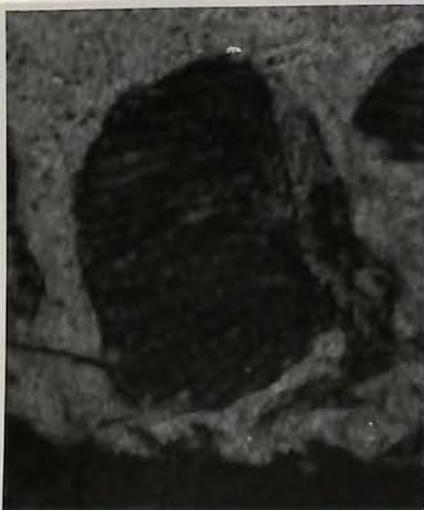
We still haven't decided where we will go on my sabbatical - by the way I have been given the leave. Now all we have to do is decide where we will go. No word from the Guggenheim folks yet.

regards to Betty

Sincerely yours,



Sidney R. Ash  
Chairman



8 February, 1983

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

The volume by Ishchenko (1956) was in my stack of mail just opened. But wasn't there supposed to be a bill? I was quite willing to pay.

On reflection, I suppose it's doubtful if I can take time for the North Dakota meeting--I must also do some field work in connection with our Silurian project, and there are other problems. Decision is not final, however.'

We are looking forward to the late July-early August trip, and I suppose we should begin firming that up one of these days.

Best to all.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

3 January, 1983

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Just now (!) got yours of 22 December. Happy New Year!

Ron is final-touching his M.Sc. thesis. As soon as he finishes (mid-Jan.?), I hope he'll start processing the samples from our last trip with you. After that he should collect additional sections, on which we naturally need your help--late July to early August was suggested as you know. Ron is a very careful scientist, as very fine worker, and I know that if he gets into the Schizoneura-Equisetum problems it will distract him mightily from the major problem. For his own good, I would hope that could be deferred until later. Ron says he would like to do it. I would like him to surge ahead on the Ph.D. thesis, making every effort to have it largely in hand before the end of the present grant in late 1984--who knows if I'll get refunded?

Re Red Tanks: I do indeed want to be involved. However, I've got a problem. Betty and I leave tomorrow for Germany. We don't get back until essentially 1 Feb. I must then work exclusively on my paper for the March NE-GSA (Triassic) meetings, in order not to make a complete fool of myself. Therefore, we're looking at at least 1 April for an opportunity to get back to the Red Tanks slides. Call me then to poke me up! Can you wait that long (I hope!)?

Re the publications. The Ishchenko 1956 paper is the only one I don't have, and I would be happy to buy it from you. How much do you suggest?

Best wishes.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: R. Litwin  
encl: xerox returned



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

December 22, 1982

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penna. 16802

Dear Al:

I presume that you have received the reprints of our little article that I shipped off to you about a week ago. If not I'm sure they'll be along directly. I have received requests for reprints of the article from Gordon Wood and R. G. Holloway who were not on the list I sent you earlier. - *2'11 send them copies.*

How is Ron getting along with his thesis research? Would you want him to get involved in another joint publication with me? The reason I ask is that I am now working on a new Schizoneura from the Fort Wingate area in New Mexico. Associated with the Schizoneura leaves and stems are the remains of a cone which I think are part of the same fossil. I have made a transfer of a bit of cone and it shows some simple poorly preserved sack-like spores. I'm not sure if the material is well enough preserved for palynological analysis or not. If Ron has the time to mess with the cone I can send it along. Perhaps he (or you) can indeed get some identifiable forms from the fossil. If so perhaps we can put together a joint publication on this curious fossil. Also I am toying with the idea of including in the same paper a study of Equisetum from the Chinle Formation. There are cones attached to these stems which might contain identifiable spores also. Let me know if you want to get involved with this stuff.

Thank you for checking that small bit of cycad ramentum for Triassic spores and pollen. Your results are certainly surprising and the only thing I can hope is that those spores and pollen were stuck to the surface of the material in spite of your attempts at cleaning. Perhaps they were brought to the fossil by ground water or maybe even surface water after the fossil was exposed. That is very curious. Thanks anyway for your try.

Some time ago I sent you a sample of the material from Red Tanks Formation in central New Mexico and you told me that it contained a typical Early Permian assemblage. Don Tidwell and I are putting together a small report about one of the fossils in there and it would be very helpful to us if you could give us a list of some of the spores and pollen that you recognized, especially

Page 2

Dr. Alfred Traverse  
University Park, Penna

those which indicate an Early Permian age for the sample. Don and I just published a short review paper about the Late Paleozoic floras of central New Mexico and I am enclosing a copy.

With best wishes.

Sincerely yours,

*Sid*

Sidney Ash  
Chairman

SRA/lid  
Enclosure

P.S. During my miss-spent youth I bought a lot of books instead of IBM stock. Amongst the books, <sup>I bought</sup> are five Russian books ~~also~~ dealing with pollen/spores. Copies of the title pages of <sup>the books</sup> are enclosed. If you can use them let me know.

*Sid*

16 December, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

I just read (Amer. Scientist 70:465) that the "New Mexico Geological Society" will publish a geological highway map of New Mexico "in early 1983". Do you have an address for the society, so I can order one? What do you think of the Muehlberger's book reviewed there, by the way?

Best for the holidays. We are going to Germany for about all of January, should you be trying to reach me.

tsk

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

7 December, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Well I finally dug out from under exams, term reports, etc., long enough to process and study your sample PFX-1, described as "Ramentum from supposed Triassic cycad". The sample seemed to be a small slice of chert. In your letter you suggested surface cleaning, which I did by cooking briefly in hot water with detergent (if I had it to do over again, I would have used an ultrasonic bath, but I doubt the result would be different.--the alices looked 100% clean). I then digested the slice--without preliminary grinding--in 20% HCl (no reaction) followed by 5% HF. As the HF digestion proceeded, I noticed "clearing" and residual blobs of darker stuff in the slice. Eventually there was 100% digestion and a very nice organic residue from which I made and studied four very nice slides. Very curious result: there is a rather abundant palynoflora consisting entirely of three genera: 2-3 spp. of Pinus, 2 species of Chenopodiaceae, probably Atriplex and Sarcobatus. The preservation of the pollen is perfect: color of exines pale yellow. Apparently this is a Recent or Sub-Recent flora. The flora must somehow be a contaminant?--but how did it get in; why is it so abundant; why just 3 genera (no composites, no grasses??)? Is it a groundwater percolation deal, or what? There is also abundant other organic matter, including weird pieces of cellular tissue, but no Triassic palynomorphs.

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

11/24/82

Al:

The reprints of our article just arrived and I am enclosing a few copies with this letter. I will be sending out copies of the article to the people on the attached lists. ~~Do you~~ <sup>How</sup> ~~many~~ ~~want~~ copies do you want to send out to your list of palynologists?

I'm also enclosing some other things which might be of interest to you.

Hope you and Betty  
have a happy  
turkey day!

Sid



IV COLOQUIO SOBRE PALEOBOTANICA Y PALINOLOGIA

P.S. I've also sent Ron copies of the reprint with the same request.

22 November, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

The deal from G. Foundation finally came yesterday. I have written an absolutely glowing report, and wish you all the luck in the world, tho' from a selfish point of view I'd rather have you stateside. If you do go, how I envy you. I'd love to visit Tasmania.

Best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

Sid Ash, evaluation for Guggenheim Fellowship

"Sid" Ash has been a scientific collaborator and personal friend for many years. As a megafossil paleobotanist and skilled field geologist, he has generously and selflessly made extremely significant contributions to my projects and to the doctoral work of many of my students. It is one of those ongoing tragedies of which academia spawns so many, that Ash has never himself had a post in a university with a doctoral program. On the contrary, "Sid" has been saddled most of his career with burdensome administrative duties, including for years the chairmanship of his department and oversight of dozens of undergraduate advisees. Through this all, he has maintained a very high level of research productivity and has assembled at Weber State a marvellous paleobotanical research collection, the heart of any paleontological effort. Most of Ash's research productivity has come as a direct result of leaves of absence of one sort and another--research productivity is almost impossible within the framework of his Weber State duties. His track record on various leaves of absence is estimable. He's a "good bet" to produce. It is perhaps irrelevant, but the "other half" of the Ash team, Shirley (M.Sc. in biochemistry, I believe) is a full-blooded Navajo Indian, and wherever the Ashes go she serves to dispel notions various people have of the downtrodden native American. In summary, Sid is a good scientist who can be expected to produce. He is a reliable, hard working, resourceful, cheerful person who will represent the USA well in Australia and South Africa (where, I assume, Shirley would be an "honorary white" like Japanese scientists?). I recommend Sid heartily for this and any other honor.

22 November 1982

Professor of Palynology

435 Deike Building, Pennsylvania State Univ., University Park, PA 16802

PLEASE DESTROY

## PLAN OF RESEARCH

Project Title: Relationships and Evolution of Early Cycadophytes.

## Background

Most of the Cycadeoidales and Cycadales (often called cycadophytes) have rather similar vegetative features such as large entire or once-pinnate leaves and short, squat, unbranched trunks. A few have arbore-scent trunks and some branch a few times. The reproductive structures of the two orders are distinct, however, and it is therefore thought that they can only be remotely related even though they are so similar in gross form. Unfortunately the early history and relationships of the two orders is still speculative.

The fossil record of the Cycadeoidales goes back to just the Upper Triassic as the oldest generally accepted cycadeoidalean fossils occur in strata of that age at numerous localities particularly in North America, Europe, and Asia where they are fairly diverse and locality common. The Cycadeoidales are even more common and diverse in the Jurassic when they reach their maximum development. Subsequently they become rare and then extinct in about the middle of the Cretaceous without leaving any known descendents.

In contrast to the Cycadeoidales, the Cycadales are still thriving in certain parts of the world although they have declined from the zenith they reached in the late Mesozoic. The fossil record of the Cycadales is rather sparse compared to that of the Cycadeoidales but it appears to go back much further than that of the Cycadeoidales. Mamay (1976) has described some reproductive structures and leaves which are most probably cycadalean from the upper Paleozoic (Upper Pennsylvanian - Lower Permian) of North America. Nevertheless there is a large gap in our knowledge of the early cycads because we do not presently know of any definite upper Permian - Middle Triassic cycads, a period of approximately 35 million years. The reasons for this are fairly simple: most of the known floras of this age in the northern hemisphere are small and poorly preserved whereas those of the southern hemisphere, which are often much larger and generally better preserved have never been completely or adequately studied. This is particularly true of those in Australia.

It is apparent from the work of the applicant and others such as Harris and Barnard on Upper Triassic and younger floras that many significant evolutionary changes occurred in the cycadophytes during the preceding years. If we had additional new data from the Upper Permian - Middle Triassic we might be able to determine if the two orders are actually related and we might be able to learn whether one order was derived from the other or if they were derived from a common ancestor. If we had additional information it would tell us what the ancestor(s) of the orders looked like. At present all we can do is speculate about the answers to these questions as Mamay (1976), Delevoryas (1982), and others have done.

## Anticipated Procedure

A study of the Triassic stratigraphy of the world and the experience of the applicant suggests that one of the best areas to search for early Triassic cycadophytes is in Australia and somewhat less likely in South Africa. Therefore, the applicant proposes to go to Australia on about September 1, 1982 and spend the next 8-9 months searching for well preserved cycadophytes and describing any which he finds. During his previous trip to Australia (1976-1977 academic year) he worked on floras in New South Wales and South Australia. That work indicated that the greatest opportunity for well preserved Lower - Middle Triassic Cycadeoidales and Cycadales in Australia is probably in the Tasmanian basin where there is a thick (3,000 feet) section of strata of that age which contains well preserved plant fossils at many horizons (Banks and Clarke, 1973). Thus he will spend most of his time in Tasmania working in the laboratory of Dr. M. R. Banks at the University of Tasmania. While there he will cooperate with other paleobotanists in the area such as Mr. Steve Forsyth of the Tasmanian Geological Survey and Dr. Bob Hill who is in the Botany Department in the University of Tasmania. Upon completion of this work in Australia he will return home via South Africa where he will work in the laboratory of Dr. John Anderson in Pretoria for about three months. While there the applicant will spend most of his time examining collections of Late Permian - Middle Triassic age for the remains of definite cycadophytes. If time permits he will also search the strata of this age in South Africa for cycadophytes. The Molteno Formation seems to offer the best potential for early cycadophytes.

The general procedure which will be followed in Australia is that the applicant will examine such plant collections as are stored in the University of Tasmania and the Tasmanian Geological Survey to determine which units seem to offer the greatest potential to yield cycadophytes. He would also examine the Townrow collection of Tasmanian plants in the Mining Museum, Sydney, New South Wales. Then in consultation with Professor Banks, Mr. Steve Forsyth and other geologists in the area he will start searching for well preserved cycadophytes. Stratigraphic units which seem to offer the greatest potential are:

- Ross Sandstone of Early Triassic (Griesbachian) age.
- Cluan Formation and Knocklofy Sandstone of Early Triassic (Dienerian) age.
- Tiers Formation of Early Triassic (Smithian) age.

All of these units have yielded plant fossils in the past and contain carbonaceous siltstones so it appears that they might contain well preserved cycadophytes. If time and circumstances permit the applicant will also search some of the Later Permian strata in Tasmania for cycadophytes. For example the Cygnet Coal Measures and the Jackey Formation seem to offer the greatest potential as they have yielded plant fossils and coal during the past. Any Cycadeoidales and Cycadales which are found will be studied using the latest techniques such as scanning electron microscope studies of the cuticles, etc., and described in appropriate scientific journals such as "Science" and "Nature". If the applicant does not find any such fossils he will describe some of the other plant fossils which he finds.

S. R. Ash

References Cited

Banks, M. R., and Clarke, M.J. 1973, Tasmania Parmeener Supergroup, in Guidebook, Field Trip No. 1, 3rd International Gondwana Symposium, p. 23-46.

Delevoryas, T., 1982, Perspectives on the origin of cycads and cycadeoids: Review of Palaeobotany and Palynology, V. 37, p. 115-132.

Mamay, S. H., 1976, Paleozoic origin of the cycads: U.S. Geol. Survey Prof. Paper 532-E, p. EI-EI5.

3 October, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Here is the check for \$100 for the reprints, as requested.

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

encl: check



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

October 8, 1982

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penna. 16802

Dear Al:

Just a note to let you know that the bill for our reprints arrived. As you can see from the attached xerox they come to a total of \$225.00 I suppose the easiest way to pay this would be for you to send me a check for \$100.00 or so made out to the AASP Foundation, ~~and send it to me.~~ Then I will match it with my own money and send both checks off at the same time. I haven't received the reprints, but as soon as I do, I'll get together with you about their distribution.

Hope your hand is improving.

Best wishes.

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld  
Enclosure

Hi Betty

October 6, 1982

INVOICE

To: Dr. Sidney Ash  
 Department of Geology & Geography  
 Weber State College  
 Ogden, Utah 84408

For: Article in Palynology, volume 6, entitled:  
 The Upper Triassic Fern Phlebopteris Smithii and its Spores.

