Technique

March 30, 1965

Dear Professor Caley:

I just have your complete list of reprints of your papers on chemical composition of ancient materials . I want to thank you for this contribution to our Library here in A. S. C. A. Something of your work was known to me through Dudley Easby, but I had no idea of the amount of work you have done in this field and we are very pleased to have it represented in the A. S. C. A. Information Center, here.

Very best wishes on continued work in the field,

Most sincerely,

Froelich Rainey
Director

Professor Earle R. Caley
Department of Chemistry
The Ohio State University
Columbus, Ohio 43210

FGR/vg

THE OHIO STATE UNIVERSITY
DEPARTMENT OF CHEMISTRY
88 WEST 18TH AVENUE
COLUMBUS, OHIO 43210

March 23, 1965

Froelich Rainey, Director
Applied Science Center for Archaeology
The University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pa. 19104

Dear Mr. Rainey,

I have been informed that one function of the Applied Science Center for Archaeology is to assemble information that may be useful to those who use your services. Therefore I am sending to you (under seperate cover) a fairly complete set of reprints of my papers on the chemical composition of ancient materials and objects.

Sincerely yours,

Earle R. Caley

Earle R. Caley
Professor of Chemistry

Sample basis of Publ. approved sent to ASCA

ERC:ksm

May 16, 1970

Dear Franca:

Long time no hear from. Please send news to us; what's going on and what is more important, please bill us for all that work on those helmets. All of us miss you and are dyeing for some news. Please let us hear soonest.

Also, Beth would like to know where her Fiat is and does she owe you money for the bollo and new battery.

As ever,

David Crownover
Executive Secretary

Miss Franca Callori
Via Aventina 59
Rome 00153, ITALY

cc: James Delmage
Beth Ralph

May 24, 1968

Dear Dr. Çambel:

Ellen Kohler has passed on to me your letter to Beth Ralph regarding an instrument servey in connection with the Keban Salvage Project. You may have a reply from Beth by this time since she is now working at Elis in Greece, but in the event that your letter has not reached her, I do want to say that we are indeed interested in experimenting with our new instruments in your project. We just now have an even newer type of cesium magnetometer which is performing wonders at Elis and which was also extraordinarily successful in an experiment at an Olmec site in SouthemMexico. There are only two of these new instruments so far produced, and Beth Ralph is scheduled to proceed from Elis in Greece to a site in Ireland where we will begin excavations in June. Thereafter, she is returning to the United States for the rest of the summer, but frankly, because of her health, I do not think she should overdo the field work this summer. Also, funds for our Applied Science Center this summer are very short and we are forced to limit our experimental work also.

However, I feel sure that we could get one of these newest instruments with an operator out to you next year if this is not too late. Would you let me know if this is feasible and how we may plan for assisting you during the coming year.

All very best wishes.

Sincerely,

Froelich Rainey
Director

Dr. Halet Çambel
Birinci cad. 212/2
Arnavutköy, Istanbul
Turkey

UNIVERSITÉ D'ISTANBUL
FACULTÉ DES LETTRES
Section de Préhistoire

UNIVERSITÄT ISTANBUL
PHILOSOPHISCHE FAKULTÄT
Abteilung für Vor-und Frühgeschichte

UNIVERSITY OF ISTANBUL
FACULTY OF LETTERS
Department of Prehistory

Fen Fakültesi PTT — ISTANBUL
Tel. : 22 49 80 — 209

Dr. Ralph - Interested
Can you
Ellen
If you do not
Please let me know
tell me what to say

Her name →

Dr.
Halet Çambel
Birinci cad.212/2
Arnavutköy -İstanbul

15.5.1968

Miss Hellen Kohler
University Museum
Philadelphia - PA .

Dear Hellen ,

İ trust you still remember me from the old days . İ am sending you a letter adressed to Dr, Ralph , whci İ would ask you to take the trouble to read and take in hand . The letter is self-explicative and as was told that you would keep in contact with her , it seemed the wisest thing to ask you to forward this to her or in some way or other get this across to her .

İ would be very grateful if you could drop me a line to tell me if you received the letter and can do something about it , at the same adresses mentioned in the letter to Dr. Ralph.

Please excuse this trouble İ give you . İt may well be that you travel together , in which case it would be so nice to have you both .

Best thanks in advance and best greetings .

Yours sincerely ,

Halet Çambel

UNIVERSITÉ D'ISTANBUL
FACULTÉ DES LETTRES
Section de Préhistoire

UNIVERSITÄT ISTANBUL
PHILOSOPHISCHE FAKULTÄT
Abteilung für Vor-und Frühgeschichte

UNIVERSITY OF ISTANBUL
FACULTY OF LETTERS
Department of Prehistory

Fen Fakültesi PTT — ISTANBUL
Tel. : 22 49 80 — 209

15.5.1968

Halet Çambel
Birinci-cad.212/2
Arnavutköy -İstanbul

Dr.Elisabeth Ralph
University Museum
Philadelphia - Pennsylvania

Dear Dr.Ralph ,

İ am writing you this letter on behalf of the Organisi (Executive)Committee of the Keban Salvage Project , both to Philade as well as to Athens so it may catch you somewhere along the line .

A rather large area with a very important bronze age settlement (also chalcolithic and earlier periods) represented by ove 5o tells will be flooded by the Euphrates dam that is being built near Elaziğ , in south-eastern Anatolia within some 2-3 years.

A salvage project was started which took on a form of considerable importance , considering the fact that there will be about lo archaeological teams digging in the area (5 Turkish teams, universities and museums , Chicago , Michigan , 2 from the British İ İnstitute and one from the German İnstitute) besides others working on the monuments . Work will start beginning of July after the necessary preparations and go on well into november , according to climatic and seasonal conditions .

The problem of wether it would be possible to do some prospection ahead of time came up quite early in the course of the organisation of the project and an official letter was sent to Philadelphia , but no answer ever obtained . We do not even know wether or not you have heard about this or in whose hands it went.

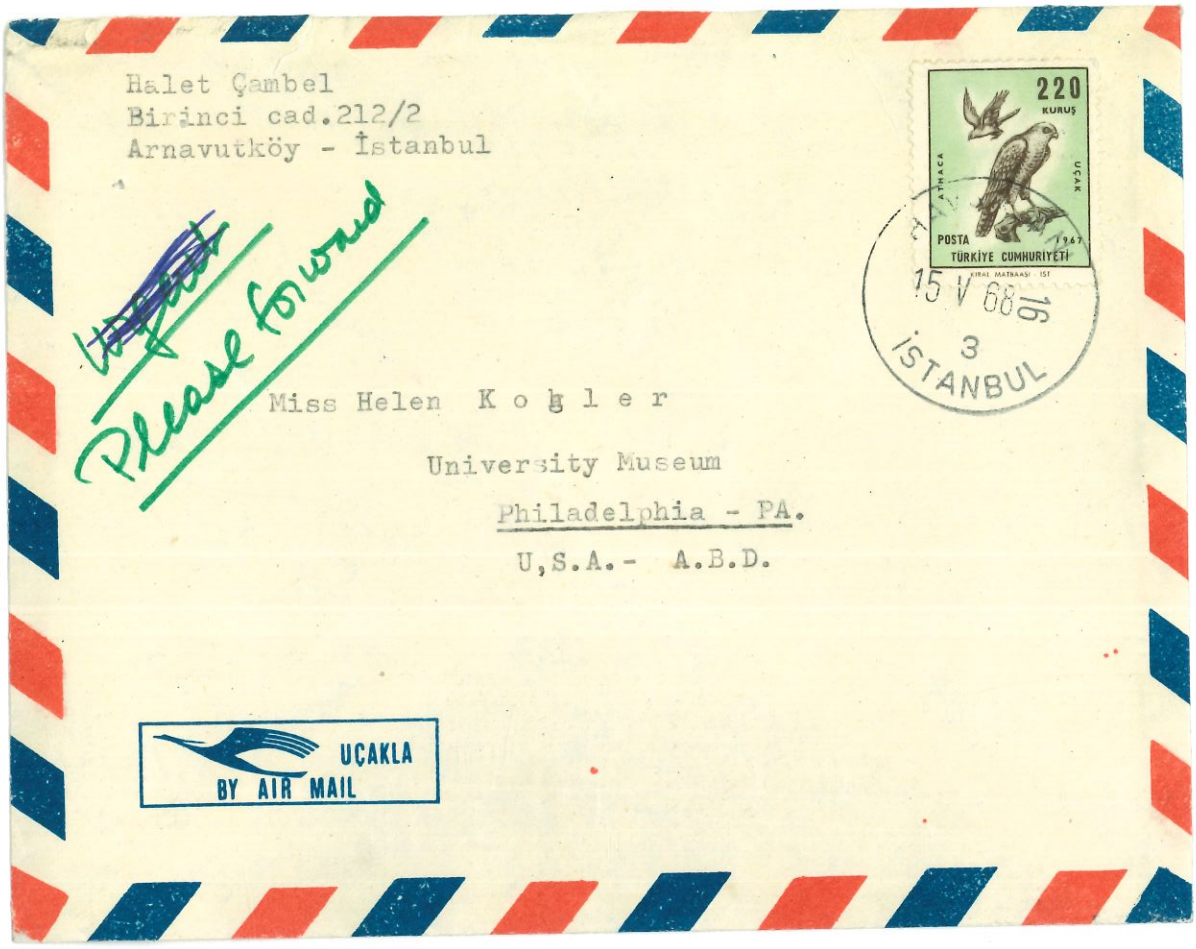
During the congress in İran İ saw Bob Dyson , who told me that you were coming over to İran via Greece and Turkey ,driving a car , carrying the instrument with you , that he would like to hav you in the last week of June and first week in July , that you were then driving back and that it could be possible to arrange for you to come by Elazig do do some prospecting there on the way out and back from İran . Bob promised he would write and tell me about your exact dates and whereabouts , so İ could contact you , but he has no done so yet and time is getting short . İ am therefore sending two copies of this letter , one to Hellen Kohler in PA and the second on tentatively to the American School in Athens .İ would appreciate it very much could you send me a line and tell me what you think .

İ shall be at Elaziğ between the 15-19 May (Halet Çamb Yüksek Teknik Okulu , Elazig,Turkey) then between 21-25 May again . İn Ankara 19-2o May and 25-May (Adress Halet Çambel c/o L Çambel , Tunus cad.15/4 , Bakanliklar ,Ankara) then in İstanbul at t home adress above .

Ufuk sends her best greetings and hopes with us all that something may be worked out .

Hoping to hear from you soon ,

sincerely yours , Halet Çambel



Halet Çambel
Birinci cad.212/2
Arnavutköy - İstanbul

~~Return~~ Please forward

220 KURUŞ
ATMACA UÇAK
POSTA TÜRKİYE CUMHURİYETİ 1967
KIRAL MATBAASI İST.

15 V 68 16
3
İSTANBUL

Miss Helen K o ğ l e r

University Museum
Philadelphia - PA.
U,S.A.- A.B.D.

UÇAKLA
BY AIR MAIL

Technique

April 1, 1966

Dear Messrs. Senning and Molineaux:

I enclose a clipping from the Washington Post which I hope will interest you. It may be a rather flippant style, but the facts are pretty much all there.

I will be in Tripoli, c/o Ambassador Newsom, until about April 20th. Then in Rome and in Sybaris, c/o Ambassador Frederick Reinhardt, at least until the end of May.

I do hope everything is set for the aerial photography and that you can let me know something about this in Rome.

Most sincerely yours,

Froelich Rainey
Director

Messrs. C. Molineaux and H. Senning
Cambridge Research Laboratory
C. R. J. T. Division
Bedford, Massachusetts

FGR/vg

enclosure

February 8, 1967

Techniques

My Dear Williams:

Enclosed are the maps locating both Snaketown and the Casa Grande national monument. You should have no problems at all in spotting the Casa Grande ruins, but to help you in spotting Snaketown, I am enclosing some copies of illustrations from a publication on the site. You will note a peculiar formation called Gila Butte which is in the background of the aerial photography and also located on two other maps. This should make it possible to line up your runs. Of particular interest are the ancient canals shown on Fig. 16. It is just possible that these can be located with infrared photography.

There are a number of curious structures here as indicated on Fig. 2, so it ought to be a good test case for infrared. The same goes for Casa Grande. Moreover, there has been a lot of digging done at both places so when we go over the photographs we will have a pretty good ideasof what shows.

All the very best of luck,

Froelich Rainey
Director

Lt. Richard Williams - Terrestrial Sciences. Lab -
Cambridge Research Laboratory
C. R. J. T. Division
Hanscomb Field
Bedford, Massachusetts 01730

FGR/vg

Enclosures

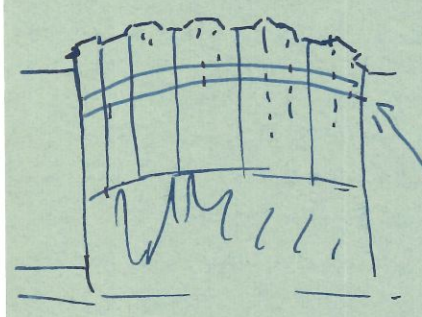
Gouda, january 27th

[CAPPEL]

Dear Beth,

Thank you very much for the Crhistmascard you sent me, which I shall answer now finally. I am also a very poor writer, although these weeks I wrote about a hundred letters to thank familiy and friends for their kind reactions on our engagementannouncement. I did not send you one, because you would not have understood it, it was in a typically dutch way, so I tell you now. Rob has finished his studies in law and we announced our engagement afterwards. He is now looking for a job, which is not so easy as we thought, because he does not want to be an attorney or a lawyer, nor a typical commercial man, something in public relations, secretarial spere. We are having a wonderful time and we are very happy, but now I am back to work, in casu my Sybaris thesis. I had to switch completely from Etruscans to Sybaris, because my professor think this subject being more interesting than the Etruscans, That meant a complete switch in preparation, other books, another approach, etc. Now I am nearly ready with reading and studyin It is an absolute pity, that I had not the knowledge last year that I have now about history, excavations, theories and obtained results. And now I do not think that I will go and work, although the Lerici's invited me to come and join the party again, but it takes to much time, I have to do other examinations and other thesises. I f this report is ready I will try to translate it in English and send it to you. What is lacking in my notes, is a precise archeological stratification next to the wall. I wrote Ellen about it in November, but she did not answer me, will you PLEASE ask her to send me it? Last week At the archeological institute they told me about the article, written by Mr Rainey in the Illus strated London News. How nice to see everyone again. I could get the last copies in Leiden, so I am very glad! Is there already something written in your University magazine, " Expedition"? If there is, could you send me a copy? I should like to collect all reports of our big adventure and use them for my work (which is just a proof, that you can work and stu study methodically, not a publication). I liked to do it so I found several interesting points, which I shall tell you, when you will come to Europe, instead of straight away to Rome, the nicer way New York - Amsterdam - Rome. Will you do this, Bett, you know how I should like it, our guest-room will be ready for you.

Now about the excavation, perhaps it is nonsens what I tell, but you never can be sure. You know that the water table in Holland is as high as in Sybaris, often even higher, 30 cm of 50 cm from the surface. For every construction, buidding, bridge, etc they construct a "constructionpit" in, which is kept dry. Long iron plates are pushed in by a machine in a circle as big as needed. With the spillo the extent of a building is traceble, for example pit D. These iron plates clasp in eachother, so no water can penetrate. By the pressure from outside is to great a ring is placed inside. They are driven in, rather quickly.



So a small area can be excavated without draining a whole area, which could endanger the vegetation.

AEROGRAMME

LUCHTPOSTBLAD

IS UW ADRES NIET JUIST
EN VOLLEDIG VERMELD
LICHT DAN AFZENDER IN.

30 C
NEDERLAND

Miss Elizabeth K. Ralph
Box 357
Woosamonsa Road
Pennington
(New-Jersey)
U.S.A.

PAR AVION / PER LUCHTPOST

CAPPEL

EXPÉDITEUR / AFZENDER

Mr. de Vos tot Nedeveen Cappel
Jongelaan 40
Gouda. Netherlands.

NIETS INSLUITEN!
GEEN ADRESSTROKEN, SLUITZEGELS, PLAKBAND, ENZ. GEBRUIKEN.
INDIEN ZULKS TOCH GESCHIEDT, DAN WORDT DEZE BRIEF
PER BOOT / TREIN VERZONDEN

OUVRIR ICI / HIER OPENEN

It is sadly easy to obtain a whole area (in Holland several methods are used), but I do not think that such a method should be used in Sybaris. I should like to show you. I hope you will have time to answer me, so I get news from you. My fiancé (and so I will) will get a new aunt, an American lady, from Massachusetts! She is very charming, well bred, and like you from Dutch origin. Please give Ellen my regards, and also to Mrs Rainey.

Molti cari auguri e speriamo di rivederci!

Mariolei.

February 7, 1963

Miss Marjolein de Vos tot Nedeween Cappel
Krugeilaan 40
Gouda, Netherlands

Dear Marjolein:

Many thanks for your letter. Ellen and I suspect that the few letters which we have written to you didn't reach you because we addressed them to M. de Vos -- perhaps, you can find them in your post office.

We were glad to hear that you are going to do your thesis on Sybaris, and we wish that you could join us again, at least, for part of the time. I have enclosed a copy of my report and Ellen's stratigraphy next to the wall is shown in figure 1. Don Brown has written an article for Expedition which will appear in the next issue and will be sent to you as soon as possible.

A graduate student who reads Greek has been looking up and reading many of the ancient references for us, and Ellen will send you a copy of his list within a week or so.

I told Dr. Rainey about your suggestion of a "construction pit" for excavation. It is a good idea, but at the moment, our main problem is to find Sybaris, and then we'll worry about ways to excavate it.

I should like very much to visit you, but, as usual, I am short of time so that I can't plan to come to Amsterdam -- better for you to come to Sybaris.

