July 2, 1970

TO WHOM IT MAY CONCERN:

This will confirm the fact that BRUCE BEVAN is a member of the Museum Applied Science Center for Archaeology and is entitled to any courtesies extended to University of Pennsylvania employees.

Sincerely,

David Crownover
Executive Secretary

May 4, 1971

To Whom It May Concern:

Bruce Bevan, Research Assistant of the Applied Science Center for Archaeology in the University Museum, University of Pennsylvania, Philadelphia, Pa., U.S.A. is duly authorized and delegated to take the equipment in his possession from Italy to France and from France to Italy or to any other European country. This authorization includes Great Britain and Greece.

The items of equipment in his possession are as follows:

1) Precision Portable Cesium Magnetometer, manufactured by Varian Associates, Palo Alto, California. Components include:
   2 Readouts Nos. 49-116-90 and 49-116-93
   2 Sensors Nos. 49-544-90 and 49-544-23
   3 30-volt battery packs
   1 Battery charger
   Miscellaneous cables, carrying straps, tapes, and spare parts

2) Model V-4971 Portable Search Magnetometer, manufactured by Varian Associates, Palo Alto, California. Components include:
   1 Audio Readout
   1 Sensor, No. 49-544-195
   1 30-volt battery pack
   1 Battery charger
   Miscellaneous cables, straps, and spare parts

3) 1 Tektronix Portable Oscilloscope Type 321, manufactured by Tektronix, Inc. Oregon

4) 2 Triplett Model 310 Voltohmeters

5) 1 Auto transformer, 220-110 volts, etc.

6) Miscellaneous hand tools for electronics repair

7) Notebooks, tape measures, simple drafting tools, etc.

8) Equipment enclosed in 4 Halliburton suitcases

This equipment will all be used by Elizabeth K. Ralph and Bruce Bevan for the purpose of archaeological research in collaboration with the proper authorities in each country.

Froelich Rainey, Director
University Museum

FR/emf

4/19/73

Remote Sensing by

SPECTRAL CONTRAST DETECTION

a research proposal -- Bruce Bevan

Graduate Committee: Dr. H.N. Kritikos, thesis supervisor
Dr. A.M. Gaines
Dr. R.F. Geigengack, Jr.

One technique of photographic remote sensing is the detection of differences in spectral irradiance between objects as they are recorded by grey contrasts on film. A camera system can be designed to maximize this photographic contrast between a pair of objects by matching the camera's filter transmission and film spectral sensitivity to the wavelength with the maximum difference in spectral irradiance between those two objects.

Practical application of this general principle is more difficult. First, there will be a statistical variation in the spectral reflectance among individuals in each of the two classes of objects. Second, there will be a variation in incident irradiance on the objects due to variable sun elevation and atmospheric haze. Third, specific filter transmission characteristics can only be approximated. Fourth, grey contrast detection by human eyes is dependent on many conditions of film observation.

I propose to investigate this more general and practical problem: maximizing the probability of detection of spectral contrast between object classes with a known statistical variance. An intermediate goal will be to develop a convenient spectral transfer function for a camera's film-filter sensitivity; different functions will be required for absolute and differential sensitivity. Special attention will be given to the detection capabilities of the human eye; effective color discrimination by detection of grey contrast with an optimized camera system will be compared to that possible by direct unaided color vision of the photo scene.

A possible test case of this technique will be the detection of moisture stress in small grain crops.

DR. RAINEY

UNIVERSITY INTRAMURAL CORRESPONDENCE

MUSEUM

MEMO

TO: ALL CURATORS

FROM: BRUCE BEVAN

DATE: SEPTEMBER 14, 1973

For the next month, there will be a display of holography in the MASCA wing. With this technique of photography, the viewer sees an accurate three-dimensional image of an object. Therefore a hologram can substitute in a display for a real object that is either too valuable or that is not in our collection.

This technique may also be useful for your records or as a substitute for inter-museum loans. The Holex Corporation charges around $300 for making the original photograph and then $5 to $10 for each copy.

If you are interested in this, please stop by at any time and I'll show you the possibilities in more detail.

Bruce Bevan

Bruce Bevan

Room 186

Dr. Rainey

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
386-7400 (Area Code 215) — Cable Address "Antique"

15 December 1973

Mr. John A. Green
Regional Administrator
Environmental Protection Agency, Region 8
Lincoln Tower Building, Room 900
1680 Lincoln Street
Denver, Colorado 80203

Dear Mr. Green,

Because of the increase of strip mining in western Montana, I'd like to suggest that the environmental impact statements prepared by the coal companies include an archaeological survey of the land to be mined.

We know that there are archaeological sites in the area of potential strip mining, for this museum did a survey in the Glendive region last summer; Dr. Froelich Rainey and Dr. Loren Eiseley did the reconnaissance on the ground while I complemented the survey with aerial photography.