PAGE CHARGES

       Pages at \$55/page       

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 Treasurer, AASP Foundation  
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 Field Research Laboratory  
 P. O. Box 900  
 Dallas, Texas 75221

Thank you.

*Robert T. Clarke*  
 Robert T. Clarke  
 Treasurer, AASP Foundation

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7 October, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Thanks for yours of 16 September. In the meantime, the samples and the jacket have arrived. We'll get to the samples in due course. Too bad about the Popo-agie. However, as you know, not only "darker colored materials", but also sometimes light shales will be productive. You even sent us a pink one once that contained palynomorphs!

Sorry to hear about Shirley's knee. She and I apparently have joint problems in common. I have had orthopedic difficulties for many years without bothering to compound them by falling! Incidentally my hand is now some better, but it will be a two-year process to recover full mobility again, if indeed it ever happens. In the meantime, I have painful and time-consuming therapy sessions twice a week at the hospital and various gadgets that I am supposed to apply from time to time in between. The function of the gadgets is to ~~pull~~ the finger that was dislocated and broken from a stiff position into a bent position or vice-versa, depending.

All the best to you as always.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

TO AT  
DATE Thurs. TIME 11:00

WHILE YOU WERE OUT

M. Sid Ash  
of \_\_\_\_\_  
Phone \_\_\_\_\_

TELEPHONED  PLEASE RETURN CALL   
CALLED TO SEE YOU  WILL CALL AGAIN   
RETURNED YOUR CALL  RUSH

MESSAGE wanted permission to  
use you for reference for  
Jungferheim proposal  
no need to return call  
unless you object. Do returning  
jacket & sending samples to  
process. Signed BT

The Standard Register Company



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

September 16, 1982

Dr. Alfred Traverse  
Professor of Palynology  
Department of Geosciences  
Pennsylvania State University  
Deike Building  
University Park, Penn. 16802

Dear Al:

Thank you for your recent letter. Sorry I haven't been in contact with you before this, but I have been pushing to get caught up and to get a paper of mine back to the editor of the AJB. I'm now in a position to bring you up to date on my travels, etc. First though, let me say I was sorry to hear that you have injured your right hand. It must be awfully painful and I'm sure it must be rather unhandy not having a right hand which functions. I certainly do hope that it does improve and you do get full recovery or nearly full recovery.

In any case, after leaving Penn State Don Tidwell, Lee Parker and I drove over to Bloomington and stayed overnight with Dave Delcher. We got to visit his lab and discuss his work. We then returned to Washington D.C. via Ohio State where we visited with Edie Smoot and her husband. We finally got to Washington late Sunday night after making a hasty tour of Gettysburg Battlefield. On Monday we visited Fran Huber and on Tuesday I saw Dr. John Lance of NSF for a little time. All in all it was a very productive and interesting trip. I had not seen a lot of the country we traveled through so it was interesting to see the area and also to see what these other paleobotanists are doing.

Everything was quiet when I got home and I have been busy trying to get caught up ever since. Shirley is having trouble with one of her knees now and the doctor tells us that it's a sprain. I certainly hope it gets better soon she is in a lot of pain and can't hardly do her chores.

I am sending you in a separate package the jacket that Betty loaned me and some samples as described on the attached sheet. I am particularly interested in the last sample number PFX. The sample consists of silicified ramentum from the cycad trunk I am working on. I think it is of Upper Triassic age but there are doubters. Thus, if you could find a few pollen grains in this ramentum it might help settle the question. As I envision it the pollen would have blown in to the ramentum while the plant was living and been fossilized in place as the hairs were enclosed in a silica. I just hope you don't find Cretaceous pollen in it. In any case, I am quite anxious about this sample so

Page 2

Dr. Alfred Traverse

September 17, 1982

if you could find time to run it and make a quick analysis of the material I would appreciate it. But I know, of course, that you have your own fish to fry so I will just be patient. One of the samples is from Nevada. It's not very big, but perhaps you will find something in it that would be of use. I hope to get over there one of these years and collect a much larger sample. The Popo-Agie section doesn't look too productive. It is mainly red sandstones and shales. Although I haven't looked at it very much, I haven't seen any darker colored materials that might be palyniferous.

Yes, I'm sorry that I didn't prepare my proposal earlier so that you could have looked at it before it went in. I am chagrined at some of the errors you noted. Oh well, anyway next time I'll try and prepare the succeeding proposal earlier, so that you will have time to look it over.

Thanks once again for your hospitality. I hope that someday you folks will be able to visit so that I can repay, in part at least, your hospitality.

Sincerely yours,



Sidney R. Ash  
Chairman

SRA/ld

Sample Number	Locality Description
LV <del>1</del> -1	Pennsylvanian shale bed in Hermosa Formation at a copper prospect across state road and opposite (se) of the road to Lisbon Spring in NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , sec. 26, T. 30S, R. 25E. Lots of <u>Cordaites</u> leaves at the locality.
MV <del>1</del> -1	Upper Triassic. Greenish shale in Mossback mbr of the Chinle Formation. SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 22, T. 30S., R24E., near the Mi Vida Mine.
WW <del>1</del> -1	Upper Jurassic. Gray shale in Westwater Member of the Morrison Formation, NE of Grants, New Mexico.
PFX-1	Upper Triassic. Ramentum from a petrified cycad which presumably came from the Chinle Formation near Petrified Forest National Park, Arizona. Collector: S. R. Ash.
MI <del>1</del> -1	Upper Triassic. Chert bed in the (?) Luning Formation. Northwest of Mina, Nevada.

3 September, 1982

Dr. Sidney R. Ash  
Department of Geology & Geophysics  
Weber State College  
Ogden, UT 84408

Dear Sid:

Just finally had an opportunity to read your proposal. I find very few editorial boo-boos that I would have caught anyway, but I think it is in general a good idea for us to have each other read these things before they are submitted. I understand that you were under great time-pressure that made that difficult. As an example of editorial things I could have caught: on page 10, line 8 isn't the correct word "presumptuous". Same page, para. 2, line 4—"the" is misspelled. Page 7, para. 3, line 5—"convenient" is misspelled. These are just a few samples. I admit freely that even after you have read mine, and Betty has had an editorial go at it, and I have combed it thoroughly, one can still find mistakes!

I was delighted by the heavy emphasis on my contribution as a facilitator for Triassic work in North America. I must get some more titles out with me as senior author so that the advertisement is more credible! In any event, I think it does help our joint efforts if we praise each other as much as possible!

One page 4, para. 2, I would challenge the statement "small amounts of coal", at least insofar as the Richmond Basin is concerned. This coal is no longer exploited commercially mostly for purely economic reasons (not stripable, for example). In the mid-19th century it was the most important mined coal in the United States. Also I thought that the statement about the lithology should have mentioned that in places there are shales and sandstones other than red. The subject is on my mind because one of my former students got me out into a quarry near Harrisburg a week ago Sunday, and I had a quite serious fall in which I mashed up my right hand, especially the little finger. An orthopedic surgeon has put it all back together and assures me that I have a 90% chance of full recovery of the hand eventually. In the meantime I can't write. I am dictating this letter with my little machine that I haven't used for about 2 years.

The marine Triassic of western Nevada interests me. I think we discussed it before. I wonder if we shouldn't look at a couple of samples some day. It might have some interesting dinoflagellate information at least. I'd also like to take a crack at the Popoagie section some day, maybe with you?

Yours very truly,

Alfred Traverse, Prof. of Palynology

AT/et

21 June, 1982

Dr. Sidney R. Ash  
Department of Geology & Geogaphy  
Weber State College  
Ogden, UT 84406

Dear Sid:

Enjoyed yours of 3 June, just arrived (!) I had forgotten that I sent you copies of the correspondence with my cousin, Muriel. I knew that I intended to. It's a miracle I didn't send it twice, as a copy of the stuff is on my desk at home, and I thought the other day that I should send it to you.

Unfortunately, the envelope-stuffer did not, however, insert the promised "article from a local newspaper" re the "holy book". I really would like that, whatever it was, and anything else you may know of re the ~~novel~~ JS is supposed to have plagiarized (at least cribbed from).

Thanks for reprints of Sanmiguelia paper—I had read it in J of P. I have given RL his copy.

Betty was pleased by the gift and will presumably pen something personal below about it.\* She and I are going west ~~this~~ week--to Stanford, where I'll take Evitt's dinoflagellate short course. It will be Betty's first visit to CA, and Utah is yet to come. That tripp you led us on was a dandy, that she and I should repeat!

No, I declined to "do" a field trip for the AIBS meeting because I am not into anything locally that would be of much interest to megafossil paleobotanists. (The Tuscarora work is practically all microfossils, ditto Gettysburg-Culpeper Basin, as you know.) Spackman, after all, is supposed to be the local paleobotanist.

Yes, I'll talk at the Rocky Mtn. Section, Spring, 1983--if you'll stretch "Colorado Plateau" to West Texas. I have been working hard with the stratigraphy-paleoecology of the Eagle Mills Fm. stuff, with Carmen Tavera and would present that as a Traverse/Tavera paper. Presumably there'll be another reminder re a title and abstract, later on?

Happy hunting for Sanmiguelia (with flowers). Best wishes.

Yours very truly,

AT/et

\*Letter already sent (et)

Alfred Traverse  
Professor of Palynology



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

June 3, 1982

Dr. Alfred Traverse  
Department of Geosciences  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

I really didn't fall off the edge of the world after I left Washington D. C. in spite of what you may have thought. It's just that I've been so busy putting out fires that I haven't had time to keep up on my correspondence. I'm sure you have kept up on the progress of our manuscript through Ron. As he has probably told you it is going to press soon if it hasn't already. I'll send you a copy of the proofs for your files when I receive them.

The correspondence between you and your cousin that you sent me some time ago is interesting. It is too bad that so many otherwise intelligent people get involved with the curious sect that your cousin is into. I am enclosing a copy of an article that recently appeared in the local newspaper which concerns some interesting perspectives on the "holy book" used by the sect. I guess P.O. Barnum is still being proven right.

I received the xerox copies of those chapters from the book on family constellation that you returned to me some time ago. The title of the book the chapters came from is "Family Constellation", and the author is Walter Tolman. It is published by Springer in New York City. I'm sure that you will be able to find a copy in your library. I think you'll be especially interested in what Tolman has to say about "older brother of brother(s)."

Enclosed with this letter are a couple of copies of the paper on Sanmiguelia in Utah which was recently published in the Journal of Paleontology. As you may recall when we passed through Capitol Reef two years ago, I searched unsuccessfully for a couple of specimens of Sanmiguelia. Later that year I returned to the area with some of the students who made the discovery and we eventually found, not only the specimen that had been noted by them, but I also found a better specimen which showed the base of the leaf. The enclosed report is a result of my study. One copy is for your files and one for Ron.

Enclosed with this is a little "thank you" memento for Betty for allowing me to be her house guest way back in March. I hope that sometime Betty will be able to accompany you on a trip out west so that we can repay your hospitality, at least in part.

Page 2

Dr. Alfred Traverse

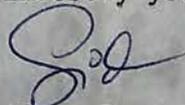
June 3, 1982

I suppose you are deeply involved in organizing a field trip and other things for the AIBS meetings in August. I wish I could attend, but common sense tells I had better stick around home here and finish a few of the projects that I have started. One of the projects I must get on to is a new proposal to NSF to continue my work on Triassic floras.

There will be a meeting of the Rocky Mountain Section of GSA in Salt Lake City during Spring 1983. I am trying to organize a symposium around the topic of "Stratigraphy and Paleocology of Lower Mesozoic Non-marine strata of the Colorado Plateau", for the meetings. Would you be interested in giving a talk at the symposium? Deadline for receipt of abstracts will be <sup>just</sup> before Thanksgiving. The exact title/theme of the symposium will depend somewhat on the papers that are received. Please let me know if you're interested.

*cheer*

Sincerely yours,



Sidney R. Ash  
Chairman

SRA/lid  
Enclosure

*P.S. I'm off to Colorado to look  
for more Sauvignonia in a couple  
of days.*

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
INTER-OFFICE CORRESPONDENCE

*Conroy*

DATE: 30 March, 1982

FROM: Alfred Traverse, Professor of Palynology

TO: Palynophiles/Paleobotanophiles

31 March, 1982

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84408

Chairman of Geology & Geography at Weber State College, Ogden, Utah, is one of the world's foremost Triassic paleobotanists. "Sid" will be here on Monday, 22 March, and will

Dear Sid:

-cum-pictate show on Triassic fossil plants in 764 Burke, at 4:00 Just a note to say that the missing hammer did turn up in the back of the station wagon during our absence. will be available

at 3:45 Hope that the poverty of outcrop didn't scare you away from us permanently! You are always welcome at Chez Traverse. After the DC hotel experience, I worried that you were cold at our place. But we let guests use the electric heat in the bedrooms, if they wish!

Best to Shirley, Kathleen and Randy.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

THE PENNSYLVANIA STATE UNIVERSITY  
DEPARTMENT OF GEOSCIENCES  
INTER-OFFICE CORRESPONDENCE

*Corresp.*

DATE: 10 March, 1982

FROM: Alfred Traverse, Professor of Palynology *AT*

TO: Palynophiles/Paleobotanophiles



Professor Sidney R. Ash, Chairman of Geology & Geography at Weber State College, Ogden, Utah, is one of the world's foremost Triassic paleobotanists. "Sid" will be here on Monday, 22 March, and will give a talk-cum-picture show on Triassic fossil plants in 244 Deike, at 4:00 p.m. You, and others you know of who might be interested, are cordially invited to attend. Coffee/tea and cookies will be available at 3:45 p.m.



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

February 18, 1982

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

I have arranged to arrive in Baltimore late on March 18. I will stay there that night and the next day, Friday the 19th, I will go into Washington D.C. to see some of the collections in the National Museum. That evening I will fly to Harrisburg on Allegheny Flight No. 727. I'm scheduled to arrive there about 6:15 P.M. and will spend the night in some flea-bag near the airport. I presume you will pick me up the next morning and then I'll be in your hands. If you can recommend a flea-bag in the vicinity of the Harrisburg Airport, please let me know. I do not think it would be worthwhile for you to drive over to Harrisburg that night. I think that the schedule calling for you to meet me on the morning of Saturday the 20th, will be fine. I'll let you know later where I will be staying in Harrisburg.

I haven't heard anything about our little paper on Phleboteris smithii yet. As soon as I do I'll be in touch.

I'm looking forward to a nice visit with you and your graduate students and Betty.