I was in Texas last week, testing some new sonic apparatus that the Petty Laboratories have developed there. Our experiments were somewhat successful and there is some hope of putting together a workable instrument this year.

With best regards,

Beth Ralph

EKR:pc

a copy of my thesis I sent you. Leiden 19th February

[CAPPEL]

Dear Bella.

Thank you so much for your letter and the prints you send me. The Lerici Foundation sent me already all this with the cataloging-scheme of the drillings. But this copy. I can use to illustrate my thesis. Thus for I am very grateful for the trouble you took to send me all this. It is an absolute pity, that you cannot pass Holland perhaps. when you return? Two days ago I received a letter from Lucia Cavaggioni-Vanoni to invite me to join the expedition again, for at least two months, but I had to refuse, because in the month of may I still have classes, which I must attend. Last year I got permission to fail them, but this year not. In June we have no more classes. And I must study really very hard, and a 3 month break out is too much, although I should like to come very, very much. I heard that Ellen is not returning to Sybaris? Than you will be the only girl?

About the letters you and Ellen wrote me: I received one from you from Belfast and than your Christmascard, from Ellen a letter with my paper with Etruscan motes. It does not matter how you write my name, if the address is correct, if you write my complete name than the house's name can be sufficient

It is a pity that Sybaris is so far away from Holland. otherwise I could spend my 3-week holliday down there. but the journey is a bit expensive for so short a time. so I do hope, you can come me once, how things progress. Will you please tell Ellen, that I also read all Greek en latin texts on the topography of Sybaris and Thurii, but I should like very much to get her's for comparision. My head thesis en german cronicle's from 16th, 17th, 18th century. in which I found some interesting things.

Two times in class I have talked about Sybaris and the teacher in archeology, who works during the summer with Luis Zancani. the famous italian archeologist, told me, that houses, and often the city walls were build in sun-dried bricks, which dissolves in water, Temples if not build in wood are mostly build of stone. also of stone are some temple sculptures, metopes, so these things can be found. ~~Annotations of~~ Masses of pottery can count for living quarters, where the walls are dissolved in

AEROGRAMME

LUCHTPOSTBLAD

IS UW ADRES NIET JUIST
EN VOLLEDIG VERMELD
LICHT DAN AFZENDER IN.

30 C
NEDERLAND

Miss Elizabeth K. Ralph
Box 357
Woosamonsa Road
Pennington (New Jersey)
U. S. A.

PAR AVION / PER LUCHTPOST

EXPÉDITEUR / AFZENDER

Mr. de Vos tot Nederveen Cappel
Galgewater 8
Leiden. Holland.

NIETS INSLUITEN!

GEEN ADRESSTROKEN, SLUITZEGELS, PLAKBAND, ENZ. GEBRUIKEN.
INDIEN ZULKS TOCH GESCHIEDT, DAN WORDT DEZE BRIEF
PER BOOT / TREIN VERZONDEN

RUIMTE VOOR SLUITKLEP

RUIMTE VOOR SLUITKLEP

pursuit of time. What more is reused stone blocks and rests of temple sculptures has been found in the excavations of the soprainendenza. I will have a discussion with her about the whole thing and then my thesis will be nearly ready. The thing I lack is a precise description, at which depths Roman Thurian and Achaean sherds have been found. Do you perhaps know? I should like to ask you a favor. I have no slide of Sybaris. May I send you a roll and could you make them pictures in colour slides for me of the whole way of discovering investigating with the magneto meter till the excavation. I should like to have that as a „ricordo" I will be glad to receive the next Expedition with the story about Sybaris. I wonder about your new apparaten. With how many do you come to Italy. My paper is finished, so I must end. My best regards, molti cari saluti. Marijke.

February 28, 1963

Miss M. deVos tot Nederveen Cappel
Galgewater 8
Leiden
Netherlands

Dear Marjolein:

Many thanks for your letter. You do sound very busy, and needless to say, life is hectic here with the preparations for leaving.

We plan to work at Sibari again from April 1st to June 30th. When is your three week vacation? If you would like to come to Sibari for three weeks, we should be glad to pay your expenses.

The last mail that I shall receive here will be on March 12th, but from the 18th to 23rd, I shall be at the Piccadilly Hotel, Piccadilly Circus, London. Then, I travel by train, arriving in Milano on the 25th and Rome on the 26th or 27th. From Rome, I shall drive to Sibari. Perhaps, you can join me.

With best regards,

E. K. Ralph

EKR/deh

Jake H. Caraway
Free-Lance Writer
Box #237
Benton City, Wash.

Dr. Elizabeth Ralph
Carbon 14 Laboratory
Department of Physics
University of Pennsylvania
Philadelphia, Pennsylvania

Dear Dr. Ralph:

I am doing a research on the Maya cultures. It is very important that I learn the results of samples taken from wooden lintels at Uxmal, Yucatan, Mexico. (At least they are reported to have been taken.) My efforts have turned up no published reports. Mr. Francisco Aguilera, Specialist in Hispanic Culture at the Library of Congress, and the Smithsonian Institution recommend you as the source for this information.

Can you help me? The results of the Uxmal experiments, as well as those on any other organic carbons of Maya origin, would be of great interest to me.

Thanking you in advance for your consideration,

Sincerely yours,
Jake H. Caraway

August 23, 1965

Mr. Jake H. Caraway
Box 237
Benton City, Washington

Dear Mr. Caraway:

Three reprints of C-14 dates for Mayan lintels, etc. from Tikal, Guatemala are enclosed.

We have not dated samples from Uxmal here. You may find references to them in the various volumes of Radiocarbon, published by the American Journal of Science, Yale University, New Haven, Conn.

Sincerely yours,

Elizabeth K. Ralph

EKR:sn
enc.

Mr. Rhys Carpenter
Jerry Run
R. D. 2 - Downingtown, Pa.

May 5
1961

OK
1:30 - 4:30

Miss Elizabeth K. Ralph
The University Museum
Philadelphia

Dear Miss Ralph:

I have been asked to write a survey study of the American contribution to the progress of archaeology in recent years. This is to be part of a larger survey of humanistic scholarship in our country commissioned by the Ford Foundation.

Could I come in on Thursday afternoon May 11th at an hour convenient to you, if you are willing to devote some time to enlightening me on C^{14} analysis? I have a reasonable grasp of the theory, but should very much like to be brought up to date on the practical problems involved. If May 11 is unsuitable, would some day in the following week (except Wednesday the 17th) be possible? I should very greatly

appreciate your assistance.

Sincerely yours,

Rhys Carpenter

May 9, 1961

Mr. Rhys Carpenter
Jerry Run
RD 2
Downingtown, Pennsylvania

Dear Mr. Carpenter:

I shall be glad to talk to you about C-14 dating on Thursday afternoon, May 11th. Anytime between 1:30 and 4:30 will be fine.

The laboratory is in the basement (rooms BW4 and BW6, 33rd St. side) of the Physical Sciences Building at 33rd and Walnut Streets. The best place to park your car is probably at the University Museum, one large block away.

Sincerely yours,

Elizabeth K. Ralph

EKR:jsm

CORR—

bernard Haldane associates

12 South 12th Street, Philadelphia, Pa. 19107
215/WA 5-1188

July 23, 1976

Dr. Elizabeth K. Ralph
MASCA
Uiversity Museum, 33d & Spruce
Philadelphia, Pa. 19104

Re: Robert J. Carpenter

Dear Dr. Ralph:

The individual referred to above has recently retained our firm to provide an objective evaluation of his capabilities and to assist him in obtaining a new career position.

As part of the evaluative process, we are contacting his business associates who are in a position to comment on his character, work habits, and potential for greater or different responsibilities.

Bernard Haldane Associates provides professional counsel to executives seeking to advance their careers. We are also consultants to major corporations, non-profit institutions and government agencies. Founded in 1947, our firm has been cited by four U. S. Presidents and twice by the House of Representatives for outstanding contributions in the area of human resource development.

Our client has specifically given us permission (as documented below) to solicit your comments with the understanding that you may wish to respond in complete confidence. We, of course, guarantee to respect that confidence.

We would greatly appreciate your candid comments, and we thank you in advance for your cooperation.

Sincerely,

Jesse Kennedy

Dr. Jesse Kennedy

I authorize Bernard Haldane Associates to solicit business references in my behalf.

(Name) (Date)

July 27, 1986

Dr. Jesse Kennedy
Bernard Haldane Associates
12 South 10th Street
Philadelphia, Pennsylvania 19107

Re: Robert J. Carpenter

Dear Dr. Kennedy:

Robert J. Carpenter (known to us as John) worked in our MASCA laboratories for 3 years.

His main responsibility was concerned with the techniques of thermoluminescent dating of pottery. He performed these tasks extremely well and conscientiously. His persistence with a technique that was mostly routine was admirable.

He was enthusiastic in explaining his work to students and other visitors, and in assisting others in the laboratories.

Since his employment here was while he was a graduate student, it is difficult to access his potential for greater and different responsibilities although we know that he has variety of other interests and capabilities.

Sincerely yours,

Elizabeth K. Ralph
Associate Director of MASCA

January 5, 1968

Dear Sam:

Here enclosed are the announcements of two conferences which concern our techniques program at the Museum, and I wonder if you would find it interesting to attend one or both of them as a representative of the Museum. The most important certainly is the symposium on remote sensing at the University of Michigan in April. I will be in Italy at that time trying to unscramble our experience with infrared at Sybaris, and Beth Ralph will be in Greece working with a cesium magnetometer at the site of Elis. I know from the Air Force people that Michigan has become a center for this kind of investigation, and this conference should be the last word in remote sensing.

Mike Coe will be returning this weekend from Florida, and I will then get him on the phone to see whether or not our infrared films have been made on the Olmec site. Also, we should then find out just when he will be working at the site. If I remember correctly, he was to leave for Mexico in January sometime. When would you be available for a look at the site with Mike, assuming the photographs will have been made this month? I remember you would be off to Brazil shortly, and hope you can fit this in with the Brazilian trip.

All the best for the New Year.

Sincerely yours,

Froelich Rainey
Director

Mr. W. Sam Carpenter, III
1060 DuPont Building
Wilmington, Delaware

FGR/sic

May 20, 1970

Dear Sam:

Attached is a summary of the work and plans for the Science Center which I hope you will look at before the Expeditions Committee and Board meetings on June 3.

The best thing about this is three new graduate students are coming into the ASCA to work and I hope these kids will have some fresh new ideas during the coming year and in this way give the Center a shot in the arm.

I hope you will look it over and let me know what you think.

All the best,

Froelich Rainey
Director

Mr. W. Sam Carpenter, III
1060 duPont Building
Wilmington, Delaware 19898

enc:

CHRISTOPHER G. CARR
10541 SOUTH TALMAN AVENUE
CHICAGO, ILLINOIS 60655
November 1, 1969

Mr. E. K. Ralph
Museum Applied Science Center for Archaeology
University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia 4, Pennsylvania

Dear Mr. Ralph:

I am a senior in high school and am very interested in archaeology. While working at Dickson Mounds this last summer, I thought quite a lot about saving digging time on subsurface sites by use of a device to detect disturbed soil features, such as an Indian pit or wall trench or hearth. Since then, I have been trying to use the electrical resistances of soils for such detection.

By using a wheatstone bridge type of resistance box, connecting it to probes of known resistance, and taking readings of soil with different distances between the probes (to get readings at different depths), or keeping equidistant probes and changing positions, (to get horizontal readings), and comparing readings to a standard, I hope to be able to graph subsurface features and tell their approximate composition.

The analysis of my readings, however is almost completely dependent upon standardizing my readings. The main standardization necessary would be for change in the distance between the probes. Without changing my readings to some standard of resistance per unit distance between probes, or resistance per volume of earth measured, I wouldn't be able to differentiate between change in distance of probes or actual change of soil in the readings. In analyzing my readings for composition of soil, I will also have to know the resistance of soil under various conditions of temperature and moisture and other unknown variables. If a table or list of mathematical constants for soils is available, would you please send me one, or direct me to a souree that would have such a standardizing table? Would you also direct me to any sources on soil resistance or geophysical prospecting that might include a method to compensate for distances between probes? If the sources are to specialized to be carried by a large public library, would you please tell me where I could get them.

I would greatly appreciate any information you would give me.

Sincerely,

Christopher G. Carr

Christopher G. Carr

November 7, 1969

Mr. Christopher G. Carr
10541 South Talman Avenue
Chicago, Illinois 60655

Dear Mr. Carr:

I admire your ingenuity in trying to measure the resistance of the earth at archaeological sites. I am not sure that I understand exactly how you made your measurements, and most important is whether you used 2 probes or 4. For reliable readings, it seems to be necessary to use 4, spaced equidistantly in a line. The Wenner configuration is used most frequently. With this, a current is sent through the outer two, and the difference of potential, due to the resistance of the earth to this current, is read between the inner two. In commercial instruments, this is usually converted to ohms or mhos.

I have enclosed copies of the instruction sheets and description of the Michimo, which, I think, will answer most of your questions. However, I do not recommend this particular instrument. A much more reliable and smaller one is the Gossen Co. Geohm, made in Erlangen, Germany, which costs about $100.00 (see literature enclosed).

Fuller descriptions of resistivity surveying at archaeological sites are given in:

Edward Pyddoke, The Scientist and Archaeology, ch. 1 (Roy Publishers, N.Y., 1963).

D. Brothwell, E. Higgs, and G. Clark, Science in Archaeology, pp. 569-582 (Basic Books, N.Y., 1963).

Sincerely yours,

Elizabeth K. Ralph

EKR/mrb
End.

CHRISTOPHER G. CARR
10541 SOUTH TALMAN AVENUE
CHICAGO, ILLINOIS 60655

November 16, 1969

Miss Elizabeth K. Ralph
The University Museum
Muniversity of Pennsylvania
Thirty-third and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Miss Ralph:

Thank you so much for your letter of November 7. I greatly appreciate you taking the time to find the information on soil resistance. Before your reply, I had not been able to find any information on specific methods of measurement. The papers you sent me are helping very much.

Thank you again.

Sincerely,

Christopher Carr

Christopher Carr.

CHRISTOPHER G. CARR
10541 SOUTH TALMAN AVENUE
CHICAGO, ILLINOIS 60655
September 3, 1970

Miss Elizabeth K. Ralph
Museum Applied Science Center for Archaeology
University Museum
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Miss Ralph:

Last November 7, I received your reply to my letter pertaining to the use of earth resistivity in mapping archaeological sites. Although this past summer I made arrangements with the Illinois State Museum to work on my project with their Geohm, it seems it was in disrepair and could not be used. Dr. Robert Hall of the University of Illinois at Chicago Circle's Anthropology Department said the Department is interested in buying a resistivity meter which will be available to students, and has asked me to look into the matter.

I know very little about the different types of meters available, and I do want to recommend to Dr. Hall a meter that would be profitable for general department use as well as my own use (applicable to the Barnes Layer Method). I would appreciate any help you would give by recommending a resistivity meter that would be useful for general purpose by the department and which would be durable, as it would take some abuse. I would also appreciate the mailing address of the manufacturers of the instruments you would recommend and the same information for Gossen's Geohm.

Sincerely,

Christopher Carr

Christopher Carr

September 9, 1970

Dear Dr. Carr:

In regard to resistivity meters, we have found the Gossen Geohm to be sufficiently rugged and we like it because it is so readily portable. However, it does have a small battery so that depth penetration is limited to 3 to 4 meters in most soils. The address of the P. Gossen & Co. GMBH is 8520 Erlangen, West Germany, and the small portable units used to cost about $100.00. It is possible that they also make a larger one.

Other resistivity instruments are described in D. Brothwell and E. Higgs, Science in Archaeology, revised 2nd edition, Thames and Hudson, 1969. I have enclosed Xerox copies of the pertinent pages of this book.

There must be some made in the U. S. A. for geophysical purposes, but the one we tried about ten years ago was extremely bulky and most of its components fell apart after a few months of use.

Sincerely yours,

Elizabeth K. Ralph

Dr. Christopher Carr
10541 South Talman Avenue
Chicago, Illinois 60655

CHRISTOPHER G. CARR
10541 SOUTH TALMAN AVENUE
CHICAGO, ILLINOIS 60655
August 18, 1971

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

Dear Dr. Ralph:

I am an anthropology student at the University of Illinois at Chicago Circle and am interested in the use of resistivity surveys for archaeological purposes. Two years ago, I wrote you concerning resistivity surveys and you kindly sent me a bibliography and information on field techniques. I thank you very much for helping me to get started in resistivity surveying.

After surveying this past spring, I have several questions concerning the processing of the data I collected:

1. Do any institutions use computors to process collected data and draw maps from the data? If so, how could I obtain these programs?
2. Do you know of any institutions or individuals that use trend-surface mapping techniques on the computor to analyze resistivity data?
3. Do you know of any publications concerning the processing of data, aside from those describing graphic method employed for the Barnes Layer method by the Michigan State Highway Department?
4. Is the Barnes Layer Method or any other layer method of calculating data used by any institutions or individuals, aside from the Michigan State Highway Department?
5. Have close order resistivity surveys with electrode spacings of ca. .4 feet and readings taken every .2 feet ever been made? If so, where could I find out the details of such a survey?

I would greatly appreciate any help you would give me.

Sincerely,

Christopher Carr

Christopher Carr

August 23, 1971

Christopher G. Carr
10541 South Talman Avenue
Chicago,
Illinois 60655

Dear Mr. Carr:

Here are some partial answers to your questions.

1. Some groups do use computers to process and plot data. For magnetic surveys, this has been done extensively by Dr. Irwin Scollar of the Rheinsches Landesmuseum, Colmanstrasse 16, Bonh 53, Germany. His and others are reported regularly in "Prospezioni Archeologiche" which can be obtained from the Lerici Foundation, via Veneto 108, 00187 Rome, Italy, at $4.00 a copy. The 1969 vol. 4 has a number of pertinent articles--they are in English.

