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(202) 225-4624

Select Committee on Assassinations
U.S. House of Representatives
3331 HOUSE OFFICE BUILDING, ANNEX 2
WASHINGTON, D.C. 20515

August 26, 1977

Received NARS
AUG 30 1977

Mr. James B. Rhoads
Archivist of the United States
National Archives and Records Service
General Services Administration
Washington, D. C. 20408

Dear Mr. Rhoads:

I am in receipt of your letter of August 10, 1977, relative to the neutron activation analysis tests which will be performed by Dr. Vincent P. Guinn of the University of California, Irvine, in connection with the Select Committee's investigation into the assassination of President John F. Kennedy. The conditions and arrangements outlines in your letter are satisfactory to the Committee.

In addition to the Commission Exhibits and the piece of curbstone mentioned in my letter to you of July 29, 1977, it is our intention to also subject the "Walker" bullet, Warren Commission Exhibit #573, to neutron activation analysis.

In compliance with your request in paragraph one of your letter of August 10, 1977, I am forwarding to you a copy of a letter from Dr. Guinn to Mr. Stephen Fallis of our staff, in which he outlines his method of obtaining samples for neutron activation analysis, his method of analysis, his plan for documentation and security of the evidence. It should be noted that Dr. Guinn will have to remove a small sample for analysis from those exhibits which are in excess of 100 milligrams in weight. Thus, for example, a sample of approximately 15 milligrams will have to be removed from Commission Exhibit #573 as well as Commission Exhibit #141, as stated in my letter of July 29, 1977. Moreover, such samples may have to be obtained from Commission Exhibit #399 and the larger bullet fragments which we plan to subject to neutron activation analysis. Dr. Guinn has informed us that with respect to those exhibits which have been previously subjected to neutron activation analysis (at Oak Ridge in 1964), he will be able to utilize the samples which were originally used at that time. We are currently in the process of attempting to locate those samples and would like

to know if they are in the custody of the Archives. If the samples are not available, Dr. Guinn will have to obtain new samples from those exhibits which are in excess of 100 milligrams in weight.

The Select Committee on Assassinations' Ballistics Panel has examined the curbstone and has found that they will be unable to scrape a sufficient quantity of lead residue without contaminating the sample with pieces of concrete. In order that the issue may be finally and definitively resolved, we would like to have the whole curbstone taken to Dr. Guinn's laboratory along with the other evidence.

The neutron activation analysis has been tentatively scheduled for commencement on Monday, September 12, 1977. Please notify me if that date is satisfactory and if the evidence can be transported in accordance with that timetable.

Thank you for your cooperation in this matter.

Very truly yours,

G. Robert Blakey

G. Robert Blakey
Chief Counsel and Director

Enclosure
GRB/sfj

[redacted]TY OF CALIFORNIA, IRVINE

[redacted]AY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF CHEMISTRY

IRVINE, CALIFORNIA 92717

B

August 19, 1977

Mr. Stephen J. Fallis
Select Committee on Assassinations
U.S. House of Representatives
3342 House Office Building, Annex 2
Washington, D.C. 20515

Dear Mr. Fallis:

As per my August 12 telephone conversation with your Mr. William Triplett, and my telephone conversation with you earlier today, I have summarized below the information requested by the Archives.

1. Method of sampling whole bullets or excessively large bullet fragments. The method of analysis to be used, instrumental neutron activation analysis (INAA), is nondestructive. For bullet lead, the usable sample size can range anywhere from a few milligrams up to a maximum of about 100 milligrams. Thus, any specimens weighing less than 100 milligrams can be analyzed as is, but larger samples - such as whole bullets or very large fragments - need to have a small portion removed for analysis. I usually perform this operation with a tiny clean carbon-steel drill, known as a pin vise, removing only about 15 milligrams of material for analysis. This makes only a tiny hole in the larger sample and does not damage it so far as microscopic comparisons are concerned. If any of the small samples taken originally for INAA by the FBI (in early 1964, at Oak Ridge) are still available, they would be quite suitable for re-analysis, thereby even avoiding the necessity of removing any further samples from the overly-large samples.