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld

P.S. If you would be interested I could give an informal lecture (slide show) about the Chinle/Dockum flora to your students while I'm in State College

WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
GEOLOGY AND GEOGRAPHY DEPT

JOHN S. TRAVERSE  
DIRECTOR

December 29, 1981

26 January, 1982

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Good to hear from you. Allegheny Commuter has one plane a day out of here to DC (connection in Harrisburg, which is directly on the way). Allegheny Commuter Flight 784 (every day but Sat.), leaves State College at 2:20, arriving Harrisburg 3:15. Depart Harrisburg (USAir Flight 726) 4:20, arrive DC 5:05. There are, of course, connections all ~~the~~ time to Pittsburgh.\*

I have drawn a blank with John Mayberry--out of town, being transferred, and this and that. However, Norrie Robbins says she'll get hold of application materials for us--so I think we have it underway--I hope. Ash-82-1

Sorry it took us so long to answer your letter. I knew there was a letter in your package, but just didn't get around to opening it for several weeks. In the future, it would be more effective to send letters separately, as I do open first class letters, especially if marked "urgent" before I open packages. Betty is at work on your sample which we have dubbed "Ash 82-1" and should have results in a few days. Looking forward to seeing you in March.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

\*(from Betty)--dictated before you called, but is being typed just after your call, so the plane info is apparently irrelevant, since Al plans to meet you in Baltimore. As I type, he is talking to Don Hoff at the Museum in Harrisburg, and they seem to be arranging something for the day you arrive. We look forward to having you with us then.



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

December 29, 1981

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16801

Dear Al:

HELP!

I am presently working on a report about a cycad stem from the Petrified Forest. However, since it could be argued that the stem was washed in from the Cretaceous I am looking for some way to prove unequivocally that it came from the Triassic. There is a mass of chert stuck to part of the stem which presumably became attached to it during the initial stages of fossilization. I don't know whether there is any possibility of the chert containing spores and pollen but in case there is I am enclosing a few fragments with the request that you analyze it. The report is just about finished so I would appreciate an early check of this material if you can work it into your busy schedule. Thanks very much.

*Ash-82-1*

The other day, after you had called me, the mail came in and it contained an invitation to attend the GSA meetings in Washington in March. I have decided that I should attend this meeting in order to start becoming acquainted with the Triassic of the east coast. After looking at the schedule here it appears that it would be best for me to visit you over the weekend of the 20th and 21st of March and then go down to Washington on the 23rd. I would like to participate in the Field Trip on the 24th and then attend the meetings on the 25-27. I would probably return on the afternoon or evening of the 27th from Washington D.C. If I can make my reservations early I can save nearly \$200.00. Another restriction is that I must travel over a weekend so I suppose that I would fly into some airport which is convenient to you on the 19th. I note that it would be financially advantageous if we could share a room while we are in Washington D.C. If that is okay with you I suppose we should make our reservations for one fairly promptly. I would appreciate it if you would consider the above schedule and advise me if it meets with your schedule and approval.

Hope you and your family had a Merry Christmas and a Happy New Year.

Sincerely yours,

*Sid*  
Sidney R. Ash  
Chairman

*P.S. Tell Betty that  
GOT's thesis arrived  
safely before  
Christmas.*

SRA/ld  
Enclosure

WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

November 11, 1981

Dr. Alfred Traverse and Mr. Ron Litwin  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16801

Dear Friends:

The corrected manuscript on Phleboteris smithii has arrived safely but I haven't had a chance to more than glance at it yet as I have just got back from spending a few days down at Petrified Forest and other hot spots in Arizona (e.g., Tucson) and have some catching up to do. On the basis of my quick look-see it seems that the corrections you have made look fairly straight-forward and seem generally acceptable to me so it should move along quite rapidly. However, I do need to add another photo or two to the plates, so it's going to take a few days before I can get the manuscript on its way to the editor of "Palynology". I will send you folks a copy of the manuscript that I do ship off.

Enclosed with this letter is a xerox copy of the dissertation of the illusive Allen Gottesfeld. I had a lengthy discussion about him with some of the people from UC Berkeley when I was in Arizona and it appears that he is completely out of this business. In fact he is about as far from it as you could possibly get and still be alive! Believe it or not he is a mountain man and lives with his second wife somewhere in the mountains of British Columbia. I should point out that this is a pirated copy of his dissertation-- that is I don't officially have it. It may be possible that you can get a better and official copy from University Microfilms. If it is not available in the University Microfilm Series one of you might write directly to Wayne Fry and ask him for a copy to make it all official. In any case I'd like my copy back someday.

My talk was well received at the Symposium in Arizona. Your slides increased interest in my talk and I received some nice comments about the reconstructions. Thanks again for making them available for me Ron.

Congratulations on your wedding Ron. Please give our best wishes to your wife. I hope that we will get to meet her sometime in the near future.

*Best wishes*

Sincerely,

*SRA*  
Sidney R. Ash  
Chairman

SRA/lld  
Enclosure

XXXXXX  
863-3419

2 December, 1981

7 December, 1981

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84408

Dear Sid:

Enclosed is the Gottesfeld thesis which Al asked me to return to you. We have xeroxed it, thereby creating yet another pirated copy.

Incidentally, according to your letterhead, your zip is 84408 and we have been using 84403 for ages. We stand corrected. You have been using 16801 for some of your mailings to us. That is the zip for State College, but not the zip for University Park, the area within State College ~~conterminous with~~ RSUSU. Consequently, our zip here is 16802.

Best wishes for the holiday season.

Yours very truly,

Elizabeth I. Traverse  
Assistant in Palynology

AT/et  
not for library  
Encl: thesis

XXXXXX  
863-3419

2 December, 1981

20 November, 1981

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Thanks for yours of 11 Nov., with the loaned copy of Gottesfeld's Ph.D. thesis. I believe I'll content myself with a xerox of your copy. I had not seen it before and would rather not write Wayne Fry about it, as I would find it difficult to be polite! WF had no business supervising a palynological doctorate, and it shows. Dreadful bloopers abound. Nevertheless, it is important to have it and to know about it! I'm very grateful to you.

All the best as usual.

Best wishes.

Yours very truly,

Yours very truly,

Alfred Traverse  
Professor of Palynology

Professor of Palynology

AT/et

cc: R. Litwin

XXXXXXXX  
863-3419

19 November, 1981  
20 November, 1981

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

The palynology class was very small this year (because of foul-up with catalog while I was in Switzerland). Only one person drew a Triassic unknown--your "cuticle shale", your location PF10. It was an undergrad girl who worked on it--Linda Fogg. She was fascinated by the cuticles material and wants to do an independent study project on it next term to look just at the "megafossils". The palynology was difficult because the palynomorphs are sparse, but she did o.k., despite a few boo-boos, huh?

Best wishes.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
encl: copy of Fogg paper

WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
GEOLOGY AND GEOGRAPHY DEPT.

DUPON STATION  
SALT LAKE CITY

XXXXXXXX  
863-3419

November 11, 1981

19 November, 1981

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

The saga of my mystery sample, T-522, from "Manning Canyon, Utah" continues. I issued the sample you sent me, per your letter of 19 May, 1981, to a new graduate student, Rob Cox, as an unknown (I hope eventually to interest him in our Triassic/Jurassic work!). Rob found the sample to be barren. We followed this closely and know that verdict is right. As a back-up unknown I gave him a hunk of good ol' T-522, and he did a bang-up job. I thought you'd perhaps like to see a copy of Rob's report. One result of his work was to discover that T-522 is actually a coal (high-ash, but nevertheless a real coal). So, it's back to the drawing board. Now the question is--is there a Manning Canyon Fm. coal? If so, where?

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

encl: copy of term report by R. Cox

Sincerely,

Sidney R. Ash

BSA/14  
Enclosure



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

November 11, 1981

Dr. Alfred Traverse and Mr. Ron Litwin  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16801

Dear Friends:

The corrected manuscript on Phleboteris smithii has arrived safely but I haven't had a chance to more than glance at it yet as I have just got back from spending a few days down at Petrified Forest and other hot spots in Arizona (e.g., Tucson) and have some catching up to do. On the basis of my quick look-see it seems that the corrections you have made look fairly straight-forward and seem generally acceptable to me so it should move along quite rapidly. However, I do need to add another photo or two to the plates, so it's going to take a few days before I can get the manuscript on its way to the editor of "Palynology". I will send you folks a copy of the manuscript that I do ship off.

Enclosed with this letter is a xerox copy of the dissertation of the illusive Allen Gottesfeld. I had a lengthy discussion about him with some of the people from UC Berkeley when I was in Arizona and it appears that he is completely out of this business. In fact he is about as far from it as you could possibly get and still be alive! Believe it or not he is a mountain man and lives with his second wife somewhere in the mountains of British Columbia. I should point out that this is a pirated copy of his dissertation-- that is I don't officially have it. It may be possible that you can get a better and official copy from University Microfilms. If it is not available in the University Microfilm Series one of you might write directly to Wayne Fry and ask him for a copy to make it all official. In any case I'd like my copy back someday.

My talk was well received at the Symposium in Arizona. Your slides increased interest in my talk and I received some nice comments about the reconstructions. Thanks again for making them available for me Ron.

Congratulations on your wedding Ron. Please give our best wishes to your wife. I hope that we will get to meet her sometime in the near future.

*Best wishes*

Sincerely,

*Sid*  
Sidney R. Ash  
Chairman

SRA/ld  
Enclosure

2 November, 1981

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Ron got back from the wedding trip with his lovely bride Friday. So we pitched right into the MS after my evolution lecture. My corrections are in red, his mostly in green (a few black--watch carefully). They are all important. Ad seriatum:

Title page: Somehow this gives me deja vu! Didn't I correct the address before? The "Department of Geology & Geophysics" should be expunged from your card or whatever.

p. 16: Ron is still unhappy about the 'fields'--and I think the best way to go is as shown.

p. 17: the? puzzled us--can you fix?

p. 28: Ron worries about the stereo-pair (important to him) and suggests changes.

p. 21: We changed part of the page so much that we made a paste-over.

Now, re the nomenclatural problem. It makes me nervous because it reminds me of the Corollina-Classopollis problem. Well, the question is this: does the illustration by Emmons convince you that his item is conspecific? If it does, the name apparently should be P. falcatus (I mean accepting that you have the story all right, etc.). On the other hand, if the figure is iffy, it is quite o.k. to use the next available name: I guess that's smithii? I must say that Emmons' picture doesn't convince me (I would need more of the frond)--but you're the expert!

So--we're all set now, I guess? Has been educational and fun.

All the best to all the Ashes! I enjoyed the article re Henry. My Korean graduate student still speaks in wonder about antelope stroganoff.

Yours very truly,

Alfred Traverse  
Professor of Palynology



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

October 16, 1981

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16801

Dear Al:

Here at last is a draft of our little manuscript. I am sorry it has taken so long, but the photographs took much longer than I expected to prepare. I am retaining the original plates and may substitute a picture or two on the plates from those that you can see here. I suggest that you and Ron go over the manuscript again, particularly those parts which deal with the spores of this varmint and make any changes or corrections that you feel desirable. Please note my questions in the manuscript itself. After you have indicated your corrections return it to me and I'll have them made and submit the manuscript to the editors of "Palynology". The manuscript is on a word processor (which we have taught to underline) so we can make changes without much struggle and the whole thing will not have to be retyped. So please do your worst. It won't embarrass me in the least if you recommend changes, additions, corrections, etc. Obviously the sooner you can do this then the sooner I can patch it back up and submit it to the editor of Palynology.

*But we haven't taught it to number the pages yet! That comes next.*

I'm enclosing a xerox copy of Harris's publication which I refer to in this manuscript. Ron said he hadn't seen this publication so you <sup>both</sup> might want to look at what Harris has to say about the indusia of the fossil he<sup>a</sup> calls by the name of the Matonia.

Also enclosed with this letter is a little blurb about my brother whose house we stayed in in Denver last year.

The slides you sent me arrived safely the other day. They look great and I am sure they will add a lot to my little talk at the Petrified Forest.

With best wishes.

*cheers*

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld  
Enclosures

Page 2

Dr. Alfred Traverse

October 16, 1981

P. S. - Since writing the above I have had time to think a little bit more about the specific name of this fossil. I am still not entirely satisfied with its assignment to the species smithii. The reason for this is that Emmons in 1856-57 briefly described and illustrated a fossil which could well have been an example of Phleboteris. He called it as you can see from our manuscript page 15 Pecopteris falcatus, (also see enclosed copy of Emmons). The fossil has been lost as I indicate in our manuscript so we cannot verify its characters. However, the illustrations given by him strongly suggest that it was a Phleboteris and, of course, Phleboteris has been described from the adjacent Pecin Formation by Hope and others. As stated on page 15 I decided to throw the earlier name away and stick with smithii. What do you think we should do here? Perhaps we should go back to falcatus because in my heart of hearts I really think he had an example of what we are calling P. smithii, but of course, we cannot verify it. It could be argued that he actually illustrated a specimen of what has been called Asterocarpus or possibly of some other fossil. At first when I started working on this present fossil I had wanted to stick with the species name of smithii but now I wonder. I really don't care and I think we should do what is most acceptable. You have had lots of experience with the code of nomenclature so I would appreciate it if you and Ron would examine this problem and tell me what you two think. If you two should feel very strongly that we should go with the species falcatus that will be okay with me. It won't be all that difficult to change the name in the manuscript since it is on a word processor. It will take a little extra effort but not all that much.

SRA/ld

Bock (1969) placed smithii - falcatus!

Well, the question is - does the illustration by Emmons prove it is conspecific? If it does, yes it should be P. falcatus. On the other hand, if it is "iffy" - it is quite o.k. to use the next available name - is that smithii?

Emmons picture doesn't convince me! But you're the expert.

isn't completely accurate. I also noticed that pinnules from specimens with fields apparently leave a midrib at a slightly higher angle than those specimens without fields. This may or may not be significant, and might be due to the relationship of the fragments on their respective pinnules.

Ronald J. Litwin  
College of Earth and  
Mineral Science  
Penn State University  
University Park, Pa.  
16802

Lastly, after making further spores-per-sporangium counts, I noticed that the sporangia commonly contain 128 or 256 spores. Some *Matonia* species also have incomplete annuli. I should change "...complete (?)" to "...incomplete (?)" in the text.

Dr. Sidney R. Ash  
School of Natural Sciences  
-Geology and Geography Dept.  
Weber State College  
Ogden, Utah 84408

I guess that's it for now. The caption I've been using is in order that you can integrate it more easily with your other work. If you prefer that I write a caption, I shall.

Enclosed are the illustrations for the paper- I had a 4X5" negative made in case they were damaged in the mail. Give my best wishes to your family.

If you prefer smaller letters on the drawings you can easily change them using rub-off dry transfer letters, which come in a variety of styles and sizes. Please feel free to change them if you want.

Sincerely Yours,

Also enclosed are copies of letters I've recently sent which pertain to you. I understand that Dr. Traverse sent you a copy of the grant renewal proposal, as well.

There are several changes I feel should be made in the manuscript. I noticed that there is a typographical error in Bock's Lockatong citation; the real date is 1969 (he was deceased by 1979!) Also, in reading Bower's fern text (1926, v.2) more closely, he notes that *Matonia*'s indusium, although thick, over-arching (superior) and "leathery", is ultimately deciduous upon sporangial maturation (or words to that effect.) All of the fertile specimens I have seen are mature, and I am not completely convinced that these specimens couldn't have had indusia earlier in their sporophytic cycle, or pre-depositionally. These specimens may be exhibiting the consequences of age or taphonomy. In all fairness, however, I have not seen Harris's work, so I don't know what the *Matonia* indusia look like fossilized, in order to compare them.

