Wrote Metropolitan 7/9/69

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY 08540

SCHOOL OF HISTORICAL STUDIES

Mai 18. 69

Dear Miss Ralph

This is only to inform you that my wife and I plan to come to Philadelphia next ~~our~~ Tuesday (May 20) in order to visit your Museum. By that opportunity I hope to see you, if you are there, and discuss on the plans of Elis you kindly sent to me.

Sincerely yours

N. Yalours

Metropolitan Museum YALOURS

האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

INSTITUTE OF ARCHAEOLOGY

המכון לארכיאולוגיה

DEPARTMENT OF ARCHAEOMETRY

August 30, 1976

Dr. E.K, Ralph
The University Museum F1
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pa. 19174

Dear Dr. Ralph,

I am engaged in neutron activation work at the Institute of Archaeology of the Hebrew University. I will be in the Philadelphia area in early October and would like to take the opportunity to visit MASCA and, if there is interest, perhaps give an informal talk on some work which I am engaged in. The work concerns the inter-comparability of neutron activation analysis and should be of interest to those concerned with provinience studies by neutron activation. It is a comparative study of neutron activation results obtained in our laboratory and results from the Lawrence Berekeley Laboratory. Since I may not be here at the time your reply comes please send a copy to my U.S. address C/O Dr. T.O. Yellin, 4 Waterford Way, Wallingford, Pa. 19036. I expect to be departing for the U.S. September 20 and will be at the above address.

Sincerely yours,

Joseph Yellin

Professor Joseph Yellin

October 27th 1977

Professor Joseph Yellin
Department of Archaeometry
The Hebrew University of Jerusalem
Mt. Scopus, Jerusalem
ISRAEL

Dear Professor Yellin,

As a sequel to Professor Maddin's letter of October 20, 1977, I am writing to say that we should welcome you to participate in experimental programs in MASCA. However, we do not have any funds to support or to supplement a post-doctoral fellowship nor for any associated expenses.

Therefore, it will be necessary for you to find sufficient funds for your support from Pennsylvania-Israel and other sources. It is my understanding that Pennsylvania-Israel does not provide complete financial support.

You are welcome to lecture on the subjects of Pottery Provenience and Neutron Activation Analysis. However, in our laboratories, we should like you to initiate or participate in some new experiments since we do not do neutron activation analyses here. If you do find the financial support, I shall be glad to be more specific in regards to the experiments. We anticipate that we should be able to provide the funds for experimental supplies and minor components of equipment.

Sincerely yours,

Elizabeth K. Ralph

c.c. Dr. Robert Maddin
Professor Martin Biddle

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 19174

(215) 243-5241

ROBERT MADDIN

University Professor of Metallurgy

October 20, 1977

Professor Joseph Yellin
Department of Archaeometry
The Hebrew University of Jerusalem
Mt. Scopus, Jerusalem, ISRAEL

Dear Joe:

It seems that the best place for you would be with the MASCA group here at Penn. The delay in informing you (I expect) is due to the fact that neither the University, the Museum or its MASCA program has any funds to support your stay. If you are successful, however, in obtaining funding through the Penn/Israel Exchange Program, then you should notify Dr. Elizabeth Ralph at MASCA.

I hope the results of your application are favorable.

Kindest regards,

Robert Maddin
Robert Maddin

write

RM:dms

cc: Martin Biddle, Director of University Museum
Elizabeth Ralph, MASCA

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 19174
(215) 243-5241

ROBERT MADDIN
University Professor of Metallurgy

6085 8337

TO : Drs. Robert H. Dyson, R. Ian Harker, Campbell Laird, James Muhly, Elizabeth K. Ralph, Walter D. Wales

FROM: Robert Maddin RM

DATE: October 3, 1977

I am enclosing a copy of a letter received from Yellin along with his curriculum vitae. If he is successful in obtaining funding from the Pennsylvania/Israel Exchange Program, he asks, in effect, what Department should house him for the academic term Fall 1978.