2. Method of analysis to be employed. As mentioned above, the method to be used is INAA. Each sample to be analyzed will first be cleaned of any external contamination by rinsing alternately with high-purity acetone and high-purity water. When dry, the sample will be accurately weighed in a small, cleaned, labeled polyethylene vial. Standard samples, containing accurately known amounts of antimony, silver, and copper, will be prepared in similar vials. The first measurements - primarily to measure the silver content of each sample - will also provide fairly

precise results for the antimony and copper contents of each sample. Each sample, and each standard, will be processed identically, one at a time, via my regular procedure: (1) a 40-second irradiation in the pneumatic-tube location of our TRIGA nuclear reactor, at a thermal-neutron flux of 2.5×10^{12} neutrons/cm^2-second, (2) a 40-second decay period, during which the activated sample is transferred to a labeled unirradiated polyethylene vial, (3) a 40-second (clocktime) count on top of our 38 cm^3 lithium-drifted germanium (Ge(Li)) semiconductor detector (with a 1 cm plastic beta absorber between sample vial and detector), coupled to a 4096-channel pulse-height analyzer, (4) storage of the pulse-height spectrum on a fresh magnetic tape, each sample spectrum being identified by its tagword, (5) subsequent printout of the appropriate radioisotope peaks, using our coupled PDP-8/L computer, already programmed for such, and (6) calculation, by standardized methods (including corrections for any analyzer deadtime), of the amount and concentration of each detected element in each sample, and the standard deviation of each quantity (calculated from the counting statistics). The gamma-ray peaks measured for these three elements are, respectively, the 658 keV peak of 24.4-second silver-110, the 498 keV peak of 93-second antimony-124 m_1, and the 1039 keV peak of 5.10-minute copper-66. All peaks present in each spectrum will be identified and measured, in case any other elements are observed. The magnetic tape and each printout will be retained for any possible future reference.

After the pneumatic-tube measurements, probably on the following day, all of the samples and standards will be activated again - this time all at the same time and for a longer period of time (one hour), in the 40-tube rotating specimen rack of the TRIGA reactor, at a thermal-neutron flux of 1.0×10^{12} neutrons/cm^2-second. Each sample and standard, in its labeled cleaned polyethylene vial, will be placed in a different tube of the rotating specimen rack. Commencing about 30 minutes after the end of the irradiation, each activated sample and standard will be counted for 10 minutes livetime on the same Ge(Li) spectrometer mentioned earlier and the spectrum transferred to the magnetic tape. Later, as before, each spectrum will be scanned for peaks, and the peaks of interest will be printed out as before. The antimony content of each sample can now be determined more precisely than before - now via the 564 keV peak of 2.80-day antimony-122. Similarly, the copper content of each sample can now be determined more precisely than before - now via the 511 keV peak of 12.8-hour copper-64. Any small corrections, due to any other contributions to the 511 keV peak besides copper-64, will be made. Any peaks due to elements other than antimony and copper that may show up will be identified and measured. Again, the taped spectra and printouts will be preserved for any possible future reference.

The induced radioactivity level of each activated sample is quite low, and soon declines to a negligible level, so the activated samples can be returned to the Archives quite safely.

Documentation and security. All procedures used, all data obtained, all calculations, and all results will be given in full in a special bound notebook, with each page signed and dated by me. This book, as well as the magnetic tape containing all of the recorded pulse-height spectra, and all of the computer printout sheets, will be retained for any possible future reference. I will also prepare a full written report of the procedures and results for the Select Committee, and for the Archives. The entire operations will be conducted in a confidential manner. During the irradiations and countings, access to the reactor/counting area will be restricted to only the few people who absolutely must be in the area. This includes the Reactor Supervisor, one Senior Reactor Operator, myself, a representative of the Select Committee, and a representative of the Archives. No persons, except the last three, will know the nature of the samples being analyzed. As I have already agreed to, I will not divulge either the nature of the work or the results thereof until the Select Committee has advised me that such has been authorized. Whenever the samples are not in the process of being irradiated or counted, they will be in the custody of the local office of the Archives.

Very truly yours,

Vincent P. Guinn

Vincent P. Guinn
Professor of Chemistry
Telephone: 714-833-6091

PG/mek

C

General Services Administration
National Archives and Records Service Washington, DC 20408

December 28, 1978

MEMO FOR THE RECORD

On December 13, 1978, Jim Conzelman of the Select Committee on Assassinations called and asked what was the weight of the bullet known as 399. I called Jim Gear, and he said that the bullet had been weighed twice in the NARS labs. with the results 10.2231 and 10.2213, a difference which he said could be caused by variations in air pressure, humidity, or error. I called Conzelman and gave him those figures.

Trudy Huskamp Peterson

TRUDY H. PETERSON

UNITED STATES OF AMERICA

GENERAL SERVICES ADMINISTRATION

National Archives and Records Service
Washington, DC 20408

DATE: October 25, 1977

Y TO
N OF: NAP

JECT: Warren Commission Exhibits - Neutron Activation Analysis

ND

Attached is my report covering NARS involvement in the Neutron Activation Analysis of specified Warren Commission Exhibit items as requested by the House of Representatives Select Committee on Assassinations.