In the U.S.A. there are various commercial companies which will process your data for you at considerable expense. The one that I know about is GeoMetrics, 914 Industrial Avenue, Palo Alto, California, 94303 (Mr. Sheldon Breiner, President).

GeoMetrics computerized our magnetic data taken at San Lorenzo, Mexico. The resulting plots were very good but the improvement over our usual method of plotting contours by hand was hardly worth the cost.

2. I'm not quite sure what you mean by trend-surface mapping. Perhaps Dr. Scollar could answer your question.

3. See "Prospezioni Archeologiche".

4. I imagine that the Barnes Layer method is used by others, but I do not know of any specific publications.

5. I think that close order resistivity surveys have been tried over small areas, but I suspect for not very long because they are too time-consuming and the spacing of the probes becomes too critical.

Sincerely yours,

Elizabeth K. Ralph

March 17, 1964

Dr. T. H. Carter,
c/o Mosul Museum
Mosul, Northern Iraq,
IRAQ

Dear T. A.,

Thank you for your letter of March 6th. We shall be glad to date the C-14 sample which represents Archaic Hassuna material, but would prefer to do a series of several samples. Therefore, if you can bring a series, so much the better. If not, we will date the one sample because it is related to others which have been dated previously.

From sad experience, we have learned not to promise a date within a certain time limit, but since we are now working on several series from the Near East, the chances are that we will date your sample(s) this summer.

With best regards,

E. K. Ralph

EKR:LF

UNIVERSITY INTRAMURAL CORRESPONDENCE

MUSEUM

MEMORANDUM

TO: Professor Robert H. Dyson, Jr., Acting Director, University Museum

FROM: Dr. Elizabeth K. Ralph, Associate Director, MASCA

DATE: 2/9/74

SUBJECT: Oxford Symposium on Archaeometry and Archaeological Prospection

Permission is requested to send Dr. Gary Carriveau to attend the above mentioned symposium at Oxford University from March 20th to 23rd, 1974

Dr. Carriveau has submitted three abstracts of new research on appropriate archaeometric subjects namely:

1) 'TL Sensitivity of a High Temperature Peak in Quartz as a Function of X-ray and Alpha Radiation'

2) 'Firing Temperature of Pottery; Annealing and its Effect on TL Dating'

3) 'The MASCA Metal Slag Dating Project'

In the second year of NSF Grant GS 36308X1, we have adequate funds ($2,200) for foreign travel, but we are required to obtain prior approval from the NSF to use the funds. With your permission we shall request this approval.

Approval granted.
RHD Feb 12, 1974

March 26, 1975

Dear Fred:

Of course we will expect to cover the lecture costs of Gary Carriveau when he talks there on April 3rd. This will come under the Kintner grant as usual.

All best wishes,

Froelich Rainey
Director

Mr. W. Fred Kinsey, III
Director, North Museum
Chairman, Anthropology
Franklin and Marshall College
Lancaster, Penna. 17604

FRANKLIN and MARSHALL COLLEGE
LANCASTER, PENNSYLVANIA 17604

NORTH MUSEUM

March 12, 1975

Dr. Froelich Rainey
Director, University Museum
University of Pennsylvania
Philadelphia, Pennsylvania 19104

Dear Fro:

Once again we are looking forward to the University Museum-North Museum lecture. As you will recall Gary Carriveau will be giving the lecture this year on April 3. His topic is "Archaeometry: Physical Science Aiding Art and Archaeology".

The understanding is that the University Museum will underwrite Dr. Carriveau's fee. Thank you for your attention to this matter.

Best wishes.

Cordially,

Fred

W. Fred Kinsey, III
Director, North Museum
Chairman, Anthropology

WFK:gjb

October 18, 1962

Mr. Charles C. Case, Jr.
2034 Alder Street
Eugene, Oregon

Dear Mr. Case:

Thank you for your letter of October 12th, and I regret that your first letter was not brought to my attention.

We are very much interested in the problem of the development of a workable sonar type sub-surface detector. Our immediate application of an instrument of this type would be at Sybaris, Italy, where we have been trying to locate the 6th century B. C. city which is burried under 6 meters of clay (most of which is wet because the water table is only 1 meter down). The problems there and some of our work prior to our recent campaign in the spring of this year are described by C. M. Levici in the enclosed copy of Expedition. A report of the instrument surveys conducted this spring, mostly with the proton magnimeter, is in press, and I'll send you a copy as soon as available.

In regard to the development of a sonic device, our efforts at the moment are three-fold. Research and experiments in this direction are being conducted on our behalf by the Texas Instruments Company (Dallas) and by Petty Laboratories, Inc. (San Antonio, Texas). In the meantime, MacLaughlin Electronics (Perkiomanville, Pa.) built a prototype unit.

I have enclosed a block diagram and brief description of the operation of this prototype unit. Dr. Rainey and I conducted the initial tests of this instrument at Sybaris in April 1962 and we were unable to detect any reflections

even when directly over known walls at depths from 1 to 5 meters. The causes for this failure were the weakness of the initial signal and/or poor coupling to the ground. The latter was supposed to be accomplished through conical aluminum spikes, tapered to a point from diameter of approximately 3/4 inches. These were of various lengths up to 18 inches and we used the longest ones (one for Transducer and similar one for geophone) that could be forced conveniently into the ground. For normal ground conditions this was about nine inches. When the coupling was bad such as with a short spike in a recently plowed field, the usual straight trace of the oscilloscope appeared distorted as shown below:

In these experiments the transducer and geophone were placed as close together as possible (spikes about 3 in. apart) with the hope that the signal would be transmitted primarily downward and that a reflection would return vertically upward.

In summary, the electronic unit functioned well and I think it could be adapted for use with other more powerful impulse sources. One special feature incorporated in the oscilloscope is a "long persistence" screen, which should assist in the intensification of weak reflected signals.

If I have neglected to include some specific information which you would like to have, please don't hesitate to let me know. Perhaps, you have some ideas for a better transducer which could be used with this detector.

Sincerely yours,

Elizabeth K. Ralph

EKR:pc
Enc.

Jeannette

Northern Arizona University · FLAGSTAFF, ARIZONA

March 3, 1967

Elizabeth K. Ralph
Asscoiate Director
Museum Applied Science Center for Archaeology
University of Pennsylvania
Philadelphia, Pennsylvania 19104

Dear Miss Ralph,

Thank you very much for your recent letter and especially for the information regarding the Lerici Foundation Course in Rome.

I realize my letter was a little indefinite, but you interpreted it correctly. I am confined to the summer for non-teaching activities unless a full-term grant is involved. My primary interest is to acquire specialized and advanced experience since I have had considerable ordinary archaeology as a River Basin archaeologist, a Park Service archaeologist (temporary), and much additional field work.

I am interested in the Lerici summer course and I will try to raise the money to attend this. I applied for a sizable grant to study at the Oxford University laboratory last year, but this was denied. However, I probably will apply again under the University Teaching Improvement Act. I have been running some X-ray defraction tests on Southwest pottery in an effort to develop a new typology, but this work is not completed at this time.

I wish to thank you again for you information, and I would like to visit the Applied Science Center if I am in the East.

Respectfully,

Charles C. Case

Charles C. Case
Professor of Anthropology

Oct.12,1962

Miss Elizabeth Ralph
Associate Director
Applied Science Center for Archeology
University of Pennsylvania;

Dear Miss Ralph,

Early in the summer I wrote the University with regard to developmental research in the area of electronic aids to archeological survey work. I was advised at that time that instruments were being tested in Europe and to contact you later in the year.

For over a year I have been trying to develope a sonar-type sub-surface detector and only recently learned that Pennsylvania was working on a similiar idea. I have been advised by numerous developmental companys, including Bendix, that my idea is feasible but that the expense to work up a proto- type would be excessive. Since I now have under construction an experimental model, I felt that I might avoid duplication and cut cost if I knew more about the nature of your work. Obviously if your instrument has proven sucessful there is no need for my continuing to work in this area. Therefore, I am interested in learning as much about your instrument and your experiments as you feel you are able to reveal. I would appreciate hearing from you.

Yours Respectfully,
Charles C Case
Charles C Case Jr.

2034 Alder St.
Eugene, Oregon.

July 24, 1962

Mr. Charles C. Case, Jr.
4624 Vista Street
Long Beach, California

Dear Mr. Case:

Thank you for your letter of July 13th. At the moment, it is a bit difficult to comment concretely on our successes and/or failures, since most of the equipment in which we have been interested has been under test in Italy most of the Spring and Summer. To date, our experiments in survey equipment have been confined to the proton magnetometer, extension of the range and sensitivity of metal detetctors, and the development of a sub-surface sonar probe instrument.

We will have little or no information available until the equipment returns from Europe at the end of the Summer. At that time, I suggest that you contact Miss Elizabeth K. Ralph, Associate Director of the Center, who has been in charge of the testing program.

Thank you.

Sincerely yours,

Robert Stuckenrath, jr.
Research Associate

refer to Rawoy's office for reply

July 13,1962

Dr. Anthony F.C. Wallace
Department of Anthropology
University of Pennsylvania
Philadelphia,Pennsylvania;

Dear Dr. Wallace:

It recently came to my attention that the Anthropology Department of the University of Pennsylvania was engaged in research and development of modern electronic devices for use in archeological explorations. Since I also have been working on an instrument for similiar uses, I felt I should write and inquire about the type of instruments you have developed, the successes and failures, and whether some of the data you have compiled is available to other persons.

My own interest lies in the development of sonar for sub-surface work, with some special features, and I would be most interested to know what success you have had along this line. Since this type of research is so expensive, I feel that unnecessary duplication should be avoided if possible.

Yours Respectfully,

Charles C. Case Jr.

Charles C Case Jr.

4624 Vista St.
Long Beach,California.

October 27, 1961

Dr. John L. Caskey
Dept. of Classics
University of Cincinnati
Cincinnati 21, Ohio

Dear Dr. Caskey:

Many thanks for your kind letter of October 24th.

We should be glad to look at your sample from Troy. If it requires treatment with NaOH, we should probably need about 50 grams. Exposure to the air (after removal of the outer surface, which you did) wouldn't necessarily have contaminated it unless ground waters containing humus washed over it continuously.

I suspect that you are becoming a C-14 collector on your sentimental journeys.

Sincerely yours,

Elizabeth K. Ralph

EKR/ic

UNIVERSITY OF CINCINNATI
CINCINNATI 21, OHIO

DEPARTMENT OF CLASSICS

October 30, 1961

Elizabeth K. Ralph
Department of Physics
University of Pennsylvania
Philadelphia 4, Pennsylvania

Dear Miss Ralph:

Many thanks for yours of the 27th. I am glad that you are willing to look at the sample from Troy and shall send it to you directly. It still looks a bit skimpy to me but I hope you will find it big enough for analysis.

Again with best thanks,

Yours sincerely,

John L. Caskey

P-441
26 g?
Medit series ~ 12 months

December 27, 1961

Dr. John L. Caskey
Department of Classics
University of Cincinnati
Cincinnati 21, Ohio

Dear Mr. Caskey:

Many weeks seem to have elapsed since we received your sample from Troy. Please forgive the delay.

We have acid treated the sample (p. 441) and it may be large enough to date, but is too small for treatment with NaOH for removal of possible humic contaminants.

Our next Mediterranean series is scheduled for approximately one year from now. Shall we keep it, or would you prefer to send it to another lab that might be able to date it more quickly? I have enclosed a sample information sheet for the data required if we do keep it.

Sincerely yours,

Elizabeth K. Ralph

EKR/bl

September 26, 1972

Ms. Joan Cavanna
Stowe D Room 207
University of Connecticut
Storrs, Connecticut 06268

Dear Ms. Cavanna:

In our center here, we apply techniques from the physical sciences to archaeological research. Therefore, we are not well qualified to answer your questions.

I have forwarded your letter to the Department of Anthropology (University Museum), If you do not hear from them, I suggest that you write to the Office of the Dean of the College to find out what courses are offered.

The Department of Anthropology here (which includes Archaeology except for Classical) is one of the best in the country.

Sincerely yours,

Elizabeth K. Ralph
Associate Director

EKR/11

COMMITTEE FOR ECONOMIC DEVELOPMENT, 1000 Connecticut Avenue, N. W., Washington, D. C. 20036 • 202 296-5860

ROBERT F. LENHART
Vice President, Administration

CED

16 April 1975

TO: Professor Froelich Rainey

FROM: Robert F. Lenhart

SUBJECT: Erratum

On Page 4, the third paragraph, of the Report Field Work at Fort Hill - October, November 1974, by George W. Baughman, should begin, "Twin Hill about two thousand feet northeast of Fort Hill . . . . . ", and not yards.

Information copies to: Messrs. Bruce Bevan
George Baughman
Walter Bowen

Beth Ralph

Mr. Chang Shih-hsien
Department of Nuclear Engineering
National Tsing Hua University
Hsin-chu, Taiwan 300
Rep. of China
March 18, 1972

Dean of College of Arts and Science
University of Pennsylvania
Philadelpha, Pennsylvania, 19104
U. S. A.

Dear Sir:

I welcome this opportunity to write this letter to you in hopes that your university might be able to admit me in pursuing my educational career. Your university has been recommended to me by a professor under whom I am doing research.

Nuclear Science was my under-graduate major in the Department of Nuclear Engineering at the National Tsing Hua University, Rep. of China. After completing the military service, in July 1970 I was employed by the Research Laboratory of the National Palace Museum, Taipei, Taiwan, R.O.C., engaged in the Chinese Antiquities Science Research Project initiated by the National Palace Museum Research Laboratory and the Nuclear Engineering Department of the National Tsing Hua University. In my work I have been investigating the Chou Dynasty bronzes by neutron activation analysis under the direction of Prof.Chio-Ming Yang and Prof. Tseng Te-Lin. Up to the present I have identified eight elements with moderate or long half-life nuclides. As for the elements with short half-life nuclides, especially for lead (Pb, $t_{\frac{1}{2}}$= 0.8 sec), I have designed rapid-test device near T.H.U. Reactor to detect their radioactivity. But it has not been completed.

It is my earnest desire to get advanced technique of neutron activation analysis in your university, in order that we may promote our level of Archaeology to the modern scientific standard. My employer, the Director of the National Palace Museum, said recently that the JDR 3RD Fund will award a fellowship to me. It is turely a very good chance. If you could send me all the necessary materials for application at your earliest convenience, I would be very grateful.

Sincerely yours

Chang Shih-hsien

Mr. Chang Shih-hsien
Department of Nuclear Engineering
National Tsing Hua University
Hsinchu, Taiwan 300
Republic of China

April 12, 1972

Director
The University Museum
University of Pennsylvania
33rd & Spruce Street
Philadelphia, Penn. 19104
U. S. A.

Dear Sir:

I welcome this opportunity to write this letter to you in hopes that your university might be able to admit me in pursuing my educational career. Your university has been recommended to me by a professor under whom I am doing research.

Nuclear Science was my under-graduate major in the Department of Nuclear Engineering at the National Tsing Hua University, Rep. of China. However, I have also had a great interest in Archaeology. After completing the military service, in July 1970 I was employed by the Research Laboratory of the National Palace Museum, Taipei, Taiwan, R. O. C., engaged in the Chinese Antiquities Science Research Project initiated by the National Palace Museum Research Lab. and the Nuclear Engineering Department of the National Tsing Hua University. In my work I have been investigating the Chou Dynasty bronzes by neutron activation analysis under the direction of Prof. Chio-ming Yang and Prof. Tseng Te-lin. Up to date I have identified eight elements with moderate or long half-life nuclides. As for the elements with short half-life nuclides, especially for lead (Pb, $t_{\frac{1}{2}}$=0.8 sec), I have designed rapid-test device near T.H.U. Reactor to detect their radioactivity. But it has not been completed.

It is my earnest desire to get advanced techniques in the field of Archaeology, in order that we may promote our level of Archaeology to the modern scientific stndard. My employer, the Director of the National Palace Museum, [illegible]

Palace Museum, said recently that The JDR 3RD Fund will award me a fellowship. It is turely a very good chance. If you could send me all the necessary materials for application at your earliest convenience, I would be very grateful.

Sincerely yours

Chang Shih-hsien

Chang Shih-hsien

Applied Science Center for Archaeology

THE UNIVERSITY MUSEUM • UNIVERSITY OF PENNSYLVANIA
33rd & SPRUCE STREETS • PHILADELPHIA 4, PENNSYLVANIA
Froelich Rainey, Director EVergreen 6-7400 (Area code 215)
Elizabeth K. Ralph, Associate Director
EVergreen 6-0100 Ext. 8168 (Area code 215)
Cable Address "Antique"

April 11, 1972

Mr. Chang Shih-hsien
Department of Nuclear Engineering
National Tsing Hua University
Hsin-chu, Taiwan 300
Republic of China

Dear Mr. Chang:

Your letter of March 18th to the Dean of the College has been forwarded to me. Unfortunately, we are not equipped to do neutron activation analyses at the University of Pennsylvania.

To my knowledge the two scientists who have been engaged most actively in neutron activation analyses for archaeological purposes are as follows:

Dr. Edward Sayre
Brookhaven National Laboratory
Upton, L.I., N.Y. 11973

Dr. Isadore Perlman
Lawrence Radiation Laboratory
Department of Chemistry
University of California, Berkeley, California 94720

In order to save time, I have forwarded copies of your letter to them.

Sincerely yours,

Elizabeth K. Ralph

WASHINGTON STATE UNIVERSITY
PULLMAN, WASHINGTON 99163

COLLEGE OF ENGINEERING
RESEARCH DIVISION

November 2, 1970

Dear Colleague:

In June, 1970, I sent a letter to members of the carbon-14 dating fraternity and a number of archeologists indicating my interest in and willingness to assist anyone in organizing another open carbon-14 and tritium dating conference.