Related to this problem is that of the "fields". I have examined specimens with fields, but the specimens were sterile; likewise I have fertile specimens of *Phleboteris smithii* here that show no trace of field development. These fields seem to be due to growth habit and the high angle venation off of the pinnule midrib. Maybe our suggestion that fields are post-depositional features of differential compression of fertile leaves

isn't completely accurate. I also noticed that pinnules from specimens with fields apparently leave the pinna midrib at a slightly higher angle than those specimens which lack this feature. This may or may not be significant; it may be artificial, and might be due to the relative position of each of the fragments on their respective pinnae. 1981

Dr. Sidi  
Lastly, after making further spores-per-sporangium counts, I think that the sporangia commonly contain 128 or 256 spores. Bower claims modern Matonia species also have incomplete annuli, so maybe we should change "...complete (?) annulus..." to "...incomplete (?) annulus..." in the text.

Dear Sid:  
I guess that's it for now. The illustration hasn't been captioned, in order that you can integrate it more easily with the text. If you prefer that I write a caption I shall.

Blicher-Taylor's idea?--if so, I could surely use one. Too bad about the idea.  
I hope these suggestions haven't caused any major problems for you. I look forward to hearing from you; please give my best wishes to your family.   
ate much; p. 163. Bairara?

Am still working on my new proposal--will send you a draft asap.

Sincerely Yours,

Heard on grapevine that you and Paul Olson have been in the field--anything interesting? Or was it just a razor.

You missed a great session in Ron Litwin you sure saved a bundle. Best wishes as always.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/at

\*p.s. Hope you won't be irritated if I offer editorial assistance-- I am a born critic and hence a good editor of MSS. And I regard it as mutually beneficial for us each to make a superb impression.

RJL/rjl

cc: Alfred Traverse

23 September, 1981

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Presumably you have a few reprints of your chapter in the Dilcher-Taylor volume?--if so, I could surely use one. Too bad about the clangers: e.g., p. 154 re Dunay's name. He's a little paranoid and will doubtless send you an envelope-bomb or something. There are others, e.g., p. 161, Fonatine--but he's dead and won't care much; p. 163, Bairera\*.

Am still working on my new proposal--will send you a draft asap.

Heard on grapevine that you and Paul Olson have been in the field--anything interesting? Or was it just a rumor.

You missed a grand session in Sydney. But you sure saved a bundle. Best wishes as always.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

\*p.s. Hope you won't be insulted if I offer editorial assistance-- I am a born critic and hence a good editor of MSS. And I regard it as mutually beneficial for us each to make a super impression.



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES-  
GEOLOGY AND GEOGRAPHY DEPT.

OGDEN, UTAH 84408  
801-626-6207

May 19, 1981

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16801

Dear Al:

Welcome back to the United States! At least I presume that you and Betty are now in Pennsylvania. The Swiss report that you obtained for me has arrived safely and I am enclosing a check for the appropriate amount of money. I sure do appreciate you tracking this down for me so promptly and efficiently. Also enclosed with this letter is a sample from the Mississippian/Pennsylvanian Manning Canyon shale which I think just might contain palynomorphs. This sample comes from the clay pits on the east side of Lake Mountain, west of Utah Lake and Provo. I think, you will recall, that we passed the clay pits when we were out there looking for such material several years ago. This is the locality which has yielded the impression of flora which Don Tidwell has described. I visited the clay pits a week ago and found that they have recently run into a layer of very black organic shale. Most of the shale in the pits is highly oxidized and as far as I know no one has found any palynomorphs in it. Hope you have some luck with this sample. If you need a bigger sample let me know.

While you have been away Ron Litwin and I have been doing some work on a Chinle fern, Phleboteris smithii, which I never got around to redescribing before. ~~A few days ago~~ <sup>Today</sup> I sent him portions of the manuscript which deal with the stratigraphy and morphology of the fern and he is working on the spores and sporangia. If you would like to join us in this publication it is just fine with me. As you will see from the title page of the manuscript I have included your name there.

I have sent you, via Ron, a xerox copy of an article that describes the Pennsylvania/Permian locality in New Mexico from which ~~came~~ <sup>came</sup> the sample that you ran in Switzerland. I have also written to Barry Kues and told him that you were very interested in working on the microflora at this locality and would like to be included in the project. I haven't heard from him yet, but I presume he will agree.

Hope you are getting back into the groove without any problem now.

Sincerely yours,

Sidney R. Ash  
Chairman

P.S. Please give the enclosed slide and sample of P. utahensis to Ron.

SRA/ld  
Enclosure

10/21/81

A1

Here is the missing Text-fig  
from our mss. Also a new  
page 4 and figure description. (I  
left out the pinna figure when  
I assembled the <sup>enclosed</sup> text-figure-  
it seemed superfluous when "A"  
clearly shows its form). Because  
I left out the pinna drawing  
we'll have to revise the mss  
in a few places.

Please don't hesitate  
to come up with another  
arrangement of the Text-figure  
if you and Ron can come up  
with something better.

By the way I'm sending  
the mss to you because I  
suppose Ron is on his honeymoon  
and I don't know when he'll be  
back.

cheer

Jim A.G.

20 April, 1981

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403 USA

Dear Sid:

Was able to get the Appert book for you, through the president of the society, who is a professor here. He got, as pres., a 25% discount, as you can see. Nevertheless, I had to pay, "Bargeld", SF 140.30, which is, at today's rate of exchange (\$1.00=SF 2.00) about \$70.00. You saved money by waiting--the rate was \$1.00=SF 1.70 when we came here in Nov., '80! (Of course, that means we shouldn't have cashed our travellers' checks, but we did!) The book is on its way. So your project owes me (personally) the \$70.00. At this point, it would be sensible to send it to me in Pennsylvania.

Now, about the Pennsylvanian/Permian sample you sent. Betty has processed it for me--and it is beautiful! I don't have any of my Permian literature here, so can only give you a very preliminary report. It's Permian all right, but looks more mid-Permian at first blush--but that should be easy to handle later--it is a beautiful, rich, well-preserved palynoflora! (dominated by saccates of all sorts--Lueckisporites, Lunatisporites, etc.). Yes, I'd like some more of it for teaching purposes (send to PA!), and also exact locality data. And yes, please get us 'hired' to do the pollen and spores. The money can be paid to Betty, who will do most of the labor. At this stage, what are we supposed to do? Will you contact the appropriate persons?

Regards to all.

Yours very truly,

Alfred Traverse  
Visiting Professor

AT/et  
encl: bill



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19 March, 1981

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403 USA

Dear Sid:

Yours of 23 February, with the sample, came, and part of it is already cooking. Was there supposed to be a locality included that missed our attention? Could you provide?

I am working on the Swiss pub. for you and expect I'll be able to get it from friends in Basel--probably will have to pay, though.

Congrats on the cycad stem. Also, thanks for update on your stratigraphic work in Petrified Forest--we want to be kept informed about that, of course. (I hope Ron has written you in the meantime, but I haven't heard a word either.)

It snowed here today, but I am really pretty stoical about weather--except for great heat, which I don't take too well.

Regards to Shirley and the children.

Yours very truly,

Alfred Traverse  
Visiting Professor

AT/et



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

February 23, 1981

Dr. Alfred Traverse  
c/o Dr. K. J. Hsu  
Geologisches Institut  
E.T.H. - Zentrum  
Senneggstrasse 5  
CH-8092 Zurich, Switzerland

Dear Al:

Thanks for your recent letter. I am glad to hear that you are enjoying your stay in Switzerland. In my previous letter I promised to send you a Pennsylvanian/Permian sample from New Mexico but I never got around to picking out one until just now. I have a lot more of this material if you should need it. I hope it contains some useful palynomorphs.

I have just run on to the name of a Swiss publication which I would like to obtain. I would appreciate it if you could let me know where I could write for the publication. Or if you could obtain it for me I would be happy to reimburse you for your efforts. The publication in question is: Appert, O. 1973. Die Pteridophyten aus dem Oberen Jura des Manamana in Südwest-Madagaskar. Schweiz. paläont. Abh., Basel, 94: 1-62, 90 pls.

I finally finished my report on the cycad stem from the Petrified Forest which I have been working on for some time and have sent it off to the AJB. Now at last I have time to work on some of the other fossils in my collection. I plan to return to the Petrified Forest during either late spring or early summer and complete my stratigraphic section of the Park so that we can work out the sequence of the micro and mega floras. I thought I had enough information to do that already, but I have discovered that there are some holes in my data.

For a time it looked like winter in Switzerland around here but most of the snow has now disappeared except from the higher elevations. Fortunately this winter has been relatively mild. I'll bet you are pretty sick of snow by now.

Best wishes to you and Betty.

*Travis*  
*Birkhimer*  
*185-*

*cheers!*

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld  
Enclosure



Ecole Polytechnique Fédérale Zurich  
Institut de Géologie

16 January, 1981

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403 USA

Dear Sid:

Yours of 5 January just came. I just finished two letters in German, so I could be a little "verwirrt" (Betty shouldn't complain--I'll type the German myself). I really have enjoyed your letter and the enclosures--you are such a good and interesting friend!

Keven Padian is brand new to me, though he apparently knows all about me. The VP people are a close bunch--all know each other. It is obvious from his letter that he is a typical VP "go-getter". (As I told you in October, my impression is that you can't be a more or less diffident VP man--you would never get anywhere. Pollen and spores are a cinch, comparatively!) I agree heartily with all that you say--I would think that we can all help each other. (I only wish Dunay and Fisher had been so polite, forthcoming and helpful!)

Yes, we'd like to get in on the Permian (?) problem. Sounds for all the world like the Dunkard. I suppose you have seen the volume for the White Symposium at Morgantown of some years ago? I recall that Callipteris was not accepted by some as proving Permian age. Hans Bode, who spoke, I seem to recall, did back Permian age on that basis?--or is it that he didn't accept it? I can't recall. You say you've sent a sample--do you mean here? That would be good, because Betty is working in the lab, and we actually are making more progress on that sort of thing here than we do at home. I am sorry that you haven't heard from Ron, and I intend to poke him up a bit on that. However, I have to confess that I haven't heard anything either! As of mid-November, when I left, he was working away on his Chinle stuff with enthusiasm.

It is hard to believe Ogden could be foggy. In one respect Zürich reminds me of Ogden. We live a couple of hundred meters above the city. This a.m. it was snowing hard where we live, but simultaneously raining with a little snow mixed in in the city.

All the best to you, Shirley and the children for 1981.

Yours very truly,

Alfred Traverse  
Visiting Professor



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES-  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

January 5, 1981

Dr. Alfred Traverse  
c/o Dr. K. J. Hsü  
Geologisches Institut  
E. T. H. - Zentrum  
Sonneggstrasse 5  
CH-8092 Zurich, Switzerland

Dear Al:

Happy New Year from Zion! I presume that you two are settled in now and getting adjusted to your new situation. Enclosed with this letter are copies of some correspondence concerning the proposed work of Kevin Padian in the Petrified Forest. As soon as the authorities at Petrified Forest received his request they contacted me to see how we felt. As you can see from my letter it appears that there won't be any conflict and, in fact, we may be able to gain something. After reading the enclosures, I hope you will agree.

In a separate package I am sending you a couple of small specimens from the Pennsylvania/Permian locality in New Mexico which I mentioned last summer. Enclosed with this letter is a copy of a preliminary report of this locality. Barry Kues, one of the authors of the report, plans to submit a proposal to NSF to support a detailed study of the locality. He anticipates hiring a number of consultants to work on various aspects. For example, I will work on the plants possibly in conjunction with Don Tidwell and if you are interested, presumably you would be hired to work on the pollen and spores. One of the major problems with the locality is its age. Perhaps if you run the samples you could help with that problem. The plant fossils include a few specimens of what appears to be Callipteris. Thus I lean toward an early Permian age.

Anyway ~~those~~ <sup>the samples</sup> that are ~~enclosed~~ <sup>being sent to you</sup> may give you something new to play around with in case you need something for that. *Sounds like your hand*

I haven't heard from Ron Litwin, but I presume he is busy catching up on his studies and so forth. I certainly look forward to cooperating with him on our Chinle project.

Page 2

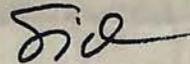
Dr. Alfred Traverse  
Switzerland

January 5, 1981

We had a nice quiet Christmas here in Ogden. The winter hasn't been too bad as far as snow goes, but we have had about a month of fog during <sup>which time</sup> many days ~~of which~~ visibility was down to 100 feet or less. Such fog is quite unusual for this area. In fact I believe the Salt Lake Airport was closed more than it was open during the last several weeks, and it is still foggy outside although one can see about a quarter of a mile now.

Best wishes to you and Betty.

Sincerely yours,



Sidney R. Ash  
Chairman

SRA/ld  
Enclosures

Dear Dr. Ash:

I see our letters crossed in the mail. I should have written sooner. Please chalk it up to the crutch left by a new faculty member in the first term. Anyway, I hope you've received the material I sent you and that it will answer most of your questions satisfactorily. If not, I'll be happy to clarify further. Incidentally, we're undertaking this study in conjunction with a similar one in the Yarenski. For which Bruce Cooper has kindly agreed to analyze preliminary pollen samples, as well as from the Yarenski, on which he has already worked. I really don't know of any palynological studies of the Yarenski, but it's not my field. The work certainly needs to be done. Is anyone doing it now?

Sorry again for my non-response, and best wishes,

Kevin Pydine  
Assistant Professor

(413)-642-7434

Dear Dr. Ash:

23 December 1980

I see our letters crossed in the mail. My fault: I should have written sooner. Please chalk it up to the crunch felt by a new faculty member in the first term. Anyway, I hope you've received the material I sent you and that it will answer most of your questions satisfactorily. If not, I'll be happy to clarify further. Incidentally, we're undertaking this study in conjunction with a similar one on the Kayenta, for which Bruce Cornet has kindly agreed to analyze preliminary pollen samples, as well as from the Moenave, on which he has already worked. I really don't know of any palynological studies of the Kayenta, but it's not my field. The work certainly needs to be done. Is anyone doing it now?

Sorry again for my negligence; and best wishes,

(415)-642-7434

*office phone.*

*Kw*  
Kevin Padian  
Assistant Professor

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF PALEONTOLOGY

BERKELEY, CALIFORNIA 94720

19 December 1980

Dr. Sidney Ash  
Weber State College,  
Ogden, Utah 84408

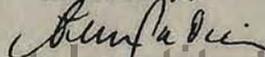
Dear Dr. Ash,

Recently I spoke with Roger Rector at the Petrified Forest about a permit to collect matrix samples from the quarries excavated by the University of California during the 1920's and gave him some idea about our aims in returning there. In his letter of reply to me, a copy of which he forwarded to you, he mentioned only that we were interested in collecting palynologic samples and notes that you and Dr. Traverse are already engaged in this study. Far from wishing to duplicate or compete with your work, I think you will see from the enclosed statment of purpose that we are interested in completely different things that can only complement each other's aims. As I state in our application, we want palynologic samples only for our records, which we would like to be as complete as possible from these horizons.