Since any traces of antiquity in the path of strip mining will be completely destroyed, this museum can help your department and the coal companies to locate as many as possible of the archaeological sites that might be affected. Both aerial and ground-level surveys will probably be required for a fast but accurate assessment.

If you agree with this approach, what should the next step be?

Very truly yours,

Bruce Bevan

Bruce Bevan

Gulf Research & Development Company

Edgar S. Driver
MANAGER
GEOLOGICAL SCIENCES DEPT.

P. O. Drawer 2038
Pittsburgh, PA 15230

June 17, 1977

Reference: 4207AG10-1

Dr. Elizabeth K. Ralph
Department of Physics
University of Pennsylvania
Philadelphia, PA 19104

Dear Dr. Ralph:

Your name was given to us as a reference by Dr. Bruce W. Bevan on his application for employment with Gulf Research & Development Company.

We would appreciate any comments you might care to make concerning his aptitudes and abilities for research and development work. These comments will be very helpful to us and will be held in strict confidence.

Very truly yours,

E. A. Flemm

E. A. Flemm (Mrs.)

EAF:jap

Mr. H. W. Bost, Professional Recruitment Representative
Research & Development, Phillips Petroleum Company
385 Frank Phillips Building
Bartlesville, Oklahoma 74004

[RE - B. BEVAN]

~~June 21, 1977~~
Sept. 29, 1977

Mrs. E. A. Flemm
Gulf Research and Development Company
P.O. Drawer 2038
Pittsburgh, Pa. 15230

Bos-631-77

Reference: ~~4207AG10-1~~

Dear Mr. Bost

Dear Mrs. Flemm:

Bruce Bevan has worked in our MASCA (Museum Applied Science Center for Archaeology) laboratories as a research fellow for seven years. His background and experience in electrical engineering made him well-qualified initially to perform a variety of research projects in our laboratories.

In 1970 the National Park Service had offered a grant to MASCA for the purpose of making better use of aerial photography at archaeological sites. Therefore, we employed Bruce to investigate the potentials of the newer techniques of aerial photography and their interpretations. This led to his extensive use of balloon and kite photography as well as comparatively low-level photography from small airplanes.

With the advent of satellites, as is well-known, the platforms have been elevated, and Bruce has been foremost in our laboratories in learning about and assessing the capabilities of remote sensing.

To return to the ground, Bruce and I have worked together at many archaeological sites and Bruce has also been in charge of several surveys on his own. These included the use and maintenance of magnetometers, resistivity apparatus, soil-penetrating radar and other types of equipment. He has always been a good companion in the field and in the laboratories, and has demonstrated his ability to adjust to unusual circumstances such as occur in remote parts of the world.

I relate this only to illustrate that he has the capability to innovate and conduct a great variety of research projects. His experience with remote sensing and his publications are outlined in his curriculum vitae.

Sincerely yours,

Elizabeth K. Ralph

EKR/cat

September 29th, 1977

Mr. H.W. Bost
Professional Recruitment Representative
Research and Development
Phillips Petroleum Company
385 Frank Phillips Building
Bartlesville, Oklahoma 74004

Dear Mr. Bost,

Bruce Bevan has worked in our MASCA (Museum Applied Science Center for Archaeology) laboratories as a research fellow for seven years. His background and experience in electrical engineering made him well-qualified initially to perform a variety of research projects in our laboratories.

In 1970 the National Park Service had offered a grant to MASCA for the purpose of making better use of aerial photography at archaeological sites. Therefore, we employed Bruce to investigate the potentials of the newer techniques of aerial photography and their interpretations. This led to his extensive use of balloon and kite photography as well as comparatively low-level photography from small airplanes.

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Sincerely yours,

Elizabeth K. Ralph
Associate Director

Geosight

GEOPHYSICAL EXPLORATION AND REMOTE SENSING

Consultation Field Surveys Interpretation

BRUCE W. BEVAN, OWNER
POST OFFICE BOX 135
(203 EAST AVENUE)
PITMAN, NEW JERSEY 08071
USA

22 February 1981

Dr. Elizabeth K. Ralph
Radiocarbon Laboratory
David Rittenhouse Lab
Department of Physics
University of Pennsylvania
Philadelphia, Pa. 19104

Dear Beth,

The tape measure which you ordered for me arrived yesterday. It's a good design and I'm glad to have it; thanks very much for remembering me. My check is enclosed.

I'm heading up to Boston tomorrow to discuss ground-penetrating radar with Mike Roberts at the Peabody Museum. The following week, I'm going out to Chicago and possibly Michigan for some field surveys and consultation. See you later.

Bruce [BEVAN]

Sent $25.00

BEVAN

Geosight

GEOPHYSICAL EXPLORATION AND REMOTE SENSING

Consultation Field Surveys Interpretation

BRUCE W. BEVAN, OWNER
POST OFFICE BOX 135
(203 EAST AVENUE)
PITMAN, NEW JERSEY 08071
USA

2 May 1981

Hi Beth,

Forty-two miles. That's a short description of my 1980 archaeological season. It's also the length of ground which I profiled with the radar.