Of the many letters which I received in return, the response was predominantly in favor of another international conference in the near future. Also, there were many kind expressions regarding the international C^{14}-H^3 conference held here in 1965. For these kind thoughts I wish to say, "Thank you."

Dr. T. A. Rafter has written me to say that under the sponsorship of the New Zealand Royal Society he now has his plans made to hold the next international carbon-14 dating conference in that country in mid-October, 1972. In conformity with my statements in the June, 1970 letter, I have written to Dr. Rafter offering him such assistance as I can give to furthering his plans. This offer he has most generously accepted.

The conference which Dr. Rafter is now organizing will serve to bring together the neophytes and those of many years of experience in radioisotope age-dating. For myself, I hope to attend the New Zealand conference and to have the pleasure of meeting old friends and making new ones.

With kindest regards,

Sincerely,

R. M. Chatters, Ph.D.

R. M. Chatters
Nuclear Engineer and Head
Radioisotopes and Radiations Laboratory

pkb

GEOPHYSICS
ELECTRONICS
CALORIMETERS
FLUXLESS SOLDERS
ELECTRIFYING METALS

Chemalloy Electronics
CORPORATION

7947 JOHN TOWERS AVENUE
P. O. DRAWER 10
SANTEE, CALIFORNIA 92071
U. S. A.

TELEPHONE 448-5715
AREA CODE 714
(SAN DIEGO, CALIF.)

CABLE: CHEMALLOY
SANTEE-CALIF-USA

Feb. 19 1969

Elizabeth K. Ralph,
Museum Applied Science Center for Archeology,
The University Museum,
University of Pennsylvania,
33rd and Spruce Streets,
Philadelphia, Pa. 19104.

Dear Miss Ralph:

Reference your letter of Jan. 16th before my mining presentation at the Denver Mining Convention Jan. 31st...on the matter of a Chemalloy Subsurface Contrast Detector, the following is the status at present.

With the exception of one that constantly use, the present batch of instruments for upto 200 feet depth have been sold and are leaving here in few days. One of these has been purchased by the Sun Oil Company at Newtown Square, Pennsylvania (Dr. Shawhan, Physics Research) following a demonstration and evaluation here by the retired head of their Research Labs now residing near here. They plan to use it in oil shale exploration shallow depths.

Possibly, you can arrange to see the instrument after it arrives there by checking with Dr. Shawhan. I plan to ship it in about one week to them by air express. Another has been sold to Comstock International in New Jersey for use in South America to evaluate several square miles of grave deposits and subsurface stratifications. In both cases, they were made available at nominal price of $600 and expected to yield additional field research data. We will need some time to build additional units when orders come in. We have this largely reserved for our mining program and do not actively seek sales of same. Instruments are sold or made available on an accommodation basis where they are to be put to interesting use and we will get additional field research data therefrom.

My program at the Denver Mining Convention drew a large audience and have been rather swamped since with meetings, visits and tests with pertinent mine operators primarily on direct smelting of metals out of ores at minesites. The geophysical apparatus is intended to help the same parties in subsurface mineral exploration and evaluation without the very high cost diamond drilling normally needed. Also, to permit covering more area in a given time and at all ranges of depth within capability of instrument size furnished.

I had an instrument with me in Denver and it functioned superbly from the 19th floor room of the Denver Hilton Hotel picking off each floor and subfloor and utility pipings etc down from there. On jet plane flight from Phoenix to Denver, I used it briefly from my seat and picked off the plane compartmentation below the seat floor and went into space for about 700 feet above clouds. Dr. Robert Baxter, fetired Professor/Dean of Colorado School of Mines spent couple hours in my room testing and using it as well as covering other mining subjects. He wants it to use as an adjunct to his work in geochemistry.

Yours sincerely,

S. Freedman

Samuel Freedman, Gen. Mgr.

sf/x

February 25, 1969

Samuel Freedman, General Manager
Chemalloy Electronics Corporation
7947 John Towers Avenue
P.O.Drawer 10
Santee, California 92071

Dear Mr. Freedman:

Thank you for your interesting letter of 19 February 1969.

Miss Ralph is not here at present. She is engaged in doing a cesium magnetometer survey of a site in Mexico and will probably not return until April. I will, however, bring your letter to her attention immediately upon her arrival.

Sincerely yours,

Mrs. Lanny Bell

Oct. 29th Issue ?

October 16, 1962

Mr. Raymond C. Stewart, Assistant Editor
Chemical and Engineering News
1155 16th Street, N.W
Washington 6, D.C.

Dear Mr. Stew art:

In response to your request this morning, eight photographs of various operations on the Plain of Sybaris performed by members of the University Museum in collaboration with members of the Lerici Foundation in the spring of 1962 are enclosed.

A report of our activities during the past year is included, and we should appreciate it if you would mention that this program was initiated with financial support from the National Science Foundation. In the enclosed copy of Expedition, there is a more general article by Eng. C. M. Lerici, Director of the Lerici Foundation in Rome. On the inside front cover of this publication, the members of our staff are listed.
The photographs were taken by James Delmege, University Museum photographer for the Sybaris expedition.

I shall appreciate it very much if you will send me a copy of your article.

Sincerely yours,

Elizabeth K. Ralph

Elizabeth K. Ralph

ACS APPLIED PUBLICATIONS

ADVANCES IN CHEMISTRY SERIES
ANALYTICAL CHEMISTRY
INDUSTRIAL AND ENGINEERING CHEMISTRY
JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY
JOURNAL OF CHEMICAL AND ENGINEERING DATA

CHEMICAL AND ENGINEERING NEWS
PUBLISHED BY THE AMERICAN CHEMICAL SOCIETY

1155 Sixteenth St., N. W., Washington 6, D. C. • REpublic 7-3337

October 31, 1962

Miss Elizabeth K. Ralph
Applied Science Center for Archaeology
The University Museum
University of Pennsylvania
33rd & Spruce Streets
Philadelphia 4, Pennsylvania

Dear Miss Ralph:

Thank you for your letter of October 16 and the photographs and other material included.

As you requested, I am enclosing a copy of our October 29 issue of Chemical and Engineering News. (see page 44)

Sincerely,

Raymond C. Stewart

Raymond C. Stewart
Assistant Editor

RCS:1a
enc.

CHEMICAL & ENGINEERING NEWS

1155 SIXTEENTH STREET, N.W., WASHINGTON, D.C. 20036 202-737-3337

ONE OF THE AMERICAN CHEMICAL SOCIETY PUBLICATIONS

August 1, 1968

Miss Elizabeth Ralph
University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pa. 19104

Dear Miss Ralph:

It was certainly a pleasure meeting you last week and having a chance to discuss with you chemical applications in archeological studies. I also enjoyed looking around your museum and seeing your labs.

I can't begin to thank you enough for all the pictures you supplied, in addition to all the printed material you gave me. I have been reading the "Search for Sybaris" which I have found most interesting as well as informative.

It was also a pleasure meeting members of your staff. We had a very enjoyable lunch in the coffee shop after leaving you. I may be in touch with you again before the article sees the light of day. At any rate, once I have a draft of the article, I hope you will have the time to review it for us, checking it especially for its technical accuracy and work that has been omitted.

Thanks again for all your help. You'll be hearing again from me soon.

Best regards,

Ernie

Ernest L. Carpenter
Assistant Editor

ELC:js

ASCA Techniques

June 13, 1963

Dr. Donald Collier
Acting Chief Curator
Department of Anthropology
Chicago Natural History Museum
Roosevelt Road and Lake Shore Drive
Chicago 5, Illinois

Dear Don:

I am glad to know from your letter of June 7th that you are establishing a conservationslaboratory in the Department of Anthropology.

Our ASCA (Applied Science Center for Archaeology) is now in its third year and we should be of some help to you. Unfortunately, practically everybody in ASCA is now in the field, but when Mrs. Danziger arrives have her ask for me and I will do the best I can.

Best wishes,

Froelich Rainey

FR/vv

I have read in the papers that the University of Pennsylvania will be doing research in Ey

CHICAGO NATURAL HISTORY MUSEUM
FORMERLY FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE SHORE DRIVE
CHICAGO 5, ILLINOIS

7 June 1963

Dr. Froelich Rainey
University Museum
33rd and Spruce Streets
Philadelphia 4, Pennsylvania

Dear Fro:

We are in the process of establishing a conservation laboratory in the Department of Anthropology. As a final step in planning our laboratory we are sending our conservator, Mrs. Christine Danziger, to visit several of the leading conservation laboratories in order to observe equipment in operation and to discuss the plans for our laboratory. We are anxious that she visit your laboratory. We would be most grateful if she could confer with you, learn about the operation of your equipment, and receive the benefit of your experience in evaluating our plan.

Mrs. Danziger intends to visit a number of cities on her trip, which complicates the arranging of her itinerary. She would like to visit your laboratory some time during the weeks of 17-21 June or 24-28 June. I would appreciate it if you would let me know if there are any times during this period when it would be inconvenient or impossible for her to visit your laboratory. As soon as I hear from you, I shall let you know when she will arrive.

Sincerely yours,

Don

Donald Collier
Acting Chief Curator
Department of Anthropology

DC/amf

TELEPHONE: WABASH 2-9410

CHICAGO NATURAL HISTORY MUSEUM
FORMERLY FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE SHORE DRIVE
CHICAGO 5, ILLINOIS

20 June 1963

Dear Miss Vitelli:

I regret that Mrs. Danziger has a complicated itinerary which will prevent her from staying over until the 25th.

I was not aware that your offices and laboratories were closed on Mondays. Do you operate only four days a week?

Sincerely yours,

Donald Collier

ADDRESS ALL CORRESPONDENCE, PUBLICATIONS, AND PACKAGES TO
CHICAGO NATURAL HISTORY MUSEUM, CHICAGO 5, ILLINOIS, U.S.A.

June 18, 1963

Dr. Donald Collier
Department of Anthropology
Chicago Natural History Museum
Roosevelt Road and Lake Shore Drive
Chicago 5, Illinois

Dear Dr. Collier:

This is in reference to yours of June 14, concerning Mrs. Danziger's trip to Philadelphia.

Dr. Rainey asked me to let you know that the Museum is closed on Monday. Would it be possible for Mrs. Danziger to come to the Museum on Tuesday, June 25th? I hope this does not upset her plans.

Sincerely yours,

Vittoria Vitelli
Secretary to Dr. Rainey

TELEPHONE: WABASH 2-9410

CHICAGO NATURAL HISTORY MUSEUM
FORMERLY FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE SHORE DRIVE
CHICAGO 5, ILLINOIS

Vittoria:
Did Dr. R write to Collier on this?
LK

14 June 1963

Dr. Froelich Rainey, Director
University Museum
33rd and Spruce Streets
Philadelphia 4, Pennsylvania

Dear Fro:

We have worked out an itinerary for Mrs. Danziger. She will be in Philadelphia on Monday, 24 June, and will come to the University Museum in the morning. I hope very much that she can talk to someone in the Applied Science Center for Archaeology. I believe a number of techniques are being applied there which are of direct significance for conservation work. As I wrote you, our first problem is the conservation of metals, and I gather that metals are of special concern in the Center.

I shall be grateful for your help to Mrs. Danziger.

Sincerely,

Donald Collier
Acting Chief Curator
Department of Anthropology

DC/amf

cc: Alfred Kidder II ✓

Dear Alfie: Mrs. Danziger is are new conservator and we are about to build a new conservation laboratory.

Yours,
Don

ADDRESS ALL CORRESPONDENCE, PUBLICATIONS, AND PACKAGES TO
CHICAGO NATURAL HISTORY MUSEUM, CHICAGO 5, ILLINOIS, U.S.A.

Copy of correspondence sent to U.P. lawyer.

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

Drinker Biddle and Reath.
491 7200

June 24, 1969

Jas. E. Eiseman
491-7301

Mr. Mark C. Han
Museum Applied Science Center for Archaeology
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pennsylvania 19104

Re: City Art Museum of St.Louis
Pflager v. Lδewi

My dear Mr. Han:

I wish to refer to your letters of October 10th and 17th, 1967 to Mrs. Judson T. Shaplin, then Assistant Curator of the City Art Museum of St. Louis, regarding your report on the thermoluminescence test which you made on samples from the supposedly Etruscan statue entitled DIANA (your number P-T-114).

As you may know the Administrative Board of Control of the City Art Museum filed suit in the Superior Court of California at Los Angeles, against Adolph Loewi, the dealer from whom the statue was purchased, for recision of contract and restitution of the amount paid for the statue.

Our California counsel, Mr. William A. Masterson, has just written me that he would like, if at all possible, to take your deposition in connection with your tests, for the purposes of our suit. I would be with Mr. Masterson when we see you. He has suggested that he would like to meet with you in the late afternoon on Wednesday, July 16th and take the deposition in your office or other place convenient to you, on the 17th.

May I suggest that upon receipt of this letter you phone me "collect" at my office (314-241-4471). Mr. Masterson has advised me that he will be in the east on another matter just prior to the above mentioned dates.

Yours very truly,
Henry B. Pflager
Henry B. Pflager, President
Administrative Board of Control
City Art Museum of St. Louis

cc - Mr. Wm. A. Masterson
Mr. Charles E. Buckley

Copy

RESEARCH LABORATORY FOR ARCHAEOLOGY
AND THE HISTORY OF ART

TEL. 55211

6 KEBLE ROAD
OXFORD

MJA/CAB

9th May, 1968.

Mrs. P. D. Shaplin,
Assistant Curator for Ancient and Primitive Art,
City Art Museum,
St. Louis,
Missouri.

Dear Mrs. Shaplin,

We have now completed tests on the three samples from your statue Diana the huntress. Our conclusion is that in all three cases the clay had been fired to a temperature well above 500 degrees centigrade during the last few hundred years, and most probably the date of firing was within the last 100 years.

A weak natural thermoluminescence was detectable from all three of the samples but by comparison with the shape of the glow curve obtained from the thermoluminescence following an artificial irradiation, we are of the opinion that this natural thermoluminescence is what is termed "spurious" (this means that it was induced, for instance, by mechanical handling during preparation rather than by ionizing radiation). However, even if one treats this "spurious" thermoluminescence as genuine, the age obtained is only a few hundred years. This is by comparison with the level of thermoluminescence induced by a known amount of artificial ionizing radiation and by measurement of the level of radioactivity found in the clay itself. In assessing the radiation dosage provided by the latter, we have taken account only of the alpha and beta radiation; this is on the assumption that the statue was not buried; allowance for a gamma ray contribution would only have the effect of making the age deduced a little smaller still.

Please let me know if there is any other information you would like.

Yours sincerely,

M. J. Aitken

April 11, 1968

Mrs. Philippa D. Shaplin
Assistant Curator for Ancient and Primitive Art
City Art Museum of St. Louis
St. Louis, Missouri 63105

Dear Mrs. Shaplin:

At the present time, we do not normally charge a fee for thermoluminescent dating services.

In the future, we plan to set up a second apparatus for this type of testing and will then charge a fee.

I was so glad to have the opportunity to meet you today.

With best regards,

Elizabeth K. Ralph

EKR/abn

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

April 5, 1968

Mr. Mark Han
Applied Science Center for Archaeology
The University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Mr. Han:

The question of releasing your results from thermoluminescent testing of our Diana is still hanging fire due to various complications, and meanwhile I have been asked by our Board of Control to inquire of you whether it is customary for us to pay the Applied Science Center a fee for the services you performed on our behalf.

Sincerely,

Philippa D. Shaplin

Mrs. Philippa D. Shaplin
Assistant Curator for Ancient and Primitive Art

PDS:les

January 23, 1968

Dr. M. J Aitken
Research Laboratory for Archaeology
6 Keble Road
Oxford, England

Dear Martin:

The people at the City Art Museum of St. Louis are persistent souls, and I am sorry that they are now bothering you, too.

From our measurements we feel that there is no doubt that the "Etruscan" Diana is a fake. The 3 separate samples had practically no natural TL, but all had normal susceptibility to X-ray irradiation and high alpha rates (more than 40 c/hrs). I have enclosed copies of Mark's 3 data sheets and samples of the natural and artificial glow curves. (Mark is bed with the flu).

Apparently, the St. Louis Museum is in a fervor because some one has said that they misused public funds when they purchased a fake.

I have enclosed a letter to Mrs. Millett, and I hope that she has some spare time this year. We have, at last, found a graduate student in metallurgy who is doing some meaningful examinations of the samples.

With best regards,

Elizabeth K. Ralph

EKR/ek

Enclosures

Mark
for your fi

RESEARCH LABORATORY FOR ARCHAEOLOGY
AND THE HISTORY OF ART

TEL. 55211

6 KEBLE ROAD
OXFORD

MJA/CAB

16th January 1968.

Miss E. K. Ralph,
University Museum,
33rd and Spruce Streets,
Philadelphia,
Pennsylvania 19104,
U.S.A.

Dear Beth,

We have been approached by Mrs. Shaplin of St. Louis to carry out thermoluminescence tests on their Etruscan Diana on which Mark Han has already worked. I am rather reluctant to duplicate work that he has already done but Mrs. Shaplin's case is that, since legal proceedings are likely to follow, it is important to have a second opinion.

However, I would not proceed with this until I have heard your views and, as they are pressing me for an answer, I would be grateful if you would indicate how you feel.

Many thanks for the revised figure caps for your article.

With best wishes.

Yours ever,

Mark Han

M. J. Aitken

Agreeable with us test Diana Letter follows 1/23/68

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

January 9, 1968

Mr. Mark Han
Museum Applied Science Center for Archaeology
University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Mr. Han:

Pursuant to my telephone conversation with Miss Ralph this morning, of which she has doubtless informed you, I am enclosing a copy of the letter we received from Mr. Aitken at Oxford, and a copy of the letter I am sending off to him today.