Although you don't know me, I'm familiar with your work on the plant remains from the Southwest. I have just recently taken this position at Berkeley, having completed my doctoral thesis at Yale under John Ostrom and Keith Thomson. I have worked in the Newark Supergroup with Paul Olsen, who knows you and Dr. Traverse quite well, and who has asked me to assure you on his behalf of the mutual benefit to be derived from cooperation on these projects. Paul and I still work quite closely on a number of things and he will be accompanying us out to the Southwest at the end of the summer. Actually I had thought several times about contacting you before this in hopes of having you analyze some samples of matrix brought back with some of our best vertebrate specimens from the Chinle here at Berkeley, but I've just been so busy since I got here that many things have slipped past me. At any rate, I wanted to assure you that we are not interfering with your research, to give you some idea of our own aims, and to take the opportunity to ask for copies of your publications if any are available. I have read and profited from your study of the Lake Ciniza beds in BYU Geol. Studies and would be interested in any other work you may have done.

Thanks for your help, and I look forward to hearing from you.

Sincerely,

  
Kevin Padian

APPLICATION FOR PERMISSION TO COLLECT  
SPECIMENS OF PLANTS, ROCKS, MINERALS, AND ANIMALS

Name of Area Petrified Forest National Park, Arizona 86028		Date 19 Dec 1980
Name of Applicant Kevin Padian (Dr.)	Home Address 937 Creston Road, Berkeley, CA 94708	
Representing (Name of Institution) Dept. of Paleontology, University of California, Berkeley, CA 94720		
Type of Specimens to be Collected Sedimentologic and paleontologic (fossil matrix, pollen and vertebrates)		
Class of Collecting* <input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class B	Check for Class B Permit <input type="checkbox"/> Paid Employee <input type="checkbox"/> WOC Collaborator	Period of Collecting From Aug 1981 To Dec 1981

Reason for Collecting  
To check and verify locality data from sites previously collected by UC expeditions; to augment these collections with samples of matrix, fossil pollen and other material.

Place Where Specimens are to be Deposited  
Museum of Paleontology, University of California, Berkeley, Ca 94720

I, the applicant, having read the conditions on the reverse of the permit relating to collections in areas administered by the National Park Service, agree that, if the permit is granted, I will comply with all the conditions stated therein.

Signed *Kevin Padian*

TO BE FILLED IN BY ISSUING OFFICE ONLY--DO NOT WRITE BELOW THIS LINE

Approved for Collecting Following Specimens		Class
Locality of Collecting Limited to		Expiration Date
Special Conditions or Restrictions		
Recommended by (Signature and Title)	Approved By (Signature and Title)	Date Approved

United States Department of the Interior  
National Park Service

COLLECTING PERMIT

CLASS

In Accordance with the Conditions and Restrictions Appearing on the Back Permission is Granted

Name of Collector	Area	Date Issued
To Collect the Following Specimens		
Locality of Collecting Limited to		Expiration Date
Special Conditions or Restrictions		
Approved (Signature)	Title	

\* Two classes of collecting may be conducted under this permit:

Class A - That required for public exhibits and for research undertaken by persons who can establish their connection with public museums or other scientific or educational institutions. Specimens collected may be insects (Hexapoda), spiders (Araneida), plants, rocks, or minerals, as designated in the permit.

Class B - That undertaken by Federal employees only for scientific or educational purposes. Specimens collected may be plants, rocks, minerals or animal life as designated in the permit.

The collecting of endangered or vanishing species of animals, if permitted at all, will be allowed only where the required approval has been obtained from the Director of the National Park Service

THIS PERMIT MUST BE CARRIED AT ALL TIMES WHILE COLLECTING. SEE REVERSE FOR CONDITIONS AND RESTRICTIONS.

## SUMMARY OF PROPOSED RESEARCH IN PETRIFIED FOREST NATIONAL PARK

In the years 1921-1926 the Museum of Paleontology of the University of California, under the direction of Charles L. Camp, made expeditions to the Petrified Forest of Arizona to collect vertebrate fossils. Their efforts resulted in an extensive collection of fossil reptiles and fish, including phyosaurs, aetosaurs, other thecodonts, undescribed reptiles, and possibly dinosaurs, and formed the basis for our understanding of the vertebrate faunas of the Upper Triassic in the Southwest. This material, housed at UCMP, is currently being reorganized and described, and the localities and horizons restudied in order to gain a more precise understanding of the microstratigraphy of the Chinle Formation, to which the horizons in Petrified Forest National Park belong. We are requesting permission to return to the Park and collect more fully the horizons where work was begun almost sixty years ago -- not simply to get more of the same, but to deepen the dimensions of our understanding of Chinle faunas and their evolution by studying new and different components of the paleontological record.

Horizons of the Chinle Formation can be characterized by the presence of particular species of the crocodile-like phytosaur, Rutiodon. The lowest occurrence of Rutiodon is in the St. Johns area of Arizona, where the species is called zunii. Three higher stratigraphic levels are known within the Petrified Forest, named after Rutiodon adamanensis, lithodendron, and tenuis. R. zunii is not known from the Petrified Forest, and the other three taxa are not found in St. Johns. We have the beginnings, therefore, of stratigraphic divisions within the Chinle Formation; the localities and horizons are recorded in the archives of the Museum of Paleontology. In recent years a number of techniques have been developed to bring stratigraphic correlation to a much finer scale, and in so doing to enrich knowledge of the flora and fauna of these paleoenvironments. One very productive technique, of course, is palynology: fossil pollen is considered the most reliable indicator of correlation used thus far in the horizons of the Southwest, as well as

in contemporaneous sediments in other parts of the world. Another extremely productive technique, just beginning to be employed on a large scale, is screenwashing of sediments in which small vertebrates and small fragments of larger vertebrates are likely to be found. In the Chinle Formation itself several thousand such specimens have been recovered from the UCMP Placerias quarry and the nearby Downs quarry of the St. Johns area. These microvertebrates were described by Jacobs and Murry (1980) and the entire collection was donated to UCMP, where it is currently under more intensive study in conjunction with our work on the megavertebrates of the St. Johns and Petrified Forest localities. More recently Jacobs (1980) screen-washed a very small sample of matrix from the Petrified Forest in which a phytosaur tooth had been found; he recovered half a dozen vertebrate taxa previously unrecorded in the Park from this tiny sample alone. The potential for further study of these horizons is difficult to overestimate; since the most complete collection from the Petrified Forest of megavertebrates, complete with locality data, is housed at UCMP, we are in an excellent position to carry out further evaluation of these horizons and to curate and provide to the Park information about its natural riches. Coupled with our ongoing study of the St. Johns region, and our study of similar aspects of the overlying Kayenta Formation, to be carried out in conjunction with Harvard University at the same time, we hope to develop a picture of faunal evolution in the Lower Mesozoic of the Southwest in much fuller detail than ever before possible.

This is what we would like to do in the Petrified Forest during 1981. In late August and early September we will be taking a crew of faculty, staff, and students to Mesozoic horizons of northern Arizona previously worked by expeditions from the University of California. Leading this tour will be Dr. Sam Welles, who has had over forty years of experience prospecting the horizons of the Southwest. Our aim will be to recover locality data and reconnaissance information about these localities for the Museum records, so that the knowledge of our collections can be richer and therefore more useful to researchers. We would like to spend several days in the Petrified Forest finding and mapping old localities, all of which are

well off the main roads and will pose no obstruction to visitors. From these localities we would also like to take a limited number of samples of the matrix types, of sediment likely to contain fossil pollen, and of sediment capable of being screen-washed for possible recovery of microvertebrate remains. The first two kinds of samples are being collected only for the purpose of our records; we are at present not involved in sedimentologic study of the Chinle, and the palynologic study is already in the good hands of Drs. Ash and Traverse. We wish mainly to enrich our locality data through both mapping and sampling, and to begin an intensive screen-washing program of Chinle horizons by taking preliminary samples of matrix likely to yield microvertebrates. Finally, we would like to keep an eye out for macrovertebrate remains which may have weathered out since the horizons were last prospected; however, we have no intention or desire to initiate large-scale excavation of vertebrate remains. We are asking permission to carry out these researches over the period of several days in late August or early September 1981, with the possibility of one or two people returning for a few days later in the Fall after other localities outside of the Park have been visited, for comparative purposes.

The members of the team who will be making this trip are as follows. The research is under my general supervision as Assistant Professor of Paleontology and Curator of Lower Vertebrates. Dr. Sam Welles, Senior Museum Scientist Emeritus, will lead the trip and it is his vast knowledge of these horizons that we hope to use and preserve for future research. With us will be Robert A. Long, of our Museum staff, who has for many years been studying intensively the vertebrate faunas of the Chinle; David Foster and Jim Clark, two graduate students working on the sedimentology and faunal stratigraphy of the Kayenta; Michael Morales, a post-doctoral fellow working on the Moenkopi vertebrates; Paul E. Olsen, a graduate student at Yale University, who has worked for many years on the Newark Supergroup of Eastern North America, horizons contemporaneous with the Southwestern formations we will be visiting, and who has been a close associate of mine for five years;

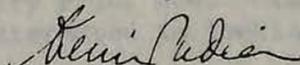
and Will Downs, preparator at the Museum of Northern Arizona, whose expertise in these areas is already known to you. I would, therefore, like permission to explore the Park's horizons to be extended to these people, with the understanding that they have a deep commitment to study these areas and that it is not simply a field trip for a school class, despite the fact that there are eight of us. Welles and Long may wish to return on the way back from other areas for a brief period.

In the past, the Museum of Paleontology and the Petrified Forest have had good cooperative working relations, and the phytosaur mural in the Park's interpretative center was executed at Berkeley during the 1930's. With our reopening of study of the Park's fossil horizons at an even finer level, we stand in a very good position to provide the Park and the scientific community in general with a much better understanding of the life of the Late Triassic. During our upcoming study of the Park we hope to discuss with you other ways of making this cooperative venture of fuller benefit to both of us.

If you would like to contact people who know of our intentions and our work in this area, I suggest you call Lou Jacobs in the Geosciences office of the University of Arizona at Tucson, and Will Downs at the Museum of Northern Arizona. Dr. Charles A. Repenning of the U.S. Geological Survey at Menlo Park, California, and Dr. Nicholas Hotton III of the Paleobiology Department of the U.S. National Museum in Washington, are two other references in governmental agencies who will offer support for our project.

Thanks very much for your help.

Sincerely,

  
Kevin Padian

Assistant Professor of Paleontology and Curator of Lower Vertebrates  
Department of Paleontology and Museum of Paleontology,  
University of California, Berkeley, CA 94720

December 29, 1980

Dr. Kevin Padian  
Department of Paleontology  
University of California  
Berkeley, California 94720

Dear Dr. Padian:

Thank you for your card and letter telling me about the work you propose to do in the Petrified Forest area. As I noted before, Al Traverse is in Switzerland so I am unable to discuss your project with him. However, I will forward copies of our correspondence to him so that he is aware of what is going on.

From what you say it seems to me that our projects will not conflict or duplicate each other. In fact they may dovetail together quite nicely. For example it would be interesting and useful from our point of view if we could study the pollen and spores at Camp's vertebrate localities in the Petrified Forest area and tie that data in with those which we obtain in the rest of the Park. Of course it may be that there are plant megafossils associated with the vertebrate remains. Therefore, I would like to visit Camp's localities sometime. It would probably be best if I could join you there next summer and have you guide me to them.

You might be interested in knowing that I have been working for some time mapping the geology of the Park in order to locate the relative stratigraphic positions of my fossil plant localities. It would be useful also if I could plug in the more important vertebrate localities into this study.

As far as I know, no one is working on the Kayenta and Moenave plant fossils at this time. However, eventually Al and I hope to move into those units after we get the Chinle under control. That is, unless you should have other plans for that part of the sequence.

You mention in your research proposal that R. A. Long will be working with you next summer. Is he at Berkeley at present? The reason I ask is that I sent him a collection of vertebrate materials from the Chinle in southeastern Utah some time ago for identification. He never has acknowledged receipt of the material or identified it and the thought has occurred to me that he might be out of the country right now. Since you are also interested in Chinle vertebrates you might be interested in looking at the stuff yourself.

Page 2

Dr. Kevin Padian

December 29, 1870

Enclosed with this letter are a few reprints of my own work which might be of some interest to you. I have a chapter in the forthcoming book Biostratigraphy of Plant Fossils which may be of interest also. I will send you a reprint of my chapter when they become available.

It seems to me the work of Al Traverse and myself on the biostratigraphy of Upper Triassic plant fossils should compliment your work. Thus, I think it would be of mutual benefit if we can cooperate on our research.

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld  
Enclosure

KEYSTONE  
LODGE

10/20/80

Al -

Hope you and Ron had  
a safe journey home.

Appreciate you letting me see  
the proposal.

Good luck on your trip  
to Switzerland.

Sing

Sid

15 September, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Thanks for the phone call of earlier today. We're still firm on arrival in Alb. 3 October, though it could be latish!

Ron is working away with dissections, light and SEM photos, etc.

Enclosed is the vita you wanted. As you can see, I am just sending you a xerox of "the lot", and you can extract what you need.

See you in "White Oak"!

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
encl: copy of vita



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES-  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

9/3/80

Dear Al

Just received your letter of August 26. As I was just getting ready to send out the enclosed reprints I thought I'd drop you this note also.

I thought I had told you about the BYU thing - any case here are the reprints. I just started sending them out.

I'll see that you have a bed in Albuquerque on the 3rd. The talks are firm and am looking forward to hearing them myself.

Although the Holiday Inn in Albuq. is right next to I40 it is difficult to get to. I suggest that you follow this route: Exit I40 at Carlise interchange to the right (north). Drive north on Carlise a block or two and then turn left (west) on Menaul Blvd. There are stop lights here. Go about a mile and half west on Menaul to Holiday Inn (on left). If you miss the Carlise interchange

#1 Best route

#2

you can exit at the ~~next~~ interchange after the next one (to the right) right (north) to Menaul and then turn east

and go about a mile to the Holiday Inn  
which will be on the right. ~~Or you could~~

If you go this way stay on I40. Or you

#3  
the worst  
route

could go north on I25, get off at the first  
exit (Candelaria) and double back to Menaul  
and the Holiday Inn. Perhaps the enclosed

map will assist you. The entrance to the

Holiday Inn is off of Menaul so you

have to get on that street one way

on another. Good luck. By the way the

Carlise Interchange is about  $6\frac{1}{2}$  miles <sup>west</sup> from

the Mountain you'll pass through before

you get to Albuq.

If you come south from Santa Fe  
your best bet is to Exit onto I40 (going  
west) and get off as in route 2 and go  
to Menaul

best wish

Sid

Ash

26 August, 1980

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Thanks for yours of 12 August. Egad--how did it take 10 days to get here?

