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段丘堆積物の^{14}C年代測定

（動力炉・核燃料開発事業団　契約業務報告書）

１９９７年３月

株式会社　大和地質研究所

Ⓑ 本資料についての問合せは下記に願います。
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1．1　件　名

段丘堆積物の^{14}C年代測定

1．2　目的

地下水の流れや分布などの地質環境を長期間にわたって予測するためには，隆起・沈降量を考慮した将来の地形や地質構造に関するデータが必要である。隆起・沈降量の予測には，変動が何時から開始し，どのような速度で継続しているかを解明する必要がある。

本調査では，各地の隆起・沈降運動の開始時期や変動速度の開析に必要な段丘の形成年代を求めるため，段丘を覆う堆積物の年代測定を行った。

今年度は，特に年代値データが不足している関東，九州，東北地方を対象に，計23試料の年代測定を行った。

1．3　作業範囲

試料の^{14}C年代測定

1．4　作業内容

表1-1に示す23試料について，加速器質量分析計を用いた年代測定を行った。さらに，可能な場合には，暦年代のキャリブレーションを行った。

1．5　作業期間

自　平成９年２月１４日　至　平成９年３月２４日

1．6　調査担当

実施責任者

株式会社大和地質研究所

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年代測定課研究員　　茂木　紀子

表1-1　測定試料一覧表

番号	試料名	試料の種類	試料数
1	Ｔｎ－１①	貝殻	1
2	Ｔｎ－１②	貝殻	1
3	Ｔｎ－３①	貝殻	1
4	Ｔｎ－４②	貝殻	1
5	Ｎｇ－２Ｐ－１０	貝殻	1
6	Ｎｇ３－８　Ｓ－１	貝殻	1
7	Ｎｇ３－１１	貝殻	1
8	ＮＳＴ－Ｄ－１	泥炭	1
9	ＮＳＴ－Ｄ－２	泥炭	1
１０	Ｉｍ－１－①	貝殻	1
１１	Ｉｍ－１－⑥	貝殻	1
１２	Ｉｍ－１－３８	貝殻	1
１３	Unzen-Mutsugi-C-1	木炭	1
１４	94624 Spfl	炭化材	1
１５	9612-1 Hk TPfl	炭化材	1
１６	86.7-11 B-Tm(Cpfl)	炭化材	1
１７	千屋１	木片	1
１８	千屋２	泥炭	1
１９	千屋３	泥炭	1
２０	千屋５	泥炭	1
２１	千屋６	泥炭	1
２２	Boso-01	泥炭	1
２３	Boso-02	貝殻	1
計			２３

2．^{14}C年代測定

2．1　原理

大気の上層で宇宙線の作用によってつくられた^{14}Cは，放射性の二酸化炭素$^{14}CO_2$となって通常の二酸化炭素に混じり，生物を媒介として形成される炭素の循環によって地球上に一定の濃度で分布するとされている。生物体に固定された^{14}Cは，生物の死後その遺体中の炭素が空気中の二酸化炭素CO_2や水圏の炭酸イオンと交換しなければ，その生物遺骸中の^{14}Cはその半減期によってβ^-崩壊し次第に減少する。このような生物体内中に含まれる^{14}Cの減少を利用した年代測定法が^{14}C年代測定法である。

いま，N個の^{14}Cがあるとき，dt時間内に壊変して減少する^{14}Cの個数dNは，壊変しうる^{14}Cの個数Nと時間間隔dtに比例する。そこで，比例定数をλとすると

$$-dN=\lambda N dt \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots ①$$

と表される。これから微分方程式

$$\frac{dN}{dt}=-\lambda N \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots ②$$

が導かれ，これを積分して任意の時刻tにおける^{14}Cの個数は

$$N=N_0\exp(-\lambda t) \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots ③$$

となる。ここで，N_0はt＝0における^{14}Cの個数である。比例定数λは壊変定数と呼ばれ，半減期$T_{1/2}$との間には次の関係がある。

$$T_{1/2}=(\ln 2)/\lambda=0.693/\lambda \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots ④$$

③と④とから，tは

$$t=\frac{1}{\lambda}\ln\frac{N_0}{N}=\frac{T_{1/2}}{0.693}\ln\frac{N_0}{N} \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots ⑤$$

と導かれる。したがって，$T_{1/2}$とN_0が既知であれば，現時点の^{14}Cの個数を測定することにより⑤式から経過時間tが算出できることになる。

以上のように，^{14}C年代測定法の前提条件は，(a)^{14}Cの初期濃度が正確にわかっていること，(b)測定試料が外部との炭素の交換が断たれた閉鎖系であったこと，(c)^{14}Cの半減期が正確にわかっていることである。

(a)については，大気の二酸化炭素の^{14}C濃度に数％の経年変動があることや特殊な生物試料では初期濃度がかなりずれている可能性のあることが判明している。しかし，現在適用されている^{14}C年代測定法では，^{14}Cの初期濃度は試料の種類によらず経年的に一定であったと仮定され，通常，NBS蓚酸標準体の^{14}C濃度の95％の値を^{14}Cの初期濃度として使用することが慣例となっている。なお，この濃度値は1950年の^{14}C濃度である。また，(c)の^{14}Cの半減期については，現在，5730±40年が最も信頼し得る値として考えられているが，^{14}C年代値の算出にあたっては半減期を変更することによる混乱を避けるため，

Libbyの半減期5568±30年を用いることが慣例となっている。

ここで，ＮＢＳ蓚酸標準体の^{14}C濃度の95％をＡ$_s$，測定試料のそれをＡとして$d^{14}C$を次のように定義する。

$$d^{14}C = \frac{A - A_s}{A_s} \times 1000 \qquad \cdots\cdots⑥$$

この式から

$$\frac{A_s}{A} = \frac{1000}{d^{14}C + 1000} \qquad \cdots\cdots⑦$$

このＡ$_s$/Ａを⑤のＮ$_0$/Ｎと置換して，Libbyの半減期を用いると，$\lambda = 1.2449 \times 10^{-4}$ y.$^{-1}$となる。この値と⑦を⑤に代入して整理された以下の式で年代値を計算できる。

$$t = 8033 \ln \frac{1000}{d^{14}C + 1000} \qquad \cdots\cdots⑧$$

なお，バックグラウンド，標準体および試料の^{14}C濃度の測定に統計的誤差が内在するために，通常標準偏差(1σ)を各測定年代値に付与する。

この測定誤差とは別に，^{14}C年代測定には様々な原因の誤差が含まれる。その要因としては，^{14}Cの半減期の差，大気中の^{14}C濃度の地域差，大気の^{14}C濃度の経年変化，陸水・海水の^{14}C濃度の差，生物の同位体分別効果などが考えられる。

これらのうち，同位体分別効果は次のように補正される。

最初に，$\delta^{13}C_{PDB}$(‰)を

$$\delta^{13}C_{PDB}(‰) = \left(\frac{(^{13}C/^{12}C)_{sample}}{(^{13}C/^{12}C)_{standard}} - 1 \right) \times 1000 \qquad \cdots\cdots⑨$$

と定義する。ただし，$(^{13}C/^{12}C)_{sample}$と$(^{13}C/^{12}C)_{standard}$は，それぞれ試料およびPDB-標準体(Belemnite化石，$^{13}C/^{12}C = 0.0112372$)についての$^{13}C/^{12}C$比である。

ＮＢＳ蓚酸標準体が導入される以前は^{14}C年代測定の標準体として木材が用いられていたことから，同位体効果の補正には平均的木材の$\delta^{13}C_{PDB}$値－25‰を標準値として用いることになっている。試料の$\delta^{13}C_{PDB}$値が－25‰からずれている場合には，同位体効果の補正を行った^{14}C濃度は，次式の$D^{14}C$値で与えられる。

$$D^{14}C(‰) = d^{14}C - 2(\delta^{13}C_{PDB} + 25) \times \left(1 + \frac{d^{14}C}{1000} \right) \qquad \cdots\cdots⑩$$

したがって，同位体分別効果を考慮に入れた^{14}C年代値はこの$D^{14}C$を用いて，

$$t = 8033 \ln \frac{1000}{1000 + D^{14}C} \qquad \cdots\cdots⑪$$

として計算される。

なお，⑪式で求められた^{14}C年代値は規約の年代値(conventional radiocarbon ages)と呼ばれ(Stuiver and Polach,1977)，次の条件を満たしている。

・Libbyの半減期5568y.を用いる。
・^{14}Cの大気濃度を一定と仮定する(経年変化無視する)
・^{14}C年代測定の標準体として蓚酸を用いる。
・同位体分別効果の補正を行う。
・^{14}C年代算出に際し，A.D.1950を起点とし，年代をy.B.P.で表す。

2．2　測定方法

^{14}Cの測定法として気体比例計数管法，液体シンチレーション法，加速器質量分析法があげられる。

気体比例計数管法では，エネルギーの低いβ線の試料自身による自己吸収をなくすため，測定試料中に含まれる炭素から充填ガスを合成して^{14}Cの定量が行われる。充填ガスとしては二酸化炭素，アセチレン(C_2H_2)，メタン(CH_4)，エタン(C_2H_6)などが用いられる。ルーティンの測定では1試料当たり16～20時間で，測定可能な年代の上限は3.5～4万年前とされている(浜田・藤山，1964；中村・中井，1988)。

液体シンチレーション法では，試料から炭素を抽出してメタノール(CH_3OH)，トルエン($C_6H_5CH_3$)あるいはベンゼン（C_6H_6)を合成し，重量を測定した後，有機の蛍光体を混合し低カリウムガラス製あるいはテフロン製のバイアル瓶に入れる。試料中の^{14}Cが改変して放出されたβ線が蛍光体を励起して生じた微小発光を，高感度の光電子増倍管で電気信号に変え，発光の回数(^{14}Cの壊変の回数)を計数して^{14}Cの定量を行う。ルーティンの測定では測定可能な年代の上限は約4万年前とされている(富樫・松本，1983)。液体シンチレーション法は気体比例計数管法に比べて，①試料の占める体積が小さいため自然放射線によるバックグランド計数率が1/10と小さい，②測定可能な炭素量が多い，③検出器の安定性が良く，操作が簡単であるなど長所がある反面，①ベンゼンやメタノールの合成に手間がかかる，②計数効率が65％と低く，合成した試料中に不純物があると，計数効率はさらに低くなるなどの短所もある。

加速器質量分析法では，^{14}Cが壊変する際に放出されるβ線を検出するのではなく，イオン化した^{14}C原子自身を直接検出する。そのため，①必要な炭素の量が2～5mgと微量で測定できる，②測定時間が短い(3～5時間)，③^{14}C検出のバックグランド計数が極めて少ないため測定可能な年代の上限が大きい(約60,000万年前)などの長所を有する。一方，①装置が複雑で保守に手間がかかる，②測定開始時の分析計の調整操作が複雑で，測定結果がオペレーターの熟練度に依存するなどの短所も備える(中村・中井，1988)。

2．3　測定結果および暦年補正

今回の^{14}C年代測定は，アメリカのクルーガー社に依頼し，すべて加速器質量分析法で行った。その測定結果を表2-1に示し，その詳細は巻末試料にまとめて示した。クルーガー社から報告された年代値は，同位体分別効果の補正を行った規約の年代値である。

さて，前述したように規約の^{14}C年代値は^{14}Cの初期濃度が一定であることを前提条件にしているが，実際には大気中の^{14}C濃度は地球磁場や太陽活動の影響を受けて経年変化をしている。このような^{14}C濃度の変化の実態は年輪年代学と^{14}C年代測定を組み合わせることによって解明されてきており(Stuvier and Pearson, 1993など)，約1万年前までの補正曲線が求められている。このような暦年補正のプログラムとしてCALIB 3.0(Stuiver and Reimer, 1993)やCalib ETH(Niklaus, 1991)がある。ここでは，後者のプログラムの方が操作の簡単さと結果の出力が優れているため，それを用いて暦年補正の計算を行うことにした。

Calib ETHは，陸上植物遺体の年輪年代と^{14}C年代値との対応関係に基づいて，紀元前9,440年(^{14}C年代値で約10,100y.B.P.)まで補正できるように作成されている。したがって，暦年補正をする際には，木などの植物遺体から得られた年代値を対象とするのが望まれる。ここでは，泥炭もDead Carbonによる汚染のない現地性の植物遺体とみなして暦年補正を行った。一方，海水中の炭素の平均滞留時間がかなり長く，かつ海水の混合もあまり良くないため，平均海水の^{14}C濃度は大気のCO_2のそれより約25‰低いとされている(このような現象を海水のリザーバ効果という)。そのため，海水中の炭酸イオンを利用して造られる貝殻などの場合には，規約の^{14}C年代値から平均海水のリザーバ効果分(400y.B.P.)を差し引いた値を用いて計算することにした。なお，表2-1に示した試料のうち，10,100y.B.P.を越える94624Spf1，9612-1 Hk-TPf1，Senya-01，Senya-05の4試料，および，貝殻の^{14}C年代値が400y.B.P.以下のIm-1-(1)については，暦年補正を行わなかった。

以上の計算結果を表2-1の右側の欄に示し，その詳細は巻末資料として添付した。

表2-1 ^{14}C年代測定値一覧表

試料番号	測定者番号	試料	規約の^{14}C年代 (y.B.P.)	$\sigma^{13}C$	暦年代			
					範囲	メヂアン	1σ	確率
Tn-1(1)	GX-22710	Shell	6,660 ± 60	-7.7	5,179 ± 71 BC	5,181 BC	5,265 - 5,203 BC	0.511
							5,174 - 5,137 BC	0.279
							5,116 - 5,083 BC	0.210
Tn-1(2)	GX-22711	Shell	6,870 ± 60	-3.2	5,381 ± 53 BC	5,382 BC	5,438 - 5,371 BC	0.662
							5,369 - 5,334 BC	0.338
Tn-3(1)	GX-22712	Shell	5,890 ± 50	-6.2	4,336 ± 59 BC	4,338 BC	4,440 - 4,426 BC	0.092
							4,365 - 4,316 BC	0.577
							4,294 - 4,255 BC	0.331
Tn-4(2)	GX-22713	Shell	4,010 ± 50	-8.1	1,955 ± 78 BC	1,953 BC	2,028 - 1,995 BC	0.218
							1,986 - 1,886 BC	0.782
Ng-2 P-10	GX-22714	Shell	8,170 ± 50	-5.6	6,545 ± 52 BC	6,543 BC	6,594 - 6,571 BC	0.213
							6,569 - 6,533 BC	0.356
							6,526 - 6,483 BC	0.430
Ng-3-8-S-1	GX-22715	Shell	5,550 ± 60	+0.3	3,935 ± 86 BC	3,949 BC	4,034 - 4,023 BC	0.058
							3,999 - 3,933 BC	0.556
							3,872 - 3,811 BC	0.385
Ng-3-11	GX-22716	Shell	8,100 ± 50	-3.3	6,499 ± 46 BC	6,495 BC	6,545 - 6,453 BC	1.000
NST-D-1	GX-22717	plant frags.	6,970 ± 60	-29.3	5,810 ± 68 BC	5,805 BC	5,926 - 5,918 BC	0.052
							5,858 - 5,729 BC	0.948
NST-D-2	GX-22718	plant frags.	3,580 ± 50	-28.0	1,907 ± 78 BC	1,912 BC	2,012 - 2,008 BC	0.023
							1,977 - 1,875 BC	0.782
							1,837 - 1,817 BC	0.110
							1,801 - 1,785 BC	0.085
Im-1-(1)	GX-22719	Shell	270 ± 50	-0.2				
Im-1-(6)	GX-22720	Shell	1,910 ± 60	-1.0	550 ± 60 AD	558 AD	457 - 479 AD	0.118
							509 - 512 AD	0.020
							531 - 635 AD	0.862
Im-1-38	GX-22721	Shell	6,240 ± 60	-2.2	4,699 ± 78 BC	4,708 BC	4,787 - 4,670 BC	0.810
							4,646 - 4,611 BC	0.190
Unzen-Mutsugi-C-1	GX-22722	Charcoal	3,620 ± 60	-25.4	1,970 ± 90 BC	1,968 BC	2,102 - 2,091 BC	0.048
							2,037 - 1,885 BC	0.952
94624 Spfl	GX-22723	Charcoal	37,100 ± 810	-25.2				
9612-1 Hk-TPfl	GX-22724	sed. organic	42,300 ± 1,400	-24.0				
86.7-11 B-Tm(Cpfl)	GX-22725	charcoal	1,210 ± 50	-22.8	828 ± 66 AD	828 AD	727 - 733 AD	0.031
							772 - 891 AD	0.969
Senya-01	GX-22726	wood	45,100 ± 2,100	-24.1				
Senya-02	GX-22727	sed. organic	5,580 ± 50	-18.3	4,414 ± 44 BC	4,413 BC	4,455 - 4,432 BC	0.267
							4,429 - 4,411 BC	0.212
							4,408 - 4,363 BC	0.521
Senya-03	GX-22728	sed. organic	4,640 ± 40	-19.0	3,429 ± 70 BC	3,445 BC	3,500 - 3,451 BC	0.578
							3,443 - 3,428 BC	0.125
							3,380 - 3,354 BC	0.297
Senya-05	GX-22729	sed. organic	16,540 ± 80	-27.6				
Senya-06	GX-22730	sed. organic	2,680 ± 60	-19.3	846 ± 55 BC	842 BC	896 - 874 BC	0.225
							860 - 800 BC	0.775
Boso-01	GX-22731	sed. organic	4,040 ± 50	-19.5	2,577 ± 100 BC	2,556 BC	2,609 - 2,595 BC	0.087
							2,590 - 2,476 BC	0.913
Boso-02	GX-22732	Shell	6,320 ± 40	0.3	4,809 ± 49 BC	4,807 BC	4,896 - 4,883 BC	0.112
							4,843 - 4,768 BC	0.862
							4,732 - 4,729 BC	0.026

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巻末資料－1　^{14}C年代測定結果(クルーガー社)

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22710-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Tn-1 (1)
shell

AGE = 6,660 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB}$ = - 7.7 ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22711-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Tn-1 (2)
shell

AGE = 6,870 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB}$ =- 3.2 ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22712-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Tn-3 (1)
shell

AGE = 5,890 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -6.2$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid. The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22713-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Tn-4 (2)
shell

AGE = 4,010 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -8.1$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22714-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Ng-2 P-10
shell

AGE = 8,170 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -5.6$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22715-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Ng-3-8-S-1
shell

AGE = 5,550 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB}$ = + 0.3 ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22716-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Ng-3-11
shell

AGE = 8,100 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB}$ = - 3.3 ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22717-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: NST-D-1
organic material

AGE = 6,970 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of plant fragments.

Pretreatment: The sample was cleaned of dirt or other foreign material and was split into small pieces. It was then treated with hot dilute HCl to remove any carbonates and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, it was combusted to recover carbon dioxide for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -29.3$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22718-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: NST-D-2
organic material

AGE = 3,580 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of plant fragments.

Pretreatment: The sample was cleaned of dirt or other foreign material and was split into small pieces. It was then treated with hot dilute HCl to remove any carbonates and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, it was combusted to recover carbon dioxide for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -28.0$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22719-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Im-1-(1)
shell

AGE = 270 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB}$ = - 0.2 ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22720-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Im-1-(6)
shell

AGE = 1,910 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -1.0$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22721-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Im-1-38
shell

AGE = 6,240 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -2.2$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22722-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Unzen-Mutsugi-C-1
organic material

AGE = 3,620 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of charcoal.

Pretreatment: The charcoal fragments were separated from any sand, silt, rootlets, or other foreign matter. The sample was then treated with hot dilute HCl to remove any carbonates, and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, the cleaned charcoal was combusted and the carbon dioxide was recovered for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -25.4$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22723-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: 94624 Spfa
organic material

AGE = 37,100 +/- 810 C-14 years BP (C-13 corrected).

Description: Sample of charcoal.

Pretreatment: The charcoal fragments were separated from any sand, silt, rootlets, or other foreign matter. The sample was then treated with hot dilute HCl to remove any carbonates, and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, the cleaned charcoal was combusted and the carbon dioxide was recovered for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -25.2$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22724-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: 9612-1 Hk-TPf1
organic material

AGE = 42,300 +/- 1,400 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the peat and clay matter were eluted away from any sand and silt by sedimentation and decantation. The organic fraction was then treated with hot dilute HCl to remove any carbonates, and also with hot dilute NaOH to remove any humic acids or other alkali-soluble organic matter. It was then filtered, washed, dried, and burned in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -24.0$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22725-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: 86.7-11 B-Tm (Cpf1) (the three outer-most rings)
organic material

AGE = 1,210 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of charcoal.

Pretreatment: The charcoal fragments were separated from any sand, silt, rootlets, or other foreign matter. The sample was then treated with hot dilute HCl to remove any carbonates, and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, the cleaned charcoal was combusted and the carbon dioxide was recovered for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -22.8$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22726-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Senya - 01
organic material

AGE = 45,100 +/- 2,100 C-14 years BP (C-13 corrected).

Description: Sample of wood.