Following Miss Ralph's suggestion we procured three samples from the same areas as the ones we sent you, and are forwarding them with accompanying photographs and a copy of your form with the information on provenience etc.

Sincerely,

Philippa D. Shaplin

Mrs. Judson T. Shaplin
Assistant Curator for Ancient and Primitive Art

PDS:les

Copy

January 9, 1968

Mr. M. J. Aitken
Research Laboratory for Archaeology and the
History of Art
6 Reble Road
Oxford
England

Dear Mr. Aitken:

Thank you for your letter of January 5 concerning our Etruscan Diana. In my first letter to you I told you that Mr. Han had been sent samples. These were sent last summer, and he has already made the tests. According to his two letters to us, copies of which I enclose, there do not appear to be any ambiguities in the interpretation of his results. After receiving your letter, I telephoned Miss Elizabeth K. Ralph and asked her to get in touch with you about Mr. Han's findings. I am also sending them a copy of your letter.

The reason that we would still like a second opinion from another laboratory is that the original purchase carried a guarantee of authenticity. Should it become necessary to take the case to court, we shall undoubtedly be asked to obtain some outside support of Mr. Han's findings. We consulted Dr. Stolow about this, and he advised that the second opinion be independently arrived at as possible.

If you feel it is impossible for you to make the tests I would appreciate your letting me know where else we might turn for help. You will see that the situation is both urgent and confidential, and in hopes that you will be able to oblige us, I am today procuring samples and having them sent off to you.

Sincerely yours,

Mrs. Judson T. Shaplin
Assistant Curator for Ancient and
Primitive Art

PDS:les

Copy

RESEARCH LABORATORY FOR ARCHAEOLOGY
AND THE HISTORY OF ART

TEL. 55211

6 KEBLE ROAD
OXFORD

January 5th, 1968

Mrs. Judson T. Shaplin,
City Art Museum of St. Louis,
St. Louis, Missouri 63105.

Dear Mrs. Shaplin,

Thank you for your letter of December 13th, which Dr. Hall passed on to me, as the thermoluminescent work here is particulary my concern. I am sorry there has been in replying but it arrived in the middle of our rush before Christmas and got put on one side.

Although we appreciate the importance of checking the authenticity of your Etruscan Diana, we are reluctant to take it on, unless we receive a direct approach from Mr. Mark Han. . It may be that his measurements have shown that the thermoluminescent technique is inapplicable in this case (because for instance the clay is unsuitable) and it would be an unnecessary waste of time for us - I am sure you will appreciate that our resources are fully engaged in establishing the method as a dating technique. On the other hand, if he feels that there are ambiguities in the interpretation of his results which might be resolved by the alternative technique that we use here, then we should be happy to go ahead.

Yours sincerely,

M. J. Aitken

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

December 14, 1967

Mr. Mark C. Han
Museum Applied Science Center for Archaeology
The University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Mr. Han:

Enclosed is the draft of our proposed news release which I read to you over the telephone this afternoon. Please feel free to make any further changes you believe necessary and return this draft to me along with a letter saying that you approve it in this corrected form.

Mrs. Shaplin would like to know if you possess any further data or information about our Diana which we should have other than that contained in your two letters to her of October 5 and October 17.

Again, our sincere thanks for your generous co-operation with us in this matter. We should appreciate your keeping this matter confidential until such time as we release the story. We shall inform you in advance of this date when it has been decided.

Yours sincerely,

Edward A. Ruesing
Publications Editor and
Public Relations Officer

EAR:les

December 15, 1967

Mr. Edward A. Ruesing
Publications Editor and Public Relations Officer
City Art Museum of St. Louis
St. Louis, Missouri 63105

Dear Mr. Ruesing,

We have read the enclosed news release , and approve it in its present form.

In regard to the Diana, we have no further information beyond that which we wrote to you in our two previous letters.

Thank you for sending us the news release so promptly.

Sincerely yours,

Mark C. Han

MCH/abn

"Credit for resolving the controversy over authenticity which has long surrounded Diana must be given to Philippa D. Shaplin, our assistant curator for ancient and primitive art," Mr. Buckley said. "It was Mrs. Shaplin who noted the recently published findings of the pioneering use of thermoluminescence in dating pottery and who suggested that our goddess could be dated by the same test."

The use of thermoluminescence in dating pottery has been developed in the last five years principally at the Research Laboratory for Archaeology and the History of Art, Oxford University, and at the Museum Applied Science Center for Archaeology of The University Museum, the University of Pennsylvania. Mark C. Han of the latter institution tested three samples from different parts of Diana the Huntress. He found "no detectable natural thermoluminescence" from any of the samples and concluded that Diana is "approximately 150 years old, or less." The samples were also measured for radioactivity content and were bombarded with X-rays in order to induce "artificial thermoluminescence." Both checks found the samples similar to one another and supported the findings of the thermoluminescence test.

When pottery is heated to 400°-500° centigrade, as it is when it is fired, each of its metastable electrons emits a photon of light. When pottery is reheated, as in the thermoluminescence test, the amount of thermoluminescence--that is to say, the amount of light

emitted under heat--is representative of the time elapsed since the original firing. Once pottery has been heated to firing temperature, no further light may be obtained by reheating after a relatively short time. Consequently, pottery fired in modern times shows no thermoluminescence.

The authenticity of Diana the Huntress has been the subject of scholarly controversy since her acquisition by the Museum in 1952. The arguments of both her supporters and her detractors have been based largely on stylistic evidence. Chemical analysis of the paint has proved inconclusive in dating the figure.

Diana is said to have been found in 1872 near Cività Castellana north of Rome by the amateur archaeologist Count Francesco Mancinelli-Scotti. Although the results of the thermoluminescence test do not preclude the possibility of the veracity of this story, they do prove that, if the story is true, Diana was discovered no more than about 50 years after she was made. It has been alleged that Diana the Huntress is the work of the Italian sculptor Alceo Dossena who died in 1937.

Charles Buckley concluded, "The admission of error when discovered is as much the responsibility of a great museum as is the education of its visitors. Let us hope that Diana, relabelled and reinstalled, will enlighten our public as much as she has ourselves."

Exeunt

Peal of trumpets

(If this is indeed a drama, as the closing stage directions would suggest, the hero and the heroine of the piece are certainly Mr. Hay and Mrs. Shaplin. Thank you, Mr. Hay!)

October 17, 1967

Mrs. Judson T. Shaplin, Assistant Curator
City Art Museum of St. Louis
St. Louis, Missouri 63105

Dear Mrs. Shaplin,

Thank you for your letter of October 10. In reference to your question regarding the date of your Diana (P-T-114), we should like to clarify some of the points regarding our statement that "her age is approximately 150 years old, or less."

We failed to inform you in our last letter of the possible margin of error, which is of the order of ± 100 years; this is inherent in the dating process. Based on the results of the studies mentioned in our previous letter, the object is more than likely not, and could be less than, 150 years old, if one keeps in mind the ± 100 year error which is inherent in the method. It is not possible for us at the current stage of our research work on thermoluminescence dating to pin down a date within such a short time span. Although it is not possible to determine a precise date, it is possible to distinguish the difference between several centuries, and thus we were able to report to you that your Diana was made in recent times rather than in the B.C. period.

We shall keep the findings confidential as you have requested, until we have heard from you further. In the meantime, for our files, could you kindly supply us with a color 35 mm. slide of the Diana.

Sincerely yours,

Mark C. Han

MCH/abn

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

October 10, 1967

Mr. Mark C. Han
Museum Applied Science Center for
Archaeology
The University Museum
University of Pennsylvania
33rd & Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Mr. Han:

Today we received your report on our Diana (P-T-114). Our Director is at present out of town; it will therefore be necessary for us to keep your findings confidential until he has returned and made a decision about what steps we should take next.

My only question at present is whether the results of your tests give any indication of the statue's age within the 150-year range you mentioned in your letter. Some scholars have thought it to be the work of Alceo Dossena, and eventually I think it will be important if we can establish the possibility of this supposition. Dossena's active years as a forger were between 1920 and 1937.

Mr. Robertson joins me in thanking you for conducting this examination on our behalf. We are most grateful, and we will be in touch with you later on when the time comes to publish the results.

Sincerely yours,

Philippa D. Shaplin

Mrs. Judson T. Shaplin
Assistant Curator for Ancient
and Primitive Art

PDS:les

c.c.: Charles E. Buckley, Director
Clements Robertson, Conservator

P-T-114

Museum Applied Science Center for Archaeology

Froelich Rainey, Director — Elizabeth K. Ralph, Associate Director

THE UNIVERSITY MUSEUM • UNIVERSITY OF PENNSYLVANIA
33rd & SPRUCE STREETS • PHILADELPHIA, PENNSYLVANIA 19104
594-7400 (Area Code 215) — Cable Address "Antique"

October 5, 1967

Mrs. Judson T. Shaplin, Assistant Curator
City Art Museum of St. Louis
St. Louis, Missouri 63105

Dear Mrs. Shaplin,

We have completed all measurements on your Diana the Huntress. We would like to inform you that our results have shown that her age is approximately 150 years old, or less.

We base this conclusion on the following evidence: First, there was no detectable natural thermoluminescence from any one of the three parts which you sent to us. In general, based on this point, one can state that the statue was made recently. In order to be more certain, we proceeded further with your three samples to make a complete measurement of each. Each of the samples were very similar to each other in their radioactivity content measurements and their response to x-ray bombardments, which we term "artificial thermoluminescence." These are all of the measurements needed for dating.

We are very happy to have done these samples for you. If you would like to refer to these samples again, please use the number P-T-114, which was assigned to your Diana by our Laboratory.

Thank you for your patience.

Yours truly,

Mark C. Han

Copy enclosed for Mr. Clements L. Robertson.

MCH/abn

P-T-114

MASCA Laboratory, University Museum
University of Pennsylvania
Philadelphia, Pennsylvania 19104

The information requested below must accompany each sample submitted.

1. Descriptive name of site and sample, and brief explanation of significance of each. Terra cotta fragments from a 5th c. B.C. statue of Diana
Said to have been excavated in or near FALERII (Civita Castellana), near Rome, 1872

2. Sample material. 3 vials each containing 3 gs. from areas indicated on the attached photographs.

3. Precise geographic location, including latitude & longitude to nearest degree. Falerii (Civita Castellana) 42·16 N, 12·24 E.
Note: the statue is in the style of Satricum (Conca), 41·28 N, 12·38 E.

4. Occurrence and stratigraphic position within site: cultural and/or geologic associations; and stratigraphic and chronological position of this sample relative to others from this site. Include sketch if necessary. No information

5. Factcrs affecting validity of date, such as subsequent exposure to heat above ambient temperatures. No known factors

6. Any further explanation felt necessary. See attached sheet

7. Name of collector and date of collection. City Art Museum of St. Louis 358:52
ex collection Francesco Mancinelli-Scotti, Civita Castellana, Italy. 1872-1937

8. Name and institutional affiliation of submitter. Clements L. Robertson, Conservator
Philippa D. Shaplin, Assistant Curator } City Art Museum, St. Louis.

9. Reference to relevant publications. Include complete title, publication, pagination, etc. See attached sheet

10. Comment by submitter and/or collector, comparing sample with other dates and sites, etc. Sample numbers and references must be complete.


2
3. Below base, inside.

ITEM 6--FURTHER EXPLANATION

A. PHOTOGRAPHS AVAILABLE

1. German Archaeological Institute, 1937. Statue with original encrustations (whether dirt or calcareous sinter not determined), the broken parts re-assembled and held together with string.

2. Vasari, Rome, about 1952. Statue during and after first restoration at Villa Giulia.

3. City Art Museum, St. Louis, 1952, accession photographs.

4. Joseph Ternbach, New York, 1952. Statue during second restoration.

5. R. Herbig (see Bibliography, no. 16), 1954,. Statue after removal of additions made during second (Ternbach) restoration.

B. TECHNICAL REPORTS AVAILABLE

1. Joseph Ternbach, New York, 1952, 1954
2. George M. A. Hanfmann, Harvard University 7/26/54
3. Andreas Rumpf, University of Cologne, 9/18/54

ITEM no. 9. (12)

Diana the Huntress

1. P. T. Rathbone, Illus. London News, Sept. 19, 1953, pp. 435, 6.
2. Joseph Ternbach, Archaeology, VI, No. 4, 1953, pp. 242-3.
3. City Art Museum Poster, September 1953.
4. Dr. Lodovico Ragghianti, Sele Arte, September 1953, pp. 76-7 "Etruscan Sculpture Rediscovered".
5. Art News, November 1953, p. 7.
6. Muehlestein, Hans, MS: "An Etruscan Statue of Diana," 1953.
7. Antonio Cederna, Il Mondo, June 8, 1954, p. 11, "I Vandali in Casa..."
8. Gnudi, Cesare, Il Mondo, June 22, 1954 (letter to editor).
9. Pallotino, Massimo, Archaeologica Classica, 1954, p. 170-171.
10. O. W. von Vacano, "Die Etrusker," Stuttgart, 1955, illus. Pl. 52.
11. Walter Lusetti, "Alceo Dossina, Scultore," De Luca Ed., Rome, 1955.
12. Cellini, Pico, Paragone, No. 5, May 1955, p. 42 ff.
13. Galdi, Ernesto, La Corrispondenza, No. 160, July 2, 1955.
14. Galdi, Ernesto, La Corrispondenza, No. 206, October 3, 1955.
15. The Italian Scene, II, 9, Oct.-Nov. 1955.
16. Herbig, Reinhard, "Die Terrakottagruppe einer Diana mit dem Hirschkalb," "Abhandlunge der Heidelberger Akademie der Wissenschaften," Philosophisch-historische Klasse, Jahrg 1956, 3 Abhandlung.
17. Cellini, Pico, Paragone, No. 81, Sept. 1956, p. 54 ff.
18. Raffaello Leccisi, Alceo Dossena, Rome, 1957, illus. Pl. 1-21
19. Pallotino, Massimo, Archaeologica Classica, Vol. IX, fasc. 1, 1957, pp. 111-115.
20. City Art Museum, Bulletin, XLIII, 2-3, 1958, Abbreviated digest by Thomas T. Hoopes of Herbig article.
21. Dr. M. Bieber, A J A, Vol. 62, 1958, pp. 341-343 (review of Herbig article)
22. St. Louis Post Dispatch, July 6, 1958, July 7, 1958, July 20, 1958.
23. The Boston Herald, July 3, 1960 (Harold W. Parsons: "Roman Genius Shook Art World With Forgeries in Ancients' Style")
24. Cf. also Bolletino d' Arte, XXXVII, April-June, 1952, p. 147 ff.
25. H. W. Parsons, "The Art of Fake Etruscan Art", ART NEWS, Feb., 1962, p. 34 ff.
26. "St. Louis' Diana, a controversy" ART NEWS, March 1962 p. 10, 65
27. Mentioned ENCY. OF WORLD ART, V, p 338.

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

President: HENRY B. PFLAGER • *Vice-President:* ROLAND W. RICHARDS • *Director:* CHARLES E. BUCKLEY • *Secretary:* ANDREW M. STEVENS

June 27, 1967

Mr. Mark Han
Museum Applied Science Center for Archaeology
The University Museum
University of Pennsylvania
33rd and Spruce Streets
Philadelphia, Pennsylvania 19104

Dear Mr. Han:

We were delighted to get your letter and to know that you will undertake tests on our Diana.

We removed the statue from exhibition this morning and would like about a week or ten days before we send you the samples and return to you your data sheet. During this period, Mr. Robertson will make a thorough examination of the piece in order to determine, among other things, the best areas from which to procure samples. I will go through our extensive files dating back to 1952 in order to get the most accurate information possible for you on date, provenance, and former history.

You will be hearing from us shortly, and thank you again for your interest and help.

Sincerely,

Philippa D. Shaplin

(Mrs.) Philippa D. Shaplin
Assistant Curator

PDS:ls

June 23, 1967

Mrs. Judson T. Shaplin
Mr. Clements L. Robertson
City Art Museum of St. Louis
St. Louis, Missouri 63105

Dear Mrs. Shaplin and Mr. Robertson:

Thank you for your letter of June 15. In reply to ypur request, we will be most happy to undertake this experiment with you. In view of our current program, we cannot promise an immediate result on your samples, but we will try to run them at the earliest possible time.

I am enclosing a sample information sheet for our laboratory use. We would also like to have any reports of analyses made on the statue. As for sampling the statue for the experiments, we would like to have two or three samples of at least three (3) grams each from different locations on the statue, separately labeled so that we may get an over-all comparison of the results.

Again I thank you for your interest and look forward to hearing from you.

Sincerely yours,

Mark Han

MH/ab

CITY ART MUSEUM OF ST. LOUIS

St. Louis, Missouri 63105

June 15, 1967

Mrs. Elizabeth K. Ralph
Mr. Mark C. Han
Applied Center for Archaeology
University Museum
University of Pennsylvania
Philadelphia, Pennsylvania

Dear Mrs. Ralph and Mr. Han:

Last year we read with interest your article in Nature on the dating of pottery by thermoluminescence, and, more recently, Ellen Kohler's article in Expedition. As you probably know, we have a well-known Etruscan terra cotta statue which we acquired in 1952 and which, since 1954, has been under suspicion as a possible Dossena forgery.

The controversy over this statue has been long and complicated. The case at present rests as "unproven", but unfortunately undue publicity in the 1950's has left a popular impression that the piece is definitely false. From time to time we continue to be plagued with irresponsible statements such as the enclosed, from a recent Newsweek.

About a month ago we discovered that a local scientist at Monsanto was interested in thermoluminescence as an archaeological tool. We approached him, only to find that they do not yet have the proper equipment in St. Louis to carry out the tests, and would have to build it. They could give us no assurances on how long this would take, and implied that we would have a very long wait.