I would appreciate having your views so that I can write to him regarding his best choice here.

MASCA ? Clear w. Mr. Riddle

No money but hospitality

Nov. 8th
Not fully funded
109 EFSH/D6
Israel Exchange Program
Mrs. Cooper

RM: dms
enc.

האוניברסיטה העברית בירושלים

THE HEBREW UNIVERSITY OF JERUSALEM

INSTITUTE OF ARCHAEOLOGY

המכון לארכיאולוגיה

Dept. of Archaeometry

September 23, 1977

Professor R. Madden
Department of Metallurgy
University of Pennsylvania
Philadelphia, Pennsylvania
U.S.A.

Dear Professor Madden,

I am applying to the University of Pennsylvania - Israel exchange program for the first semester of 78/79. If my application is successful I plan to lecture on Pottery Provinience and Neutron Activation Analysis. Actually, I do not really know if there is an interest in such topics and who is the appropriate person or department I should work thru and so I am writing to you to get some advice. Any advice will be much appreciated. I am enclosing my curriculum vitae for your information.

Sincerely,

Joseph Yellin

Joseph Yellin

Talk to Jim Harker. Dyson? Ralph Wolle Laird

CURRICULUM VITAE

NAME	:	Joseph Yellin
DATE AND PLACE OF BIRTH:		1938, Tel Aviv
ADDRESS - Work	:	Department of Archaeometry, Institute of Archaeology The Hebrew University, Mt. Scopus, Jerusalem, Israel Tel. - 882405
Home	:	Ha'Chayil 21/9, French Hill, Jerusalem Tel. - 810364
MARITAL STATUS	:	Married, two children
EMPLOYMENT	:	Associate Professor in Archaeometry and Physics, The Hebrew University of Jerusalem, 1973-
		Consultant, Lawrence Berkeley Laboratory, 1976-77
		Research Physicist, Lawrence Berkeley Laboratory, University of California, 1965-1973
		Visiting Senior Lecturer in Physics, The Hebrew University of Jerusalem, 1970-71
		Research Assistant, University of California at Berkeley, 1962-65
		Teaching Assistant, University of California at Berkeley, 1960-62
		Summer Work, Naval Ordinance Laboratory, 1959-60
AREAS OF SPECIALIZATION	:	Neutron Activation and gamma-ray spectroscopy with application to trace elements in ceramics and rocks and provenance of ancient ceramics; atomic physics, including beam-foil level crossing spectroscopy, atomic beam spectroscopy and optical pumping.
CONTRIBUTIONS	:	Publication list attached
DEGREES, EDUCATION AND HONORS	:	Ph.D., Physics, University of California at Berkeley, 1965
		B.S./B.A., Physics/Math with Distinction, University of Delaware, 1960
		Phi Beta Kappa, Phi Beta Phi; Undergraduate Scholarship

Curriculum Vitae (continued)

GRANTS : Stiftung Volkswagenwerk Foundation
Principle Investigator with I. Perlman
In Archaeometry; Title: Provenience and dating
of archaeological materials

PROFESSIONAL SOCIETIES : Member American Physical Society, Israel Physical Society, New York Academy of Science, Israel Exploration Society

Recent Activities:

Since 1973 I have been deeply involved in the establishment and development of a new Department of Archaeometry at The Hebrew University of Jerusalem. The Department presently has two academic members — Professor I. Perlman (Head) and myself — and a technical staff of seven (electronics, chemistry, archaeology, computer and secretarial). My responsibilities are in research, teaching and administration.

Research: Most of my research activities are aimed at the chemical characterization of ancient ceramics with the object of determining their provenience (origin). This is a central problem in archaeology as it bears directly on the movements of people in ancient times. The chemical characterization or "fingerprinting" is accomplished by neutron activation analysis of some 25 trace and major elements. The archaeometric researches are carried out with the participation of archaeologists from various institutions in Israel and abroad. In addition to pottery provenience, I am a co-principal investigator in an extensive program to trace the origin of obsidians found in archaeological excavations in Israel.