Pretreatment: The wood sample was cleaned of dirt or other foreign material and was split into small pieces. It was then treated with hot dilute HCl to remove any carbonates and with hot dilute NaOH to remove humic acids and other organic contaminants. After washing and drying, it was combusted to recover carbon dioxide for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -24.1$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22727-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Senya - 02
organic material

AGE = 5,580 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the clays and organic matter were eluted away from any sand and silt by sedimentation and decantation. The clay/organic fraction was then treated with hot dilute HCl to remove any carbonates. It was then filtered, washed, dried, and roasted in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -18.3$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.

The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22728-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Senya - 03
organic material

AGE = 4,640 +/- 40 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the clays and organic matter were eluted away from any sand and silt by sedimentation and decantation. The clay/organic fraction was then treated with hot dilute HCl to remove any carbonates. It was then filtered, washed, dried, and roasted in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -19.0$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid. The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22729-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Senya - 05
organic material

AGE = 16,540 +/- 80 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the clays and organic matter were eluted away from any sand and silt by sedimentation and decantation. The clay/organic fraction was then treated with hot dilute HCl to remove any carbonates. It was then filtered, washed, dried, and roasted in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -27.6$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid. The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22730-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Senya - 06
organic material

AGE = 2,680 +/- 60 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the clays and organic matter were eluted away from any sand and silt by sedimentation and decantation. The clay/organic fraction was then treated with hot dilute HCl to remove any carbonates. It was then filtered, washed, dried, and roasted in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -19.3$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

GEOCHRON LABORATORIES a division of
KRUEGER ENTERPRISES, INC.

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. GX-22731-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Boso - 01
organic material

AGE = 4,040 +/- 50 C-14 years BP (C-13 corrected).

Description: Sample of sediment organic.

Pretreatment: The entire sample was dispersed in a large volume of water and the clays and organic matter were eluted away from any sand and silt by sedimentation and decantation. The clay/organic fraction was then treated with hot dilute HCl to remove any carbonates. It was then filtered, washed, dried, and roasted in oxygen to recover carbon dioxide from the organic matter for the analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = -19.5$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid. The age is referenced to the year A.D. 1950.

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RADIOCARBON AGE DETERMINATION — REPORT OF ANALYTICAL WORK

Our Sample No. GX-22732-AMS

Submitted by: Ms. Noriko Mogi
Daiwa Geological Laboratory, Inc.
6-18 Matsunami-cho
Fukushima-City, Fukushima 960
Japan

Sample Name: Boso-02
shell

AGE = 6,320 +/- 40 C-14 years BP (C-13 corrected).

Description: Sample of shell.

Pretreatment: The shells were cleaned thoroughly in an ultrasonic cleaner. They were then leached thoroughly with dilute HCl to remove additional surficial material which may have been altered, and to be sure only fresh carbonate material was used. The cleaned shells were then hydrolyzed with HCl, under vacuum, and the carbon dioxide was recovered for analysis.

The sample was very small and analysis by accelerator mass spectrometry (AMS) was required.

Comment:

$\delta^{13}C_{PDB} = +\ 0.3$ ‰

Notes: This date is based upon the Libby half life (5570 years) for ^{14}C. The error stated is $\pm 1\sigma$ as judged by the analytical data alone. Our modern standard is 95% of the activity of N.B.S. Oxalic Acid.
The age is referenced to the year A.D. 1950.

巻末資料－2　Calib ETH計算結果

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22710
- Label : Tn-1(1)
- C14-age : 6260 ± 60 BP

Results of calibration :
- Calibrated age : 5179 ± 71 BC
- Median : 5181 BC
- Intersection(s) : 5226 BC,

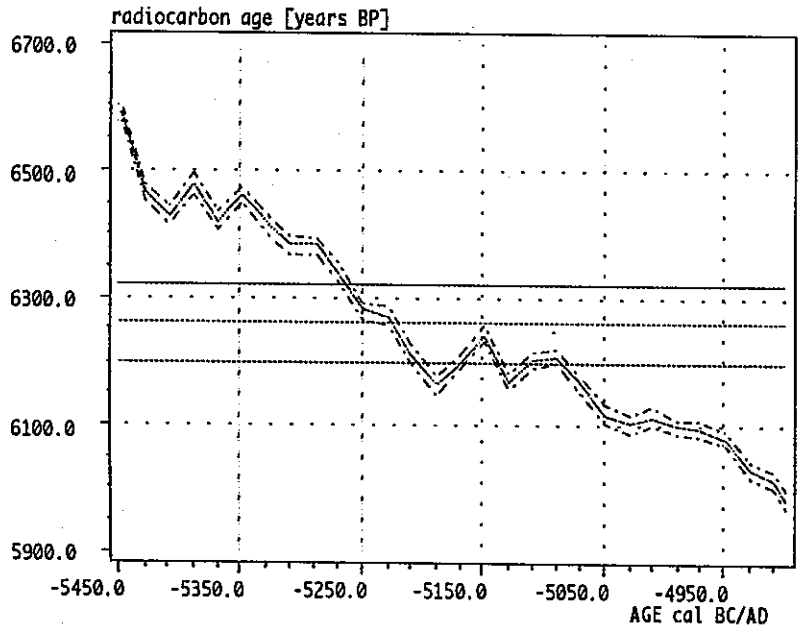
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.78 % , limit : 3.65E-03
  5265 BC , 5203 BC / (51.1%) : 5234 ± 17 BC
  5174 BC , 5137 BC / (27.9%) : 5155 ± 10 BC
  5116 BC , 5083 BC / (21.0%) : 5099 ± 10 BC

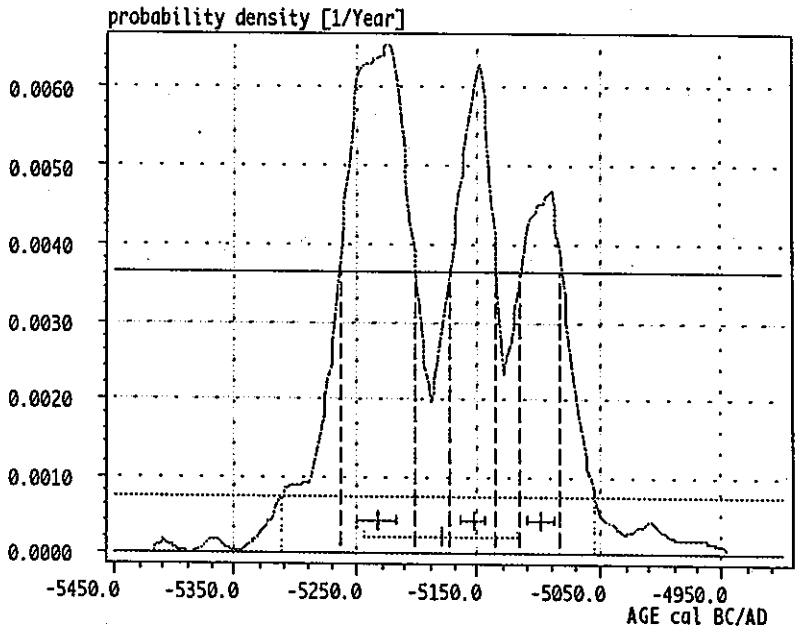
- Two Sigma (95.44%): 95.52 % , limit : 7.44E-04
  5313 BC , 5055 BC / (1.0E+02%) : 5181 ± 63 BC

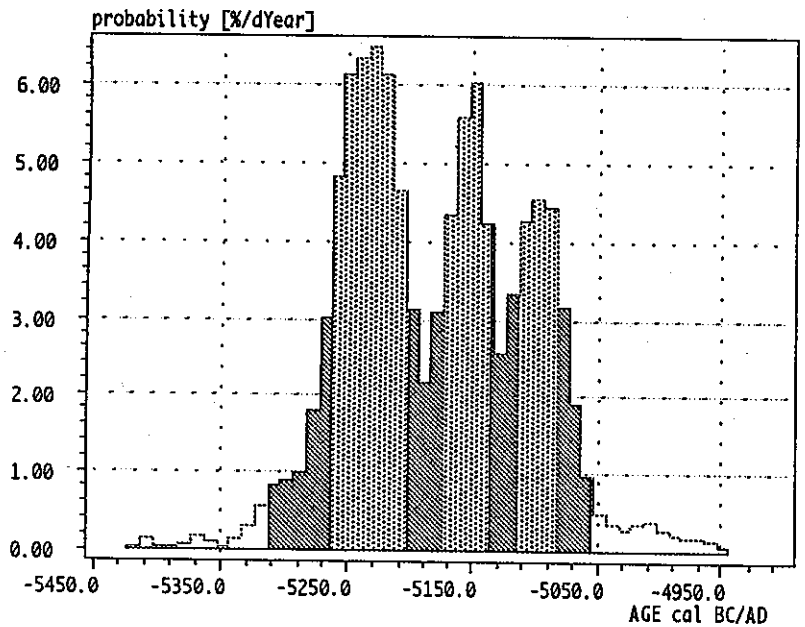
- User Sigma (50.00%): 50.37 % , limit : 4.56E-03
  5261 BC , 5209 BC / (61.7%) : 5235 ± 15 BC
  5167 BC , 5140 BC / (30.2%) : 5153 ± 8 BC
  5097 BC , 5089 BC / (8.1%) : 5093 ± 3 BC

Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [5252 BC, 5101 BC]
- Two Sigma (95.44%) : [5305 BC, 5043 BC]
- User Sigma (50.00%) : [5237 BC, 5124 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [5419 BC ... 4948 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
6700.0
6500.0
6300.0
6100.0
5900.0
-5450.0
-5350.0
-5250.0
-5150.0
-5050.0
-4950.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-5450.0
-5350.0
-5250.0
-5150.0
-5050.0
-4950.0
AGE cal BC/AD


probability [%/dYear]
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-5450.0
-5350.0
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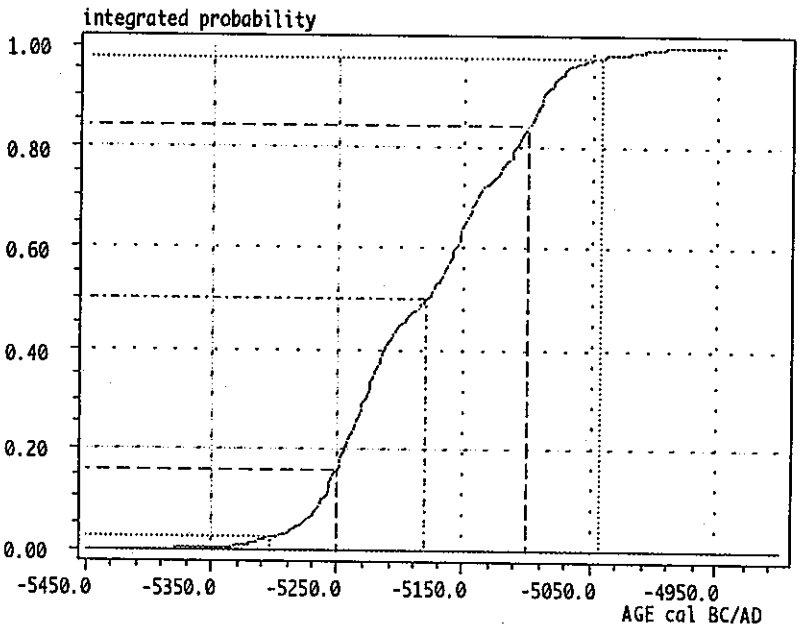
-5150.0
-5050.0
-4950.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-5450.0
-5350.0
-5250.0
-5150.0
-5050.0
-4950.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZÜrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22711
- Label : Tn-1(2)
- C14-age : 6470 ± 60 BP

Results of calibration :
- Calibrated age : 5381 ± 53 BC
- Median : 5382 BC
- Intersection(s) : 5430 BC, 5394 BC, 5386 BC,

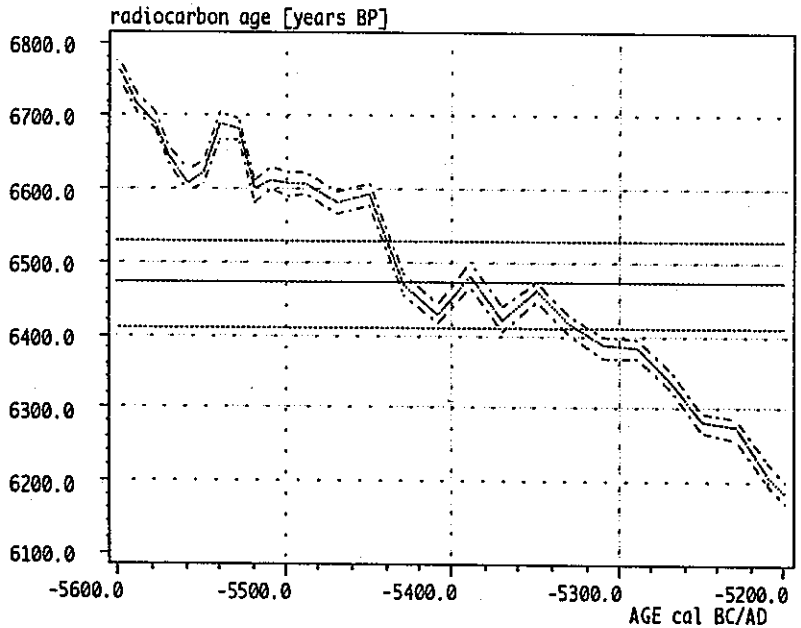
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.81 % , limit : 5.58E-03
  5438 BC , 5371 BC / (66.2%) : 5405 ± 19 BC
  5369 BC , 5334 BC / (33.8%) : 5351 ± 10 BC

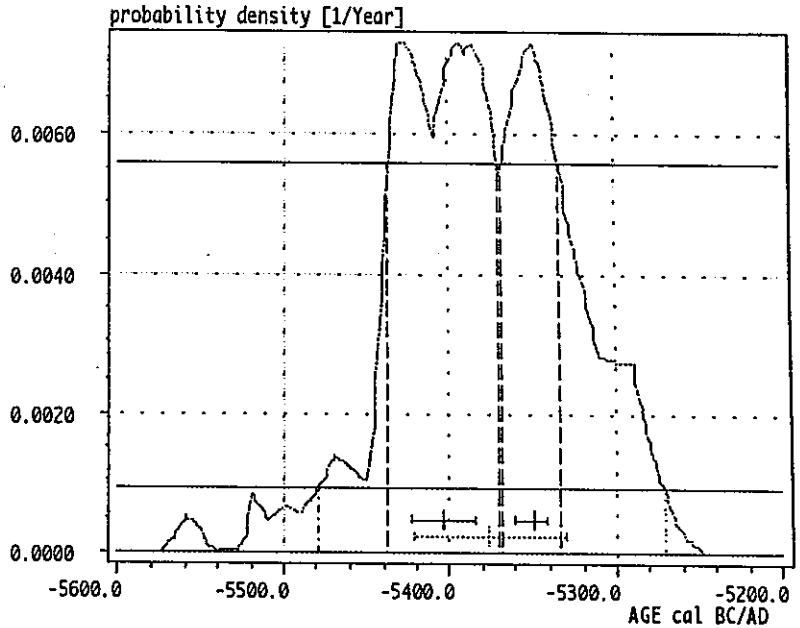
- Two Sigma (95.44%): 95.45 % , limit : 9.32E-04
  5480 BC , 5272 BC / (1.0E+02%) : 5377 ± 46 BC

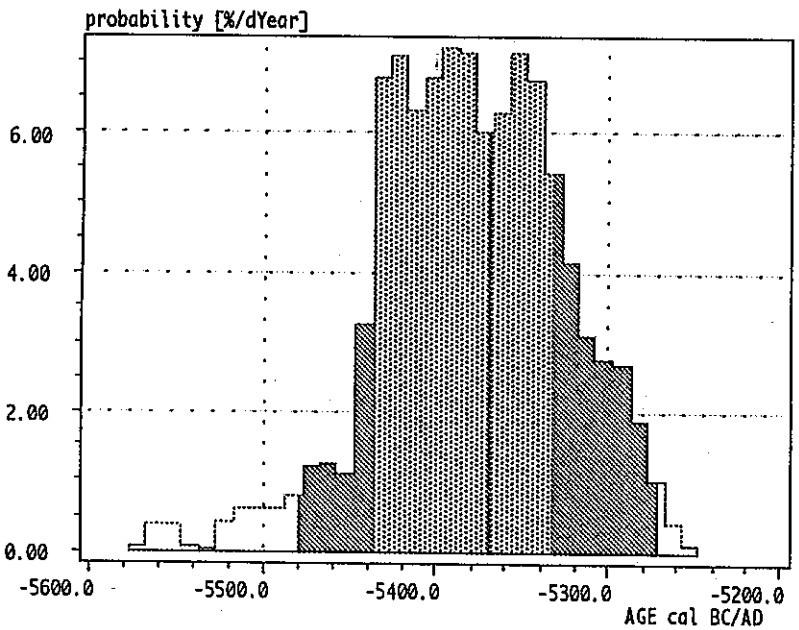
- User Sigma (50.00%): 50.57 % , limit : 6.49E-03
  5435 BC , 5415 BC / (28.4%) : 5425 ± 6 BC
  5406 BC , 5376 BC / (42.1%) : 5391 ± 9 BC
  5361 BC , 5340 BC / (29.5%) : 5351 ± 6 BC

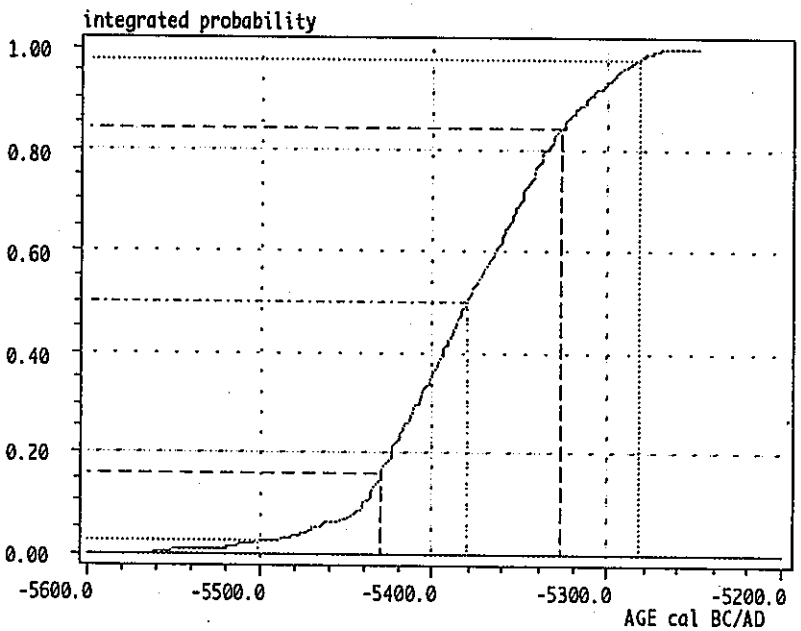
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [5431 BC, 5328 BC]
- Two Sigma (95.44%) : [5502 BC, 5283 BC]
- User Sigma (50.00%) : [5418 BC, 5344 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [5573 BC ... 5251 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
6800.0
6700.0
6600.0
6500.0
6400.0
6300.0
6200.0
6100.0
-5600.0
-5500.0
-5400.0
-5300.0
-5200.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0040
0.0020
0.0000
-5600.0
-5500.0
-5400.0
-5300.0
-5200.0
AGE cal BC/AD


probability [%/dYear]
6.00
4.00
2.00
0.00
-5600.0
-5500.0
-5400.0
-5300.0
-5200.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-5600.0
-5500.0
-5400.0
-5300.0
-5200.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22712
- Label : Tn-3(1)
- C14-age : 5490 ± 50 BP

Results of calibration :
- Calibrated age : 4336 ± 59 BC
- Median : 4338 BC
- Intersection(s) : 4342 BC,

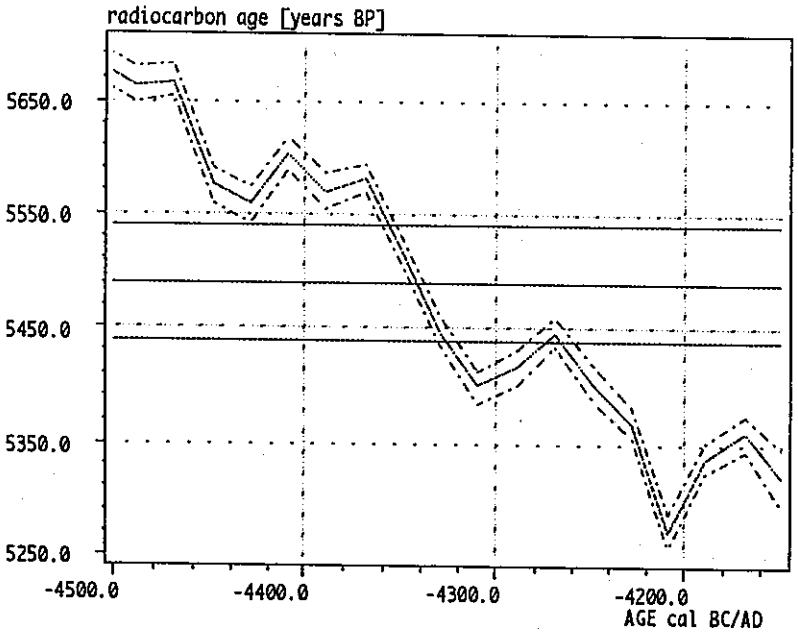
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.61 % , limit : 3.75E-03
  4440 BC , 4426 BC / (9.2%) : 4433 ± 4 BC
  4365 BC , 4316 BC / (57.7%) : 4341 ± 12 BC
  4294 BC , 4255 BC / (33.1%) : 4274 ± 10 BC