We have also talked to Mr. Joseph V. Noble who has confirmed our impression that further chemical tests of the paint (some have been made already at the University of Cologne in 1954) could only be inconclusive.

We feel that it is time to settle the problem of authenticity once and for all, particularly in view of the importance of this statue. If genuine, it is both a major work and a unique piece. If false, it would be a forgery of almost the same magnitude as the Metropolitan warriors.

The Kohler article would indicate that you already have data from trial samples, made during your analysis of the University Museum's statuette, which could serve very well as comparative material. There will also be no problem in procuring samples of the necessary size from the various parts of our "Diana", as needed. In fact, our piece is perfectly suited for further application and confirmation of the methods you carried out so successfully on the University Museum piece, with a minimum of complications.

We would be most grateful if you would be willing to undertake this experiment with us, and hope that we may hear from you in the near future. If you are agreeable, we are already prepared to supply you with detailed information on the statue, photographs, and reports on analyses made to date.

Sincerely,

Clements L. Robertson

Clements L. Robertson
Conservator

Philippa D. Shaplin

(Mrs.) Judson T. Shaplin
Assistant Curator, Ancient and
Primitive Art

/ls

Enclosures

October 2, 1969

Dr. Christoph Clairmont
Classics Department
Douglass College
New Brunswick, N.J. 08903

Dear Dr. Clairmont:

In regard to dating some wood from Salona, I am sorry to say that we continue to have a large backlog of samples waiting to be dated in our laboratory. Therefore, we are trying not to accept ones from new sites unless they are of very great interest to one of the curators in our museum. We prefer also to date series of samples. We have recently become interested in several neolithic sites in Yugoslavia - Lepinski Vir, Divostin, Grivac, etc. so that if there is any possibility of your eventually obtaining a series from Roman to Neolithic times, that could change our decision.

A commercial laboratory, Isotopes, Inc. (50 Van Buren Ave., Westwood, N. J. 07675, Dr. Eric H. Willis) does very good work if you specify that they count the samples for, at least, 2000 minutes. Also, they give you the results within six weeks. The cost is about $150.00 per sample.

Sincerely yours,

Elizabeth K. Ralph

EKR/emf

UNIVERSITY of PENNSYLVANIA
PHILADELPHIA 4

The School of Metallurgical Engineering

November 13, 1963

COPY

Miss Katherine Clapp
1 Gray Street
Cambridge, Massachusetts

Dear Miss Clapp:

Professor Cyril Smith has told me of your interest in a graduate interdisciplinary program in archaeology and metallurgy leading to the Ph. D. degree here at the University. We are attempting to obtain support for such a program from the National Science Foundation. The program includes some of the faculty in Metallurgy, Miss Elizabeth Ralph, Director of the Applied Science Laboratories for Archaeology, Dr. F. Rainey, Director of the University Museum and members of his staff in Archaeology.

We have not as yet determined the course requirements for the degree in this program. However, there are many precedents for such requirements at the University. For example, we have in Metallurgy a interdisciplinary program for dentists who are working towards the Ph. D. degree in Science of Materials. In this case, as I am sure it would be for a program in archaeology and metallurgy, we do not expect the Ph. D. candidate to fulfill requirements for a Ph. D. degree in metallurgy, nor do we expect the candidate to acquire all of the courses to qualify for a Ph. D. degree in dentistry. A candidate in a disciplinary program in "archaeological" metallurgy would not be expected to fulfill all requirements for the Ph. D. degree in metallurgy and in archaeology. A committee consisting of metallurgists, archaeologists, chemists would administer the program.

Although we cannot write the requirements until a committee is convened, it is reasonable to state that a good candidate should fulfill the requirements and obtain the degree within three or four years.

I am enthusiastic about the initiation of such a program in archaeological metallurgy and the possibility of obtaining a candidate to work in this most interesting field. May I have your reaction to applying for admission to the Graduate School with the goal of a Ph. D. degree in this area.

Sincerely yours,

R. Maddin

/h

cc: Dr. C. S. Smith
Dr. F. Rainey
Miss E. Ralph

May 15, 1963

Name: Katharine P. Clapp

Address: 13 Shepard Street
Cambridge, Mass.
UNiversity 4-8464

Personal Data:

Age:	26	Date of Birth;	May 8, 1937
Height:	5'7"	Marital Status:	Single
Weight:	125	Social Security Number:	334-30-4671

Education:

1959-60 University of Florence, Italy.
1955-59 Vassar College. A.B. degree.
1952-55 Shipley School, Bryn Mawr, Pa.

Major Field of Study: History of Art, minors in English and Chemistry.

Work Experience:

1960-Present Metallographer, Wakefield Bearing Co. Wakefield, Mass.
Summer, 1954-56 Volunteer, Peabody Museum, Salem, Mass.
Summer, 1957-58 Laboratory Technician, Wakefield Bearing Co.

Foreign Languages: French, Italian, some German.

Travel:

Summer, 1962 Travel in Mexico
Winter, 1959-60 Living in Florence, Italy, with travel to Austria, Belgium, France, England, Turkey and Greece.
Summer, 1955 Tour of Italy, France, and England.

References:

Mr. Donald G. Barnett, Vice President, Wakefield Bearing Corp. Wakefield, Mass.
Dr. J. H. Brophy, Massachusetts Institute of Technology, Cambridge, Mass.
Mr. Ernest Dodge, Director, Peabody Museum, Salem, Mass.
Vassar College Vocational Bureau, Poughkeepsie, N. Y.

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

SF-1201 (4-60)

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

20 JUN 20 PM 10 53

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

1038P EDT JUN 20 61 PA877
P ETA247 (W SNB132) (DAF NI4 9289) GOVT PD SN WASHINGTON DC
20 559P EDT
FROELICH RAINEY
UNIVERSITY OF PENNSYLVANIA DY PHILA
CONGRATULATIONS ON RECEIVING AN AWARD FROM THE NATINXXX THE
NATIONAL SCIENCE FOUNDATION. BEST WISHES FOR YOUR FUTURE CAREER
JOSEPH S CLARK USS.

Ev 6/21/61 — ack unknown here Ivy
Ev 6 8402 phone Dietz 11:11 P

1961 JUN 20 PM 10 52

A- 95084

RUTGERS · THE STATE UNIVERSITY

DOUGLASS COLLEGE
CLASSICS DEPARTMENT

NEW BRUNSWICK, NEW JERSEY 08903
September 29, 1969

Miss
Elizabeth Ralph
The University Museum
Philadelphia, Pa. 19104

Dear Miss Ralph:

In our first season of excavations at Salona, Yugoslavia, which I conducted for Douglass College, we found some wood. I was wondering whether you would be interested and could undertake a C 14 analysis for us. I could send you the wood any time you wish. I would appreciate knowing when the analysis would be ready and if there is any charge for it.

Looking forward to hear from you,

Sincerely yours,

Christoph Clairmont

Christoph Clairmont
Associate Professor of Archaeology
and Classics

[MARY CLARK]

213 Van Hoosen Hall
East Lansing, Michigan 48823
April 23, 1969

Miss E.K. Ralph
A.S.C.A.
University Museum
33rd and Spruce Streets
Philadelphia, Pa. 19104

Dear Miss Ralph,

Dr. Wailes has advised me to consult you regarding part-time employment in the A.S.C.A. Lab during the 1969-70 academic year. My future husband and I have been accepted by the Anthropology department to begin our graduate studies, directed towards specialization in archaeology, in the fall. Although he has been awarded a full University Fellowship, I have not as yet been offered any sort of financial aid. I must find part-time employment in order to continue my studies.

I am hoping to find employment within the field, if at all possible. Work at the museum would be especially valuable to me because I am extremely interested in conservation techniques and the presentation of anthropological data through museum display, as a result of my current work for the museum at Michigan State University.

I was first introduced to conservation techniques in a summer study program for archaeology at Westminster College, Oxford, England. Sponsored by the Association for Cultural Exchange, the course was academically structured by Dr. Wailes. Following the course, I worked at a crop-mark site (Saxon and Roman) in Essex.

During the past summer, I attended the archaeology summer field school, conducted by Michigan State University, at the French and British trading-fort site of Michilimackinac, in Northern Michigan. I have been very fortunate in that I have been able to follow the materials excavated and cataloged in the field, to the research lab and have thus gained a clearer sense of the entire process of archaeological investigation.

My current work in the museum consists of the cleaning, preservation , and identifying the iron artifacts according to the typology established by Lyle Stone for the Michilimackinac site. I am also working on the distribution of iron scrap.

In addition to this experience, I have a background in general anthropology, as this is my undergraduate major. I have had highschool chemistry, physics, and algebra as well. I have had considerable art training in highschool and have taken several university art courses. I hope to apply this art training to the preparation of photographic and graphic illustrations for academic publications if the opportunity to learn such techniques presents itself.

I will be happy to send any additional information or references that would assist you in your evaluation of my qualifications. Dr. Wailes has kindly consented offer you any information that is available to him.

I sincerely appreciate the time and consideration that you are giving this request for employment.

Yours sincerely,

Mary H. Clark

Mary H. Clark

April 29, 1969

Mary H. Clark
213 Van Hoosen Hall
East Lansing
Michigan 48823

Dear Miss Clark:

There is a slight possibility of our being able to offer you part-time employment in our ASCA labs during the 1969-70 academic year. However, I cannot be definite about it at this time because our funds are indefinite.

Unfortunately, I shall be leaving for field work in Italy and Yugoslavia within a few weeks, but the chances are anyway that we won't know about funds until mid-July when I shall be back.

If you do not find a more definite position before then, please send me a reminder before mid-July.

Sincerely yours,

Elizabeth K. Ralph

EKR/mrb

January 3, 1967

Dr. Charles E. Cleland
Curator of Anthropology
The Museum
Michigan State University
East Lansing, Michigan

Dear Dr. Cleland:

After our "no show" last year, you may not want to bother with us and our instruments again. In case you do, however, I am writing to ask if July, 1968, would be a suitable time for your.

With best regards,

Elizabeth K. Ralph

EKR/ek

August 16, 1967

Dr. Charles Cleland
Box 88
Mackinow City, Michigan

Dear Dr. Cleland,

It is with regret that I did not come to Michigan this summer. I had looked forward to coming, and I have appreciated your making the exact time of arrival so flexible.

When I wrote to you from Italy, I had no idea of the bad state of affairs in our C-14 laboratory. The C-14 lab is my first responsibility, but usually it is under better control. I knew that Bob Stuckenrath had left for Alaska, but I did not know that one of the experienced assistants had also disappeared. That left one new girl, fortunately, very capable, to do all of the work. Things might have been all right if almost all of our old circuits, etc. had not decided to breakdown this summer. I spent last week taking care of the more obvious breakdowns and thought that we would be back to where I left things in May, but this week, some others acted up. Therefore, I decided last night that my responsibility is definitely here until Stuckenrath returns on September 6th.

Another complication is that I found a significant wall on the plain of Sybaris this summer, and now the Museum has suddenly become interested in excavating it. If I had known this beforehand, I could have made all the arrangements before leaving Italy, but now I have to write my reports in great haste and write to various people in Italy (all in Italian) to organize this the "hard way." Also, I may have to return there for a few weeks in September.

I think that this is the first time that we have failed to appear for an instrument survey when scheduled, and I hope that you will forgive us. Dr. Rainey feels as badly about it

as I do, and has offered to give a lecture or two at your convenience in the fall or thereafter. Also, if you want us to come next summer, your schedule will have top priority.

I hope that you had a successful season of excavations.

Sincerely yours,

Elizabeth K. Ralph

EKR/ab

Museum Applied Science Center for Archaeology

Froelich Rainey, Director — Elizabeth K. Ralph, Associate Director
THE UNIVERSITY MUSEUM • UNIVERSITY OF PENNSYLVANIA
33rd & SPRUCE STREETS • PHILADELPHIA, PENNSYLVANIA 19104
594-7400 (Area Code 215) — Cable Address "Antique"

July 20, 1967

Dear Miss Ralph,

This morning a Mr. Charles Cleland from the University of Michigan called. He wanted to speak to you about a trip to Michigan on the first of August, or the first week of August. Apparently he has spoken to you about this some time ago. As we told him that you were expected in this area about the middle of August, he is wondering if you are still going to Michigan at that time. His address is

Charles Cleland
Box 88
Mackinow City, Michigan

Phone: 616 436 5563

write

If you'd like us to write to him, please just send us a note. I'm sorry to bother you with this now. I'm looking forward to meeting you and to speaking Italian with you too--- Everything here is fine. Enjoy Italy!

Angela Bargellini

Angela Bargellini

28 July, Fri

Beth!-

Mr Cleland should be at 616-436-5563 next week (July 31 - Aug 4) after 5:30 pm. He's out in the field during the day.

It would be best if you could talk to him & arrange to meet him somewhere yourself. I was not able to get in contact with him, but spoke to one of his colleagues who told me the above.

If Mr Cleland is in East Lansing when you

call, he can be contacted either at the Museum of Michigan State, or at the Anthro department. The man didn't know these phone numbers. 616-436-5563. is this number in Mackinow City, Michigan -

I'm sorry that the info isn't more specific —

Cheers A

C. Colani
8 München 9
Brehmstraße 20.

München den 24.Mai1964.

Frau
Elizabeth K. Ralph, Ass.Dir.
Applied Science Center for Archaeology
University of Pennsylvania
33rd Spruce Streets
Philadelphia 4 Pennsylvania USA.

Sehr geehrte Frau Ralph!

Ich danke für Ihren Brief vom 6.d.M., der mich erst jetzt erreichte. Herr Lerici erwähnte schon Ihr Interesse an meinem Ortungsgerät. Nun ist es nicht leicht, in der Kürze eines Briefes einen ausreichenden Abriß des Verfahrens und des Gerätes zu bringen, weshalb ich auf die Veröffentlichung in der ETZ-A Bd.85 (1964)H.6 S.167-170 verweise. Ihre spezielle Frage nach der Reichweite möchte ich mit dem beigefügten Diagramm beantworten. Unter "maximal ausnutzbare Reichweite" ist die Weite verstanden, bei der störende Effekte durch das umgebende Medium noch vernachläßigbar sind. Das ist besonders wichtig bei Seewasser. - Das Diagramm zeigt Meßwerte. - 5% NaCl entspricht ca. 4 S/m, wie ich in der Nordsee gemessen habe. - Die Meßwerte für Seewasser wurden mit meinem Gerät in der Nordsee und Adria gewonnen.

Ich würde mich freuen, wenn mein Verfahren Ihr Interesse fände und sich vielleicht ein nützlicher Einsatz ergäbe. Im letzten Jahr habe ich mit verschiedenen Firmen verhandelt und es ist möglich, daß in einiger Zeit Geräte auf dem Markt sind. Doch ist es wahrscheinlich, daß diese Geräte nicht für archäologische Zwecke entwickelt werden. Deshalb könnte es unbedingt interessant sein, wenn sich ein archäologisch ausgerichtetes Institut einer Sonderentwicklung annähme. Dies wäre mein besonderer Wunsch, den ich auch Herrn Lerici gegenüber äußerte. Es sind bisher jedoch keine Entschlüsse getroffen worden. -- Deutsche archäol. Kreise sind ablehnend. Nicht aus technischen Gründen. Sie sehen keinen lohnenden Einsatz und befürchten "Schatzsucher-Technik". In Italien ist es anders. Ihre Meinung würde mich sehr interessieren, auch Ihre Aufgabenstellungen. Wenn es Sie interessiert, werde ich gern ausführlicher berichten.

Ich verbleibe mit freundlichem Gruß

Ulan Colani.

C. Colonè
Letter 5-24-64

I thank you for your letter of the 6th of this month, which reached me only now. Mr. Lerici already mentioned your interest in my (locating apparatus) spotter apparatus. Now it is not easy, in the short space of a letter to give a sufficient sketch of the process and apparatus, therefore I refer to the publication in Elektrotechnische Zeitschrift A, vol 85 (1964) part section b pp. 167-170. I could answer your specific question about the range with the attached diagram. Under "maximum utilizable range" is understood the width, at which the disturbing effects through the surrounding medium are still negligible. That is especially important in the case of sea water. The diagram shows measurement values — 5 db/Nace corresponds to about 4 lengths of a side, as I have measured in the North Sea. The measurement values for sea water were obtained with my instrument in the North Sea and Adria.

L-6,7
Hoose School Lib

I would be happy if my process found your interest and perhaps it would have a useful application. a useful deposit (?) would follow from this. Last year I have dealt with various firms and it is possible that at some time the instruments would be on the market. Still it is probable that this apparatus could not be developed for archeological purposes. Therefore, it could be absolutely interesting if an archeological institute would assume a separate (special) development. This would be my special wish

which I have also expressed to Mr. Kerici.
Up to now no resolutions have been met.
German archeological circles are declining (have refused). Not for technical reasons. They see no profitable investment and are afraid of "wealth-seeking technic." In Italy it is different.
Your opinion would be very interesting to me, also your position (stand) on the problem.
If it interests you, I would gladly inform you in greater detail.