Aside from purely archaeometric research I am involved as a partner in several projects, the most important of which are:

1) Provenience of Tektites - in collaboration with I. Perlman of The Hebrew University and W. Gentner and O. Muller of the Max-Planck-Institute of Nuclear Physics.

2) Trace element distributions in ocean sediments and deep sea drilling cores - in collaboration with I. Perlman and M. Kastner of the Scripps Institution of Oceanography.

3) Interlaboratory comparisons of neutron activation analysis - in collaboration with I. Perlman and F. Asaro of the Lawrence Berkeley Laboratory.

4) Refinement of analytical techniques, development of new equipment and computer codes for neutron activation analysis; development of x-ray fluorescence apparatus for major element analysis.

Teaching: My teaching duties have been mainly with the Physics Department, where I have taught Modern Physics and Optics for the past three years. I also teach a course on Physical Methods in Archaeology for graduate students.

Administration: Chiefly responsible for hiring and supervision of the technical personnel and the Department's budget.

JOSEPH YELLIN

PUBLICATIONS

1. Study of Optical Pumping Transients in Rubidium and Cesium Vapors, J. Yellin, R. Marrus and W.A. Nierenberg, UCRL - 11636 September 4, 1964.

2. Study of Optical Pumping Transients in Rubidium and Cesium Vapors, J. Yellin, R. Marrus and W.A. Nierenberg, Bull. Am. Phys. Soc. 9, 563 (1964), UCRL - 11351 March 1964.

3. Collision-Induced Relaxation of Oriented RB-87 Atoms in the $5^2P_{1/2}$ State, J. Yellin and R. Marrus, Bull. Am. Phys. Soc. 9, 720 (1964), UCRL - 11742.

4. Study of Optical Pumping Transients in Rubidium-87 and Application to Disorientations Cross Sections (Thesis), Joseph Yellin, September 1965, UCRL - 16241 July 9, 1965.

5. Optical Pumping Transients in Rubidium-87 and Application to Disorientation Sections, R. Marrus and J. Yellin, Phys. Rev. 141, 130 (1966), UCRL - 16165 June 23, 1965.

6. Collision-Induced Mixing in the $5^2P_{3/2}$ State of Rubidium and the $6^2P_{3/2}$ State of Cesium, Joseph Yellin, UCRL - 17175 October 4, 1966.

7. Atomic Beam Study of the Stark Effect in the Cesium and Rubidium D Lines, D. McColm, R. Marrus and J. Yellin, Conference on the Physics of Free Atoms (8th Brookhaven), UCRL - 16541 August 8, 1966.

8. Atomic Beam Study of the Stark Effect in Cesium and Rubidium D Lines, J. Yellin, R. Marrus and D. McColm, Bull. Am. Phys. Soc. 11, 327 (1966), UCRL - 16644.

9. Atomic Beam Study of the Stark Effect in Cesium and Rubidium D Lines, R. Marrus, D. McColm and J. Yellin, Phys. Rev. 147, 55 (1966), UCRL - 16541 December 28, 1965.

Publications (Continued)

10. Measurement of the Hyperfine Structure of Optically Excited States of Radioactive Isotopes, J. Yellin, R. Marrus and E. Wang, Bull. Am. Phys. Soc. 12, 905 (1967), UCRL - 17620.

11. Measurement of the Hyperfine Structure of Optically Excited States of Radioactive Isotopes, R. Marrus, E. Wang and J. Yellin, Phys. Rev. Letters 19, 1 (1967), UCRL - 1758 May 23, 1967.

12. Atomic Beam Study of the Rubidium-85, 87 Relative Isotope Shift, T.H. Duong, R. Marrus and J. Yellin, Phys. Letters 27B, 565 (1968), UCRL - 18309 July 1968.