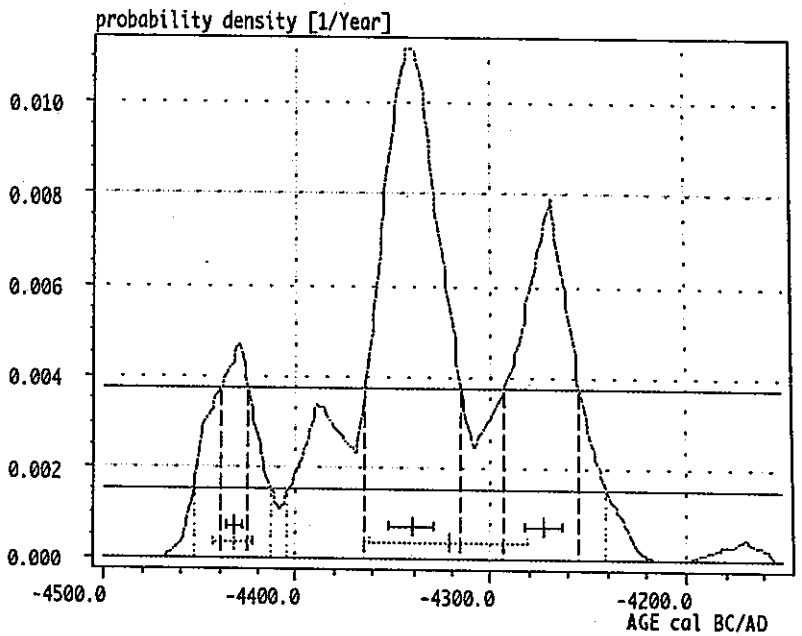
- Two Sigma (95.44%): 95.51 % , limit : 1.53E-03
  4454 BC , 4414 BC / (13.9%) : 4434 ± 10 BC
  4405 BC , 4241 BC / (86.1%) : 4322 ± 41 BC

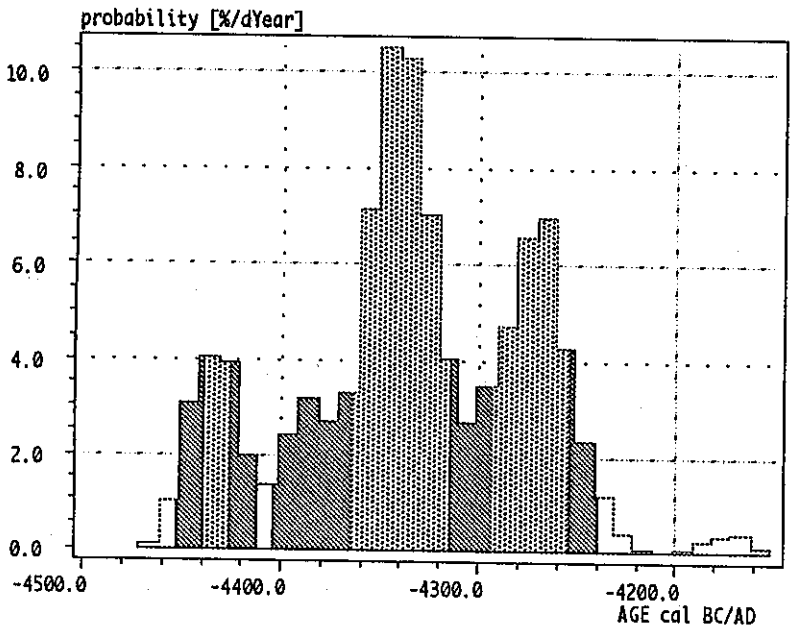
- User Sigma (50.00%): 50.34 % , limit : 5.34E-03
  4361 BC , 4322 BC / (69.1%) : 4342 ± 10 BC
  4284 BC , 4261 BC / (30.9%) : 4272 ± 7 BC

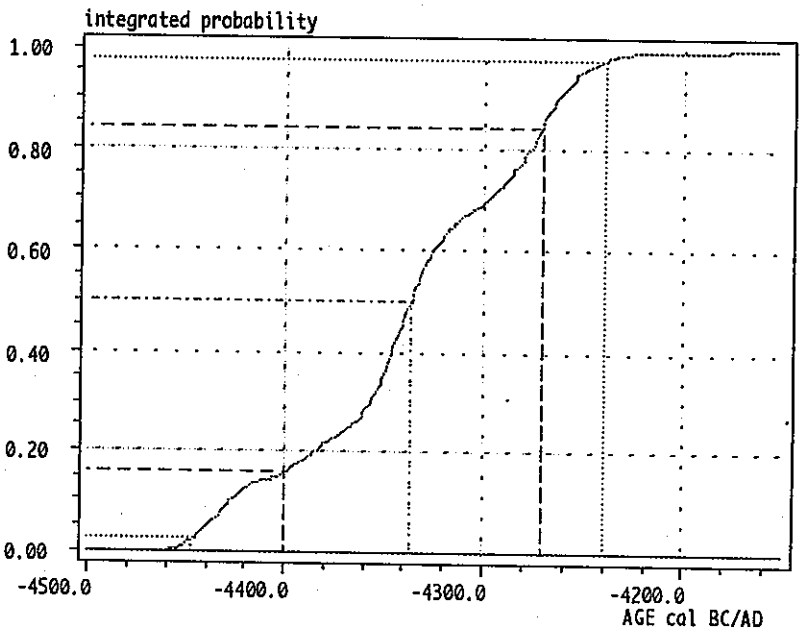
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [4401 BC, 4272 BC]
- Two Sigma (95.44%) : [4448 BC, 4240 BC]
- User Sigma (50.00%) : [4368 BC, 4287 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [4467 BC ... 4157 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
5650.0
5550.0
5450.0
5350.0
5250.0
-4500.0
-4400.0
-4300.0
-4200.0
AGE cal BC/AD


probability density [1/Year]
0.010
0.008
0.006
0.004
0.002
0.000
-4500.0
-4400.0
-4300.0
-4200.0
AGE cal BC/AD


probability [%/dYear]
10.0
8.0
6.0
4.0
2.0
0.0
-4500.0
-4400.0
-4300.0
-4200.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-4500.0
-4400.0
-4300.0
-4200.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22713
- Label : Tn-4(2)
- C14-age : 3610 ± 50 BP

Results of calibration :
- Calibrated age : 1955 ± 78 BC
- Median : 1953 BC
- Intersection(s) : 1944 BC,

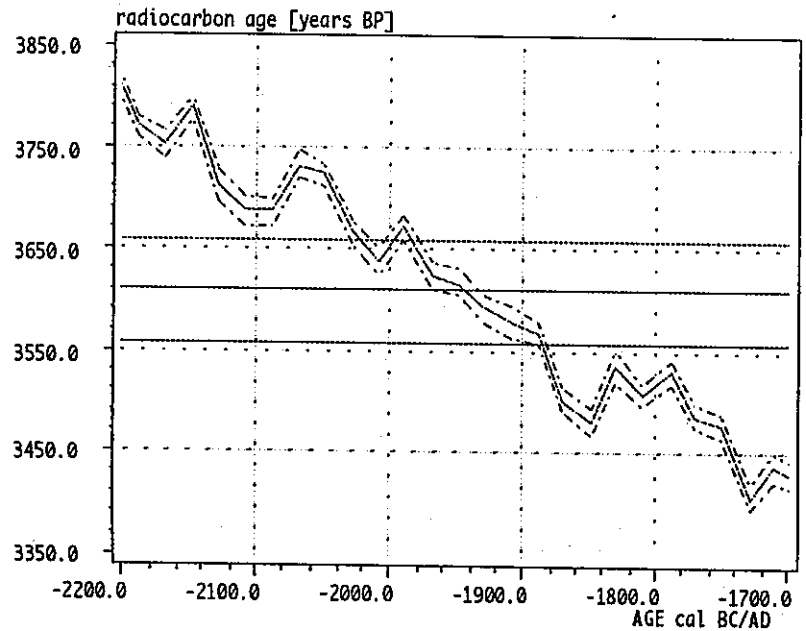
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.60 % , limit : 3.59E-03
  2028 BC , 1995 BC / (21.8%) : 2011 ± 9 BC
  1986 BC , 1886 BC / (78.2%) : 1937 ± 28 BC

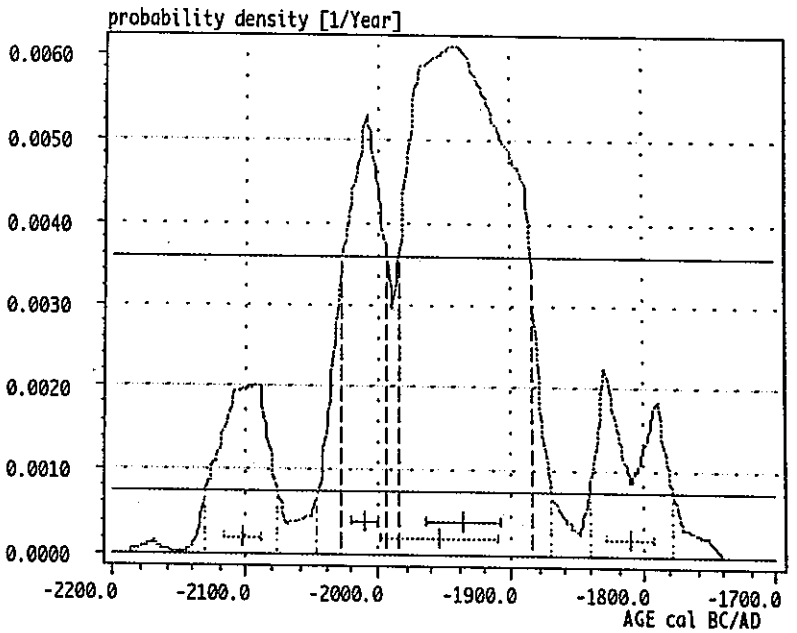
- Two Sigma (95.44%): 95.51 % , limit : 7.43E-04
  2131 BC , 2077 BC / (8.9%) : 2103 ± 14 BC
  2047 BC , 1871 BC / (81.8%) : 1956 ± 44 BC
  1842 BC , 1778 BC / (9.3%) : 1811 ± 18 BC

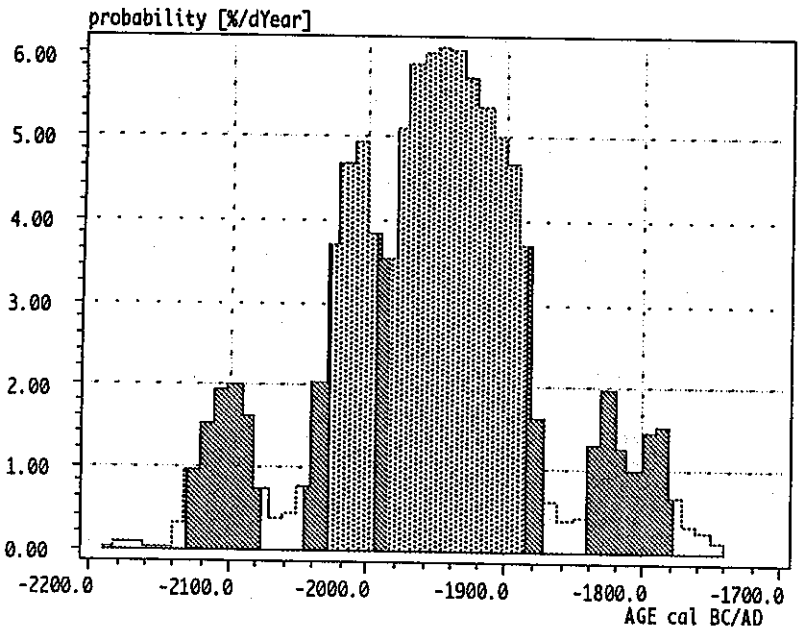
- User Sigma (50.00%): 50.20 % , limit : 4.78E-03
  2016 BC , 2005 BC / (11.7%) : 2010 ± 3 BC
  1979 BC , 1900 BC / (88.3%) : 1940 ± 22 BC

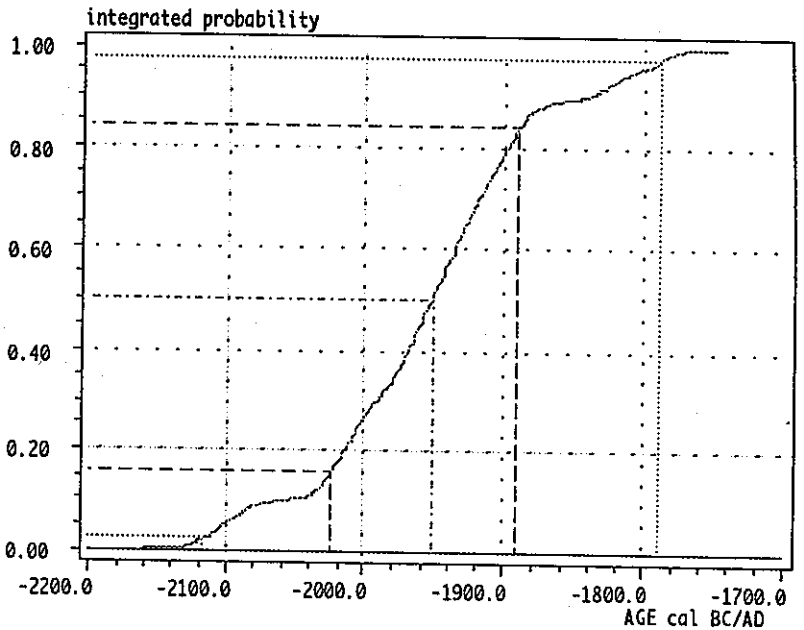
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [2025 BC, 1891 BC]
- Two Sigma (95.44%) : [2117 BC, 1789 BC]
- User Sigma (50.00%) : [2005 BC, 1910 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [2187 BC ... 1743 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
3850.0
3750.0
3650.0
3550.0
3450.0
3350.0
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


probability [%/dYear]
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22714
- Label : Ng-2 P-10
- C14-age : 7770 ± 50 BP

Results of calibration :
- Calibrated age : 6545 ± 52 BC
- Median : 6543 BC
- Intersection(s) : 6548 BC,

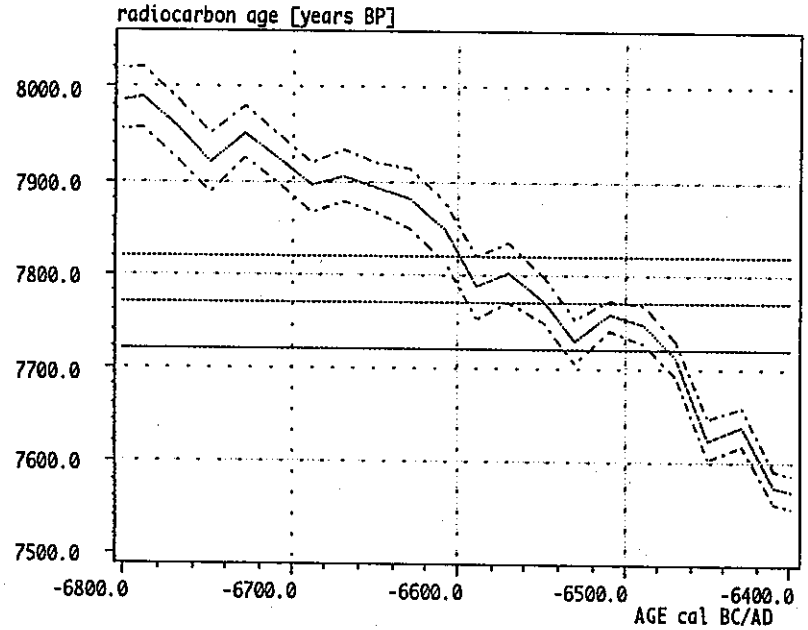
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.64 % , limit : 5.93E-03
  6594 BC , 6571 BC / (21.3%) : 6583 ± 7 BC
  6569 BC , 6533 BC / (35.6%) : 6551 ± 10 BC
  6526 BC , 6483 BC / (43.0%) : 6505 ± 12 BC

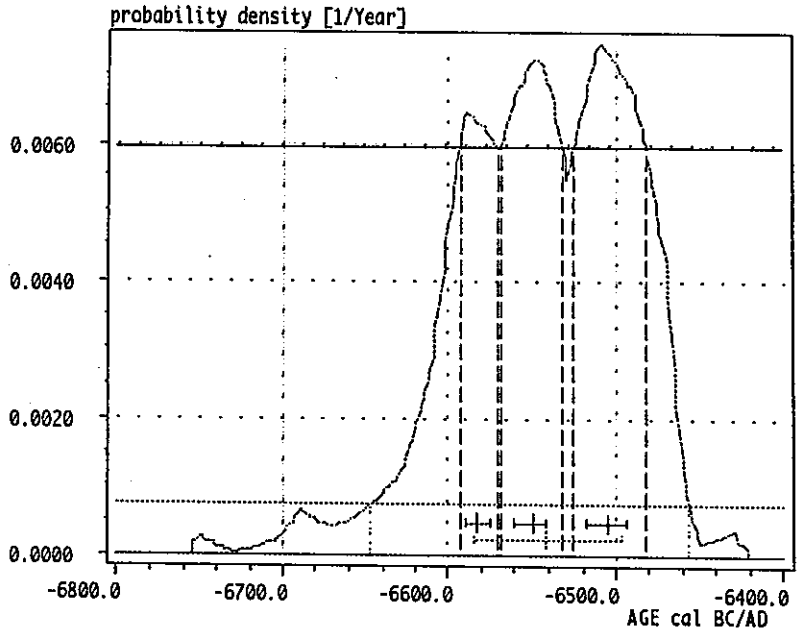
- Two Sigma (95.44%): 95.47 % , limit : 7.25E-04
  6648 BC , 6457 BC / (1.0E+02%) : 6541 ± 44 BC

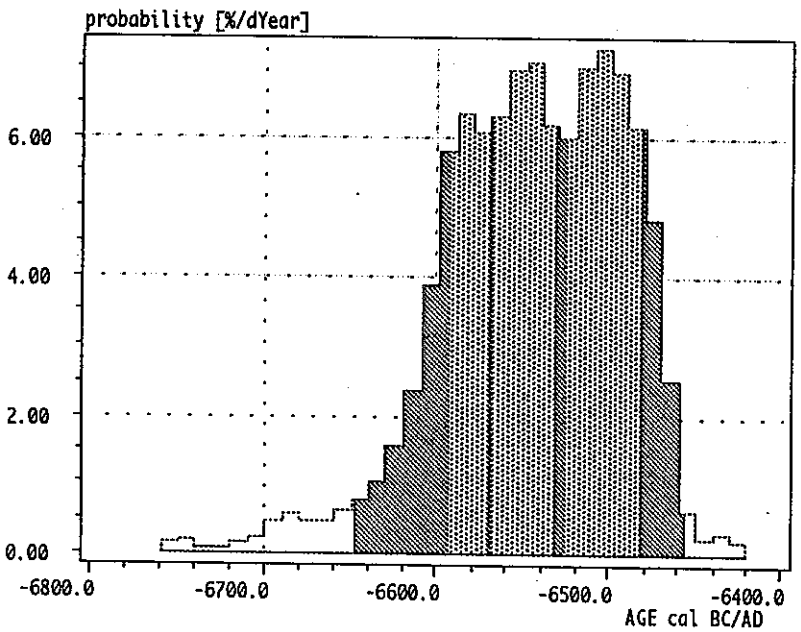
- User Sigma (50.00%): 50.26 % , limit : 6.33E-03
  6591 BC , 6584 BC / (9.9%) : 6588 ± 2 BC
  6565 BC , 6536 BC / (40.0%) : 6550 ± 9 BC
  6522 BC , 6486 BC / (50.1%) : 6504 ± 10 BC