I remain with a friendly greeting,

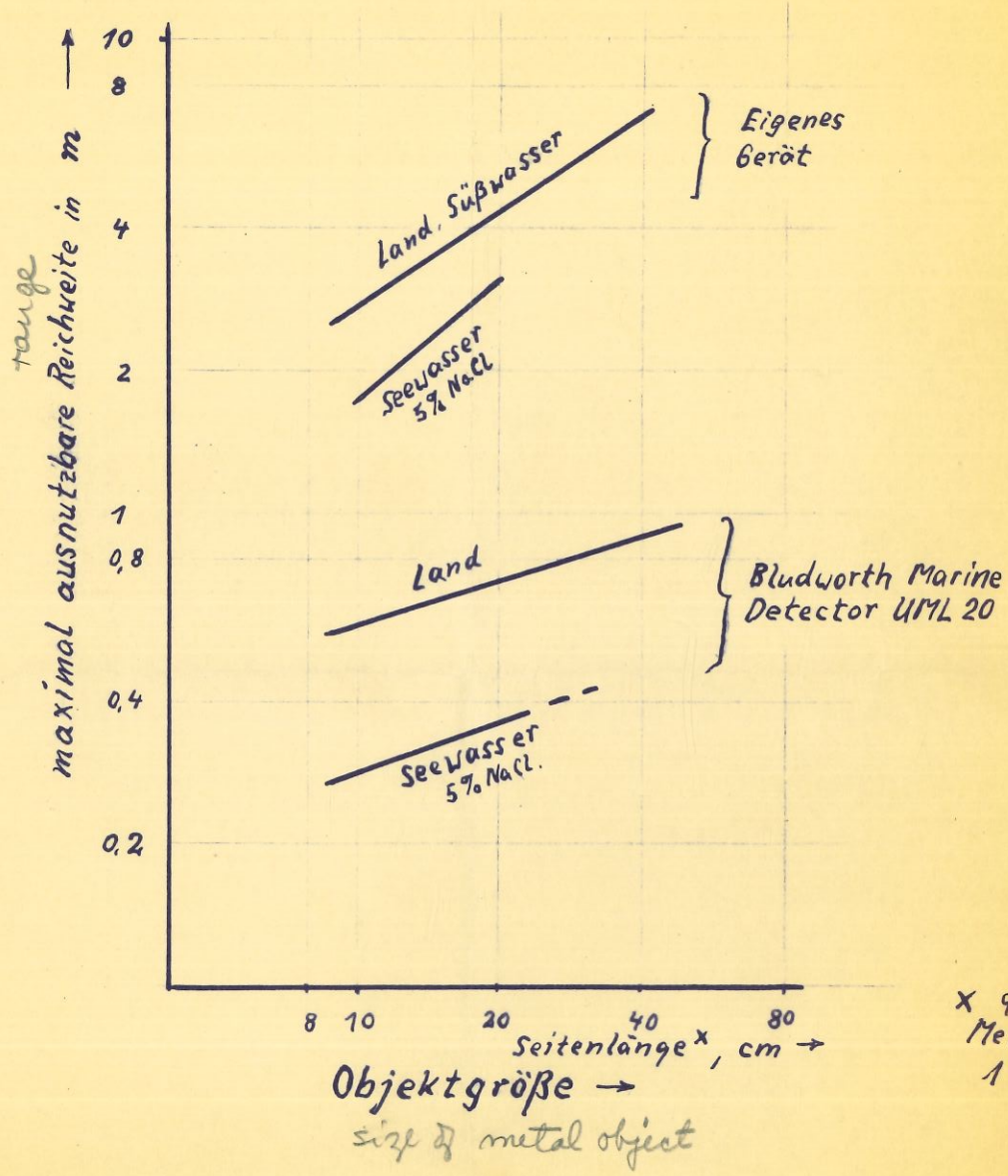


Bild 3.

Reichweite in Abhgkt. von der Objektgröße.

Range depending on size of object.

Colani

Ob Ingenieur Claus Colani
8 München 9
Brehmstrasse 20

rec'd from
Ing. Lenici 2/27/64

Size of object
& distance
Sensitivity

willing
good testing gr.
explored

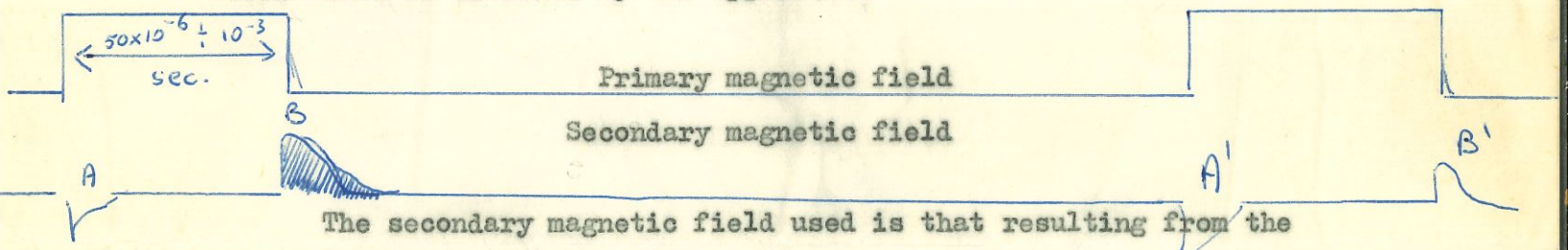
ING. CLAUS COLANI'S ELECTROMAGNETIC APPARATUS FOR THE LOCATION OF METAL OBJECTS

Operating Principle

The apparatus produces a pulsating magnetic field by means of a coil consisting of some turns of wire, the size of which can vary within wide limits ; into the coil are sent current pulses of a duration between 50 microseconds and 1 milliseconds, at $\frac{1}{2}$-second intervals.

The intensity of the current pulses is normally 20 A, but at full power the intensity can be as high as 100 A.

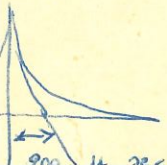
The pulsating magnetic field induces currents in the metal bodies close to the coil, both at the time when it is established and when it is cut off ; the induced currents create a secondary field which is detected by the apparatus.



The secondary magnetic field used is that resulting from the cancellation of the primary field (B, B', etc.).

The primary field is not cancelled instantly, but drops to zero along an exponential curve $A = A_o\, e^{-t/T_1}$, where $T_1 = \frac{L_1}{R_1}$ is the time constant. The value of the time constant in the primary circuit is in the order of one microsecond.

The secondary field, created by the currents induced in the metal objects by the variation of the primary field, has a much higher time constant, in the order of 200 microseconds ; therefore, a few microseconds after the current is turned off, the primary field

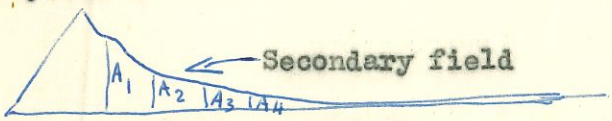


is practically cancelled, while the secondary field is slightly below its peak and can be measured by the same coil used to create the primary field.

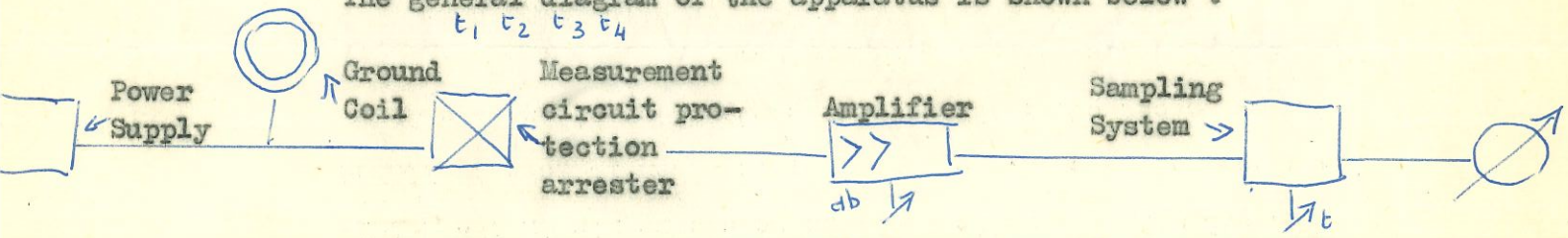
In other words, the total magnetic field (primary + secondary) linked with the coil is cancelled rapidly in the absence of metal objects, while it drops more slowly when such objects are present.

The plotting of the secondary magnetic field drop curve is effected by the sampling system. It involves measuring the ordinates of the chart at various instants, variable at will. Since the transition is repeated cyclically (every $\frac{1}{2}$ second), by changing the instant of measurement with respect to the cutting off of the current, and measuring with an indicating instrument the related values of the secondary field, it will be possible to plot the chart of the latter.

Sampling System :



The general diagram of the apparatus is shown below :



As compared to the conventional electromagnetic apparatus for the detection of metal objects, operating on a permanent sinusoidal-power supply, Ing. Colani's apparatus offers the following advantages :

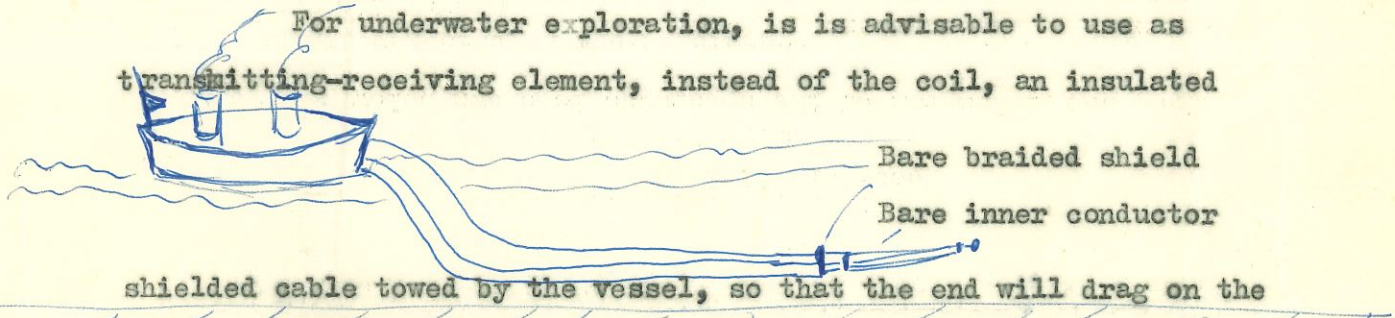
1) it measures the secondary field when the primary field has been cancelled ; in the conventional apparatus the secondary field

is measured in the presence of the primary field, and it is therefore necessary to cancel out the primary field by means of a previous balancing, always hard to achieve and to maintain ;

2) it uses a single coil, whose shape, size, etc. can be varied within wide limits ; in the conventional apparatus (of the mine-detector type) two coils are used, whose geometrical shape is fixed and whose relative position, once the balancing is achieved, must remain unchanged.

3) according to Ing. Colani, this apparatus can be used for detection work at a range much greater than that of conventional apparatus ; it is pratically not influenced by soil moisture, unlike the other apparatus, and can be used also in highly conductive media, such as seawater.

For underwater exploration, is is advisable to use as transmitting-receiving element, instead of the coil, an insulated

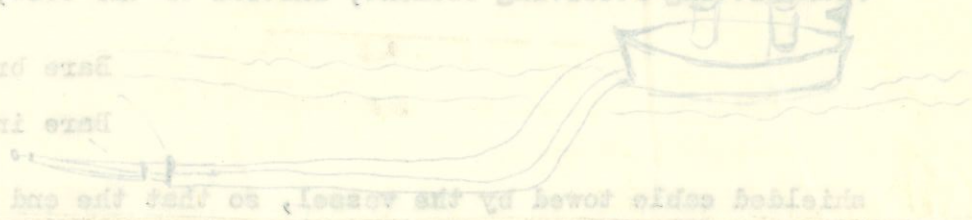


shielded cable towed by the vessel, so that the end will drag on the bottom. The external conductor (copper braided shield) will be cut off and bared at a few meters' distance from the free end.

At the end, instead, the inner conductor is bared. Instead of the coil, thus, there will be provided a dipole which can easily be towed by the vessel.

Ing. Colani is very much interested in having his discovery applied to scientific research projects ; he is in touch with German organizations interested in it. He possesses one set, which he built during his own free time.

NA 1 6600
ext 421



MARINI STRAND HOTEL
VIA DEL TRITONE, 17
673.941 - MARINIHOTEL
00187 ROMA

HOTEL EXCELSIOR
VIA E. GIANTURCO, 3
891.020 - EXCELSIORHOTEL
80077 ISCHIA

HOTEL BOSTON
VIA LOMBARDIA, 47
471.592 - BOSTONHOTEL
00187 ROMA

June 3rd 1969

Dear Iro –

I have been singularly unsuccessful in getting anything accomplished. Had lunch with Jim but he was of little help other than saying Toti was to get started this month.

Franca is up at her country home and can't be reached other than by little

Minor strikes here and there in communications hamper efforts to get anything done. P. Janeopi & Georgio Buchner seem to be beyond reach by phone

We are off to Sicily for five days when there is a strike of hotel employees. Will return in six days and if I can get anything done will cable before the 15th –

Allie. [OLIVER COLBURN]

P S The postal strike is a mysterious thing and there is talk all letters are or will be burnt & not delivered. Hope you at least get this.

O.C.C.

Jim had no word from Bith

The National Society
of the
Colonial Dames of America
in the
State of Maryland

April 27

Dear Miss Ralph,

I do want to thank you again for finding the time in your busy schedule to come to Mount Clare and try to help us find the tunnel. While this was not successful we all feel that the possibility of having found some of the foundations of the original buildings to be most exciting. I hope that perhaps you will be able to return and help us pursue this research further. Having watched you work and

having studied the birds and tape-recording, I now have a much better understanding of your fascinating work and its possibilities.

Please thank Mr. Bevan and Mr. Hancock. It was a pleasure to meet you all. I hope your efforts this summer are successful – I know the projects will be interesting.

Hoping to see you soon again,

with best regards,

Charlotte Auer

100 W. University Pkwy.
Baltimore, Md. 21210

March 4, 1975

Dr. Ernest C. Conrad
10896 Walnutwood Way
Rancho Cordova, Cal. 95670

Dear Dr. Conrad:

Thank you for your letter to Barry Weiss. If the enclosed MASCA Newsletter does not answer your questions, then I give up! However, the limit of our correction factors is 5300 B.C.

Sincerely yours,

E.K. Ralph, Ph.D.

My computer says this is page 2

Ernest C. Conrad
10896 WALNUTWOOD WAY, RANCHO CORDOVA, CAL. 95670

Es gibt nichts schrecklicheres
als aktive Unwissenheit

Goethe

" The bristlecone pine data suggest that the concentration of carbon 14 was greater some thousands of years in the past and must have decreased over a period up until about 250 years B.C. Thus, with these somewhat confusing and conflicting data on the hands of the University of Pennsylvania, the carbon 14 dating system becomes unreliable when used for periods before calibration materials which are historically dated are available. Such materials only go back about to about 1500 B.C., and some of those are now being severely questioned. I believe that the evidence shows that' drastic atmospheric readjustments greatly affected the carbon 14 content of the biosphere and atmosspere a few thousand years B.C. Therefore, the system as used by Pennsylvania and others requires drastic correction factors beyond about 4000 years ago. Just what model should be used for the correction I am prepared to propose, since necessary data ~~is~~ are lacking....."

I do not known the high powered source for the above comments...But it is fun!

May I beg you (before you decay) to make comment on the above comments on your comments. Ill bug you no more on this matter. " honest injun" Its up to you to defend old U.P. and the lab of C 14.

With All Good Wishes

Ernie Conrad

Thank you for your letter to Barry Weiss. data are plural. If the enclosed MASCA Newsletter does not answer your questions, then I give up! However the limit of our correction factors is 5300 B.C.

E K Ralph, PhD.

Ernest C. Conrad
10896 WALNUTWOOD WAY, RANCHO CORDOVA, CAL. 95670

Es gibt nichts schrecklicheres
als aktive Unwissenheit

Goethe

Professor Barry Weiss
The College
Department of Physics
University of Pennsylvania
Philadelphia 19104

Dear Colleague: (AKA " A C-14 atom who is about to decay."

Please find attached your recent letter to me concerning one of my students comments concerning the age of the earth. I hope it will jog your memory concerning the problem.

The statement was:

> The rate of formation and decay of radioactive carbon should be the same after approximately 30,000 years. The scientifically verifiable observation that this is not yet the case indicates that the atmosphere of the earth is not yet that old. Indeed, properly corrected carbon 14 ages should give maximum ages of only 10,000 years.

I showed her your comment of "the" C 14 lab in the United States....and in a few days the following note appeared in my box.

> " The radiocarbon dating method is based upon the assumption that the content of carbon-14 in the biosphere and atmosphere is constant and has been constant over the period to be dated. This would imply that the equilibrium has been established between the rate of production of of carbon-14 in the upper atmosphere and the rate of decomposition of carbon-14 on the earth. But the evidence indicates that this equilibrium has not been established, that it is perhaps as much as 30 percent out of equilibrium, i.e., the rate of decomposition is only 70 to 80 percent of the rate of production. This means that the carbon 14 should be building up now toward equilibrium. But given the present rate of production this equilibrium should be established in 30,000 years or less. And if the present data is plugged into the mathematical equation for the build up of carbon 14 toward equilibrium, one comes out with an age for the atmosphere of only about 12,000 years, or a little less, depending upon which set of data you use.
>
> As for the bristlecone pine.

See Page two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POST CARD

I shall never forget the wonderful days I spent in your Laboratory - To you and to your co-workers, many Thanks and..... ARRIVEDERCI in Caracas

Gino Cosci

Dr.
ELIZABETH RALPH
UNIVERSITY of PENNSYLVANIA
CARBON 14 LABORATORY

PHILADELPHIA 4

Archaeological Techniques

May 26, 1961

Dr. John L. Cotter
Regional Archaeologist
United States Department of the Interior
143 South Third Street
Philadelphia 6, Pa.

Dear Jack:

Would you like to join us on Thursday, June 1st to hear Richard Linington talk about geophysical prospecting.

A number of archaeologists are going to gather here at 10 a. m. and will have luncheon afterward. I hope you can come and will you give the Museum a call on the 31st to let us know if we may expect you. Many thanks, With kindest regards,

Sincerely yours,

AK:ah

Alfred Kidder II
Associate Director

COPY

August 5, 1963

Dr. John Cotter
Independence National Historical Park
420 Chestnut Street
Philadelphia 6, Pennsylvania

Dear Dr. Cotter:

In regard to the survey at Fort McHenry, we are glad to have our instruments used there with the understanding that Hamilton Carson is no longer employed by the University Museum, University of Pennsylvania.