13. Measurement of the Isotope Shifts in the D Lines of 127-Cs, 129-Cs, 133-Cs, 134-Cs, and 137-Cs, E.C. Wang, R. Marrus and J. Yellin, UCRL - 18513, Bull. Am. Phys. Soc. 13, 1650 (1968).

14. Atomic Beam Measurement of Isotope Shifts in the D Lines of 127-Cs, 129-Cs, 133-Cs, 134-Cs, and 137-Cs, R. Marrus, E. Wang and J. Yellin, Phys. Rev. 177, 122 (1969), UCRL - 18349 July 22, 1968.

15. Start Effect in the Potassium Resonance Lines, J. Yellin and R. Marrus, Bull. Am. Phys. Soc. 13, 1395 (1968), UCRL - 18398 and UCRL - 18045.

16. Electric Polarizabilities of the 4^2P Level of Potassium, R. Marrus and J. Yellin, Phys. Rev. 177, 127 (1969), UCRL - 18354 July 22, 1968.

17. Atomic Beam Study of the 39-K, 42-K Isotope Shift, J. Yellin, R. Marrus and W.C. Wang, Bull. Am. Phys. Soc. 14, 85 (1969).

18. Atomic Beam Measurement of the Potassium 39-41-42 Isotope Shift, E.C. Wang and J. Yellin, UCRL - 19520, Phys. Rev. A4, 838 (1971).

Publications (Continued)

19. Stark Effect in the Resonance Lines of Indium and Thallium, T. Fowler and J. Yellin, Bull. Am. Phys. Soc. 14, 832 (1969).

20. Electric Field Effect in the Resonance Lines of Indium and Thallium, T. Fowler and J. Yellin, Phys. Rev. A 1, 1006 (1970).

21. The Use of Polarized Light in the Measurement of Differential Stark Shifts by the Atomic Beam Method, Joseph Yellin, UCRL - 19575 (May 1970), submitted to the Second International Conference on Atomic Physics, Oxford, England, July 1970.

22. Hyperfine Structure of the $^2P_{1/2}$ States of Gallium, Indium and Thallium in Crossed Electric and Magnetic Fields, Joseph Yellin, UCRL - 19573 (May 1970), submitted to the Second International Conference on Atomic Physics, Oxford, England 21-24 July 1970.

23. Combined Zeeman and Stark Effect in the Hyperfine Structure of the $6^2P_{3/2}$ State of Thallium 205 and 4^2P State of Gallium 69, Joseph Yellin, UCRL - 19569 (March 1970).

24. Hyperfine Structure of ^{69}Ga in Crossed Electric and Magnetic Fields, Joseph Yellin, Physics Letters 32A 337 (1970).

25. Optical Pumping by Forbidden Lines, J. Yellin, UCLBL-293 (January 1972).

26. Improved Resolution Method for Beam Foil Spectroscopy, T. Hadeishi, M.C. Michal, J. Yellin and E. Geneux, Nuclear Instruments and Methods 110, 445 (1973).

27. Lifetime and Alignment of the 5^1D_2 State of the He^4 by Beam-Foil Level Crossing, J. Yellin, T. Hadeishi and M.C. Michel, Phys. Rev. Letters 30, 417 (1973).

Publications (Continued)

28. Time Resolved Hanle Effect in the $3^3P_{2,1,0}$ State of ^4He, J. Yellin, T. Hadeishi and M.C. Michel, Bull. Am. Phys. Soc. 18, 121 (1973).

29. Alignment of Some Triplet and Singlet D States of Helium, J. Yellin, T. Hadeishi and M.C. Michel, Phys. Rev. Letters 30, 1286 (1973).

30. A comparative Study of Neutron Activation Results, J. Yellin and I Perlman, Bull. IPS, Vol. 1 22, p. 20 (1976).

31. Intercomparison of Neutron Activation Results, J. Yellin, I. Perlman and F. Asaro, Bull. Am. Phys. Soc. 21, 981 (1976).