Your itinerary looks fine. We'll arrive in Albuquerque on the evening (late?) of the third (3-x-80). You'll have a 2-bed double reserved for Ron and me, I suppose. This poses no problem--will keep to a schedule that'll get us there on the 3rd!

I note that the 5th has a ? on talking to Park personnel--you mean it's not firm? I planned to talk on "Triassic palynomorphs of North America". My talk for the Weber Geology Club will be: "Black Sea Paleopalynology by Glomar Challenger". O.K.?

Keystone is in greater Denver. I presume you have more data now from Nichols.

I have perused the map--reminds me--I am assuming you will bring whatever detailed maps we need?

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: Ron Litwin

WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84403  
801-626-8207

7/18/80

Dear Al

26 August, 1980

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

How come you never told me about BYU Geology Studies 1978 with your paper and Stone's paper, etc.?--or did you tell me? Anyway, have quickly ordered one!

See you in Albuquerque on the 3rd of October!

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

I suggest that you look at the samples from the SW and describe which localities you would like to see the most. I suggest that we meet in Amarillo, Texas and visit the Sauvignac locality near Canyon. Then drive west stopping at Ft. Wingate and Petrified



WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

7/18/80

Dear Al

Just a quick note to acknowledge receipt of your letter and to let you know I'm still alive.

We spent most of June visiting relatives in NM, Ariz and Colo. While down here I did a little work, especially in the Petrified Forest. After getting back to Ogden I taught for a week and have just started to do a bit of research. I won't get far with that, however, as I go to Mexico City <sup>on Sunday</sup> to give a paper at the IV Coloquio Sobre Paleobotanica y Palinologia. Hopefully I'll be able to devote most of August to our project.

I suggest that you look at the samples from the SW and decide which localities you would like to see the most. I suggest that we meet in Amarillo, Texas and visit the Saumiguella locality near Canyon. Then drive west stopping at Ft Wingate and Petrified Forest. Then we could go north and visit



Capitol Reef and/or the Early Jurassic  
locality in northwestern Arizona, <sup>from</sup> where Cornet  
identified Early Jurassic spores/pollen from the  
Moencave Fm. There are lots of other  
localities we could visit in the same  
area. After you have decided which ones  
we must visit then we can decide  
which of the other localities we can  
also visit.

Best wishes

Sid

P.S. I tried to call you a couple  
of times this week but I didn't  
get any response.

13 August, 1980  
14 August, 1980

Dr. Sidney R. Ash  
Department of Geology and Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Just a thought--please make reservation (2 bed, double) in Albuquerque when you get there for Ron and me for the night we need it (4 October, I guess?). According to my notes, we meet you at the Holiday Inn that night.

Best wishes.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

13 August, 1980

Dr. Sidney R. Ash  
Department of Geology and Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Just phoned Doug Nichols and corroborated that AASP meeting doesn't really begin until 15 October, so we needn't arrive until evening of 14th.

I am sending in Ron and my pre-registration, request for accommodation, etc. It occurred to me that I had better check with you to be sure you're making such arrangements for yourself? You could get the appropriate blanks, etc., from Doug Nichols (USGS, P. & S. Branch, Federal Center, Mail Stop 919, Box 45046, Denver, CO 80225). He just told me that he knows your niece, Debby (?), from Ft. Collins, who also is a "balloon chaser". (I thought that's what he said!)

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

Proposed Itinerary

Ash

Dates	Events
October 3	Meet in Albuquerque and stay there at the <del>Holiday Inn.</del> <sup>Hilton Inn. X</sup>
4	Collect in Ft. Wingate area; stay in Gallup with my father-in-law?
5	Collect in Petrified Forest National Park; stay there; <u>Speak to Park personnel?</u>
6	More collecting in the Park; stay there or in Flagstaff.
7	Visit the Grand Canyon (South Rim); stay at Kayenta (Arizona) Holiday Inn.
8	Visit Monument Valley; stay at Hanksville or Capitol Reef, Utah.
9	Collect in Capitol Reef area; stay there.
10	Collect in Capitol Reef area; stay at Toquerville, Utah.
11	Collect at Moenave locality; stay at Parowan or Panguitch, Utah.
12	Stay in Ogden at my house.
13	<u>Speak to Geology Club; visit Mississippian coal field; stay at Rock Springs, Wyoming.</u>
14	Arrive Denver/Keystone.

8/12/80

At:

Here is the itinerary I propose we follow in October. I gathered from our conversation this morning that it would be okay to meet on the third rather than the fourth. If that is correct it will give us a little more time in the Capitol Reef area than I had originally planned. We won't be going to

8 August, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Closer examination of AASP info convinces me there is no point in arriving at "Keystone" before evening of 14 October. That gives us one more day to work with, I suppose. On the other hand, it will be ~~tdiffcult~~ difficult to get to Albuquerque before ~~the~~ the 3rd of October or so. Most likely this will arrive too late to help you with your planning, but I thought it was worth the effort. I can respond directly to your proposals later.

Best,

Alfred Traverse  
Professor of Palynology

AT/et

7-VIII-80

Tacked w. Lid Feb.

We agreed on meeting time circa of  
October in Albuquerque, NM.

We will work the Ft. Wingate,  
Petrified Forest N. Park, Capital  
Reefs and some other sections.  
Then to Ogden, UT, and on to  
Denver<sup>2</sup> meeting of ASAP, where we'll  
presumably meet Jack Choi and  
bring him back to S.C.??

29 July, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Yours of 18-VII was one of the things on my desk on our return from 5-IPC.

Wish I could be at the "IV Coloquio" with you. But one just can't go to everything, even in palynology!

Now, about our fall field work. Although Bruce's "discovery" is very interesting (I read his paper for him at Cambridge), I don't think we should spend the limited time we have on that. Dunay has, for the moment, probably done enough on the Texas-N Mex. sections. I believe we should go with your earlier proposal for Litwin's thesis-- Arizona, Utah, (Colorado?) sections? See your letter to me of 28 December, 1979. His thesis work should strike into some new areas-- and I really liked your idea of a foothold in the Park sections (already studied to some extent), plus the Capitol Reef sections as "new". But you know more about it than I. I propose to telephone you in a few days after this has soaked in--say, 7 August. It's time to formalize the itinerary, I guess.

Very best wishes, dear friend.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: R. Litwin

1 June, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Just a briefie, pre-5IPC—Betty and I leave for U.K. in a little over a week.

Ron Litwin and I had a very productive visit with Pat Gensel in Chapel Hill. While there we pulled lots of spores off a couple of our specimens from you~~rs~~. We had a good exchange of ideas, and Ron is getting on the tracks for his M.Sc. thesis on the spores (and hopefully more #fom you later).

Did you notice that your peel (slide #3) has many, many bi-saccate (conifer, presumably) pollen grains pulled off from the matrix?! That was an unexpected thrill!

All the best. We're still holding to the idea of driving West in October in a university vehicle.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: Litwin

P.S. By coincidence, a report due in Winter Term (!) just came in from a student (he was ill) on your #27 (see letter of 7 Nov., 1977). One of richest Triassic palynofloras I've ever seen—marvellous stuff! I am turning it over to Ron now—he has the other samples of that series. Perhaps we should go to Capitol Reef Nat. Mon.?

9 April, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Good to get yours of 1 April--I trust the date doesn't mean I should discount it. You were right about Easter. Today (Easter Wednesday) is the first day since March 29 with no church activities. However, as I may have mentioned, I have resigned as vicar effective 1 July, so I am a 'short-time' man!

Latest: Ron and I are taking your ferns to North Carolina on 21 April to spend a day with Pat Gensel learning how to get spores in situ out of 'em most expeditiously and most completely, etc. She is the world's authority. I guess I'll give a seminar while there.

Now re the field work--great news! I guess there are advantages to being chairman, though the idea is appalling to me. For various reasons, I prefer to drive out--before AASP is fine, and we'll plan to arrive at Ogden, or at a rendezvous in the field, as you think appropriate, on the date you suggest. The heart of AASP sessions in Colorado is 16-18 October, so I would think we should be heading from the field to the meeting about the 14th or so. I would think we can justify as many days actually in the field as you deem necessary. So we'll await further word. There's certainly plenty of time. We do seem to be getting into fuzzy focus already.

All the best to you and Shirley and the kids.

Yours very truly,

AT/et  
cc: R. Litwin

Alfred Traverse  
Professor of Palynology



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

April 1, 1980

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

Thanks for your recent letter. Yes, I was beginning to wonder about the material I sent you in February, but I figured you were busy so I wasn't worried. I suppose you are busy with Easter activities now.

I believe that the two samples labeled "2" are from the same locality and are examples of the same species Wingatea.

Your suggestion about some joint field work out here during October seems very practical. I am going to arrange things so that I won't have to teach in the Fall Quarter. Thus my only duties will be administrative and I'll delegate those to someone else for a week or so without any difficulty while we are in the field. I would suggest that we do the field work prior to the AASP meetings because of the weather. I think there is a better chance of it being dry early in October than after the meetings, but then again.... Perhaps you and Ron could fly directly to Salt Lake City on the 4th or 5th of October. Unless we drive all night it takes about a day and a half of normal driving to reach the Petrified Forest so we would have to spend a total of about three days driving. I believe that the key to our schedule rests with you and Ron and how much time you can afford to spend in the field. When I know that and whether you are going to fly or drive out here I can set up a schedule, but there is no hurry about that.

Best wishes to you and Betty for the Easter season.

Sincerely yours,

Sidney R. Ash  
Chairman

SRA/ld

Ash, P. 2

Because of "other obligations" sounds perhaps best for  
not to mention we might have to Ogden, by the way, as  
it would permit us some stopovers enroute for other busi-  
ness.

19 March, 1980

Dr. Sidney Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

It has taken far too long to respond to yours of 12  
February--got caught in end-of-term business, etc. The  
package arrived in apple pie order--except that there are  
two of the ferns--samples labelled "2". Were there two  
"2s"? I snapped a couple of quick polaroid pics of 'em,  
enclosed. We'll hold tight until we hear. You could  
mark photos and return them, if one isn't 2, or if lo-  
calities are different, or whatever. Otherwise discard.  
(Dousy pictures!--we can do better, and will, but this  
was just for your info.)

and Ron is a good man, (and he'll get results from this--  
it is to be hoped well before we all get together. He  
also is working on the small set of your samples I have  
turned over to him, to which PF 12, PF 13a, PF 13b have  
now been added.

Re your Prof. Paper on Chinle Ferns: I guess you mean  
613D, 1969? Yes--I do have one. Neat piece of work.

Now, about the fieldwork--I've had still another  
thought--if Ron and I were to go west in October, we could  
make AASP-Denver (16-18 October) on one set of tickets.  
That would be a good experience for Ron. However, I suppose  
there is a good chance that we're looking at a conflict  
with your WSC obligations--insuperable conflicts? We'll  
wait to hear from you before making any final decision,  
of course. I think it's imperative that we have a few  
days with you in the field, and perhaps if we're lucky you  
could do it even in October by utilizing a long weekend?  
The various itineraries are all o.k., and I would be guided  
by your judgment--the Petrified Forest-to-Salt Lake itinerary,

Ash, pg. 2

because of "other localities" sounds perhaps best for Ron's education? We might drive to Ogden, by the way, as it would permit me some stopovers enroute for other business.

It would be fun if Betty could accompany us--at the moment it doesn't seem likely, but it's not impossible!

Best wishes to all of you.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: R. Litwin  
encl: 2 polaroid pics (overexposed!)



# WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

February 12, 1980

Dr. Alfred Traverse  
College of Earth and Mineral Science  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

Thank you for your recent letter. As agreed I am sending you a few fertile examples of the Chinle ferns for Ron Litwin to work on. My collection of ferns is sadly depleted and I haven't been able to locate a single fertile hand specimen of Cynepteris lasiophora. However I was able to locate a slide preparation which shows sporangia that may contain a few spores. If they are present Ron should be able to isolate them by macerating the peel. If he can't get any spores this way I will try and collect a fertile example this summer. One of the ferns, Phleboteris smithii, has never been redescribed. I had planned to do this someday myself. Perhaps Ron could describe the spores of this species and I could describe the leaf itself and the two of us, and perhaps you if you are interested, could then publish a complete description on both the leaf and spores.

I am enclosing the following fossils:

1. Clathropteris walkeri. Locality PF1.  
\*slide preparations and specimen
2. Wingatea plumosa. Locality FW2
3. Cynepteris lasiophora. Locality FW2 \*Slide preparation.  
(shows sporangia but they may be empty).
4. Phleboteris smithii. Locality PF1.
5. Todites fragilis. Locality FW4. Isolated Sporangia only. No specimens of leaves available. lu  
\*slide preparations consist of an acetate peel mounted in Canada Balsam.

Also I am enclosing three samples of rock from the Petrified Forest for pollen/spore analysis. They are PF12, PF13a, PF13b.

Do you have a copy of my Professional Paper on the Chinle Ferns? If not I can probably resurrect one from my files so please let me know.

Page 2

Dr. Alfred Traverse  
Pennsylvania State University

February 12, 1980

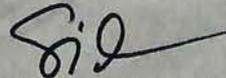
Yes, I can arrange to do some field work with you and Ron in late August or early September. One possible itinerary would be for you two to fly to Salt Lake City and stay with us in Ogden for a day or so after which we could drive south to the Petrified Forest stopping at several localities on the way. Then I could drop you off in either Flagstaff or Gallup and you could fly back from there. Alternately you could ride back to Salt Lake with me from the Petrified Forest and we could stop at other localities on the way and see some of the scenery. A third alternative would be for me to meet you in Gallup or Flagstaff and then bring you two back here if you had time. If you didn't you could fly back from Gallup or Flagstaff. I guess the itinerary depends mainly on how much time and money you want to spend on this phase of the field work. By the way, I'll have a State car which I'll charge to my project so you won't have to pay for that part of the trip. Food and lodging will be another matter of course.

Is there any chance of Betty coming out here with you so she can see some of the scenery we are so proud of?

I will probably be going to <sup>the</sup> Paleobotany Colloquium, which will be held in Mexico City in July. The organizers invited me to give a paper at the colloquium and since I hope to work on the Triassic floras of Mexico, I have decided to go there instead of England.

Best wishes to you and Betty.

Sincerely,



Sidney R. Ash  
Chairman

SRA/ld  
Enclosures

15 January, 1980

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Thanks for your very good letter of 28 December. I have discussed it with Ron Litwin. He is already working on the last batch of samples you sent (in late 1978--ouch!). Of course, he will also have complete access to the slides and residues for the previous Triassic-Jurassic studies here (including a largish number of Ash sples.!). By the way, you have the best nose for probably palynologically productive shales of any megafossil person I've ever worked with.

I think the in situ spore project for Ron would make a fine master's thesis or paper, with a biostratigraphic contribution for his doctorate going along at the same time. So, send 'em on, and we'll get started! I would envision this as involving light and SEM microscopy. I believe we'll also confer with Pat Gensel about techniques, as she is the world's expert on in situ spores/pollen.