We request that the instruments be returned to the University Museum not later than 10:00 A.M. Saturday, August 24, 1963. The list of instruments includes the following:

Seismograph
Geohm
Fisher Single Head Detector
Fisher Double Head Detector
Small Simpson Voltmeter
Augur Probe
Possibly camping and other items
purchased with University Museum funds.

In the absence of Dr. Rainey, this request supercedes any previous verbal instructions.

Sincerely yours,

Elizabeth K. Ralph
Associate Director of
Applied Science Center for
Archaeology

EKR/ek

Consiglio Nazionale delle Ricerche

PROGRAMMA SPECIALE SCIENZE SUSSIDIARIE DELL'ARCHEOLOGIA

Roma, 7 aprile 1972

POSTA: PIAZZALE DELLE SCIENZE, 7 - 00100 ROMA
TELEGRAFO: CORICERCHE - ROMA
TELEFONO: (06) 4993

Posiz. S.S.A. Prot. N. D. 277

Allegati:

OGGETTO:

Al Prof. Froelich RAINEY
Director Applied Center for
Archaeology - University
of Pensylvania - U.S.A.

Green + ASCA

Dear Sir,

We have developed some applications of nuclear techniques in the study of cultural property at the Nuclear Physics Laboratory of the Faculty of Engineering in Rome. Research in the fields of paintings, frescoes, enamels and ancient bronzes was carried out in collaboration with the Istituto Centrale del Restauro and with the advice of the Consiglio Nazionale delle Ricerche (C.N.R.). This work was undertaken also with the support of the "Programma Speciale Scienze Sussidiarie dell'Archeologia" of the C.N.R.

The following institutions have formed a Committee with the aim of organizing a Conference on the applications of nuclear methods in the study and conservation of cultural property:

1 - Programma Speciale Scienze Sussidiarie dell'Archeologia, C.N.R., Roma.
2 - Istituto Centrale del Restauro, Roma.
3 - Laboratorio di Fisica Nucleare, Facoltà di Ingegneria, Roma.

Also the International Centre for the Study of the Preservation

./.

Si prega di trattare per ogni lettera un solo argomento e di indicare nella risposta il numero di protocollo.

Consiglio Nazionale delle Ricerche

and the Restoration of Cultural Property is collaborating.

The Conference should be held in Rome in 1973 according to a provisional programme which is set out on the attached sheet. In order to begin in the best possible way we think it necessary:

1 - To ask for the sponsorship of national and international organizations, such as, for instance, EURATOM, UNESCO, ICOM, CNEN.

2 - To have, one year in advance, an informal meeting of qualified experts in order to decide both, the organization and the scientific guide lines of the Conference.

We have pleasure, therefore, in inviting you or a representative on your behalf to attend this informal meeting which will be held in Rome on June 8, 1972, at the C.N.R., Piazzale delle Scienze 7. Further particulars will follow in due course.

This date has been chosen so as to allow presentation of the recommendations to the next meeting of the ICOM Committee for Conservation (Madrid, October 2-6, 1972).

If you are unable to attend the preparatory meeting, would you please be so kind as to write giving any suggestions you might have to further the successful outcome of the project.

Yours faithfully,

The Committee

(Prof. Giuseppe Donato)

(Prof. Pasquale Rotondi)

(Prof. Sebastiano Sciuti)

APPLICATION OF NUCLEAR METHODS IN THE FIELD OF WORKS OF ART

A. Study of Works of Art

1. Neutron Activation and Radioisotope X-ray Fluorescence for Elemental Analysis of Paintings, Illuminated Manuscripts, Potteries, Bronzes, Brasses and other Alloys and Materials.

2. Neutron Activation Autoradiography of Paintings; Neutron Radiography as a complementary Technique of X-ray Radiography.

3. Dating Techniques.

4. Miscellaneous.

B. Conservation of Works of Art

1. Neutron sources for humidity measurements in walls.

2. High activity Gamma sources for sterilization and polymerization of impregnated porous materials.

3. Labelled compounds for the study of chemical, physical and microbiological processes of degradation.

4. Miscellaneous.

July 1, 1965

Mr. Pelych
Industrial Dept.
Corning Glass Company
Corning, New York

Dear Mr. Pelych:

For low-level counting in our C-14 laboratory, we purchased a quartz counter. As presently designed, however, it is inoperable. We are wondering, therefore, if your company could rework the quartz tube to our specifications as shown on the enclosed sketch.

The counter, at present, consists only of the quartz tube. The copper end plates could be fabricated either here or by you. The terminals, also, could best be selected by you. Even if your company does not want to undertake the reworking of the quartz tube and possibly the assembly, will you please send us a catalog of possible terminals. The inner conductor should preferably have a hole about 1/8" in diameter for stringing the center wire.

If you are interested in this work, we shall appreciate it also if you will send an estimate of the cost.

Sincerely yours,

Elizabeth K. Ralph

EKR:ek

Encl.

UNIVERSITY of PENNSYLVANIA
PHILADELPHIA 19104

The Faculty of Arts and Sciences
DEPARTMENT OF PHYSICS

May 7, 1979

Ms. Pam Jean Crabtree
4209 Chester Avenue, D-7
Philadelphia, Pa. 19104

Dear Ms. Crabtree:

Thank you for your letter of April 23rd. We may have a position in the Radiocarbon Laboratory starting in September, but our budget is uncertain at this time. If we do, the salary is about $5,200 per year, and one also has free tuition.

There is a possibility that we shall also have an opening this summer, but, again, we have to find the funds.

Therefore, I cannot offer you anything definite until we solve our financial problems.

However, if you would like to come in to talk to us and see the laboratory, we shall welcome you at any time.

Sincerely yours,

EKR:emd

Elizabeth K. Ralph

UNIVERSITY OF MICHIGAN
ANN ARBOR

THE HARRISON M. RANDALL LABORATORY
OF PHYSICS

November 21, 1952

Miss Elizabeth Ralph
Randal Morgan Lab of Physics
University of Pennsylvania
Philadelphia 4, Pennsylvania

Dear Miss Ralph:

I was very glad to get the information you sent about the schedule for bomb tests. Our C^{14} lab has been out of business since November 14. I am not sure that I agree with the AEC in the statement that the present dose is weaker than previous ones. Although our counter was (fortunately) closed at the time of the arrival of the cloud, our background went up by a factor 4. It is still twice normal, and we have not dared to open the counter yet.

An experiment we did was to tie a piece of kleenex over a blower and blow air through it for about 10 minutes, to collect dust, etc. When the kleenex was wrapped around a thin walled GM counter it gave about 2,000 c/min. The only time it was worse here was last June after the last of the Nevada shots.

I hope you fared better this time than we did.

Sincerely yours,

H. R. Crane

H.R. Crane

cc: Prof. E.S. Deevey
Dr. J.L. Kulp
Prof. W.F. Libbey

November 18, 1952

Dr. H. R. Crane
Harrison M. Randall Lab of Physics
University of Michigan
Ann Arbor, Michigan

Dear Sir:

In June I consulted the New York operations office of the Atomic Energy Commission about obtaining information similar to that given to the photographic industries so that contamination of samples from bombs could be minimized.

The person to whom I talked is away and since his assistant doesn't have the names of the other Cl4 laboratories, he asked me to give you the information that he told me yesterday.

He said that the November 1st bomb which was reported in the newspapers is the last in this series of tests and that another series is not scheduled until after January 1st. The radiation from this last bomb is widely scattered and will be weaker in the eastern United States than previous ones.

Most of you probably know this already, but I am passing it on as requested.

Sincerely yours,

Elizabeth Ralph

Elizabeth Ralph

cc: Dr. E. S. Deevey
Dr. L. J. Kulp
Dr. W. F. Libby

Dr. H. R. Crane
Harrison M. Randall Lab. of Physics
Univ. of Michigan, Ann Arbor

E. S. Deevey
Dr. ~~Yale~~ Geochronometric Lab.
Yale Univ., New Haven, Conn.

Dr. L. J. Kulp
Lamont Geological Lab., Columbia Univ.
Torrey Cliff, Palisades, N. Y.

~~Piermont 2-0320~~

Dr. W. F. Libby
Institute for Nuclear Studies, Univ. of Chicago
Chicago 37, Illinois

March 18, 1954

Dr. H.R. Crane
Harrison M. Randall Laboratory of Physics
University of Michigan
Ann Arbor, Michigan

Dear Dr. Crane:

I enjoyed seeing you and learning about your new method which is so successful. When you were here, I neglected to mention my modern carbon problem. I have been using wood for samples and from the beginning, I have had significant differences from different types of trees.

The first samples I used were young green trees about 20 years old from which I extracted the center parts of the tree trunks. I counted three different types - white pine, tulip, and black oak, and had good agreement. My average of these runs was 6.29 $\pm$ .04 c/m. Then I used two samples of seasoned dead wood - walnut and yellow pine, and obtained a higher average - namely, 6.89 $\pm$ 0.10 c/m, but had good agreement with several runs of the two woods. Because of this discrepancy I ran several samples of known age and a curve through these points with the half-life slope intersects the axis at a counting rate of 6.80 c/m. Therefore, I have been using this figure for my age calculations.

I did'nt worry too much about it again until this week when I counted a second sample of seasoned dead hickory. I had good agreement for the two runs, and got a figure of 6.38 $\pm$ .08 c/m. This tree grew in the same location (in country air) as my earlier green samples, but I expected it to agree with my seasoned dead wood figure.

I am repeating a few runs of known age samples to make sure that my counting efficiency hasn't changed, but I don't expect to find that it has. I am wondering if you would want to count one of these hickory samples in your counter to see if it is also lower than your modern carbon rate.

Sincerely,

Beth Ralph

BR:js

January 30, 1953

Dr. H. R. Crane
Harrison M. Randall Laboratory of Physics
University of Michigan
Ann Arbor, Michigan

Dear Dr. Crane:

I was sorry to hear that the last bomb tests had caused you so much trouble. I was lucky, for the clouds seemed to have missed Philadelphia.

I have received another communication from Mr. Daniel E. Lynch, Co-ordinator of Special Projects Health and Safety Division, Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, New York. He suggested that if you would like this information, which is similar to that given the photographic industries, that you write to him directly, indicating what kind of work you are doing and why you need the information.

I have given him a list of the five laboratories, but, apparently, he wants to hear from each one before releasing this information to it.

Sincerely yours,

Elizabeth Ralph

March 30, 1967

Dear Dr. Crowe:

I enjoyed our conversation regarding the development of sonic devices for archaeological prospecting. As you know, we have been pursuing this goal for about five years because I have long been convinced that this should be the most practical type of survey instrument. We have had very considerable success in developing the cesium magnetometer, but as you know this can be used only on archaeological sites where soil conditions give us a magnetic contrast with buried archaeological remains. Hence, all magnetometers have a limited use in archaeology. Our own research indicates that you can get reflections from archaeological objects in the ground with the sonic device, but so far we have had great difficulty with the coupling device.

If you can develop something which can work for cavities in a pyramid. That should be a step in the right direction for an instrument to be used more widely in archaeological prospecting.

All best wishes for your research and to keep in touch with us.

Most sincerely yours,

Froelich Rainey
Director

Dr. Kenneth Crowe
Department of Physics
University of California
Berkeley, California

FGR/vg

October 5, 1967

Dear Dr. Crowe:

I was reminded of our conversation, here in Philadelphia, about the development of sonic devices for archaeological prospecting, by one of the young men from Tikal, who tells me you did try out some devide there during the spring or summer. Of course, I am most anxious to know how you made out. Also, this young man, Mr. Callendar, tells me that you thought the device might be used for aerial prospecging for archaeological sites.

It now happens that Varian Associates in Palo Alto have written to me saying that our collaboration in developing such instruments as the cesium magnetometer, have been so successful that they wish to pursue such collaboration, and they are asking me for advice. Could you let me know in a little more detailedwhat you are doing and what success you have had. It may be that we may work something out with Varian, and also it is possible that we can assist you in testing devices at our various field operations.

We have just had complete success with the cesium magnetometer in a large site near Olympia in Greece, and at the moment we are doing some rather exciting experiments with infrared aerial film, infrared scanners and other remote sensing devices. I am about to write Varian regarding these developments. But, I am still very much interested in some sort of sonic device for archaeology. As you know, our experiments in that line have not been very successful.

Most sincerely,

Froelich Rainey
Director

Dr.Kenneth Crowe
Department of Physics
University of California
Berkeley, California

FGR/vg

November 8, 1961

Dr. Lloyd A. Currie
Dept. of Chemistry
Pennsylvania State University
University Park, Pa.

COPY

Dear Dr. Currie:

It was a pleasure to meet you on Sunday, and I continue to admire your water tank and other innovations in your C-14 lab.

In regard to counter problems which seem to plague all of us, we have tried out our new one with pyrex electrodes (.625" dia., extending 1¼" into counter with 1/8" nickel rod extending in an additional ½"). We are still getting end region effects with this arrangement. Therefore, the 1/8" dia. rods will have to be made longer and possibly the pyrex too, so that the end region will be inactive for a distance inside the counter greater than half the I.D. of the counter (in ours this is 2½"). If this doesn't solve the problem, I'll let you know.

I am sending Mr. Schultz 4 samples from the Arctic for contamination studies and 4 known-age control samples, and have sent him the pertinent information about these.

Sincerely yours,

E.K. Ralph

EKR/ic

THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PENNSYLVANIA

COLLEGE OF CHEMISTRY AND PHYSICS
DEPARTMENT OF CHEMISTRY

November 14, 1961

Dr. Elizabeth K. Ralph
Department of Physics
University of Pennsylvania
Philadelphia 4, Pennsylvania

Dear Dr. Ralph:

Thank you very much for your letter of November 8. I was very happy to meet you, and Mr. Schultz and I are very grateful to you for interest and advice and assistance with our contamination studies.

Our "noise" problems are slowly being eliminated; we discovered that we were operating in a region where the curve of counting rate vs discriminator setting had a very steep slope, and hence slight variations in high voltage or amplifier characteristics destroyed reproducibility. We shall let you know when all this is cleared up.

Your standards as well as the Arctic samples arrived today, and we shall process them as soon as we become satisfied with the electronics. Your assistance with such samples is of great value to us, and is truly appreciated.

Sincerely yours,

Lloyd A. Currie

Lloyd A. Currie

THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PENNSYLVANIA

COLLEGE OF CHEMISTRY AND PHYSICS
DEPARTMENT OF CHEMISTRY

February 23, 1962

Dr. Elizabeth K. Ralph
Department of Physics
University of Pennsylvania
Philadelphia 4, Pennsylvania

Dear Dr. Ralph:

I am about to move from Penn. State to the National Bureau of Standards (Radioactivity Section), and I am writing to inform of the present status of our mutual (C^{14}) interests.

For the last two months I have been studying the properties of the low-level water shield, and I hope to put my results in order for publication before too long. My primary interests have been: meson flux, neutron- and gamma contributions to background, and sources of background radiation such as radioactivity in the counter wall, the shield, and the atmosphere. As a result of this research the counters and the electronics are now in good working condition, and I have hopes for Hy Schultz's work once he completes the chemical separations and has his gas (methane) sufficiently pure.

I expect that Hy will write to you in the near future about the details.

Although I shall be somewhat more remote in Washington, I shall have continued interest in the research, and shall do anything that I can to assist. On campus, Hy will still have the able supervision of Fred Matson and Warren Miller.

Again I thank you very much for your interest and cooperation, and I hope that we may cooperate in the future.

Sincerely yours,

Lloyd A. Currie

Lloyd A, Currie

UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

August 4, 1975

Dr. E. K. Ralph
Museum Applied Science
Center for Archaeology
33rd & Spruce Streets
Philadephia, PA 19174

Dear Dr. Ralph:

Many thanks for sending the book Dating Techniques for the Archaeologist. The description of your system for CO_2 production and purification will be most helpful to us. Also, I am very pleased to have available information on the other dating techniques described in the book.

As I mentioned during our telephone conversation, I would be very pleased to have you visit, if you have a chance during one of your trips to Washington.

Sincerely yours,

Lloyd A. Currie

Lloyd A. Currie
Special Analytical Instrumentation Section
Analytical Chemistry Division

cc: B. Ralph

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Turin, 30.IV.74

Dr. F. RAINEY
The University Museum
33 Spruce Streets
PHILADELPHIA - PENNSYLVANIA
U.S.A.

Dear Doctor Rainey,

I have received your MASCA of Dec. 1973 and I thank you cordially.

The magnetometer survey at Malkata appears an experiment really interesting.

By the by, do you know what means in Piedmontesish "masca"? The phantom, in particular the one which appears near the tabernacles on the country cross-roads with full-moon!

Have best greetings by yours

Silvio Curto.

IL SOPRINTENDENTE
(Prof.Silvio Curto)

March 16, 1961

Mr. Robert Cutler
Nuclear-Ohio Corp.
Knickerbocker Road
Bay Village, Ohio

Dear Mr. Cutler:

Herewith, Dr. Ostlund's Miami address, at long last:

Dr. Gote Ostlund
The Marine Laboratory
University of Miami
1 Rickenbacker Causeway
Miami 49, Florida

Construction has begun in our laboratory to isolate our air supply, seal up porous walls, etc., in order to prevent any repetition of the tritium contamination, and we have taken temporary refuge in the University Museum. The work is scheduled for completion, tentatively, within the next three weeks, and we shall then be looking for the quartz counter.

Should you wish to write, please continue addressing mail to the Radiocarbon Laboratory, Physics Department-- any change of address at this point would only turn confusion to chaos.

Very truly yours,

Elizabeth K. Ralph
C-14 Laboratory
University of Pennsylvania

RKR:rs