32. Interlaboratory Comparisons of Neutron Activation Results, J. Yellin and I. Perlman, Bull. IPS, Vol. 1 23, p. 54 (1977).

33. Comparison of Neutron Activation Analysis from the Lawrence Berkeley Laboratory and The Hebrew University, J. Yellin, I. Perlman and F. Asaro, UCLBL-5298 (October 1976) (in press).

34. Provenience of Middle Bronze Cypriote Ware from Tel Akko, I. Perlman and J. Yellin, Fourth Archaeological Conference in Israel, Jerusalem, 17-18 March 1976.

35. Computer Analysis of Neutron Activation Data, J. Yellin and I. Perlman, Bull. IPS, Vol. 1 23, p. 54 (1977).

36. Neutron Activation Analysis of Tektites, I. Perlman and J. Yellin, Bull. IPS, Vol. 1 23, p. 55 (1977).

37. Provenience of Obsidians from Beisamun, I. Perlman and J. Yellin (in press).

38. Provenience of Iron Age Pottery from Tel Mevorak, J. Yellin and I. Perlman, Contribution to a Forthcoming Volume of Qedem on the Excavations at Tel Mevorak.

March 30, 1962.

Mr. and Mrs. Arthur M. Young,
1810 Delancey Place,
Philadelphia 3, Pa.

Dear Mr. and Mrs. Young:

This is an inadequate note to tell you how much I enjoyed your meeting on Saturday before last. Your ideas are inspiring ones and were a vital jog to me to try to do some thinking. Thank you too for the delicious luncheon.

I hope that you can be persuaded to visit our laboratories when Dr. Rainey and I return from Italy.

Sincerely yours,

EKR:LF

Elizabeth K. Ralph

June 20, 1973

Dear Arthur:

I am just getting off for the Southwest, but the people in the Applied Science Center keep bugging me for enough Julsrud materials to make a radio carbon analysis i.e. two or three pounds. Do you think you have a few inferior objects we could chew up for that purpose? Also, if you can find all that stuff and the photographs, we will send the station wagon out for it in preparation for our big expose exhibition in September.

Also, Beth Ralph in the Applied Science Center for Archaeology is looking for Hapgood's book on the chifting poles, do you have a copy of that?

I will be back briefly at the end of July, but not really back to work until the first of September. All the best to you and Ruth.

Sincerely,

Froelich Rainey
Director

Mr. Arthur M. Young
1810 Delancey Street
Philadelphia, Penna.

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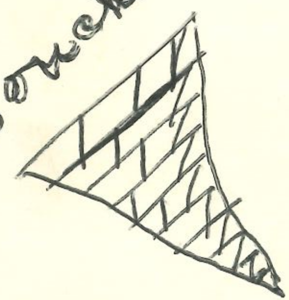

January 7, 1966

Dr. Paola Zancani
S. Agnello
(Napoli)
Italy

Dear Paola,

Many thanks for your Christmas card and message.

Last week we had a conference here with Lee Langan, and the result is that we are going to act as agents for Varian Associates during the coming spring and summer. We expect to have two complete cesium magnetometers and two graduate geophysicists working, first with us and then on their own, in doing surveys on a contract basis. The worst of this arrangement is that we have to charge $3000 per month to cover the costs of instrument rental and the geophysicists.

I realize that I offered to come to Sele without this big rental charge, but we are wondering if you happen to have any "idle" funds that would help defer these costs.

Fro asked me to write to you in this respect, so now I've done it. Please don't hesitate to tell us exactly what you think.

I hope to send you a copy of my preliminary Sybaris report in the near future.

With love,

E. K. Ralph

EKR/rs

March 15, 1966

Signora Paola Zancani
St. Agnello
(Napoli)
Italy

Dear Paola:

Many thanks for your good letter. I don't think that I had the opportunity of meeting Prof. Mustilli, but I am very sorry to hear of his death.