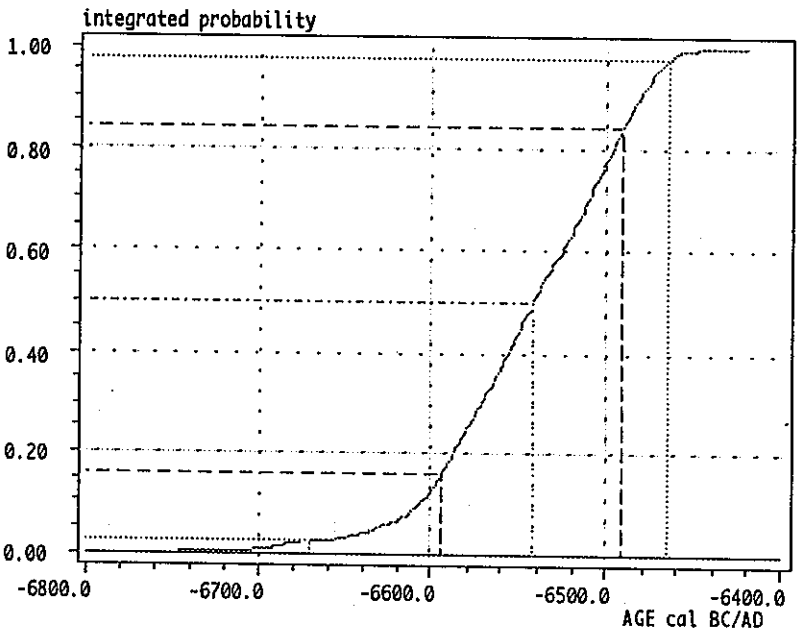
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [6595 BC, 6492 BC]
- Two Sigma (95.44%) : [6672 BC, 6466 BC]
- User Sigma (50.00%) : [6581 BC, 6505 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [6755 BC ... 6423 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
8000.0
7900.0
7800.0
7700.0
7600.0
7500.0
-6800.0
-6700.0
-6600.0
-6500.0
-6400.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0040
0.0020
0.0000
-6800.0
-6700.0
-6600.0
-6500.0
-6400.0
AGE cal BC/AD


probability [%/dYear]
6.00
4.00
2.00
0.00
-6800.0
-6700.0
-6600.0
-6500.0
-6400.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-6800.0
-6700.0
-6600.0
-6500.0
-6400.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22715
- Label : Ng-3-8-S-1
- C14-age : 5150 ± 60 BP

Results of calibration :
- Calibrated age : 3935 ± 86 BC
- Median : 3949 BC
- Intersection(s) : 3965 BC,

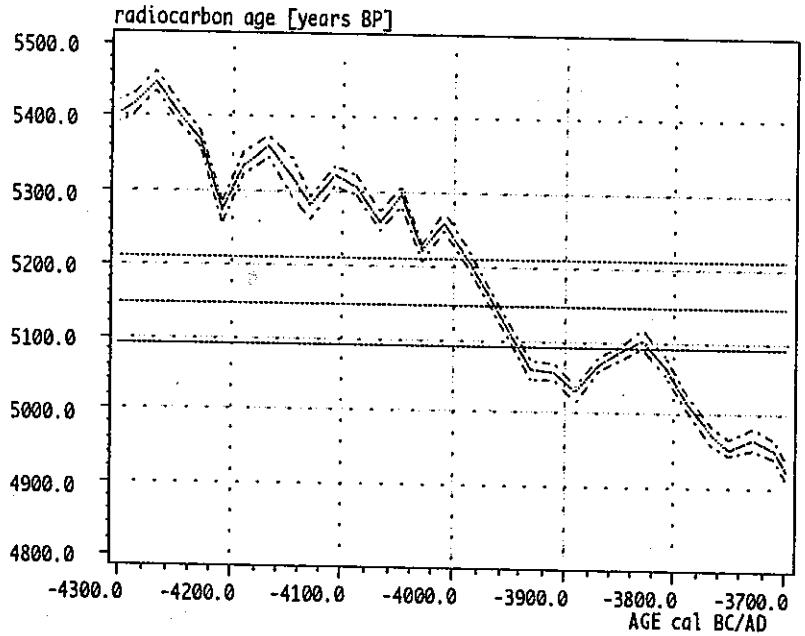
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.70 % , limit : 2.99E-03
  4034 BC , 4023 BC / (5.8%) : 4029 ± 3 BC
  3999 BC , 3933 BC / (55.6%) : 3966 ± 17 BC
  3872 BC , 3811 BC / (38.5%) : 3841 ± 17 BC

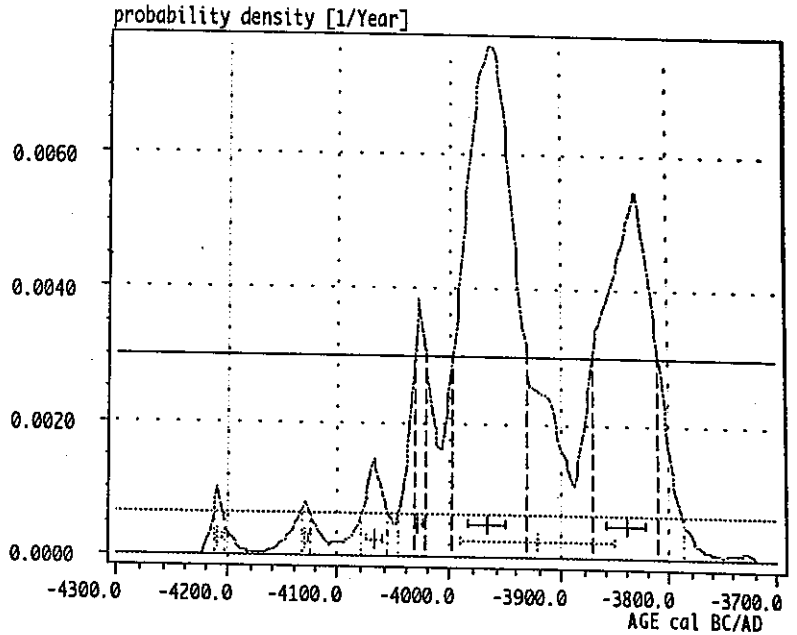
- Two Sigma (95.44%): 95.56 % , limit : 6.45E-04
  4213 BC , 4205 BC / (0.8%) : 4209 ± 2 BC
  4134 BC , 4126 BC / (0.7%) : 4130 ± 2 BC
  4081 BC , 4056 BC / (2.8%) : 4069 ± 7 BC
  4047 BC , 3789 BC / (95.8%) : 3922 ± 69 BC

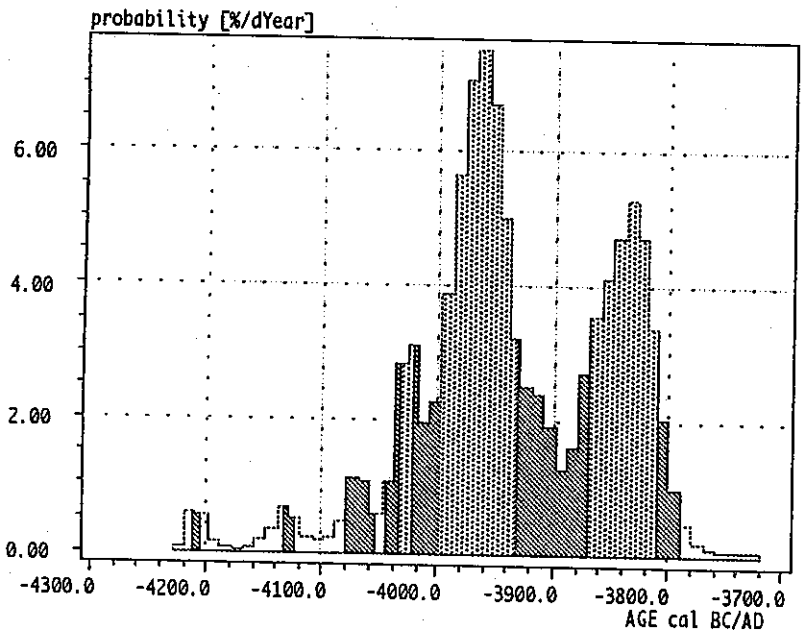
- User Sigma (50.00%): 50.31 % , limit : 4.17E-03
  3992 BC , 3939 BC / (66.6%) : 3966 ± 14 BC
  3854 BC , 3820 BC / (33.4%) : 3837 ± 10 BC

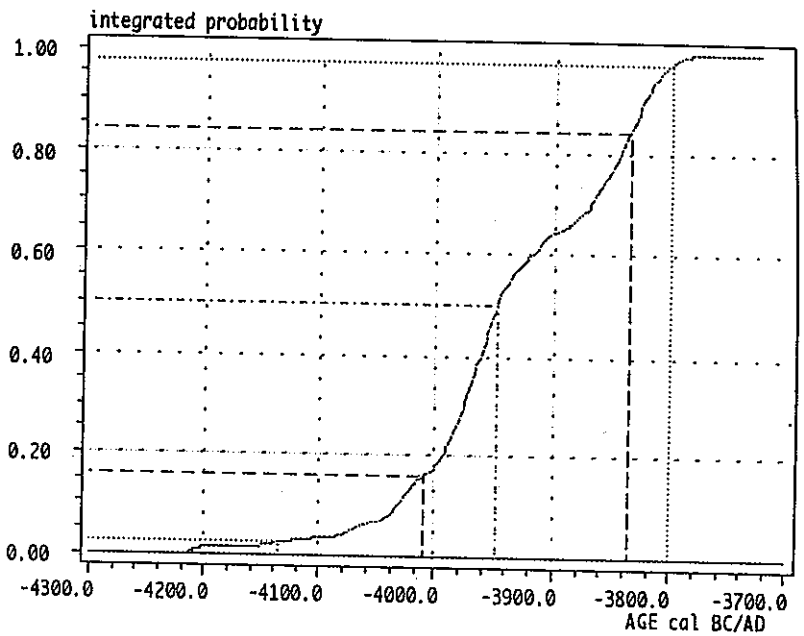
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [4012 BC, 3837 BC]
- Two Sigma (95.44%) : [4136 BC, 3802 BC]
- User Sigma (50.00%) : [3985 BC, 3857 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [4224 BC ... 3723 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
5500.0
5400.0
5300.0
5200.0
5100.0
5000.0
4900.0
4800.0
-4300.0
-4200.0
-4100.0
-4000.0
-3900.0
-3800.0
-3700.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0040
0.0020
0.0000
-4300.0
-4200.0
-4100.0
-4000.0
-3900.0
-3800.0
-3700.0
AGE cal BC/AD


probability [%/dYear]
6.00
4.00
2.00
0.00
-4300.0
-4200.0
-4100.0
-4000.0
-3900.0
-3800.0
-3700.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-4300.0
-4200.0
-4100.0
-4000.0
-3900.0
-3800.0
-3700.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22716
- Label : Ng-3-11
- C14-age : 7700 ± 50 BP

Results of calibration :
- Calibrated age : 6499 ± 46 BC
- Median : 6495 BC
- Intersection(s) : 6467 BC,

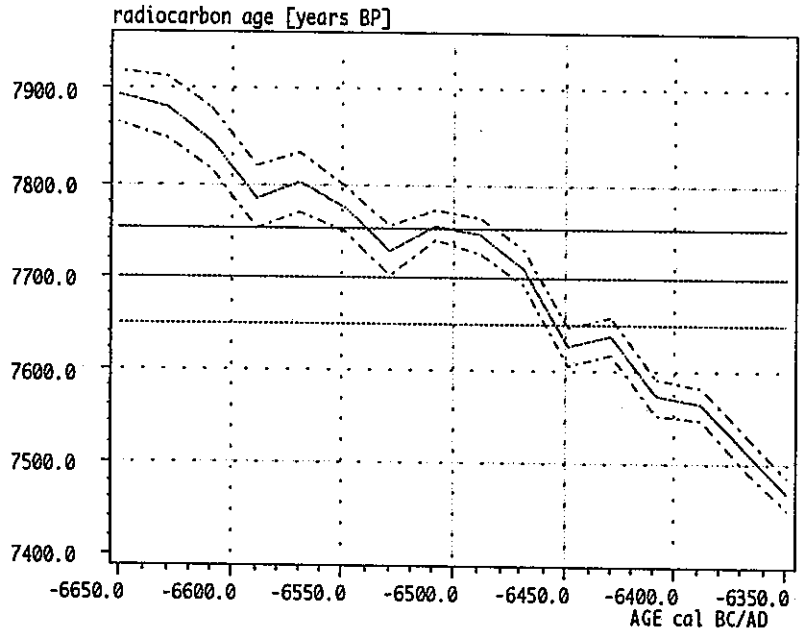
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.45 % , limit : 5.05E-03
  6545 BC , 6453 BC / (1.0E+02%) : 6497 ± 27 BC

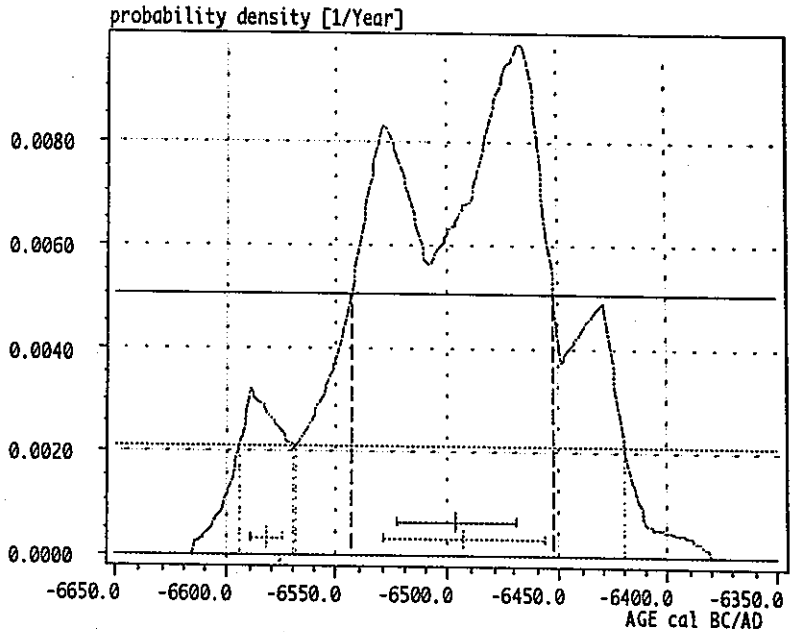
- Two Sigma (95.44%): 95.65 % , limit : 2.08E-03
  6595 BC , 6571 BC / (6.8%) : 6583 ± 7 BC
  6569 BC , 6420 BC / (93.2%) : 6493 ± 37 BC

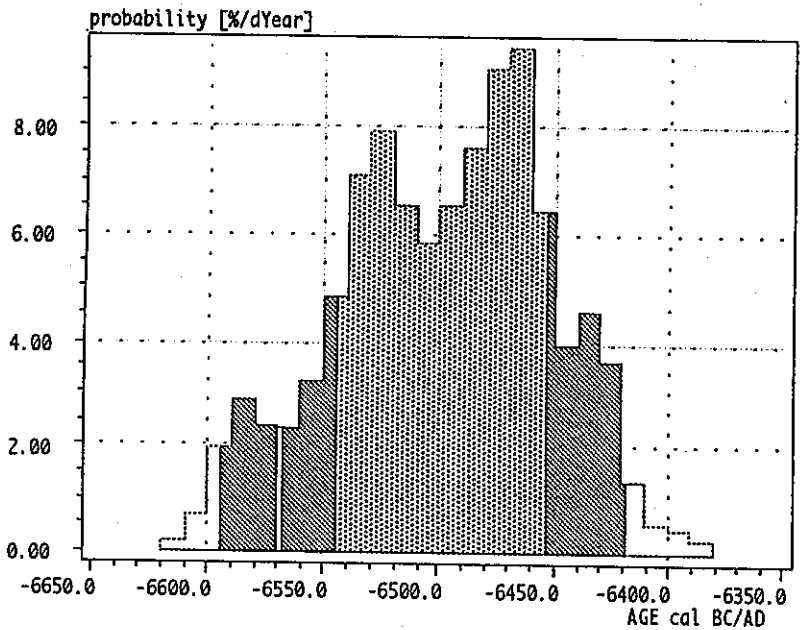
- User Sigma (50.00%): 50.63 % , limit : 6.54E-03
  6539 BC , 6516 BC / (34.5%) : 6528 ± 7 BC
  6496 BC , 6456 BC / (65.5%) : 6475 ± 11 BC

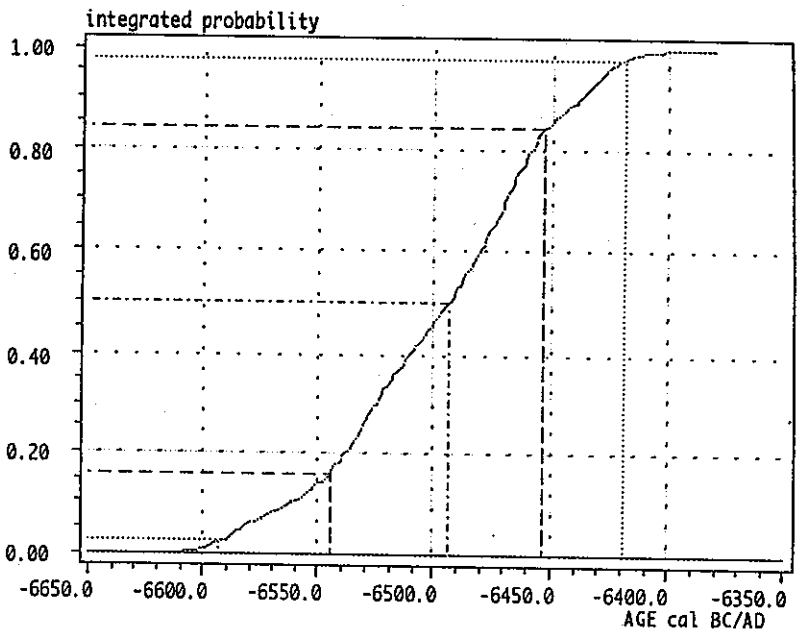
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [6546 BC, 6454 BC]
- Two Sigma (95.44%) : [6594 BC, 6420 BC]
- User Sigma (50.00%) : [6532 BC, 6466 BC]

CalibETH Configuration :
  Standard calibration curve error : 15.0
  Sigma multiplier for integration range : 3.00
  Integration range : [6616 BC ... 6382 BC]
  Width of bar in histogram plot : 10
  Resolution of probability density : 1
  Integration ranges are fixed by : autoscaling
  Interpolation of calibration function : linear
  Interpolation of calib. function error : linear
  Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
7900.0
7800.0
7700.0
7600.0
7500.0
7400.0
-6650.0
-6600.0
-6550.0
-6500.0
-6450.0
-6400.0
-6350.0
AGE cal BC/AD


probability density [1/Year]
0.0080
0.0060
0.0040
0.0020
0.0000
-6650.0
-6600.0
-6550.0
-6500.0
-6450.0
-6400.0
-6350.0
AGE cal BC/AD


probability [%/dYear]
8.00
6.00
4.00
2.00
0.00
-6650.0
-6600.0
-6550.0
-6500.0
-6450.0
-6400.0
-6350.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-6650.0
-6600.0
-6550.0
-6500.0
-6450.0
-6400.0
-6350.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22717
- Label : NST-D-1
- C14-age : 6970 ± 60 BP

Results of calibration :
- Calibrated age : 5810 ± 68 BC
- Median : 5805 BC
- Intersection(s) : 5780 BC,

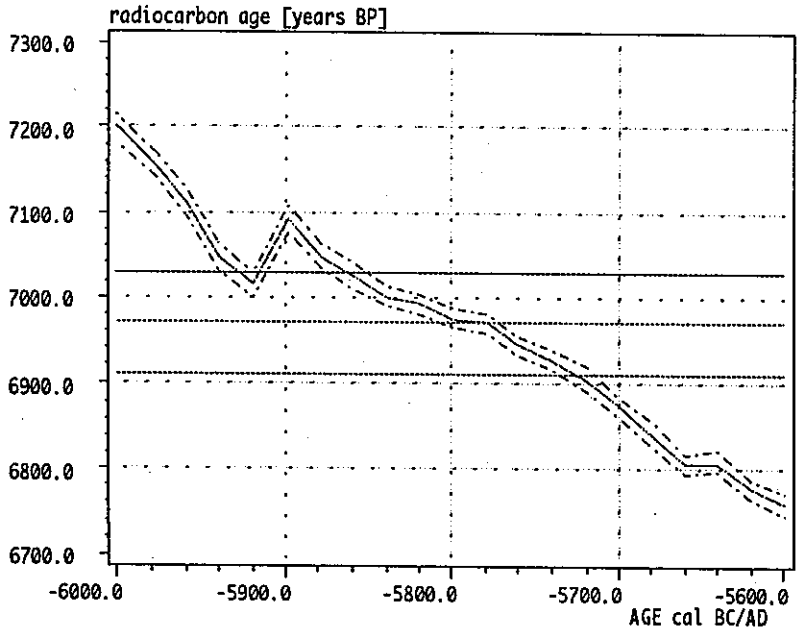
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.59 % , limit : 3.74E-03
  5926 BC , 5918 BC / (5.2%) : 5922 ± 3 BC
  5858 BC , 5729 BC / (94.8%) : 5794 ± 36 BC

