

RECORD OF LABORATORY EXAMINATION

Number: 16.511
Location:
~~PI-GG-3~~
Date in:

Category: Jade Object: Ornament

Attribution: Chinese; date: Atchou Neolithic, ca 2000 B.C.

Owner: FGA

Reason for Examination: Prior to exhibition
Color(s): see FS
veining:

Examiner: EWF
Date begun: 8/1/80

*Hardness: 6.5 (yellow area)

Mineral identification

Provisional (from appearance & hardness): nephrite

Certain (from X-ray diffraction)

~~XXXXXXXXXX~~ Film # Date: nephrite - see over

Working; any evidence:
if hole, drilled from 1 side:
2 sides:

Condition

Breaks: NO

Repairs: NO

Alteration: NO: "altered" or "incrusted" area consists of white veining which appears to have 6.5 hardness and may be part of the natural mineral.

Incrustation: FS: "silvery incrustation, more profuse on reverse"

Special handling needed: No

Weight:

Accessories received:

Inscriptions, seals etc:

Distinguishing marks:

*Hardness: Nephrite: 6-6.5
Jadeite: 6.5-7

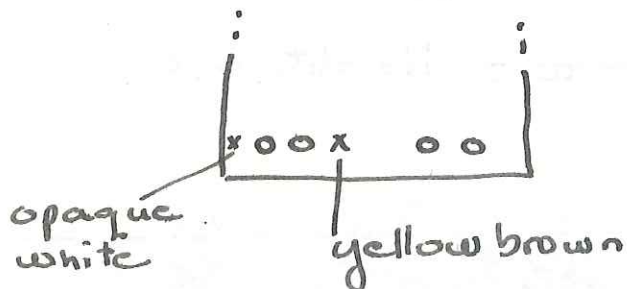
CARDS 9-24-80
SUMMARY 8/6/80
VISIT CARD +12/29/82
FOLDER SHEET 8/6/80
+12/29/82

over

12/15/82

Mineral to be identified by X-ray diffraction prior to being put in Commodore exhibition.

Sampled for X-ray diffraction, on back



of plaque, on either side of pair of holes to the left, as indicated.

Yellow brown + opaque white was sampled

Film F2903. Yellow brown: Nephrite

Film F2904. Opaque white: Nephrite

Hardness checked; yellow brown + opaque white areas both have hardness of 6.5

Opaque white is called "~~altered~~" "^{ation}encrusted" on folder sheet. This

opaque white is not a soft alteration but is part of the original minerals. Similar opaque white veins or layers have been seen (by EWF) on mineral samples (of nephrite) in the S.I.

Dept. of Mineral Science mineral collection.

5/30/93 The plaque was examined prior to exhibit and found in good condition.

FREER GALLERY TECHNICAL LABORATORY
CONDITION AND TREATMENT REPORT

Accession No: 16.511 Date: Dec. 29, 1982

Type of Object: Jade, Chinese, ornament, Neolithic

Operator: EW FitzHugh Location of Record: Tech. Lab.

~~XXXXXXXXXX~~
Condition: The mineral is definitely nephrite as determined by X-ray diffraction (films F2903, yellow-brown area, and F2904, opaque white area). The opaque white areas have a hardness of 6.5, correct for nephrite, and, from evidence available at present, are part of the original mineral and not "incrustation" as noted above, or alteration.

~~XXXXXXXXXX~~
Treatment: The designation as Serpentine (?) in 4. above is incorrect.

For detailed report see Tech. Lab. File.

Calendar: _____

Folder sheet: _____

Annual Report: Counted in Tech. Lab.