This is a hasty note to say that I plan to land in Rome on March 24th. I have many errands to do, but hopefully, I'll be able to travel south on Saturday or Sunday, the 26th or 27th. I plan to stay at the Hotel Boston if you want to reach me.

I'm looking forward to seeing you soon.

Love,

Beth

February 14, 1967

Dr. Paola Zancani
S. Agnello
(Napoli) Italy

Dear Paola:

Many thanks for your good letter. My plans for the spring are still uncertain, but one thing has been decided upon - namely, that if the Museum excavates this year on Torre del Mordillo, Roger Edwards will be in charge. He is the Associate Professor in our Department of Classical Archaeology and 4th century B.C. pottery, etc. are his specialties.

He is a shy meticulous man and has already begun to worry about various matters. He wants to have the whole plateau and its slopes surveyed in order to have an accurate map of the region on which he can locate the grids that he plans to make. From what you have said, I guess that Geom. Meranda is the most capable surveyor in the area. Do you think that there would be any possibility of his doing this before they start excavating in June and roughly how long would it take? Then, when they excavate in June and July, Roger would like to have him or some one equally as capable (or an architect) on hand to locate and draw the trenches, buildings, etc.

If you are too busy to write to him, may I trouble you to send me his address? If you think that there is no chance of his being free, could you recommend another person? Could you tell us too approximately what salary we should pay so that Roger can include it in his budget.

I'm sorry to bother you with all of these questions because I imagine that you are very busy.

We are just now getting the results of the infrared aerial photography and we are seeing a few anomalies. So far none of them is where we have been with the cesium magnetometer. This would make a good excuse for me to return.

With best regards,

Beth Ralph

EKR/bs

December 24, 1969

Dear Paola:

What with all the mail difficulties you have had in Italy, I wonder if you have received my letter of November 19 suggesting we get cracking on the Temessa site. As you can guess, Orville is getting restless about our plans and because of that I am anxious to settle on the Temessa site if possible. Although Orville is still enthusiastic about the Vix excavation in France, we may well do them both. In any case, let me know how you think we should proceed.

Beth is in the hospital again having another operation for a slipped disc, but she is coming through it very well and should be out in a few days. Have you been able to avoid the Asiatic flu? It really hasn't hit here yet.

Pen joins me in all best wishes for the Christmas and New Year.

Sincerely,

Froelich Rainey
Director

Sig. Paola Zancani-Montuoro
S. Agnello Sorrento
Napbli, Italy

FR/c

PRINTS (OBJECTS, SITE)

ZAUINSKY - PARK


A-12 E-16

TABLADA LURIN
Peru

JGZ APRIL, 1972

TABLADA LURIN 1969
Peru

JGZ APRIL, 1972

TABLADA LURIN 1969
Peru

JGZ APRIL 1972

NATIONAL ACADEMY OF SCIENCES
2101 CONSTITUTION AVENUE
WASHINGTON, D.C. 20418

OFFICE OF THE FOREIGN SECRETARY

April 12, 1972

replied 4/18/72

Etzatlan, Mexico

Dr. Elizabeth Ralph
Associate Director
Applied Science Center
for Archaeology
University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Dr. Ralph:

I am returning the manuscript you lent me. The results are discouraging, yet the mystery intriguing. Have you developed an explanation for the ineffectiveness of the prospecting techniques in what would appear to be good (magnetic) conditions? Have you returned, or do you have definite plans to return, to the sites during the wet season?

I have enclosed three photographs taken at one of the two sites I referred to during my visit with you last month. It is called Tablada Lurin and is located just south of Lima. One photo reveals the nature of the site and the type of terrain rather well—stone structures buried one to two meters in a dry, sandy soil. Please note in that photo an intact sherd towards the lower right. It represents the first firm evidence of "chavivoid" influence at that site, which indicates that occupation of the site began at least 2,500 years ago.