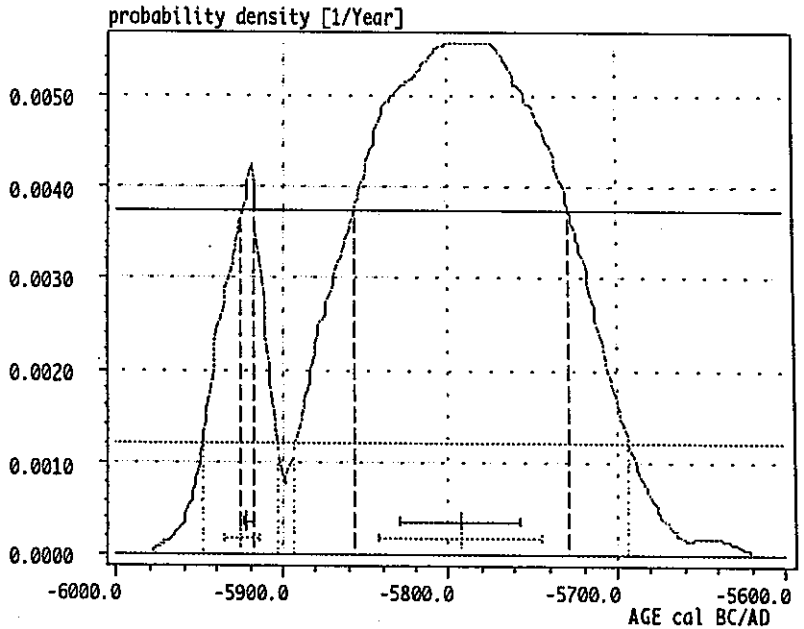
- Two Sigma (95.44%): 95.50 % , limit : 1.21E-03
  5949 BC , 5904 BC / (13.2%) : 5926 ± 11 BC
  5893 BC , 5693 BC / (86.8%) : 5794 ± 49 BC

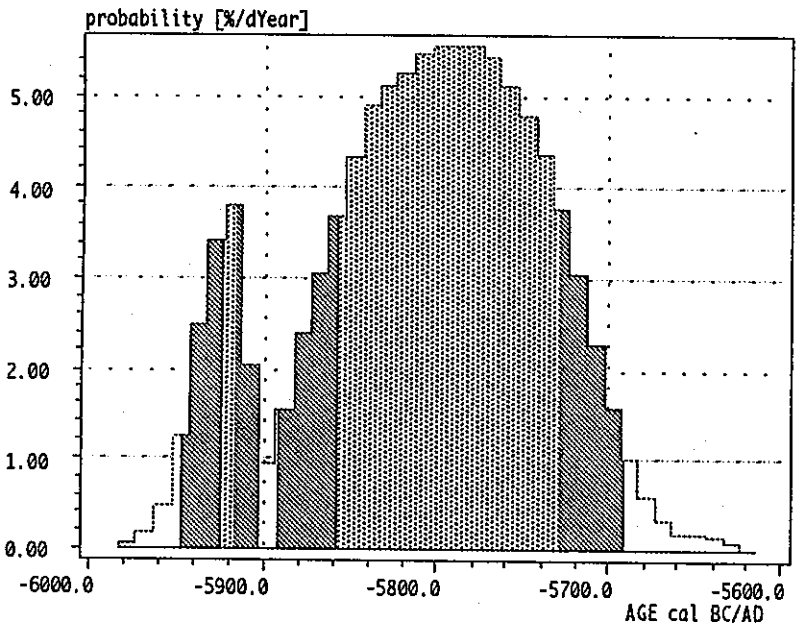
- User Sigma (50.00%): 50.43 % , limit : 4.76E-03
  5842 BC , 5748 BC / (1.0E+02%) : 5795 ± 27 BC

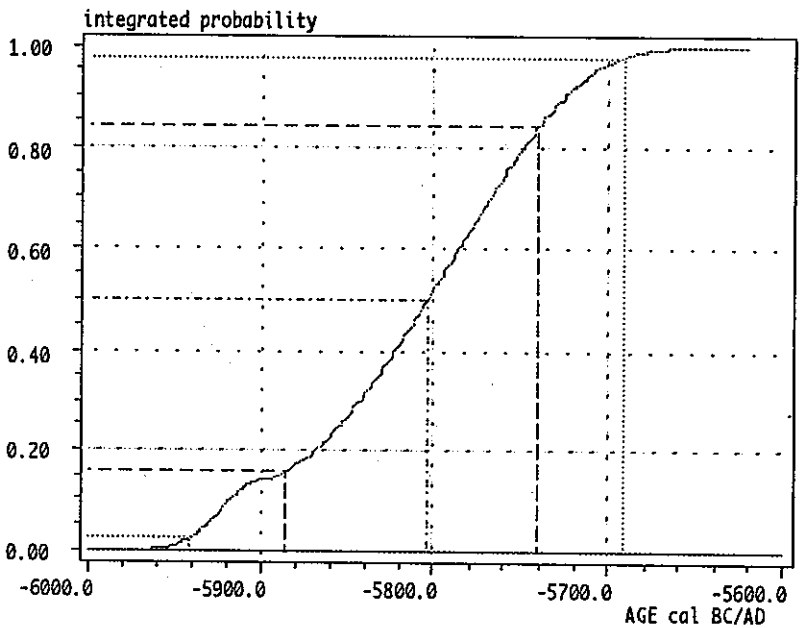
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [5886 BC, 5741 BC]
- Two Sigma (95.44%) : [5943 BC, 5693 BC]
- User Sigma (50.00%) : [5855 BC, 5760 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [5979 BC ... 5623 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
7300.0
7200.0
7100.0
7000.0
6900.0
6800.0
6700.0
-6000.0
-5900.0
-5800.0
-5700.0
-5600.0
AGE cal BC/AD


probability density [1/Year]
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-6000.0
-5900.0
-5800.0
-5700.0
-5600.0
AGE cal BC/AD


probability [%/dYear]
5.00
4.00
3.00
2.00
1.00
0.00
-6000.0
-5900.0
-5800.0
-5700.0
-5600.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-6000.0
-5900.0
-5800.0
-5700.0
-5600.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22718
- Label : NST-D-2
- C14-age : 3580 ± 50 BP

Results of calibration :
- Calibrated age : 1907 ± 78 BC
- Median : 1912 BC
- Intersection(s) : 1911 BC,

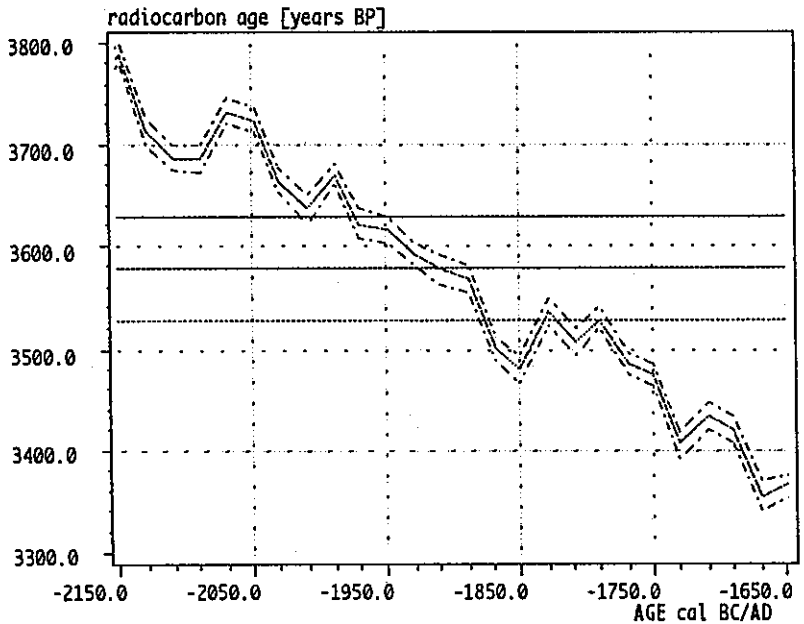
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.38 % , limit : 3.06E-03
  2012 BC , 2008 BC / (2.3%) : 2010 ± 1 BC
  1977 BC , 1875 BC / (78.2%) : 1924 ± 28 BC
  1837 BC , 1817 BC / (11.0%) : 1827 ± 6 BC
  1801 BC , 1785 BC / (8.5%) : 1793 ± 5 BC

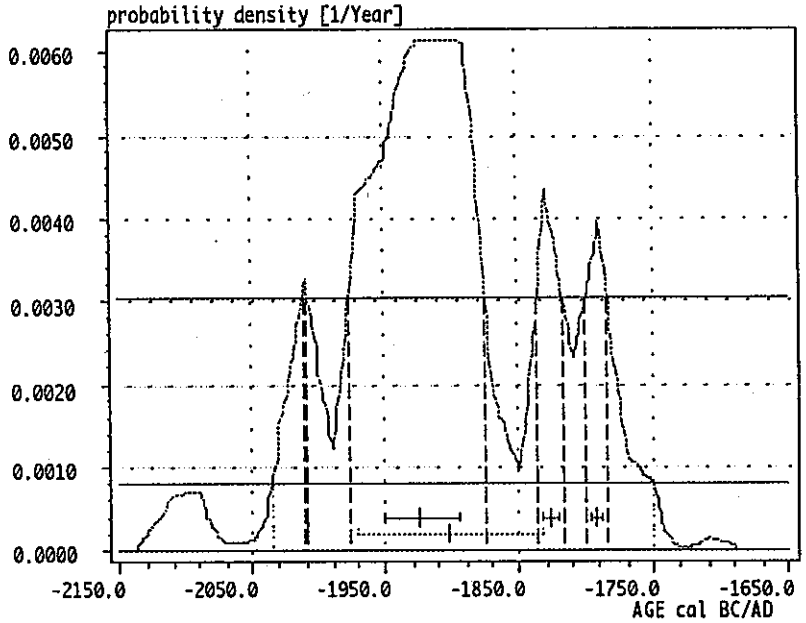
- Two Sigma (95.44%): 95.49 % , limit : 8.10E-04
  2036 BC , 1750 BC / (1.0E+02%) : 1902 ± 69 BC

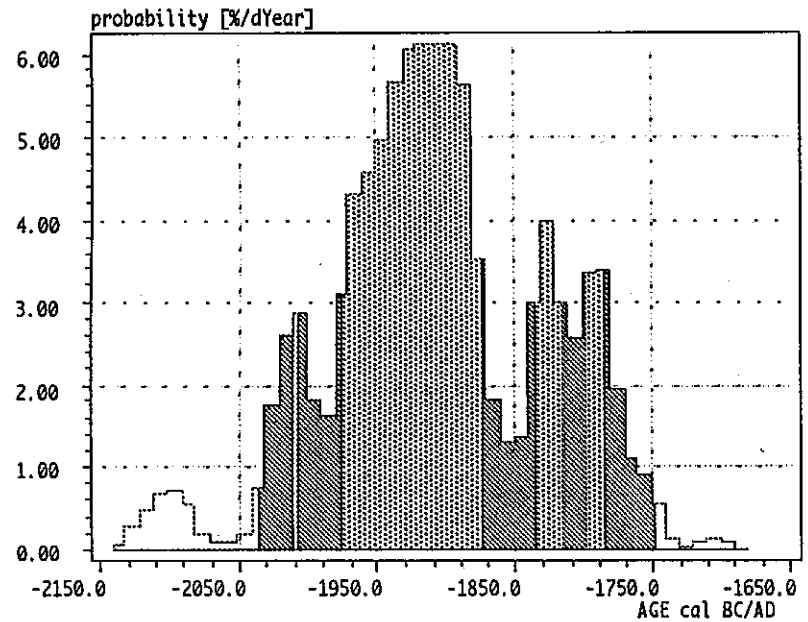
- User Sigma (50.00%): 50.13 % , limit : 4.30E-03
  1970 BC , 1880 BC / (98.3%) : 1923 ± 25 BC
  1830 BC , 1829 BC / (1.7%) : 1830 ± 0 BC

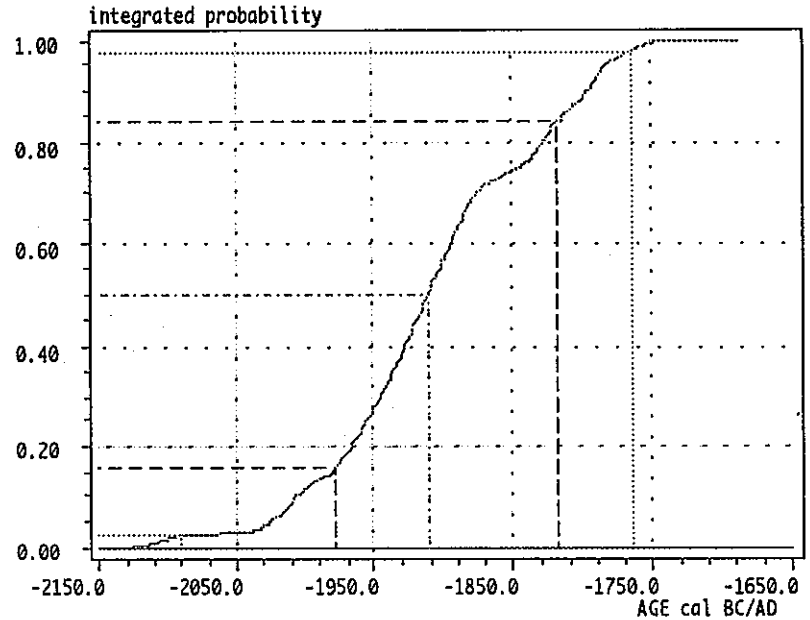
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [1979 BC, 1818 BC]
- Two Sigma (95.44%) : [2092 BC, 1766 BC]
- User Sigma (50.00%) : [1957 BC, 1846 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [2137 BC ... 1691 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
3800.0
3700.0
3600.0
3500.0
3400.0
3300.0
-2150.0
-2050.0
-1950.0
-1850.0
-1750.0
-1650.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-2150.0
-2050.0
-1950.0
-1850.0
-1750.0
-1650.0
AGE cal BC/AD


probability [%/dYear]
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-2150.0
-2050.0
-1950.0
-1850.0
-1750.0
-1650.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-2150.0
-2050.0
-1950.0
-1850.0
-1750.0
-1650.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22719
- Label : Im-1-(1)
- C14-age : 270 ± 50 BP

Results of calibration :
- Calibrated age : 1648 ± 116 AD
- Median : 1637 AD
- Intersection(s) : 1651 AD,

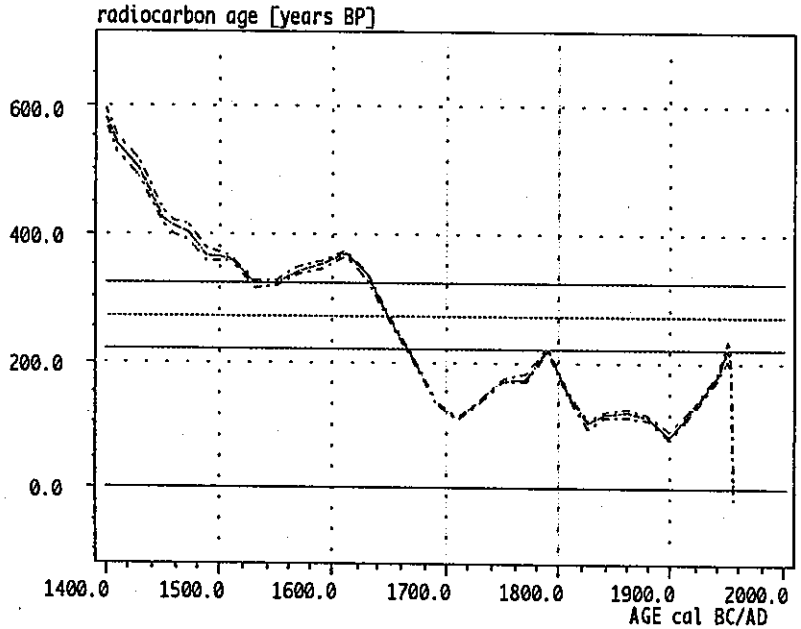
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.64 % , limit : 3.02E-03
  1518 AD , 1578 AD / (38.9%) : 1546 ± 16 AD
  1625 AD , 1673 AD / (44.9%) : 1650 ± 12 AD
  1779 AD , 1797 AD / (10.9%) : 1788 ± 5 AD
  1945 AD , 1953 AD / (5.3%) : 1949 ± 2 AD

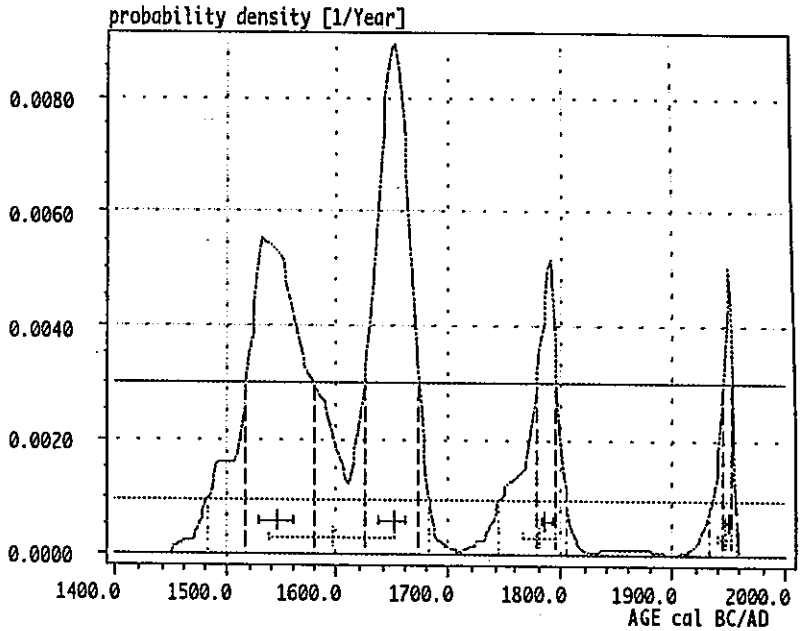
- Two Sigma (95.44%): 95.48 % , limit : 9.05E-04
  1483 AD , 1683 AD / (79.1%) : 1595 ± 56 AD
  1746 AD , 1806 AD / (14.8%) : 1781 ± 15 AD
  1934 AD , 1956 AD / (6.2%) : 1947 ± 5 AD

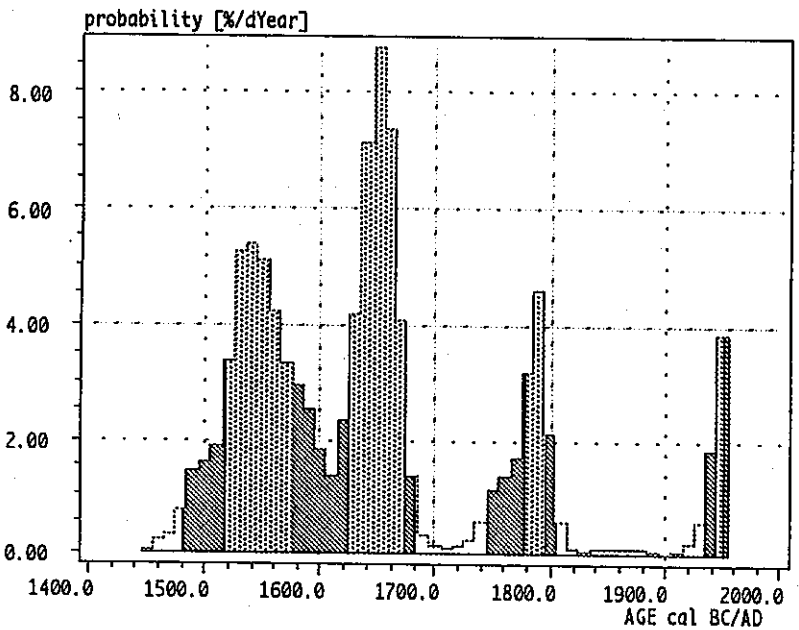
- User Sigma (50.00%): 50.61 % , limit : 4.37E-03
  1525 AD , 1559 AD / (34.8%) : 1542 ± 10 AD
  1631 AD , 1669 AD / (53.6%) : 1650 ± 10 AD
  1786 AD , 1793 AD / (7.3%) : 1789 ± 2 AD
  1949 AD , 1953 AD / (4.3%) : 1951 ± 1 AD

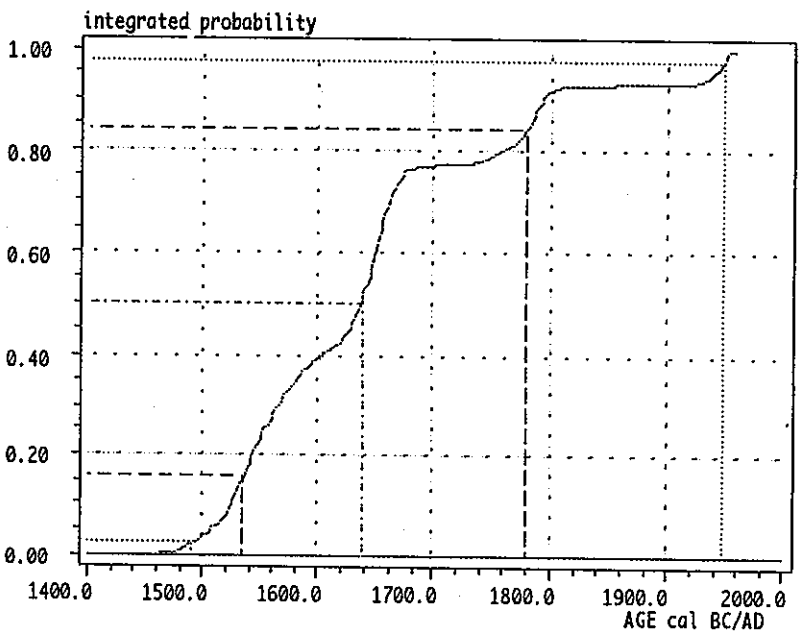
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [1536 AD, 1780 AD]
- Two Sigma (95.44%) : [1491 AD, 1948 AD]
- User Sigma (50.00%) : [1553 AD, 1672 AD]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [1450 AD ... 1955 AD]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
600.0
400.0
200.0
0.0
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
AGE cal BC/AD


probability density [1/Year]
0.0080
0.0060
0.0040
0.0020
0.0000
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
AGE cal BC/AD


probability [%/dYear]
8.00
6.00
4.00
2.00
0.00
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZÜrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22720
- Label : Im-1-(6)
- C14-age : 1510 ± 60 BP