Results with it have continued to be excellent. Concentrations of rubble can be mapped to delineate the former locations of buildings; footings can sometimes be traced also. I have gotten more experience with the radar at prehistoric sites, and find it to be good for mapping the internal structure of some shallow mounds, locating lenses of ash and charcoal, and detecting some refilled pits.

I'm also very pleased with the results from my electromagnetic induction meter, which I use as a rapid substitute for the normally slow resistivity measurements. It is excellent for locating large earth features such as leveled mounds and refilled ditches. However, the features must be larger than about 5 ft in size.

About half of my work continues to be for engineering and environmental applications, with surveys last year distributed over the USA from Florida to Alaska.

Currently, my equipment lineup includes a ground-penetrating radar, two proton magnetometers, an EM induction meter, cameras for aerial photography, and four electrical resistivity meters. I am saving money to buy a replacement radar system, for mine is getting well-used. Also, I'm considering buying some geophysical equipment which could be rented to archaeological expeditions.

Every survey which I've done this year has taught me more about what these instruments can and cannot do. All things considered, I'm even more enthusiastic about the benefits of geophysical surveys than ever before. The enclosed list summarizes my 1980 surveys in chronological order; every site and every survey yielded good, and I hope, important, results.

Thank you for having confidence in me. Please let me know whenever I can do anything to help you.

It was a good season. I hope to get into Phila. this coming week and will be able to tell you more about these surveys.

Bruce

609-589-9294

1980 Geosight Archaeological Surveys

Note: In many cases, my conclusions as stated below are still tentative; the final decision on results can only come from the archaeologists investigating these sites.

site: Old Ste. Genevieve, Missouri (18th century French settlement)
for: Mel Thurman
Old Missouri Research Institute
results: The radar located a cluster of small anomalies, possibly defining an area of former occupation. Some lineaments could be Mississippi River flood scars.

site: Petersburg Battlefield, Virginia (Civil War battlefield)
for: Dave Orr
National Park Service
results: Aerial photography revealed sharp contrasts in vegetation, but no clear fortification lines. A magnetic survey showed that there is brick or iron concentrated in the area where a buried floor-like surface was located in 1979 with a radar survey.

site: Deer Creek, Kaw Reservoir, Oklahoma (Witchita-speaking Indian)
for: Daphne Derven and Wayne Shields
U.S. Army Corps of Engineers
results: The radar survey mapped many likely refilled pits and the complex internal structure of some mounds. The electromagnetic meter clearly defined leveled mounds and ditch sedimentation.

site: Tombigbee Historic Townsites Project, Mississippi (19th century)
for: Lee Minnerly and Randy Mason
Michigan State University
results: My work has just been consultation on this extremely large magnetic survey. The data look excellent, but interpretation is not complete.

site: Fort de Chartres, Illinois (18th century French fort)
for: Mel Thurman
Old Missouri Research Institute
results: The electromagnetic meter readily mapped a refilled fortification ditch. The ground-penetrating radar traced what is apparently a stone-lined drain.

site: South Pass City, Wyoming (19th century mining town)
for: Tom Larson and Bill Fawcett
University of Wyoming and Wyoming Recreation Commission
results: Both radar and magnetic surveys delineated an area of rubble, possibly the location of a cabin.

site: Original Phoenix Townsite, Arizona (19th century)
for: Lyle Stone
Archaeological Research Services
results: The concrete footings of former buildings were readily mapped by the radar survey; also, it appears that the rubble from an adobe structure was also delineated.

site: Las Canopas, Phoenix (Hohokam)
for: Glen Rice
Arizona State University
results: The radar possibly traced a prehistoric canal here; the anomalies at this site were few and weak.

site: Pueblo Grande, Phoenix (Hohokam)
for: Glen Rice and Roy Pettyjohn
Arizona State University
results: The radar located a number of distinct earth contrasts, including one possible wall segment.

site: Rolley Site, Mesa, Arizona (Hohokam)
for: Glen Rice and Sam Barr
Arizona State University and Mesa Historical Society
results: Several lineaments were mapped with the radar; it is likely that these are mud brick walls.

site: Fairmount Park, Philadelphia (19th century)
for: Craig Blakely
Philadelphia Historic Preservation Corp.
results: A buried cast iron building facade almost surely is the cause of the intense magnetic anomaly which was located. Excavation reveals that is is buried deeper than 10 ft and possibly cannot be recovered.

site: La Ciudad, Phoenix (Hohokam)
for: Ron Yablon and Don Weaver
Museum of Northern Arizona
results: The radar survey located ash and charcoal lenses, and some prehistoric refilled pits and thick cultural layers; it also mapped historic trash pits and trenches. The electromagnetic survey located some sedimentation basins, but the contrast of the prehistoric cultural layers was too small to be detected.