James L. Gear

JAMES L. GEAR
Director
Preservation Services Division

Neutron Activation Analysis of Warren Commission Exhibit Items

At the request of the House of Representatives Select Committee on Assassinations, ten items from the Warren Commission Exhibit (CE 141, 399, 567, 569, 573, 840, 841, 842, 843, and the piece of curbstone) were transported to the University of California, Irvine, California for neutron activation analysis.

Dr. Vincent P. Guinn, Professor of Chemistry, University of California, was the forensic scientist selected by the Select Committee to perform the analysis.

The samples were removed from NARS on September 9, 1977 and taken to California. While in California the samples were kept at night in a locked vault at the Federal Records Center, Laguna Niguel, California.

Security of the samples was maintained for NARS by the Federal Protective Service who provided personnel for security escort and transportation to and from the airports (Dulles International and Los Angeles), Los Angeles to Laguna, Niguel and the University of California at Irvine. The Security personnel remained with me at the University during the day.

The Warren Commission exhibit items were placed in two locked containers for transportation and both containers were carried onto and off the airplane by FPS personnel.

The first meeting with Dr. Guinn was at Irvine on September 12, 1977 at 1:30 pm. At that time, Dr. Guinn examined each sample and outlined a schedule for testing to begin at 10:00 am on September 13, 1977. At that time, Dr. Guinn did decide that there was not sufficient residue on the curbstone to remove for testing without contamination from the stone itself. Thus no tests were performed on the curbstone. In addition, this eliminated having to transport this heavy item between the Records Center and Irvine.

On September 13, 1977, at the University, the samples were removed from their containers and placed in marked vials. The following samples were tested:

CE 842 - 2 samples
CE 843 - 2 samples
CE 840 - 2 samples
CE 399 - 1 sample
CE 567 - 1 sample
CE 573 - 1 sample

Each sample was weighed, washed with water and acetone, and then subjected to a 40 second neutron activation. The samples were then measured for neutron activation. During the procedure, the samples had to be transferred to clean vials. Each time both Dr. Guinn and myself verified the transfer. Since the samples were to be subjected to a one hour nuclear bombardment later the next day, they were left in the vials. There were no small samples of CE 399, 567, and 573. Thus Dr. Guinn, using a drill, took a sample from CE 399, and using a scalpel cut a sample from 567 and 573.

On September 14, 1977, CE 141 which had never been tested was opened and enough material was drilled from the butt end of the bullet to provide two samples. After sampling the cartridge was reloaded. These samples were added to the other samples and exposed for one hour. The data from the one hour neutron activation concluded the tests.

Each sample was then transferred from the vials to its original container. In the case of CE 141, 399, 567, and 573, the samples were left in the vials and placed in the original container. Again each transfer of a sample was verified by Dr. Guinn and myself.

On September 15, 1977, all materials were returned to the National Archives building and their respective storage area 6-W-3.

The following week Dr. Guinn requested that weights of CE 399 (the bullet) and the samples removed from CE 141 be rechecked. The samples were obtained, and reweighed in NARS Preservation Research Laboratory.

Documentary photographs taken by myself of the tests and procedures are attached(including camera negatives) They are identified as follows:

1 - Set-up for transferring samples to vials

2-5 - CE 842 - Transfer to vial

6 - CE 843 - Transfer to vial

7 - CE 840 - Transfer to vial

8-11 - CE 399 - Drilling and removing sample and placement in vial

12-15 - CE 567 - Cutting to obtain samples (2) and placement in vial

16-19 - CE 573 - Cutting to obtain sample and placement in vial

20 - weighing samples

21 - washing samples with acetone and water to remove oils and dirt

22 - Reactor control panel

23 - Top row of vials contain samples CE 842 - 2, CE 843 -2, 840 - 2, 399 - 1, CE 567 - 1, CE 573 - 1, (9 vials with samples)

Middle row - 2 vials (standards)

Lower row - 10 vials (9 for samples plus 1 additional standard)

24 - Vacuum holder used to transport samples to reaction chamber

25 - Counter into which samples were inserted after exposure

26 - Data bank equipment used to read and store sample data

27 - Samples (in vials) were placed in tube, and tube inserted into vacuum holder for transport to reactor chamber

28 - Sample being returned from reactor after exposure

29 - Tube used to transport vials and samples to reactor chamber

30-37 - CE 141 - Removal of bullet from casing

38-41 - Removal of sample from butt end of bullet

42-50 - Replacement of powder and bullet in casing.

51 - Preparing tubes to hold vials and samples for one hour reactor exposure

52 - Placement of sample in reactor tube

53 - Reactor core

54-55 - General view of reactor area

56 - Data bank and computer hook up for storage and treatment of input data

James L. Gear

JAMES L. GEAR
Director
Preservation Services Division

October 25, 1977