The photo of a group of sherds gives an example of a burial of a more recent culture in the same site but apart from the stone structures. The bean shape ("frijoloide") is very distinctive of that region, if not just to that site. At first glance, I would say that the sand has a low iron content. The large stone with the rope around it could be volcanic, but the others appear to be sedimentary. Would you be able to make any preliminary estimate of the usefulness of cesium magnetometers at that site?

I want to express my gratitude to you and your staff for your time, advice, and patience. The visit to the MASCA laboratory was an extremely useful and stimulating experience for me. Unfortunately, my application of this new knowledge in Peru will be delayed. Within a week of my scheduled departure, I received word that arrangements at the two universities at which I was to teach

under the Fulbright Program were not in order. I have, therfore, chosen to delay the commencement of the Award for several months. On the brighter side, I expect to be in Lima for nearly two weeks at the end of May and will make every effort to collect samples from that site and, perhaps, from the other (Chancay).

Again, my sincere thanks to Dr. Mark Han, Dr. Bruce Bevan, and yourself.

Sincerely,

Jim Zavistoski

James G. Zavistoski
Professional Associate
Board on Science and Technology
for International Development

Enclosures

April 18, 1972

Dr. James G. Zavistoski
Office of the Foreign Secretary
National Academy of Sciences
2101 Constitution Avenue
Washington, D.C. 20418

Dear Dr. Zavistoski:

Thank you for your letter and for the photographs of your site in Peru.

I guess we did not make it clear in our Mexican report that because of the magnetic rocks and soil we could not detect the tombs which probably exhibit little or no magnetic contrast. Bruce Bevan has now returned to the sites, but, again in the dry season.

Sincerely yours,

Elizabeth K. Ralph

EKR/mm

December 16, 1965

Dr. E. J. Zeller
Brookhaven National Laboratory
Long Island, New York

Dear Dr. Zeller:

Upon my return from Italy, Mark Han told me of your telephone conversation in November.

We are both eager to talk to you about thermoluminescence, and would be very pleased if you could visit our laboratory. If this is not convenient, is there a day (after Christmas) that would suit you for us to come to Brookhaven?

Sincerely yours,

Elizabeth K. Ralph

EKR/mhr

January 26, 1966

Dr. E. J. Zeller
Brookhaven National Laboratory
Long Island, New York

Dear Dr. Zeller:

Mark and I enjoyed our visit with you, Mrs. Zeller, and Eduardo, and needless to say, we learned a great deal.

I am very much tempted to play with exoelectrons, but our libraries do not have the publication which you showed to us--either it is too new or classified. If it is not top secret, could I trouble you to send us a Xerox copy of it?

I hope that you will find time and good flying weather to visit us soon. My field work plans have changed somewhat. I'll be away from January 31 to February 5 and also on February 14 and 15. It's a shivering thought at the moment.

With best regards,

E. K. Ralph
Associate Director

EKR/rs

UNIVERSITY OF CALIFORNIA, RIVERSIDE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF ANTHROPOLOGY
RADIOCARBON LABORATORY

RIVERSIDE, CALIFORNIA 92502

replied 9/9/75

July 23, 1975

Dr. Elizabeth K. Ralph
Applied Science Center for Archaeology
University Museum
University of Pennsylvania
33 rd & Spruce Street Fl
Philadelphia, Penn 19174

Dear Dr. Ralph:

I do not know if you recall my vivit to your laboratories almost two years ago. I direct the radiocarbon lab here at the Riverside campus of UC and am involved in several other archaeological science projects.

I am writing to find out from you what your experience has been with the Anthropology program at NSF in terms of funding archaeological science proposals. I have had no success over the last four years in getting any grant funds out of them--excepting a NSF postdoctoral Fellowship. What I am trying to find out is whether it is the merit of the proposals or is there some problem with the Anthropology panels. Are other labs and groups involved with archaeological science getting the cold shoulder from them?