Results of calibration :
- Calibrated age : 550 ± 60 AD
- Median : 558 AD
- Intersection(s) : 563 AD, 586 AD, 591 AD,

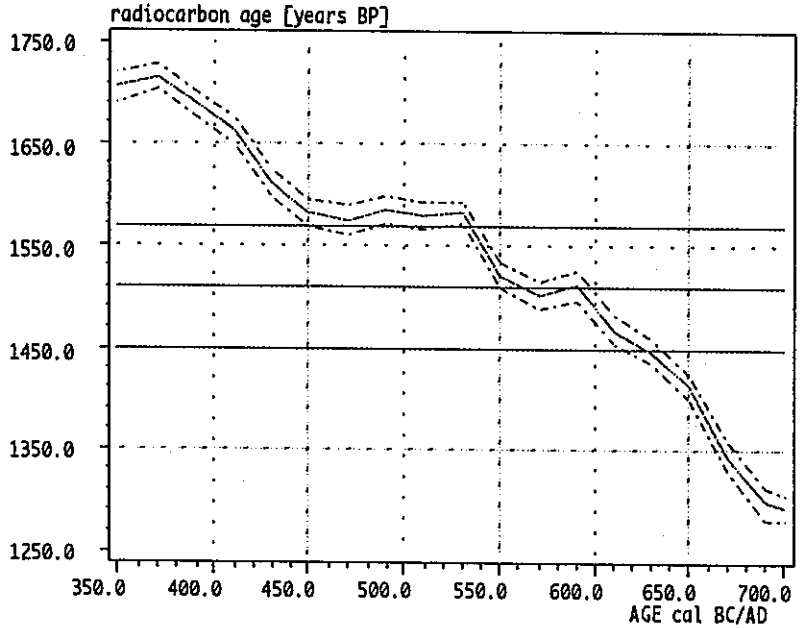
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.55 % , limit : 3.45E-03
  457 AD , 479 AD / (11.8%) : 468 ± 7 AD
  509 AD , 512 AD / (2.0%) : 510 ± 1 AD
  531 AD , 635 AD / (86.2%) : 581 ± 28 AD

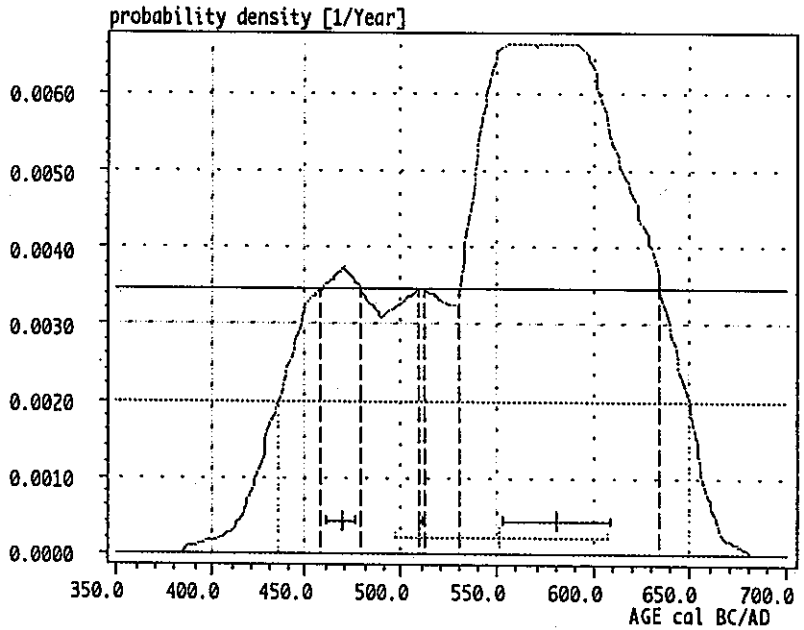
- Two Sigma (95.44%): 95.55 % , limit : 1.95E-03
  435 AD , 650 AD / (1.0E+02%) : 552 ± 56 AD

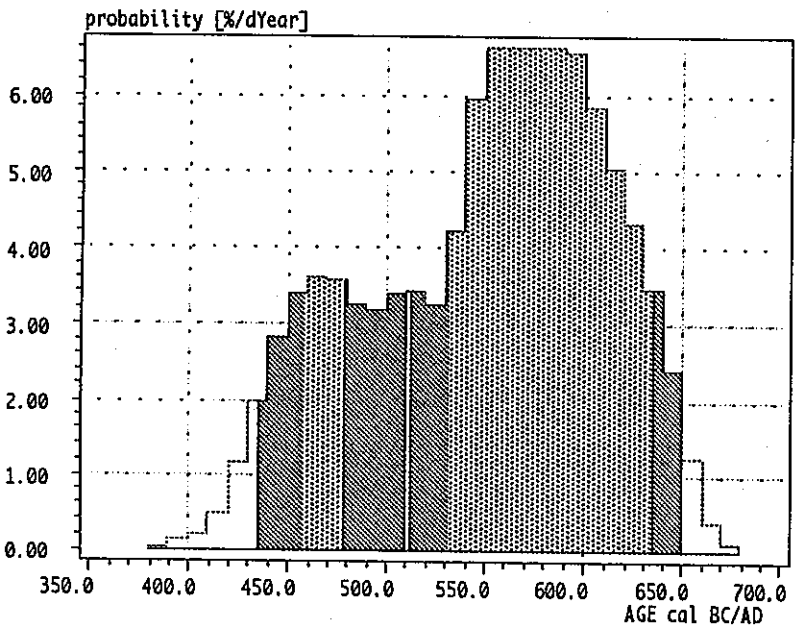
- User Sigma (50.00%): 50.38 % , limit : 4.81E-03
  538 AD , 618 AD / (1.0E+02%) : 577 ± 22 AD

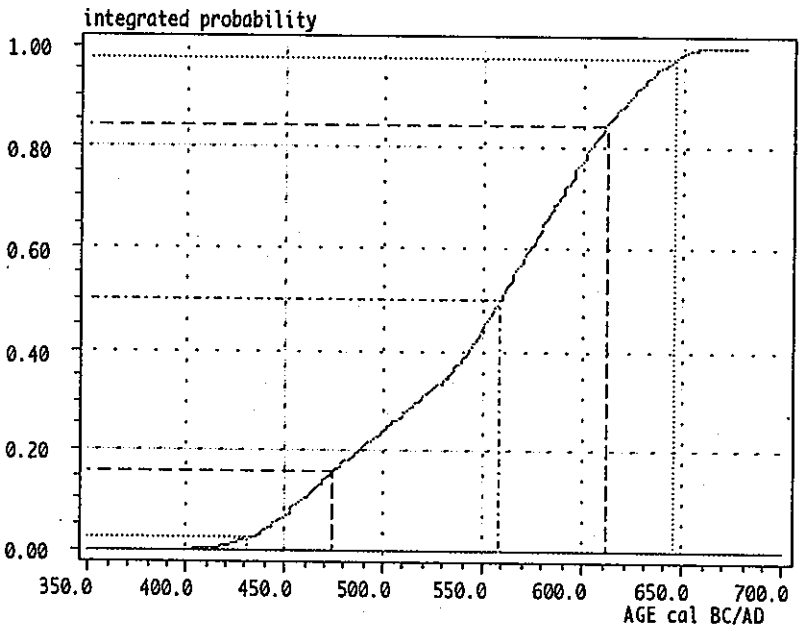
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [475 AD, 612 AD]
- Two Sigma (95.44%) : [431 AD, 647 AD]
- User Sigma (50.00%) : [503 AD, 596 AD]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [385 AD ... 679 AD]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
1750.0
1650.0
1550.0
1450.0
1350.0
1250.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
AGE cal BC/AD


probability [%/dYear]
6.00
5.00
4.00
3.00
2.00
1.00
0.00
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22721
- Label : Im-1-38
- C14-age : 5840 ± 60 BP

Results of calibration :
- Calibrated age : 4699 ± 78 BC
- Median : 4708 BC
- Intersection(s) : 4719 BC,

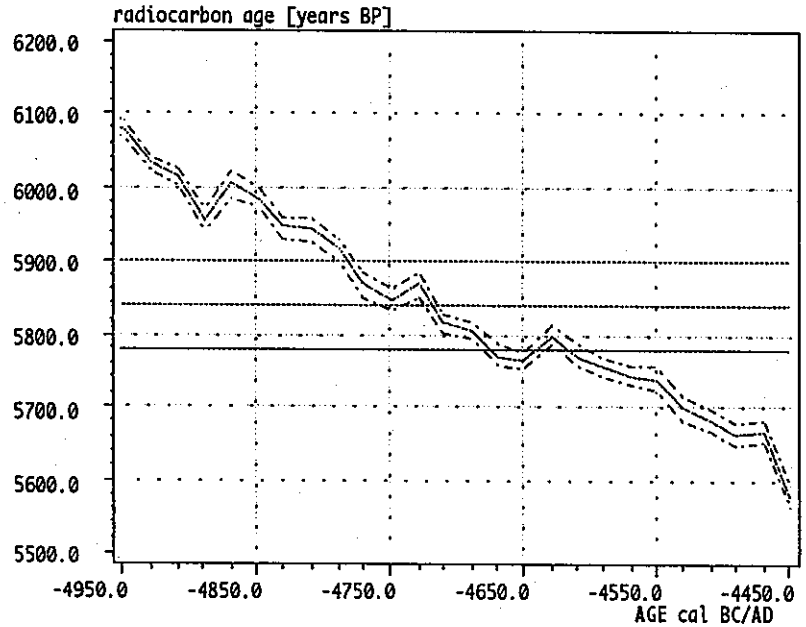
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.28 % , limit : 2.90E-03
  4787 BC , 4670 BC / (81.0%) : 4729 ± 32 BC
  4646 BC , 4611 BC / (19.0%) : 4629 ± 10 BC

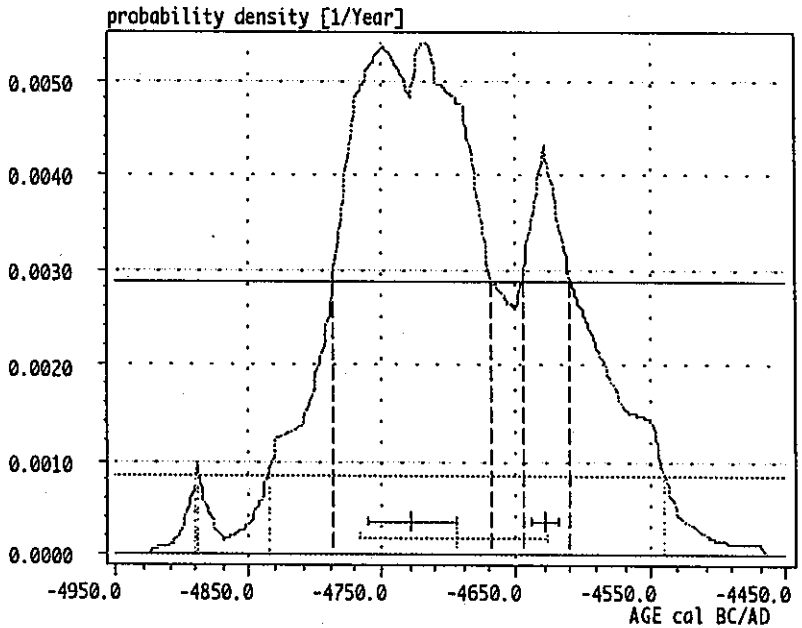
- Two Sigma (95.44%): 95.46 % , limit : 8.48E-04
  4891 BC , 4889 BC / (0.3%) : 4890 ± 1 BC
  4836 BC , 4541 BC / (99.7%) : 4697 ± 70 BC

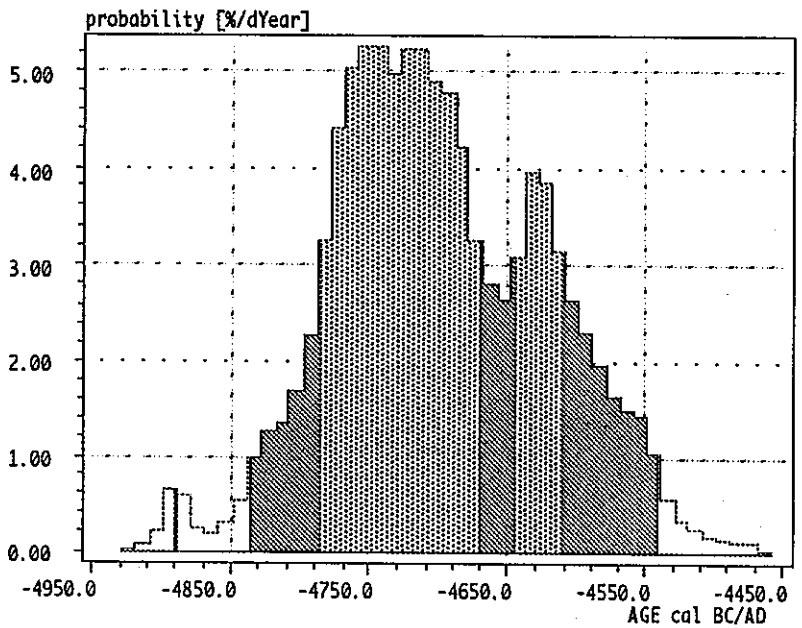
- User Sigma (50.00%): 50.27 % , limit : 4.06E-03
  4777 BC , 4682 BC / (94.2%) : 4730 ± 27 BC
  4633 BC , 4627 BC / (5.8%) : 4630 ± 2 BC

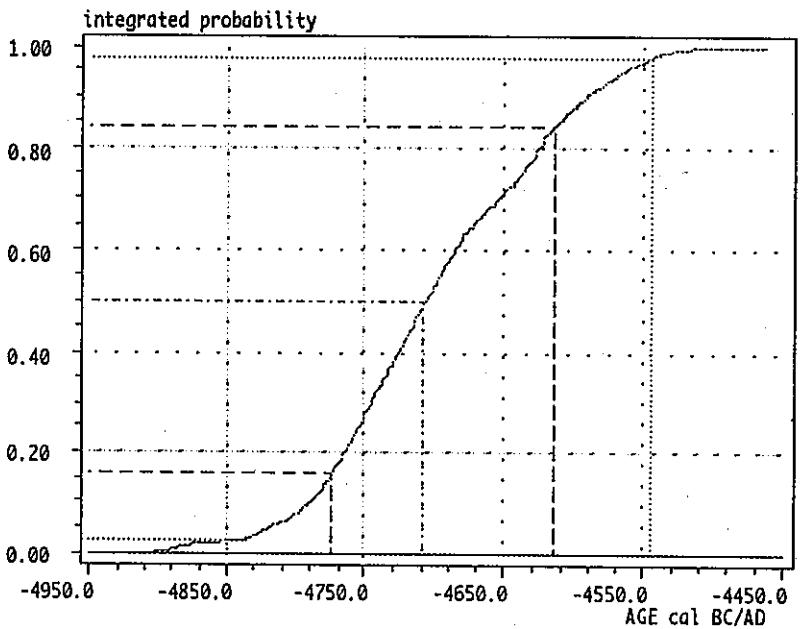
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [4774 BC, 4615 BC]
- Two Sigma (95.44%) : [4850 BC, 4546 BC]
- User Sigma (50.00%) : [4756 BC, 4639 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [4924 BC ... 4467 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
6200.0
6100.0
6000.0
5900.0
5800.0
5700.0
5600.0
5500.0
-4950.0
-4850.0
-4750.0
-4650.0
-4550.0
-4450.0
AGE cal BC/AD


probability density [1/Year]
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-4950.0
-4850.0
-4750.0
-4650.0
-4550.0
-4450.0
AGE cal BC/AD


probability [%/dYear]
5.00
4.00
3.00
2.00
1.00
0.00
-4950.0
-4850.0
-4750.0
-4650.0
-4550.0
-4450.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-4950.0
-4850.0
-4750.0
-4650.0
-4550.0
-4450.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22722
- Label : Unzen-Mutsugi-C-1
- C14-age : 3620 ± 60 BP

Results of calibration :
- Calibrated age : 1970 ± 90 BC
- Median : 1968 BC
- Intersection(s) : 1957 BC,

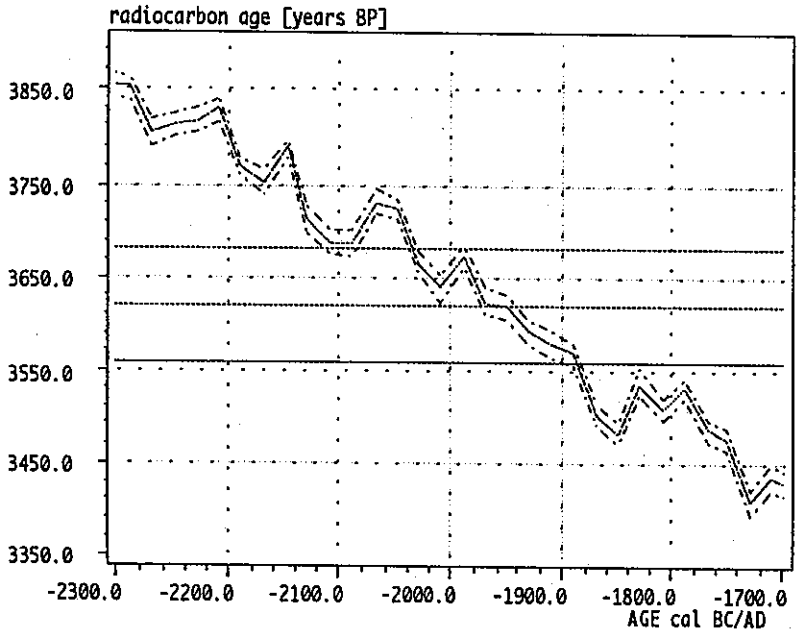
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.56 % , limit : 2.72E-03
  2102 BC , 2091 BC / (4.8%) : 2096 ± 3 BC
  2037 BC , 1885 BC / (95.2%) : 1962 ± 42 BC

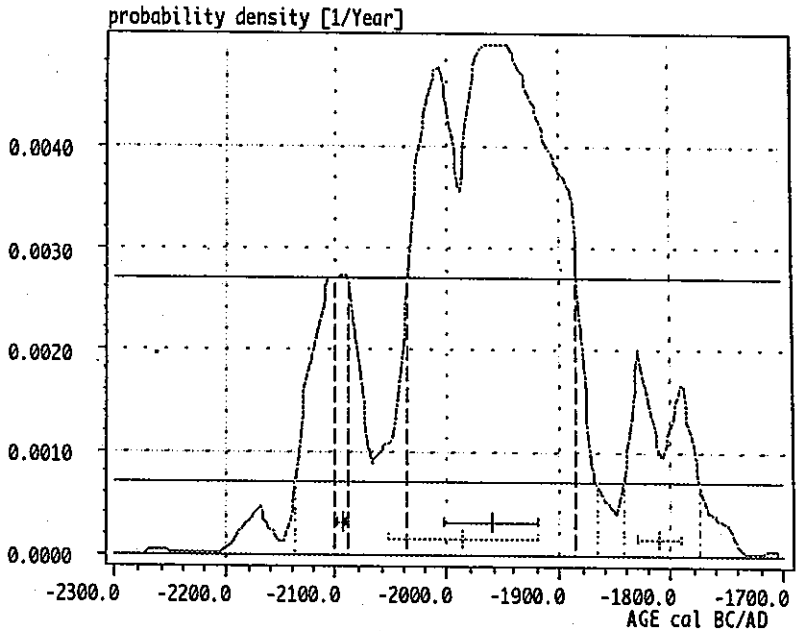
- Two Sigma (95.44%): 95.50 % , limit : 7.13E-04
  2138 BC , 1867 BC / (90.6%) : 1987 ± 68 BC
  1844 BC , 1776 BC / (9.4%) : 1811 ± 19 BC

