

BRADDOCK SERVICES INCORPORATED

APPLIED MATERIALS SCIENCE FOR ART AND ARCHAEOLOGY

May 26, 1976

BRADDOCK SERVICES INC.
17200 Longdraft Road
Gaithersburg, Md. 20760
301-840-9585

Dear [REDACTED]

We are pleased to offer this proposal for a technical study of your Nigerian bronze portrait head attributed to the Ife culture.

To review briefly, we have examined this object last year and carried out the "proximate age" TL test of the core material. We also made radiographs to examine the casting details. The results of this work support the attribution to the Ife period, at least to the extent of ruling out a late 19th or early 20th century copy.

In response to your request, we are prepared to complete an extended technical characterization of the piece and to prepare an interpretive report, including due consideration of published work by other investigators. The objective of the project is to develop as nearly as we can from scientific examination the proper historical placement of this object. We believe that there is sufficient comparative data in the open literature to form a valid basis for our conclusions.

We will conduct the following tasks in the laboratory:

1. Redetermine the TL dose by more precise methods including, insofar as feasible, the "pre-dose" technique and separate determination of dose to fine grains and inclusions. These are the methods applied to the extended study of the bronze Greek horse in the Metropolitan Museum (reported by D. W. Zimmerman, et al, in Archaeometry, vol 16, pp19ff 1974).
2. Determine the internal radioactivity of the core material to establish the "age" with greater accuracy. While we cannot guarantee the accuracy or precision, since we cannot be certain of these values until the experiment is complete, we anticipate being able to establish the age of the

casting to plus or minus 15% (plus or minus 100 years for a 13th century object).

3. Determine the chemical composition of the copper alloy for comparison with published results for pieces of known origin.

We will then prepare a report summarizing all of our technical studies and reviewing, as appropriate, other publications. We will not, however, undertake any consideration of stylistic or historic attributes since that is outside of our competence. This report will be submitted to you in a form suitable for publication in a journal such as Archaeometry.

We are pleased to offer this work for a firm, fixed price of \$875.00, which includes the following level of effort:

Principal investigator - 10 hours	\$200.00
Associate investigator - 80 hours	400.00
Subcontracts and materials	<u>275.00</u>
	\$875.00

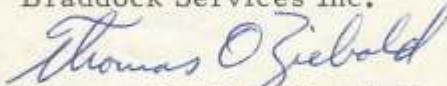
As far as handling of the object, I believe that we can take what samples we need if you will bring the object to our laboratory for a day. There will be no need for us to keep it longer than that. In any case, you should provide insurance against risks of loss or damage of whatever kind.

We would like to begin this work on June 15, 1976, and will have the report completed within three months after that date.

If this proposal is acceptable, please sign and return the white copy of the enclosed service contract. Please note that the terms and conditions on the reverse of that contract are applicable to this work. We ask that you submit one half of the contract price in advance to cover commitments that we must make to other laboratories.

Thank you for your patronage. We look forward to doing this project for you. If you have any questions at all, please do not hesitate to call.

Yours Truly,
Braddock Services Inc.


Thomas O. Ziebold, Ph.D.
President

BRADDOCK SERVICES INCORPORATED

APPLIED MATERIALS SCIENCE FOR ART AND ARCHAEOLOGY

15250 NEW HAMPSHIRE AVE.
SILVER SPRING, MD. 20904
301-384-1128

CERTIFICATE OF TEST

Proximate Age Determination By Thermoluminescent Dosimetry

Report to:

Sample submitted:

[REDACTED]

Date 4/22/75 Lab. No. 75.60

Form object Mark or ID none

Washington, DC 20001

Presumed Age Ife Culture - 13th Century

The sample described above has been tested for thermoluminescent (TL) emission characteristics by Braddock Services Incorporated in accordance with standard procedures published by the Company. These test procedures include measurement of natural TL output and determination of the induced TL output from various exposures to radiation from a strontium-90 radioactive source.

Based on the tests performed, the "equivalent beta dose" exhibited by the sample submitted is determined to be: 350 ± 150 rads.

A reasonable interpretation of the time interval since last firing of the sample material may be derived by assuming a typical annual dose of 0.5 rads from natural radiation. Accordingly, the "proximate age" is computed from the reported "equivalent beta dose" as: 700 ± 300 years.

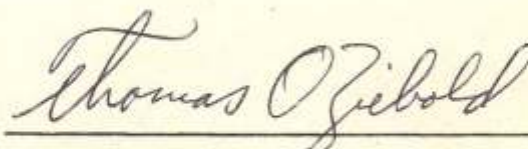
The results above are certified as an accurate report of laboratory procedures and results by Braddock Services Incorporated.

Test samples were taken by the laboratory from core residue inside the head of a bronze portrait "Queen Mother", 42 cm high. The material is believed to represent the original casting core.

Test results are consistent with and tend to confirm the stylistically attributed age of the object.

Certificate # 63.75.074

Date April 29, 1975



Thomas O. Ziebold, Ph.D.
President


BRADDOCK SERVICES INCORPORATED

APPLIED MATERIALS SCIENCE FOR ART AND ARCHAEOLOGY

15250 NEW HAMPSHIRE AVE.
SILVER SPRING, MD. 20904
301-384-1128

June 26, 1975

INVOICE


Re: Technical Services

Radiography of two bronze figures

\$80.00

Paid in full. Thank you.

Notes and Conditions of Issuance of this Certificate

1. Unless stated otherwise, error limits or range of values are based on 95% statistical confidence (two standard deviations), which implies that there is one chance in twenty that repeated determinations would exceed the given limits.
2. The test measures the time of last firing or heating above 300°C. This may be later than the time of manufacture if the object has been refired.
3. The test applies only to the sample of the object removed for testing. If the object has been restored or repaired, various parts have have different "ages". In the case of a negative test, i. e., results indicating recent firing of a presumed antiquity, the object should be examined carefully for evidence of restoration.
4. It has been assumed that the object or sample submitted has not been exposed to man-made radiation which might cause the TL "age" to be greater than the true age. The test will generally reveal evidence of artificial radiation, and this will be so stated on the certificate when detected.
5. This test report shall be considered confidential and shall not be released to anyone other than the addressee shown hereon except by written permission of the addressee.
6. Test data, laboratory notebooks and calculations, and documentary photographs of the object tested shall be retained by Braddock Services Inc. for at least three years from the date of this certificate and will be made available for examination by the addressee if requested.
7. In the event of any legal action arising as a result of the issuance of this certificate or performance of this test, Braddock Services Inc. shall be compensated at the rate of five hundred dollars per day or fraction thereof, plus expenses, for any consultation, testimony, court appearances, or any other time required by or on behalf of any party to such action.
8. Other conditions stated in the published test procedures and service orders apply.