If this seems to be widespread, have you ever thought of working to set up some type of separate NSF interdisciplinary category involving analytical studies outside the anthropology panel. Its just an idea.

I would appreciate your comments.

Yours truly,

ERT

R. E. Taylor

ZIMMER

WASHINGTON UNIVERSITY

ST. LOUIS, MISSOURI 63130

CENTER FOR ARCHAEOMETRY
BOX 1105

TELEPHONE (314) 863-0100
EXT. 4036 / 4458

October 20, 1975

Dr. Elizabeth K. Ralph
Museum Applied Science Center
The University Museum
University of Pennsylvania
Philadelphia, Pennsylvania 19100

Dear Beth,

I have just been reading (or more correctly re-reading) the article by you and Mark in the Risø-Conference proceedings and it raises a number of interesting points which I would like to discuss with you and Mark. I realize that the conference was 4 years ago so that these points may be quite out of date by now; indeed Martin Aitken may have discussed some of them with Mark then although it doesn't appear in the discussion section.

Although I certainly agree with you that alpha particles produce less TL per rad than betas or gammas, I wouldn't agree that they produce less radiation damage. I think physicists generally consider that alphas produce more damage in terms of the classic measures of damage such as production of vacancies; it just happens that the damage is distributed in such a way as to produce less TL. I attempted to explain this difference in a paper in Radiation Physics in 1971, in case you haven't come across it.

You mention the difficulty of preparing thin samples. I of course met the same problem and it is interesting how we found different solutions. I make them by settling the grains onto a disk from a suspension in acetone (described in articles in Archaeometry in vol. 10, 1967 and vol. 13, part 1, 1970, in articles or fine-grain dating).

You state that you found that betas and gammas are only 16% and 20% as effective as X-rays in producing TL. I am not sure how

you mean this. On a per rad basis, of energy absorbed in the phosphor (pottery), I think betas, gammas, and X-rays are exactly equal in efficiency of producing TL. The larger response from X-rays must be due to the much larger dose delivered to the pottery than the exposure to air (as measured by the ionization chamber) by the X-rays as a result of the higher value of atomic no. Z of the pottery compared to air, and thus much greater photoelectric absorption.

I agree with you that one needs to know the Th/U ratio to calculate the dose rate but this ratio can be measured in the alpha counting process by the "pairs" technique. I believe you can find descriptions of this technique in several of Aitkin's early articles or in his book.

Your faience experience is an interesting example of the important role potassium can play. We have recently had a similar experience in dating a sample of granite which was rich in potassium but low in U & Th.

As regards the use of $CaSO_4$ for environmental monitors I might mention that Vagn Mejdahl (now with Hugh McKerrell in Edinburgh) has had a lot of experience with this process (such as using the correct containers to obtain the right response to the lower energy x & γ-rays in the soil - see e.q. Risø Report #219, 1970) in case you are not familiar with it.

We have formed a small Center here for our Archaeometry work - small blurb enclosed.

Joan and I still think of the most enjoyable time we had surveying with you in Greece.

Best regards,

Dave

David W. Zimmerman

Encl.
DWZ:fr

October 24, 1975

Dr. David W. Zimmerman
Washington University
Center for Archaeometry
Box 1105
St. Louis, Missouri 63130

Dear Dave:

Thank you for your letter of October 20th and for the enclosures. I think that most of the questions that you have mentioned are answered in more recent publications and especially at the seminar in Boston (preprint enclosed).

Years ago we had thought too that alphas had a greater effect upon radiation damage due to the production of vacancies, but numerous experiments have not confirmed this.

You must have misunderstood our faience experiment. The dosimeters that we placed in Egyptian tombs were too measure the level of cosmic radiation in tombs at various depths.

Best of luck with your new center.

Regards to you and Joan,

Elizabeth K. Ralph