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Radiocarbon dating of a sample from the Tangka shown in the following picture (private collection)

ANALYTICAL REPORT

Turin, December 2007

Dott. Marco Nicola

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The sample listed in table was treated with radiocarbon dating using mass spectrometry at high resolution technique (AMS) with high definition.

Sample	Measures	Material	Analysis Code	Origin
TGK	about 79 mt. x 115 cm	Fabric	LTL2618A	Fragment of paint

The sample was taken by ADAMANTIO srl, on September, 2007. All further treatment of the sample, the dating and the analytical report, was carried out by Centro di Datazione e Diagnostica dell'Università di Lecce under the supervision and the scientific direction and responsability of Professor Lucio Calcagnile (AMS operator Dott. Gianluca Quarta).
Macro contaminants were removed from the sample by mechanical handpicking under optical microscope. The selected portions of the sample were treated with the Acid/Alkali/Acid (AAA) method in order to chemically remove any possible source of contamination.
The purified sample material was then sealed in quartz tubes together with copper oxide and silver wool and then combusted to carbon dioxide at 900 °C. The obtained carbon dioxide was converted at 550°C into graphite by using ultrahigh purity Hydrogen as reducing medium and 2 mg iron powder as catalyst. The sample yielded enough graphite to allow an accurate determination of the radiocarbon age by the accelerator mass spectrometer.
The radiocarbon concentrations have been determined in the accelerator mass spectrometer by comparing the ^{12}C, ^{13}C currents and the ^{14}C counts obtained from the sample with those obtained from standard materials supplied by IAEA (International Atomic Energy Agency) and NIST (National Institute of Standard and Technology). The "conventional radiocarbon age" was calculated with a $\delta^{13}C$ correction based on the $^{13}C/^{12}C$ ratio measured directly with the accelerator.
For the estimation of the measurement uncertainty (standard deviation) both the radioisotope counting statistics and the scattering of the data have been taken into account.
The larger of the two is given as final error in table:

Sample	Analysis Code	Radiocarbon Age (BP) (*)	$\delta^{13}C$ (‰)
TGK	LTL2618A	**939 ± 25**	**-17.6 ± 0.4**

(*) BP is related to the conventional raw radiocarbon age whose calculation implies (cfr. M. Stuiver, H.A. Polach,Radiocarbon, Vol. 19, No.3, 1977, 355-363):

- The use of Libby's half-life time (5568 years) and not the later more accurated value of 5730 years.
- The year 1950 as 0 BP.
- The direct or indirect use of oxalic acid as reference standard.

The radiocarbon dating for the sample was then calibrated using the software OxCal Ver. 3.10 based on atmospheric data [Reimer PJ, et al. 2004 *Radiocarbon* 46:1029-1058].

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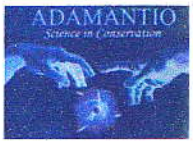

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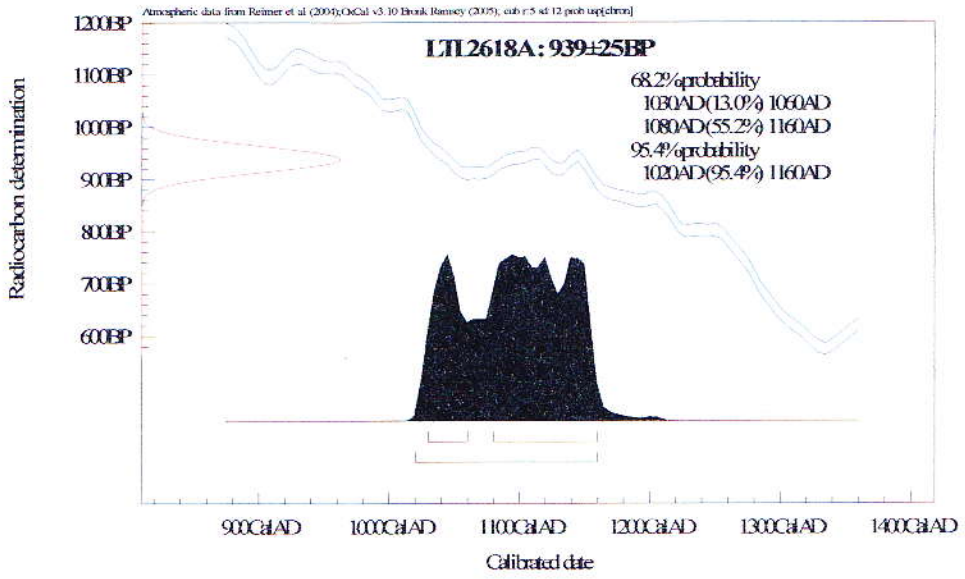
The result of calibration is reported in the following graph and table:



Sample	*Calibrated Dating*	*Probability*
TGK	1020 – 1160 cal AD	95.4 %

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