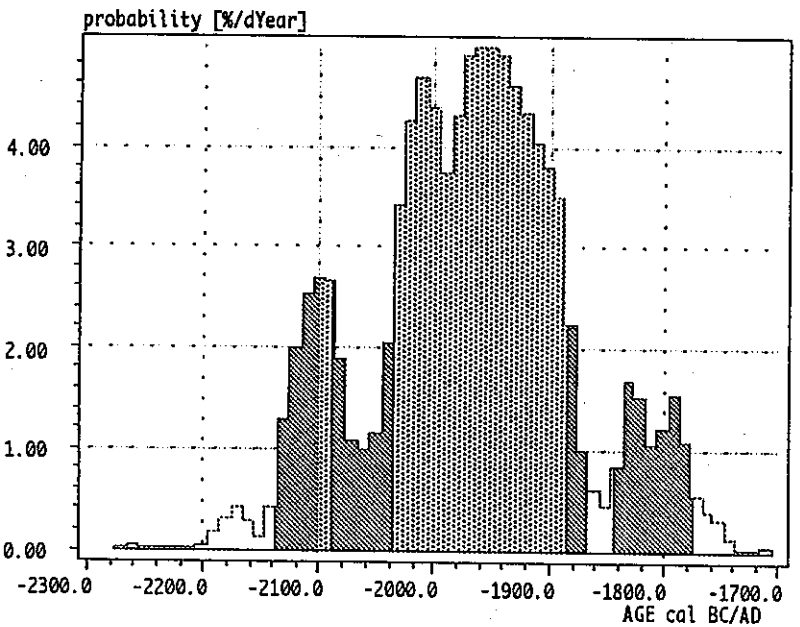
- User Sigma (50.00%): 50.24 % , limit : 3.92E-03
  2028 BC , 1996 BC / (28.3%) : 2012 ± 9 BC
  1986 BC , 1908 BC / (71.7%) : 1948 ± 22 BC

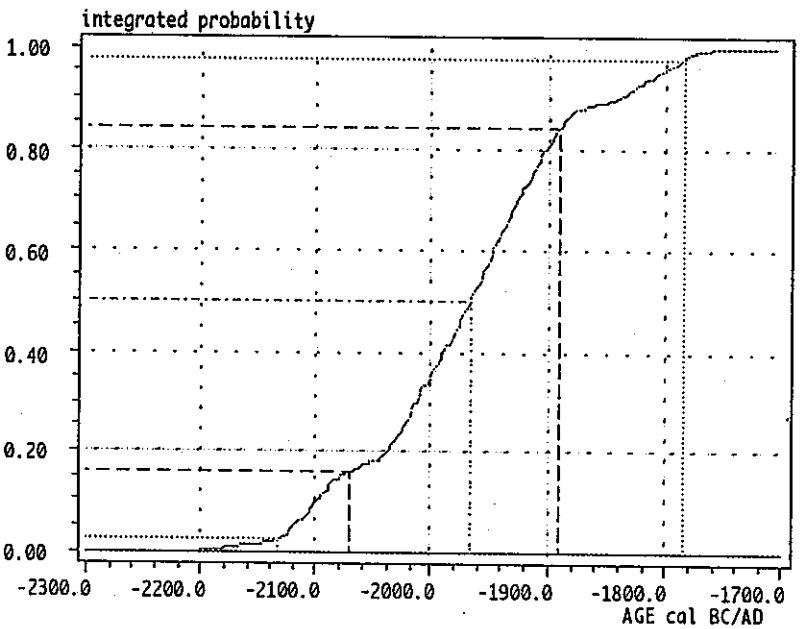
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [2073 BC, 1891 BC]
- Two Sigma (95.44%) : [2135 BC, 1786 BC]
- User Sigma (50.00%) : [2025 BC, 1915 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [2272 BC ... 1707 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
3850.0
3750.0
3650.0
3550.0
3450.0
3350.0
-2300.0
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


probability density [1/Year]
0.0040
0.0030
0.0020
0.0010
0.0000
-2300.0
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


probability [%/dYear]
4.00
3.00
2.00
1.00
0.00
-2300.0
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-2300.0
-2200.0
-2100.0
-2000.0
-1900.0
-1800.0
-1700.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZÜrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22725
- Label : 86.7-11 B-Tm(Cpf1)
- C14-age : 1210 ± 50 BP

Results of calibration :
- Calibrated age : 828 ± 66 AD
- Median : 828 AD
- Intersection(s) : 821 AD, 840 AD, 860 AD,

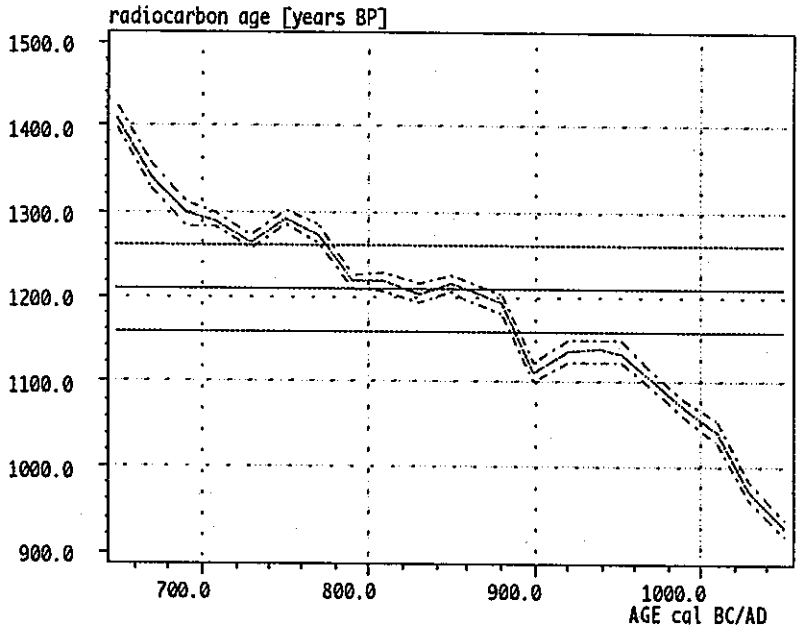
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.52 % , limit : 2.95E-03
  727 AD , 733 AD / (3.1%) : 730 ± 2 AD
  772 AD , 891 AD / (96.9%) : 832 ± 33 AD

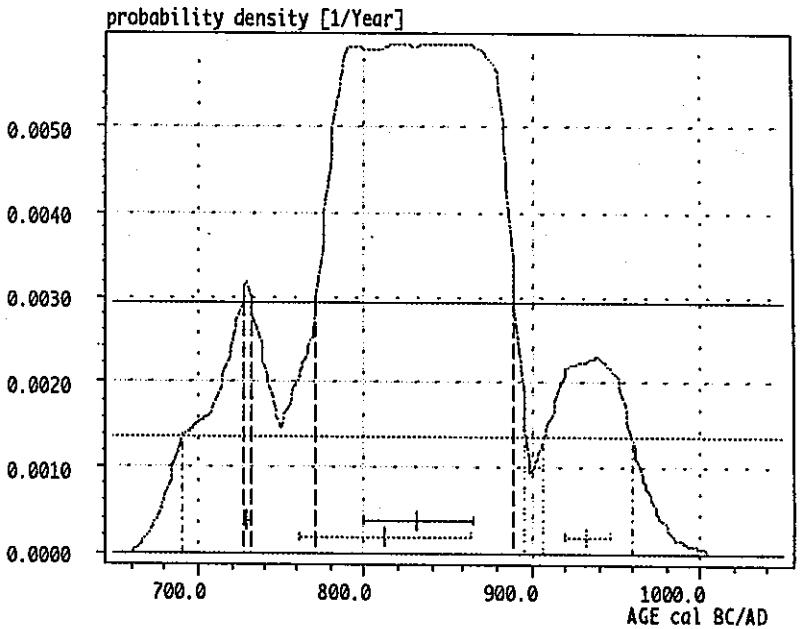
- Two Sigma (95.44%): 95.47 % , limit : 1.37E-03
  690 AD , 897 AD / (88.9%) : 813 ± 51 AD
  908 AD , 960 AD / (11.1%) : 934 ± 14 AD

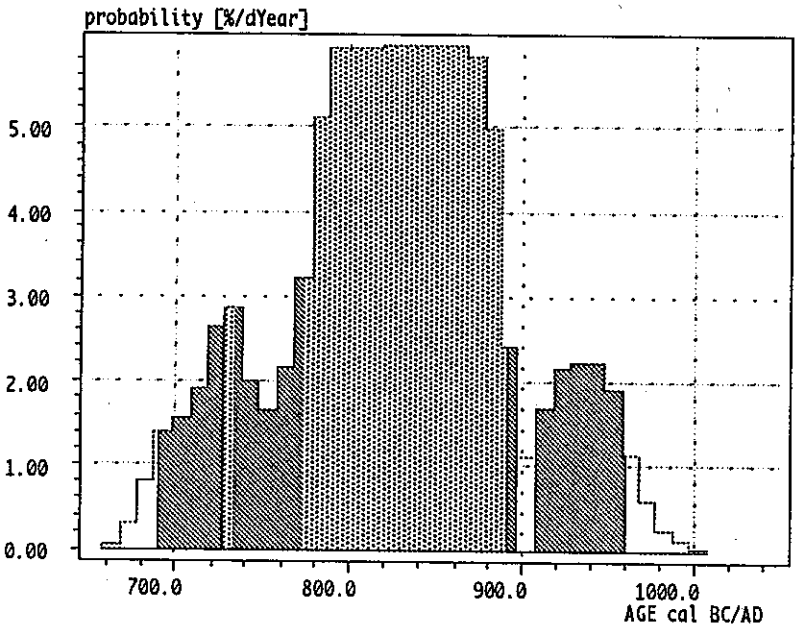
- User Sigma (50.00%): 50.56 % , limit : 5.84E-03
  789 AD , 873 AD / (1.0E+02%) : 831 ± 25 AD

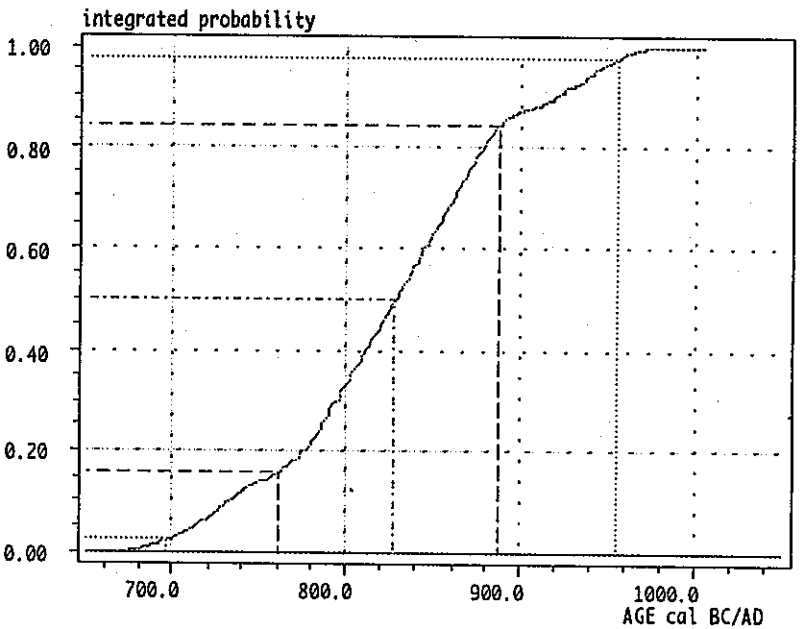
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [761 AD, 888 AD]
- Two Sigma (95.44%) : [696 AD, 956 AD]
- User Sigma (50.00%) : [786 AD, 870 AD]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [663 AD ... 1003 AD]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
700.0
800.0
900.0
1000.0
AGE cal BC/AD


probability density [1/Year]
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
700.0
800.0
900.0
1000.0
AGE cal BC/AD


probability [%/dYear]
5.00
4.00
3.00
2.00
1.00
0.00
700.0
800.0
900.0
1000.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
700.0
800.0
900.0
1000.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22727
- Label : Senya-02
- C14-age : 5580 ± 50 BP

Results of calibration :
- Calibrated age : 4414 ± 44 BC
- Median : 4413 BC
- Intersection(s) : 4451 BC, 4420 BC, 4396 BC, 4373 BC,
4369 BC,

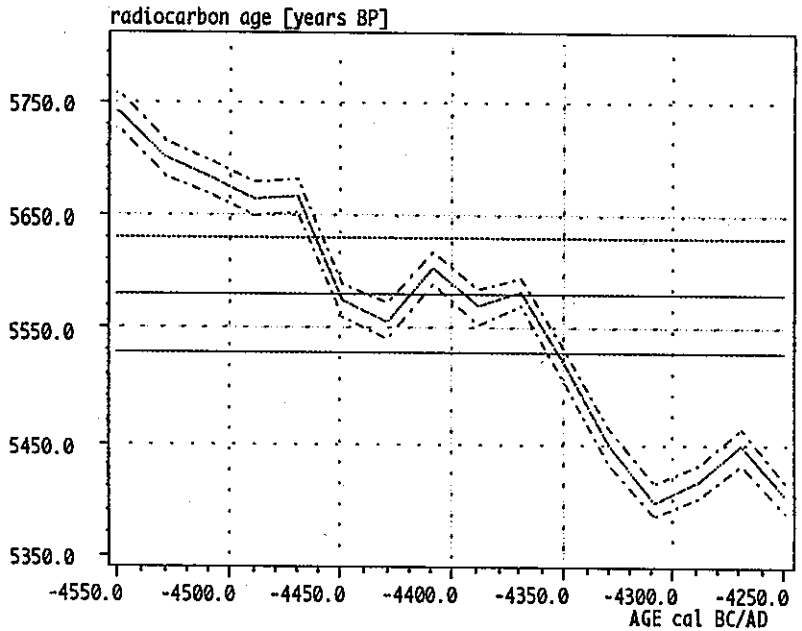
Calibrated age ranges from probability density :
- One Sigma (68.26%): 69.00 % , limit : 7.41E-03
4455 BC , 4432 BC / (26.7%) : 4444 ± 7 BC
4429 BC , 4411 BC / (21.2%) : 4420 ± 5 BC
4408 BC , 4363 BC / (52.1%) : 4385 ± 13 BC

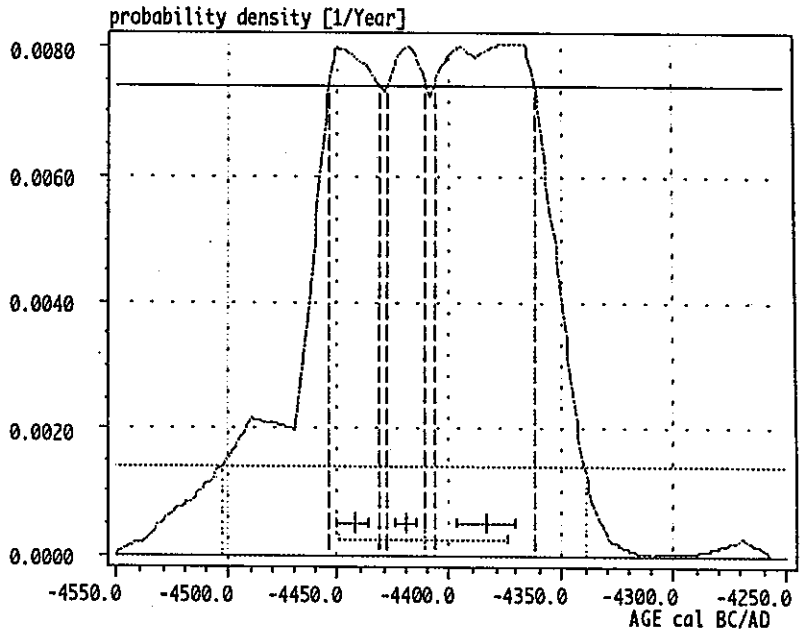
- Two Sigma (95.44%): 95.54 % , limit : 1.41E-03
4504 BC , 4340 BC / (1.0E+02%) : 4412 ± 38 BC

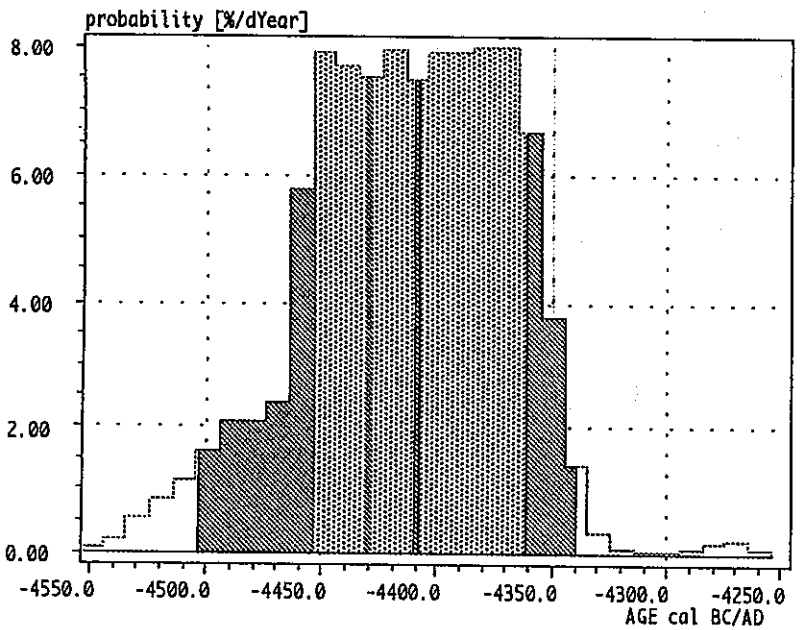
- User Sigma (50.00%): 50.02 % , limit : 7.76E-03
4454 BC , 4440 BC / (22.2%) : 4447 ± 4 BC
4426 BC , 4415 BC / (17.8%) : 4420 ± 3 BC
4404 BC , 4365 BC / (59.9%) : 4384 ± 12 BC

Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [4457 BC, 4369 BC]
- Two Sigma (95.44%) : [4510 BC, 4345 BC]
- User Sigma (50.00%) : [4445 BC, 4381 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [4550 BC ... 4260 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
5750.0
5650.0
5550.0
5450.0
5350.0
-4550.0
-4500.0
-4450.0
-4400.0
-4350.0
-4300.0
-4250.0
AGE cal BC/AD


probability density [1/Year]
0.0080
0.0060
0.0040
0.0020
0.0000
-4550.0
-4500.0
-4450.0
-4400.0
-4350.0
-4300.0
-4250.0
AGE cal BC/AD


probability [%/dYear]
8.00
6.00
4.00
2.00
0.00
-4550.0
-4500.0
-4450.0
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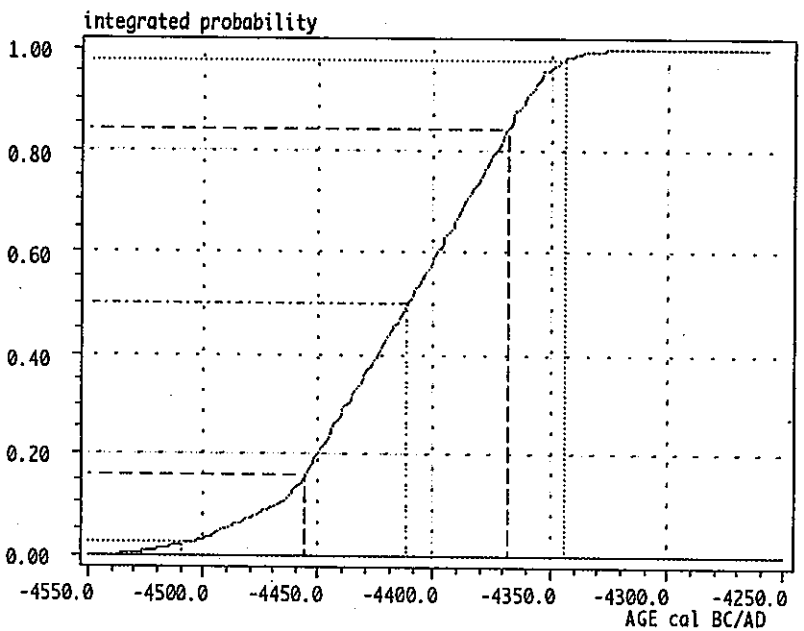
-4350.0
-4300.0
-4250.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-4550.0
-4500.0
-4450.0
-4400.0
-4350.0
-4300.0
-4250.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH Zürich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22728
- Label : Senya-03
- C14-age : 4640 ± 40 BP

Results of calibration :
- Calibrated age : 3429 ± 70 BC
- Median : 3445 BC
- Intersection(s) : 3370 BC,

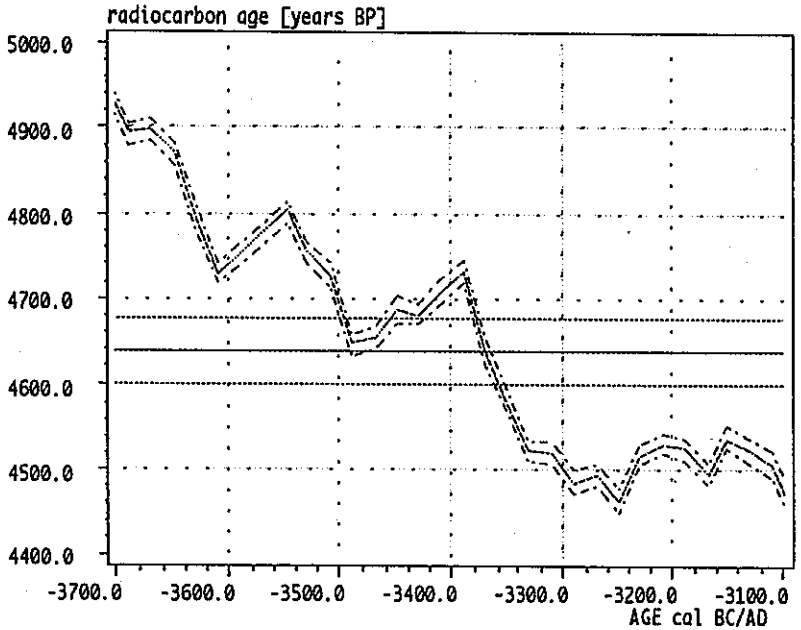
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.98 % , limit : 5.31E-03
  3500 BC , 3451 BC / (57.8%) : 3476 ± 13 BC
  3443 BC , 3428 BC / (12.5%) : 3435 ± 5 BC
  3380 BC , 3354 BC / (29.7%) : 3367 ± 7 BC