We must defer to your judgment about the value of a thorough Chinle study--I suppose, with the Dunay and Gottesfeld studies on the fringes, it would make sense to nail it all down. I believe your suggestion of a Litwin-Traverse-Ash visit to the area makes a lot of sense. The 5-IPC will occupy me until mid or late July, and I will then need to get sorted out. How does the latter half of August sound to you tentatively?

All the best to you all.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
cc: Ron Litwin



*Xerox for R.L.*

WEBER STATE COLLEGE

SCHOOL OF NATURAL SCIENCES—  
GEOLOGY AND GEOGRAPHY

OGDEN, UTAH 84408  
801-626-6207

December 28, 1979

Dr. Alfred Traverse  
College of Earth and Mineral Sciences  
Pennsylvania State University  
University Park  
Pennsylvania 16802

Dear Al:

Thanks for your letter of December 10th and for your Christmas card. Regretfully I never did get around to sending out any Christmas cards myself. Anyway a belated Merry Christmas and Happy New Year to you and Betty.

Yes, my project was also funded in November. However, I haven't done much on it yet. I am happy that you have a new graduate student and I look forward to cooperating with the two of you on our projects. It certainly would be good if the three of us could get together to discuss our projects. I have written some travel expenses into my budget for consultation with you and inspection of Newark collections. Perhaps I can do this during the Spring quarter. On the otherhand, would it be possible for you and Ron to come out here for a short collecting trip next summer? In the meantime, I will send along a few of my thoughts about the directions our research could take and a few more samples.

During the last year I have thought about our projects and it seems to me that our best approach at the beginning would be to devote considerable time to the fossils preserved in the Petrified Forest of Arizona. Not only have most of the pollen and spore studies in the Upper Triassic of western North America been devoted to samples from the Park, but there appears to be a fairly complete section of the Chinle exposed there. Although the basal 100 feet or so of the Chinle isn't exposed there it is in nearby areas. As you can see from the enclosed stratigraphic chart several of the samples which I have sent you in the past came from the park. The lower part of the section has been fairly completely sampled. Next summer I plan to sample the upper part of the section and fill in the gaps in the lower part. There are a few other areas where we could get a similarly nearly complete section of the Chinle Formation, such as in the Fort Wingate area of New Mexico or in the Capitol Reef area of Utah. In both of these areas there are fossil plants and I believe I have sent you samples from them.

Page 2

Dr. Alfred Traverse

December 28, 1979

What do you think about having Ron work on the spores from the Chinle ferns? If he did then he probably would be able to correctly assign those spores if they were observed in other samples. I can furnish fertile examples of most all the ferns if you think this would be a useful project. Please let me know your feelings about these comments.

Best wishes.

Sincerely yours,



Sidney R. Ash  
Chairman

SRA/ld  
Enclosure

*P.S. The attached map & section show where my  
samples have come from.*

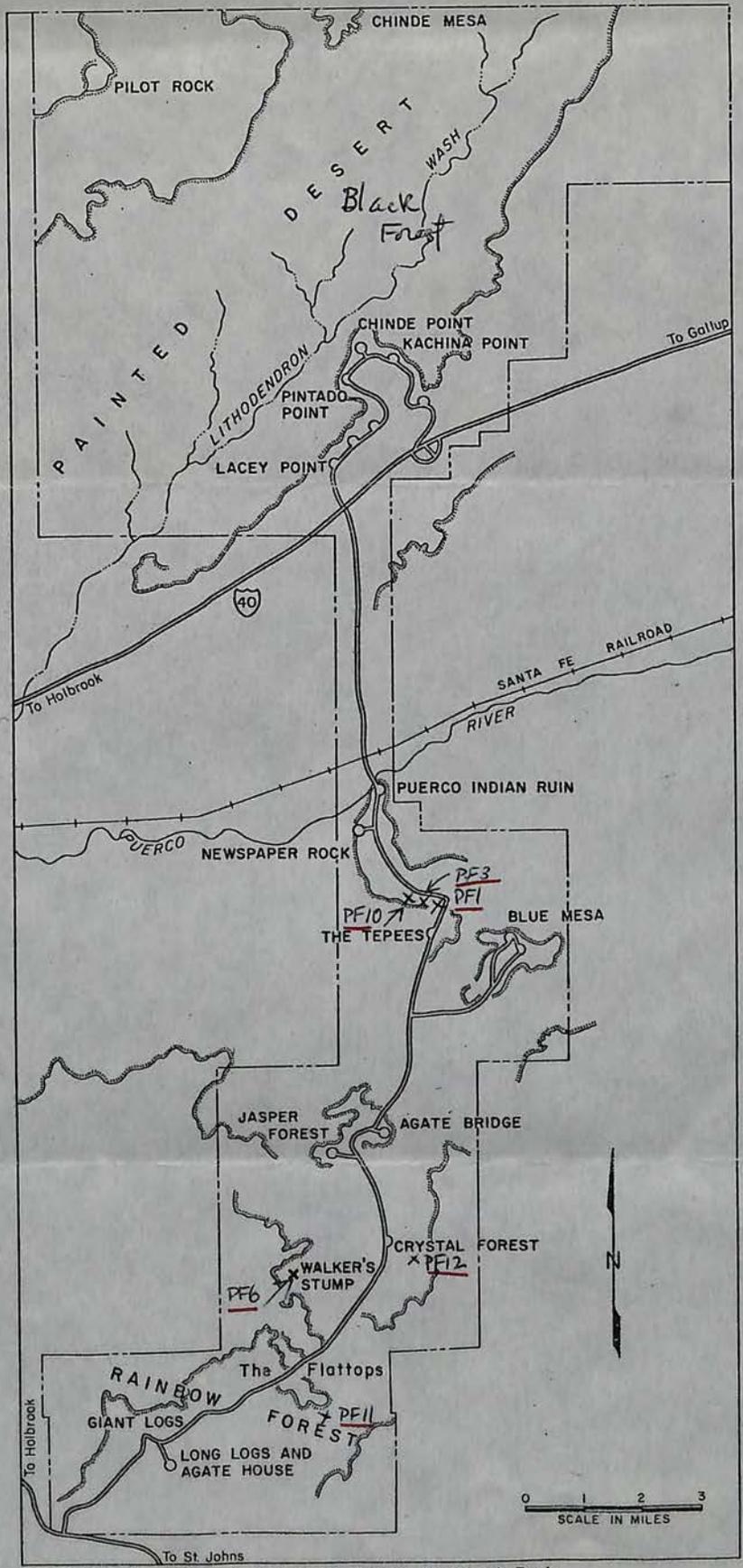
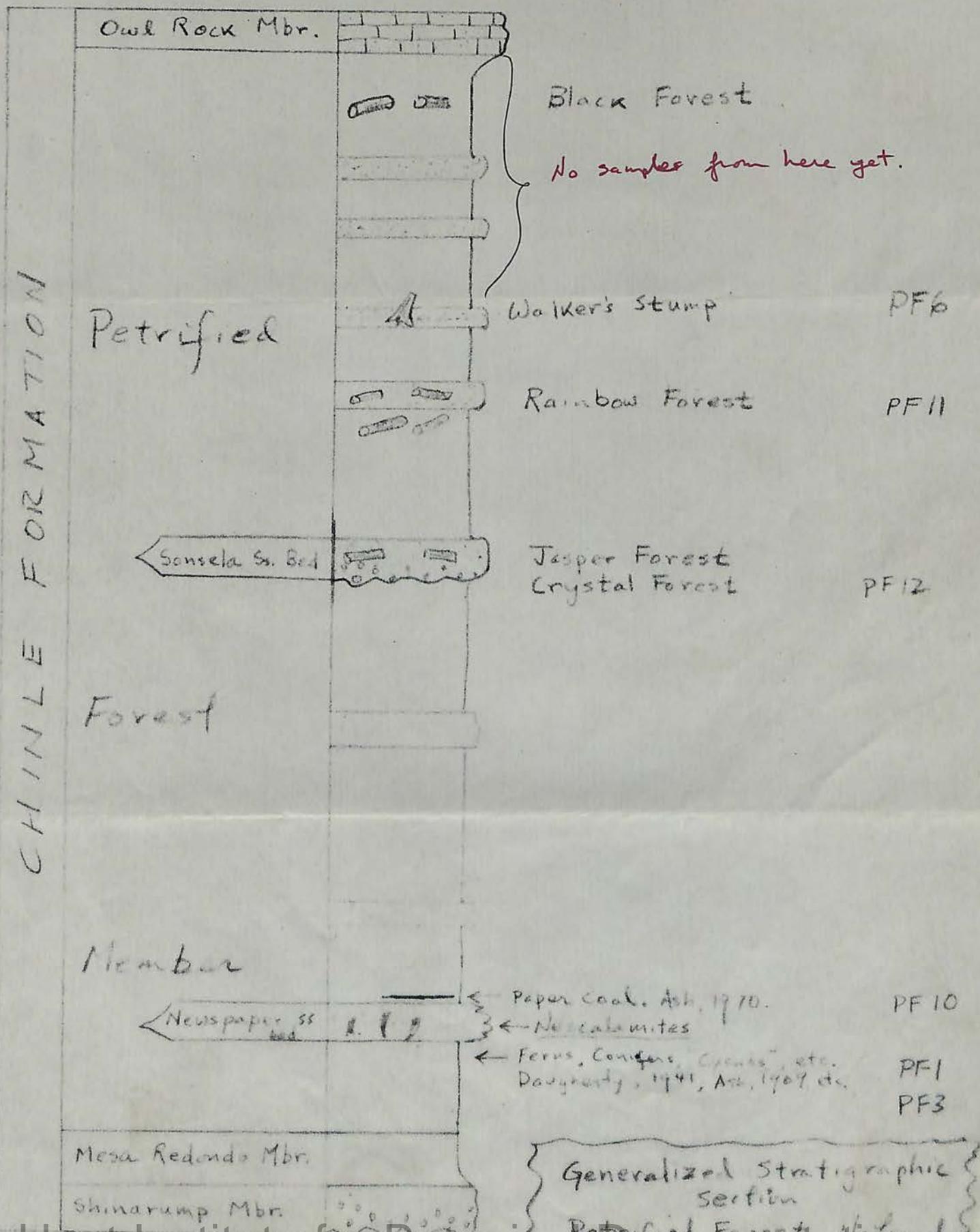


FIGURE 3. - Map of Petrified Forest National Park

— Not to Scale —

CHINLE FORMATION



Black Forest  
 No samples from here yet.

Petrified

Walker's Stump PF6

Rainbow Forest PF11

Sansela Ss. Bed Jasper Forest Crystal Forest PF12

Forest

Member

Newspaper ss (1) Paper Coal. Ash. 1970. PF10  
 Mesosporites  
 Ferns, Conifers, Cycads, etc. PF1  
 Douglady, 1941, Ann. 1969 etc. PF3

Generalized Stratigraphic Section  
 Petrified Forest National Monument  
 Park E., Arizona

XXXXXX

10 December, 1979

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Just a note of information to let you know that I now have a new graduate student, Ron Litwin, who has agreed to be part of the Triassic project. Our funding did begin 1 November, and Ron's arrival for the Winter Term is providential. He's a very good man, and we have talked quite a bit about the directions his thesis work could take. I think you and he and I ought to get together one of these days before too long, and would welcome input from you about that. Perhaps we should arrange to meet in St. Louis, as I have previously suggested, or do you have some other idea? I presume that you also were funded and that we should be moving forward now to get some results for the taxpayers' money. Happiest of holidays to you and your beautiful family.

Yours very truly,

Alfred Traverse  
Professor of Palynology  
Alfred Traverse  
Professor of Palynology

AT/et

AT/et

22 March 1979

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

I got the phone message that came apparently while I was lecturing in historical geology. Regarding the grant--no, I haven't heard a thing. I don't know whether that's good news or bad. I'll tell you this, I can live with whatever they decide to do. There are plusses and minuses both ways. I would like the idea that having the grant would mean that Sid and Al would get together from time to time, as I enjoy your company and would love to see Shirley again too!

Best wishes as always.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/ef

10 October, 1978

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, Utah 84408

Dear Sid:

Half-a-loaf first! I enclose your draft proposal with comments and suggested corrections. I believe the style of the literature references is very important if you wish to maximize my (our?) chances! Both Cornet, Traverse & McDonald (1973) and Cornet and Traverse (1975) were at least as much my doing as Bruce's, so it's fair enough.

By the way, it is nice of Bruce to state that it is o.k. if I wish to continue my interest in the Triassic, inasmuch as I invited him here to be a part of a project I had begun years before (pre-Dunay) he came, when he was playing with model trains. Don't get me wrong. I respect Bruce very much, but he can be damnably presumptuous.

I am now working on my proposal and will get you a draft within a few days.

All the best.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et  
encl: marked up draft

P.S. Your proposal doesn't "plug" me nearly hard enough. I began work in the Triassic when at Texas--Dunay's thesis eventually worked that up--then here with the "Newark" basins. Henry Andrews sent me Cornet to do a Ph.D., and I put him on that. I now have two "Triassic students"--Tavera and Robbins, etc.

9/27/78

Dear Al

Here is a preliminary draft of my proposal. I will wait until I hear from you before I submit this. I'd appreciate it if you'd "edit" the proposal as necessary so that it will match your proposal. ~~and with~~ If you see places where it can be improved please ~~to~~ make the changes.

As I mentioned on the phone the deadline for Earth Science proposals "to be considered for the Jan advisory panel meeting" is Nov. 1. Therefore if we wait ~~it~~ until after the Tempe meetings then it will be too late!

I plan to put the finishing touches on my proposal on the 16th of Oct and send it in later in that week. We hope to mail it on October 20 at the latest.

By the way I talked to Bruce Cornet on the phone the other day (for about an hour - glad he paid for it!). He said he was still interested in the Triassic and wants to get back to it. Also he said there is plenty of room for all of us when

I mentioned that we were thinking of  
submitting a proposal.

best wishes

P.S. Please excuse this crude  
note - ~~but~~ If I wait until this  
is typed it won't go out until  
tomorrow.

Greetings to Betty -

Sid

Ash

RESEARCH PROPOSAL SUBMITTED  
TO THE NATIONAL SCIENCE FOUNDATION

by

Weber State College  
Ogden, Utah 84408

Correlation of continental Triassic rocks in  
North America with plant megafossils

Principal Investigator

Name: Dr. Sidney R. Ash

Title: Professor of Geology

Soc. Sec. No.: 525-46-5472

Dept. Affiliation: Department of Geology-Geography

New or renewal request: New

Proposed starting date: June 1, 1979      Proposed duration: 24 months

Amount requested: \$50,700

Endorsements:

Principal Investigator:

\_\_\_\_\_  
Sidney R. Ash, Professor of Geology  
Telephone number: (801) 626-2607

\_\_\_\_\_  
Date

Dean:

\_\_\_\_\_  
Garth L. Welch, Dean, School of Natural  
Science. Telephone number: (801) 626-6157

\_\_\_\_\_  
Date

Institutional Administration Officer:

\_\_\_\_\_  
Alan J. Dayley, Executive Director, Office  
of Research and Development  
Telephone number: (801) 626-6055

\_\_\_\_\_  
Date

2  
INTRODUCTION

Financial assistance is requested in this proposal to enable the principal investigator <sup>to</sup> ~~to~~ establish closer correlation of the continental Upper Triassic <sup>Lower</sup> rocks of North America than has been yet accomplished. This project will be part of a larger project which will be conducted jointly with Dr. Alfred Traverse of Pennsylvania State University, who is submitting his own proposal at this time. I will base my correlations primarily on a ~~modern~~ detailed study of the plant megafossils which occur in these strata, whereas Dr. Traverse will be studying the associated palynomorphs. All other published data bearing on the correlation of these rocks will also be evaluated. These data will include but are not limited to <sup>those</sup> ~~that~~ offered by vertebrate and invertebrate fossils, paleomagnetism, radiometric dates, and <sup>litho</sup> stratigraphy.