List of Additions: _____

Jade Material - Observations and analysis

LRN:

Accession No. F16.511

Period Neolithic
Culture Liangzhu

Checklist name Headdress ornament

Object term

Mineral(jade) nephrite
Color beige (altered)
Hardness -
Texture

Mineral Inclusions some needle-like crystals of brown to black color (at the back surface)

Veining features

Burned surface ? (or more probably highly altered)

Translucency -
Color +/-
Luster +
Class of Alteration III

Munsell-Unaltered 5Y8/4
Munsell-Altered 5Y9/1-2
Munsell-discoloration

XRD

FTIR sample taken Nov.7,95 D-W;
nores.-4/30/97-JD; no
FTIR done resample 12/1/98 JD

SEM sample taken Nov.7,95 D-W; not
res.-4/30/97-JD

SEM done

Fe to Fe+Mg ratio

SI sample possible

Sample location at the boarder

XRF Data

SiO2 MnO
CaO FeO
K2O Cr2O3
TiO2 NiO
MgO.Al2O3

Comments carving lines are irregular by width and depth, and are not straight, and circle lines are consist by many short straight lines, like hand made.

Date in 10
Date mod 12/1/98

Fig. 511

EDXRF ANALYSIS
SPECTRACE INSTRUMENTS

PROCEDURE : NEPHRITE - HE
FILTER USED : NO FILTER
ATMOSPHERE : AIR
COUNT RATE RANGE : MED
ANALYSIS METHOD : FUN. PARAMS.

TUBE VOLTAGE : 15 KV
TUBE CURRENT : 0.99 MA
LIVETIME : 100 SEC
PRESET COUNT : 0 K

TIME : 1:50 pm

DATE : 11/8/95

SAMPLE	ELEMENT	CONCENTRATION		ERROR
F16.511.1	SI02	60.391 %	+/-	0.4856
	K2O	0.058 %	+/-	0.0271
	CaO	11.021 %	+/-	0.0725
	TiO2	0.120 %	+/-	0.0123
	CR2O3	0.045 %	+/-	0.0087
	MNO	0.037 %	+/-	0.0068
	FeO	1.583 %	+/-	0.0172
	NiO	N D		
	C	0.000	ADDED	
	MGO	26.745	DIFF	

~~f~~ reverse side of plaque

F16.511

EDXRF ANALYSIS
SPECTRACE INSTRUMENTS

PROCEDURE : NEPHRITE - HE
FILTER USED : NO FILTER
ATMOSPHERE : AIR
COUNT RATE RANGE : MED
ANALYSIS METHOD : FUN. PARAMS.

TUBE VOLTAGE : 15 KV
TUBE CURRENT : 0.99 MA
LIVETIME : 100 SEC
PRESET COUNT : 0 K

TIME : 1:53 pm

DATE : 11/8/95

SAMPLE	ELEMENT	CONCENTRATION	ERROR
F16.511.2	SI02	63.751 %	+/- 0.4861
	K2O	N D	
	CAO	11.760 %	+/- 0.0754
	TIO2	0.055 %	+/- 0.0139
	CR2O3	0.046 %	+/- 0.0089
	MNO	0.062 %	+/- 0.0070
	FEO	1.593 %	+/- 0.0176
	NIO	N D	
	C	0.000 ADDED	
	MGO	22.732 DIFF	

front of plaque

EDXRF ANALYSIS
SPECTRACE INSTRUMENTS

PROCEDURE : NEPHRITE - HE
 FILTER USED : NO FILTER
 ATMOSPHERE : AIR
 COUNT RATE RANGE : MED
 ANALYSIS METHOD : FUN. PARAMS.

TUBE VOLTAGE : 15 KV
 TUBE CURRENT : 0.99 MA
 LIVETIME : 200 SEC
 PRESET COUNT : 0 K

TIME : 11:01 am

DATE : 4/30/97

SAMPLE	ELEMENT	CONCENTRATION	ERROR
F16.511.1	SiO2	56.363 %	+/- 0.1646
	K2O	0.028 %	+/- 0.0102
	CaO	12.219 %	+/- 0.0296
	TiO2	0.101 %	+/- 0.0048
	CR2O3	0.050 %	+/- 0.0035
	MNO	0.069 %	+/- 0.0027
	FeO	1.659 %	+/- 0.0067
	NiO	N D	
	C	0.000 ADDED	
	MgO	29.511 DIFF	