3  
BACKGROUND

Continental Upper Triassic rocks are exposed in five regions in North America. In the eastern part of the continent they are confined to <sup>about 6</sup> ~~some~~ narrow <sup>bounded</sup> fault basins which extend along the Atlantic coast from ~~North Carolina to~~ <sup>to North Carolina (Florida - Georgia is subsurface)</sup> Nova Scotia, ~~Canada~~ and are generally referred to the Newark Group (supergroup of some authors). In the western United States <sup>the</sup> ~~they~~ <sup>are</sup> much more widely distributed and are exposed over large areas in the Colorado Plateau region of New Mexico, Arizona, Utah and Colorado where they are assigned to the Chinle Formation, and the lower part of the Glen Canyon Group, in eastern New Mexico and adjacent areas in Texas and Oklahoma where they are referred to the Dockum Group and in Wyoming where they are referred to the Popo Agie Formation. Smaller exposures occur also in Montana, Kansas and Nevada. Such deposits are exposed at a number of places in the state of Sonora in northwestern Mexico where they are called the Santa Clara Formation and possibly elsewhere in that country (Maldonado-Koerdell, in Reeside et al 1957).

The continental Upper Triassic rock in North America consist<sup>s</sup> principally of red beds and, in places, of small amounts of coal, limestone and basalt. Typically they occur in discontinuous, intertonguing beds which cannot be traced any great distance. General reports on some of them are included with the correlation charts prepared (Reeside, et al 1957) by the Triassic subcommittee of the Committee on Stratigraphy of the National Research Council and with the Paleotectonic maps of the Triassic System published by the U.S. Geological Survey (McKee, et al 1959). The continental Upper Triassic of the Rocky Mountains has been summarized more recently (Mallory et al 1972), and a detailed report on the Upper Triassic rocks of the Colorado Plateaus regions has been published (Stewart, et al 1972). A similar report has been published (Reinemund, 1955) on the Deep River Coal Field of North Carolina.

4

The correlations of the continental Upper Triassic rocks proposed on these charts are based primarily on lithologic similarities, scattered vertebrate fossils and a few collections of plant megafossils. Since publication of these charts, ~~a few~~ palynomorph studies have been used to improve the correlations and dating of several of these units, particularly in the eastern United States (e.g. <sup>Dunay, et Travers</sup> Dunay and Fisher, 1974, Cornet, <sup>Traverse et al. Journal 1973</sup> and others, 1973, Cornet, 1977a). <sup>Cornet & Travers 1975</sup> One of the most significant findings of Cornet, <sup>and his associates</sup> was that the upper part of the Newark Group or Supergroup, which was thought <sup>by most</sup> to be entirely of Late Triassic age is of Early Jurassic age. Also Cornet (in Olsen and Galton, 1977) determined that the boundary between the Upper Triassic and Lower Jurassic in the western United States is lower than formerly thought and apparently lies in the basal beds of the Glen Canyon Group. By using these same studies it has become possible to correlate these units with Triassic in Germany. Recent work by the principal investigator (Ash, 1976, in press) suggests that at least three floral zones based on megafossils are present in the continental Upper Triassic rocks of North America. These were coordinated with the microfossil zones recognized by Cornet (1977) and Cornet and <sup>Traverse</sup> ~~others~~ (1975) in the eastern Triassic and thus correlated with the Triassic of Germany. ?

\* Very important  
"politically" to  
give Traverse as  
much credit as  
as possible here!  
border.  
Cornet et Travers  
1975

5

Although plant megafossils and microfossils occur at many localities in the Upper Triassic of North America rocks they have never been adequately studied in a systematic manner except in a few isolated instances. In fact, most of the work on the plant megafossils in the Upper Triassic rocks in eastern North America was accomplished during the last century as shown below and thus it needs to be thoroughly reevaluated.

The presence of Upper Triassic plant fossils in North America was first reported by Hitchcock in 1823 when he described their occurrence in Connecticut. Later in that century several people worked on the Upper Triassic plants of the eastern United States including Emmons (1856) who described some impressions from North Carolina, Fontaine (1883) who worked on impressions from Virginia and Newberry (1888) who reported on some leaves from Connecticut and New Jersey. Early in the present century Ward (1900) reevaluated the prior work on the Upper Triassic plants of North America, but it was not until quite recently that any significant contributions have been made to our knowledge of them. Following World War II Bock studied the Upper Triassic floras of the United States for several years and in 1969 published a summary of his findings. However, because of his disregard of the Rules of Botanical Nomenclature and his <sup>eccentric</sup> ~~unusual~~ viewpoint, all of his work needs to be completely reevaluated. Of more significance is the work of Delevoryas and Hope (1970-76), who are working on material from North Carolina, and Cornet (1977a, 1977b) who has described a few megafossils from Pennsylvania although he has concentrated principally on palynomorphs.

Upper Triassic plant fossils were first reported in western North America by Simpson (1850) when he noted their occurrence in Arizona. Later Newberry (1876) described additional fossils from New Mexico and old Mexico, Fontaine and Knowlton (1890) described additional material from New Mexico, and Berry (1924) reported on some poorly preserved leaves in the Upper Triassic of Wyoming. In the 1930's a large number of leaves were discovered in the Petrified Forest of Arizona which were subsequently described by Daugherty (1941). Others who have worked on Upper Triassic plants of western North America include Arnold (1956, 1965), Pineda (1961), Gould (1971), Miller (1968) and the principal investigator (1967-1978). Upper Triassic palynomorphs from this region have been studied by Daugherty (1941), Scott (1960), Gottesfeld (1972), ~~and~~ Dunay and Traverse (1971), and Dunay and Fisher (1974).

It has become increasingly apparent in the last few decades that land plants were evolving quite rapidly in North America during Late Triassic time and a number of short ranging forms developed. Many of these also are distinctive and easy to recognize. Examples of these short ranging distinctive forms include Sanmiguelia Brown (1956), Wingatea Ash (1969), Penkinopsis Hope and Patterson (1970), Dinophyton Ash (1970), Eoginkgoites Bock (1952), Leptocycas Delevoryas and Hope (1971), and Compsostrobus Delevoryas and Hope (1976). Consequently it appears that it will be possible to differentiate several floral zones by using these or other distinctive forms which can then be used to correlate Upper Triassic rocks in North America and perhaps eventually with other areas such as western Europe. The correlation with other areas may have to be done primarily with palynomorphs, but the recent discovery of typical Chinle plants in the marine Triassic of western Nevada may allow the correlation of the floral zones with the marine invertebrate zones.

*Needs b. b. Daugherty!*

ANTICIPATED PROCEDURE

During the period covered by this proposal the principal investigator will concentrate his efforts on refining the floral zonation <sup>he has proposed for</sup> of the Upper Triassic strata in the Colorado Plateau region ~~which he has proposed~~ and extending the zones to other areas. To do this he will make additional collections of plant fossils in the upper part of Chinle Formation and lower part of the Glen Canyon Group in southern Utah and northern Arizona and identify them as closely as possible. Also he will identify all of the fossil plants in his collections from that region. Then as time permits he will extend the floral zones westward into Nevada, northward into Wyoming, eastward into Texas, and southward into southern Arizona. In addition he will make preliminary examinations of the Upper Triassic plant fossils from the Newark Group (Supergroup) which are preserved in the U.S. National Museum of Natural History, Washington, D.C. and at the Academy of Natural Sciences, Philadelphia, Pennsylvania. During the second two year period of this project the principal investigator will concentrate mainly on the floral zones in the Newark Group (Supergroup). In the third two year period he will work on the plants in northern Mexico and refine his correlations throughout North America.

When the principal investigator makes collections of megafossils he will also obtain samples <sup>from measured sections for palynological</sup> for pollen analyses by Alfred Traverse. Also he will supply Traverse with samples from all of the localities which he has already sampled. Thus it will be possible to correlate <sup>the palynological records of</sup> my work with ~~that of~~ Traverse's <sup>laboratory.</sup> At all times the principal investigator will correlate his findings with vertebrate and invertebrate fossils, paleomagnetic and radiometric data, and stratigraphic relations of the beds.

EXPLANATION OF BUDGET ITEMS

A-1 The principal investigator intends to devote approximately one third of his time to this project during the academic months from September 1, 1979 to May 31, 1980 and September 1, 1980 to May 31, 1981, as well as full-time during the months of June and July in 1979 and 1980.

A-2f A full-time field assistant will be needed for the field work to be carried on during the project.

A-2g A part-time secretary will be needed for a total of approximately six weeks during each academic year to type the resulting reports.

B. Fringe benefits include FICA, TIAA-CREF and medical insurance on the principal investigator.

C. No major items of equipment are needed for the project.

D. Only a modest sum is requested for the expendable supplies and equipment needed for the project. They include various chemicals, slides, cover slips, photographic supplies and small items of laboratory equipment such as beakers, etc.

E. Funds are requested for about 4 weeks of field work during 1979 and another 4 weeks during 1980 in the southwest. It is estimated that this field work will cost about \$2000.00. Funds also are requested for a trip of about four weeks duration in the eastern United States so I may inspect some of the present collections of Triassic plant fossils in Washington, D.C. and Philadelphia, Pennsylvania. This trip is estimated to cost about \$1000.00. Financial assistance is also requested for the purpose of attending one national professional meeting each year to present some of the results of my research. It is estimated that the trips will cost about \$800.00.

*travel to  
Casita w.  
Traverse  
in part.*

*o.k. - missed this first time around.*  
*At - I'll include a bibliography for the previous paper, a biography ~~of~~ ~~my~~ publications between 1978 & 1980*

- 9
- F. Funds are requested to help cover the costs of publishing the results of the research conducted under the grant.
  - G. It has been demonstrated that Scanning Electron Microscope micrographs are of great aid in studying fossil plants. Therefore, funds are requested to do a limited amount of this work on an SEM at the University of Utah.

#### FACILITIES

Excellent laboratory, storage and dark room facilities are available for this project in the six story, four million dollar science complex at Weber State College. All major items of equipment needed for the project, except for a Scanning Electron Microscope, are available in the Department of Geology and Geography at Weber State College. A Cambridge Stereoscan Scanning Electron microscope is available for use in the project at the University of Utah which is about 30 miles from Ogden.

#### STRUCTURE OF THE INSTITUTION

Weber State College is a tax-supported, four year, liberal arts college with a present enrollment of about 9,000 students. Approximately 10-12 baccalaureate degrees in geology are given annually. The faculty in geology is composed of four members, all who have earned the Ph.D. degree.

#### OTHER SPONSORS

This proposal has not been submitted to any other possible sponsor.

21 September, 1978

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

It is my current plan to attend the AASP meeting in Phoenix after all--you know, late October. Is there any chance we can get together then? Just thought I'd better keep you advised of my movements. I seem to recall that at one point you thought you might attend.

Looking forward to hearing from you and perhaps seeing you, and with best wishes, I am

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

18 August, 1978

Dr. Sidney R. Ash  
Dept. of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

Thank you so much for your nice letter of the 15th of August. It got here in only three days. Perhaps you pre-dated it!?

I'm glad to hear that your administrative duties are slacking off a bit. I am certainly grateful that I don't have any of that.

I will see that Carmen gets the reprint that you sent. Her last name is Tavera--pretty close to an anagram of Traverse! She is at the moment on vacation with her three kids somewhere out your way. For all I know, she'll pop in on you when you least expect it. In fact, if I had had the presence of mind I would have suggested it, as she probably in reality will not have the nerve to come, although I think Utah is on her itinerary. She and I should certainly get out a paper along with Fournier on that core material. It is important, as Fournier knew. The difficulty is that I was hopeful that Carmen would use it as the basis for a Ph.D. thesis in paleopalynology, but I never could persuade her that that was a feasible project. Therefore, we are trying to work it up out of our back pockets as it were, and it is taking much too long. In fact Fournier is getting rather impatient with us.

Regarding the Phoenix meeting in October (not Tucson--if you do decide to go please go to the right city!--I at the moment can not decide whether to go or not. I am flat out of travel money, and that is an awfully long trip to pay for out of my own pocket. I suppose the probability is that I won't go. We may have to revert to plan A--to rendezvous in St. Louis! I have a place to stay there, and could probably arrange one for you, so all it would cost us basically would be rail fare, and that is quite cheap (less than \$100 round trip for me). Anyway, keep in touch. Best wishes to Shirley and the kids.

Yours very truly,

Alfred Traverse  
Professor of Palynology

16 August, 1978

Dr. Sidney R. Ash  
Department of Geology & Geography  
Weber State College  
Ogden, UT 84403

Dear Sid:

I'm enclosing a xerox copy of a recent communication from George Fournier which should be of interest to you in connection with questions you brought up when you were here. Indeed, it was in response to your visit that I wrote George and provoked this letter. He says in his letter that "the name Dockum has been dropped"--but the enclosures do not seem to confirm this as far as the High Plains, Northwest Texas, etc., are concerned. What do you think of all of it? Best wishes as always. Let's keep plugging away toward a common Triassic project. I still am interested. Regards to Shirley.

Yours very truly,

Alfred Traverse  
Professor of Palynology

AT/et

encl: xerox of letter and enclosures from Fournier

8/15/78

Dear Al

No I didn't fall off the end  
of the world after I left Huntington  
in June. I've just been exceedingly  
busy with teaching and ~~administering~~<sup>administering</sup>  
this \*!#! department. Thus I haven't  
had time to keep up with my  
correspondence or to write proposals.  
Summer school is now over, however, and  
I'm <sup>now</sup> trying to catch on my correspondence.  
Later I'll tackle our proposal.

Your graduate student Carmen asked  
me for a copy of the enclosed report  
but I don't remember her last name so  
I'd appreciate it if you'd give <sup>it to</sup> her.

~~the enclosed~~

Will you be attending the AASP meeting  
in Tucson in October? I'd like to but I  
don't think I'll be able to myself - it

would be good if we could get together  
on the proposal at that time.

more later

Sid

ASH

P.S. I really think you ~~and~~

Carmen should consider publishing  
a note on the microflora ~~you~~ <sup>she</sup>  
got from the core she has been  
working on — from <sup>the</sup> Waco, Texas area.  
As far as I can determine no  
one has actually <sup>had fossils to</sup> correlated ~~the~~ the  
Gulf Coastal sequence with the Triassic  
sequence in West Texas (at least such  
correlation has not been published.)

cheer