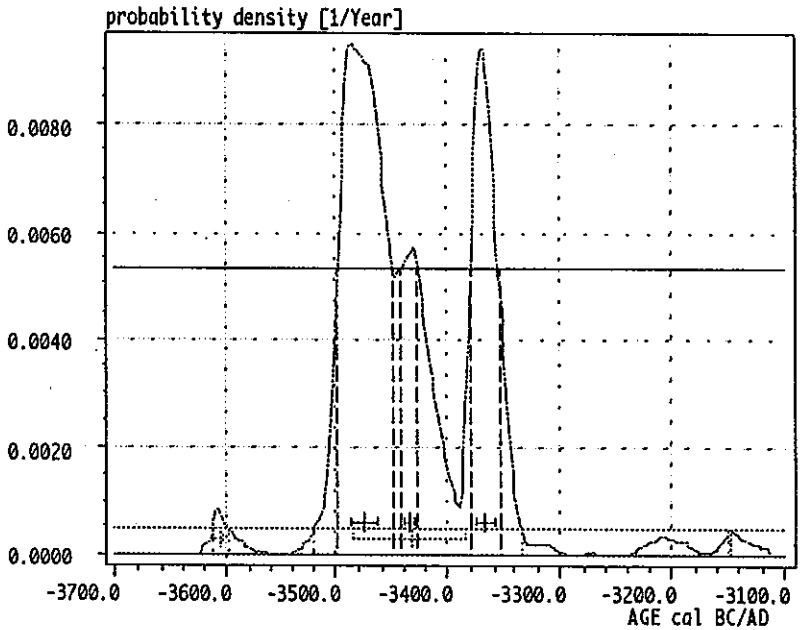
- Two Sigma (95.44%): 95.51 % , limit : 4.89E-04
  3614 BC , 3599 BC / (1.1%) : 3607 ± 4 BC
  3521 BC , 3335 BC / (98.7%) : 3434 ± 50 BC
  3151 BC , 3148 BC / (0.2%) : 3149 ± 1 BC

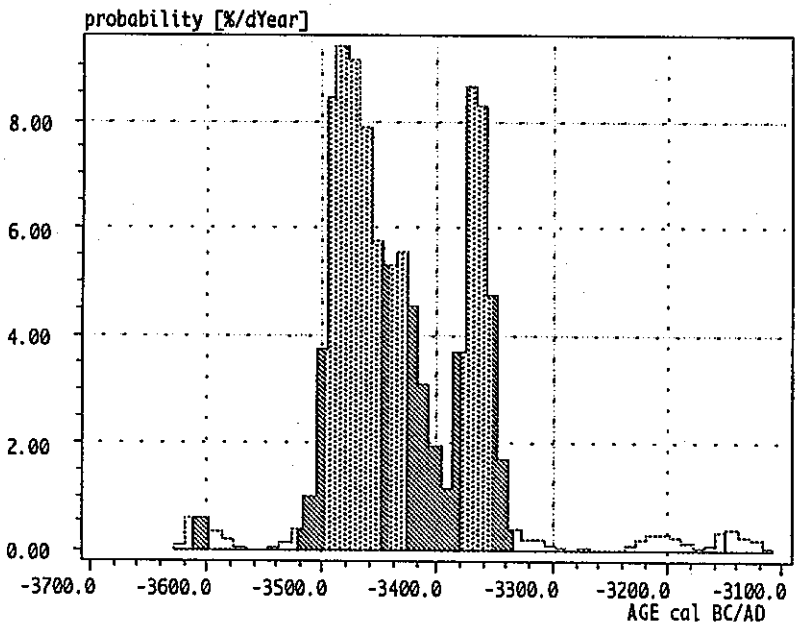
- User Sigma (50.00%): 50.41 % , limit : 6.94E-03
  3497 BC , 3459 BC / (67.8%) : 3478 ± 11 BC
  3377 BC , 3359 BC / (32.2%) : 3368 ± 5 BC

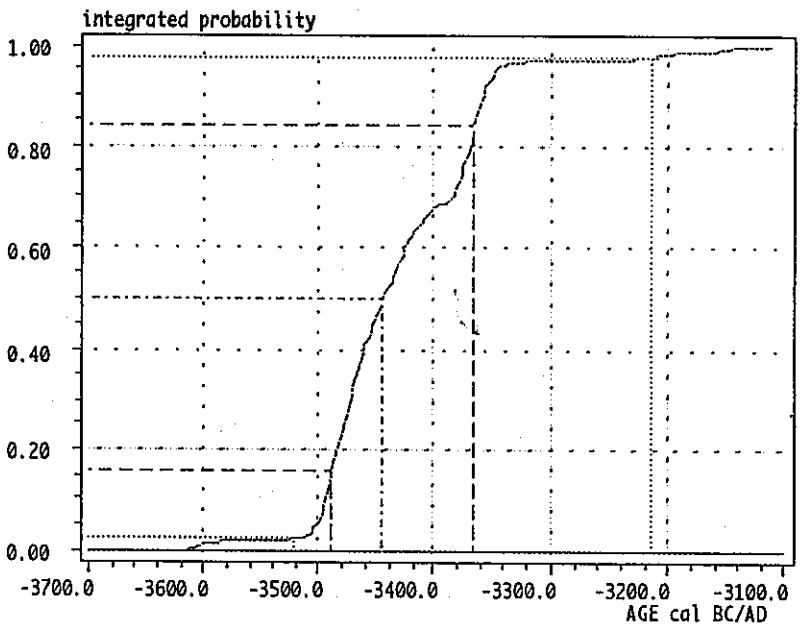
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [3489 BC, 3366 BC]
- Two Sigma (95.44%) : [3522 BC, 3215 BC]
- User Sigma (50.00%) : [3479 BC, 3376 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [3623 BC ... 3114 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
5000.0
4900.0
4800.0
4700.0
4600.0
4500.0
4400.0
-3700.0
-3600.0
-3500.0
-3400.0
-3300.0
-3200.0
-3100.0
AGE cal BC/AD


probability density [1/Year]
0.0080
0.0060
0.0040
0.0020
0.0000
-3700.0
-3600.0
-3500.0
-3400.0
-3300.0
-3200.0
-3100.0
AGE cal BC/AD


probability [%/dYear]
8.00
6.00
4.00
2.00
0.00
-3700.0
-3600.0
-3500.0
-3400.0
-3300.0
-3200.0
-3100.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-3700.0
-3600.0
-3500.0
-3400.0
-3300.0
-3200.0
-3100.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22730
- Label : Senya-06
- C14-age : 2680 ± 60 BP

Results of calibration :
- Calibrated age : 846 ± 55 BC
- Median : 842 BC
- Intersection(s) : 818 BC,

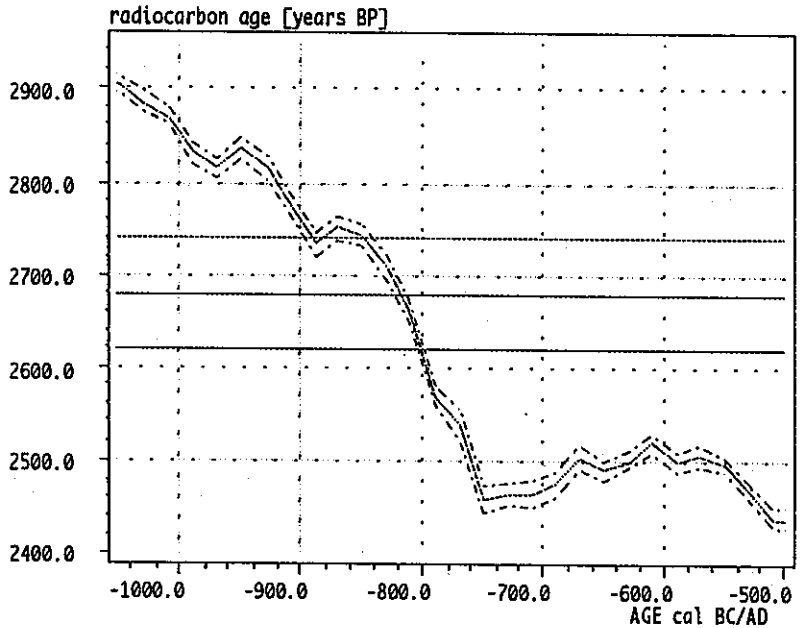
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.64 % , limit : 6.09E-03
  896 BC , 874 BC / (22.5%) : 885 ± 6 BC
  860 BC , 800 BC / (77.5%) : 828 ± 16 BC

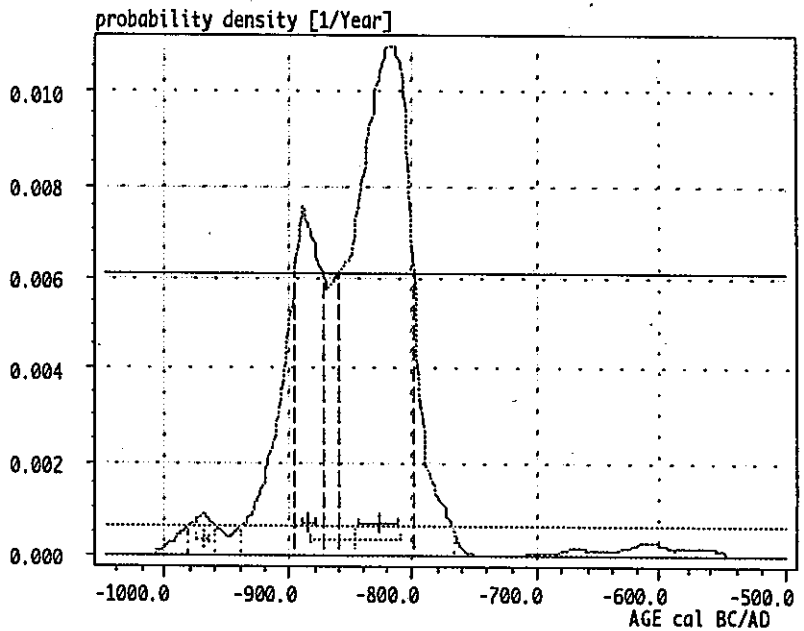
- Two Sigma (95.44%): 95.48 % , limit : 6.31E-04
  982 BC , 960 BC / (1.9%) : 971 ± 6 BC
  940 BC , 768 BC / (98.1%) : 847 ± 37 BC

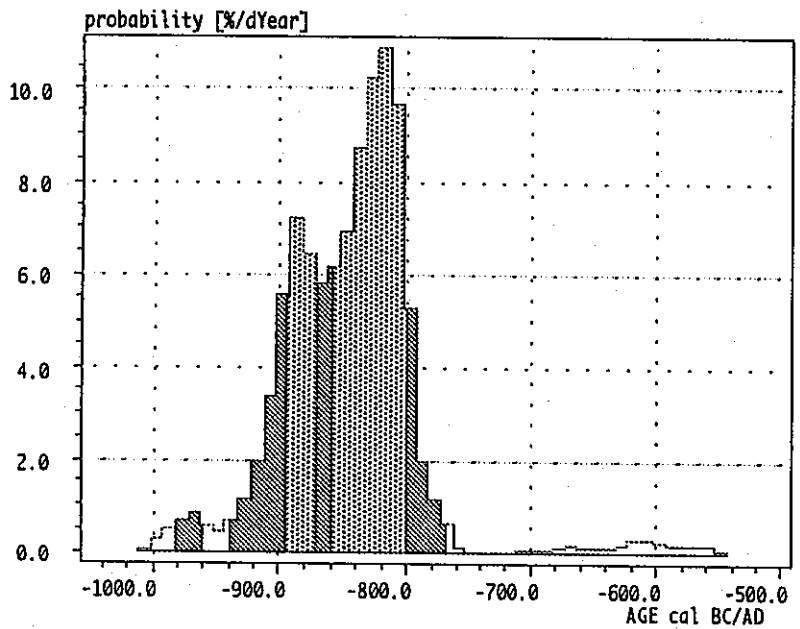
- User Sigma (50.00%): 50.60 % , limit : 7.01E-03
  892 BC , 884 BC / (12.7%) : 888 ± 3 BC
  847 BC , 801 BC / (87.3%) : 823 ± 13 BC

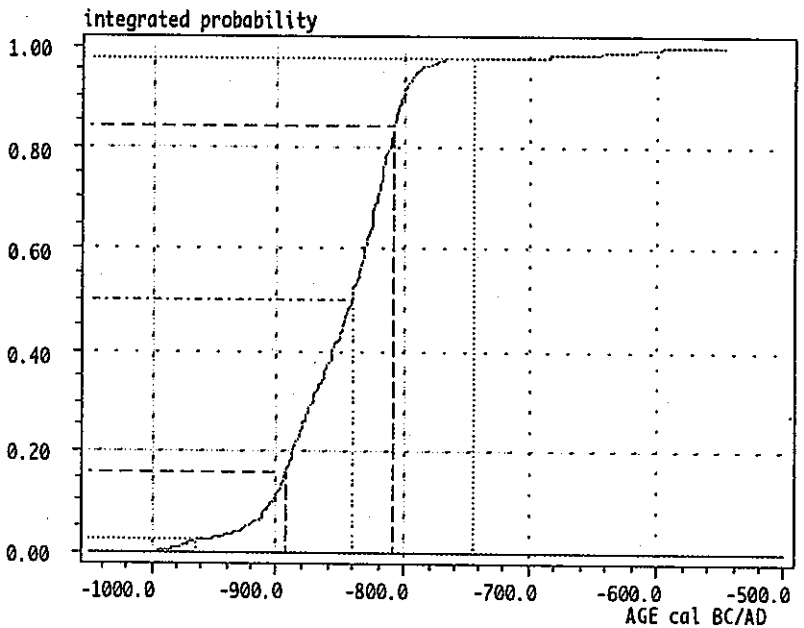
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [894 BC, 808 BC]
- Two Sigma (95.44%) : [965 BC, 746 BC]
- User Sigma (50.00%) : [881 BC, 817 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [1008 BC ... 550 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
2900.0
2800.0
2700.0
2600.0
2500.0
2400.0
-1000.0
-900.0
-800.0
-700.0
-600.0
-500.0
AGE cal BC/AD


probability density [1/Year]
0.010
0.008
0.006
0.004
0.002
0.000
-1000.0
-900.0
-800.0
-700.0
-600.0
-500.0
AGE cal BC/AD


probability [%/dYear]
10.0
8.0
6.0
4.0
2.0
0.0
-1000.0
-900.0
-800.0
-700.0
-600.0
-500.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-1000.0
-900.0
-800.0
-700.0
-600.0
-500.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZUrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. NO. : GX-22731
- Label : Boso-01
- C14-age : 4040 ± 50 BP

Results of calibration :
- Calibrated age : 2577 ± 100 BC
- Median : 2556 BC
- Intersection(s) : 2568 BC, 2519 BC, 2504 BC,

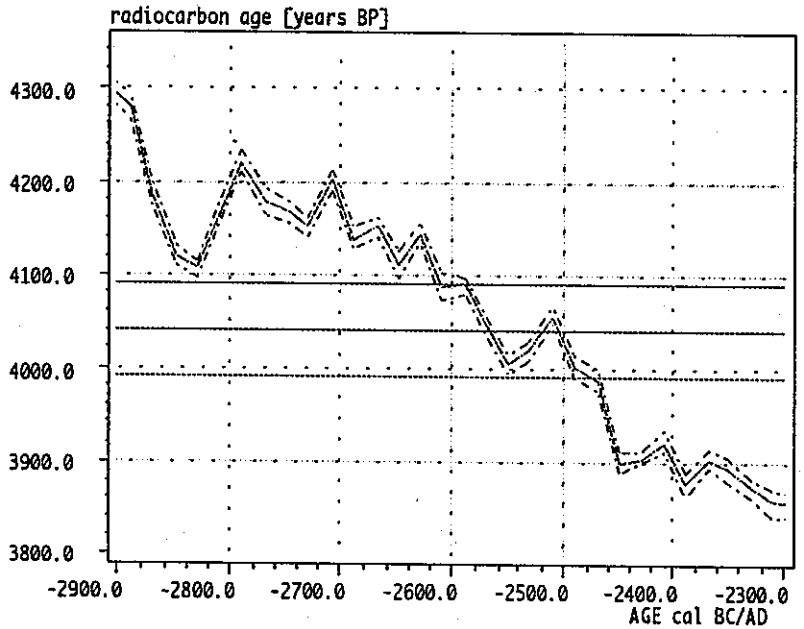
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.99 % , limit : 4.00E-03
  2609 BC , 2595 BC / (8.7%) : 2602 ± 4 BC
  2590 BC , 2476 BC / (91.3%) : 2534 ± 32 BC

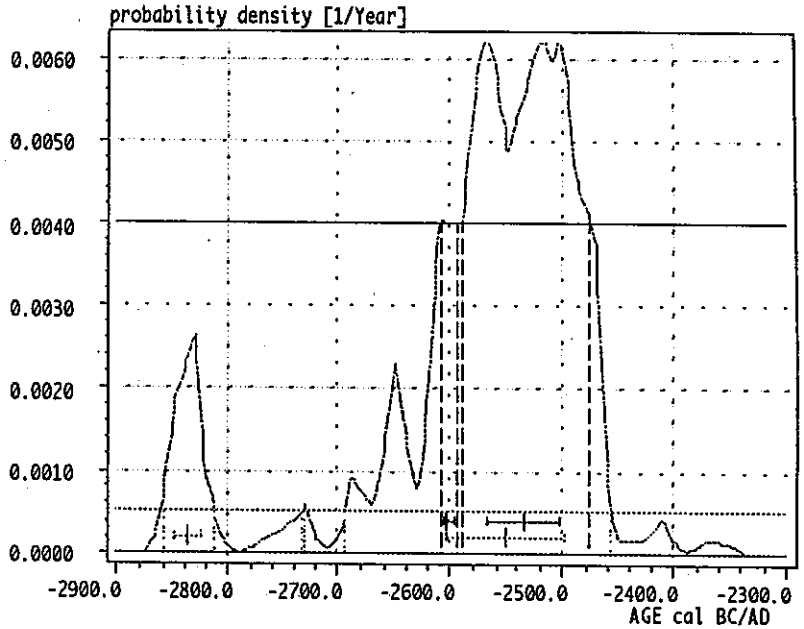
- Two Sigma (95.44%): 95.52 % , limit : 5.34E-04
  2860 BC , 2814 BC / (8.3%) : 2837 ± 11 BC
  2733 BC , 2730 BC / (0.2%) : 2731 ± 1 BC
  2695 BC , 2456 BC / (91.5%) : 2551 ± 53 BC

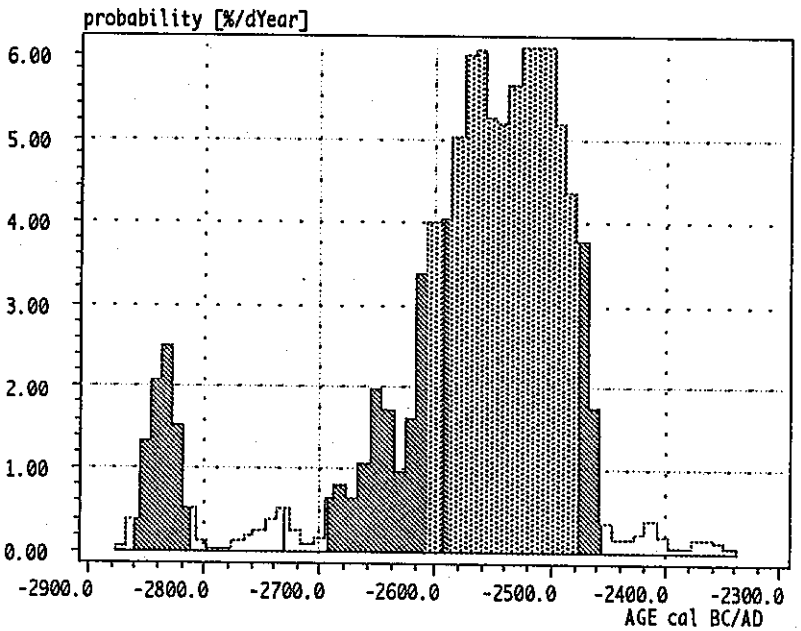
- User Sigma (50.00%): 50.89 % , limit : 5.01E-03
  2583 BC , 2551 BC / (37.0%) : 2567 ± 9 BC
  2547 BC , 2492 BC / (63.0%) : 2519 ± 16 BC

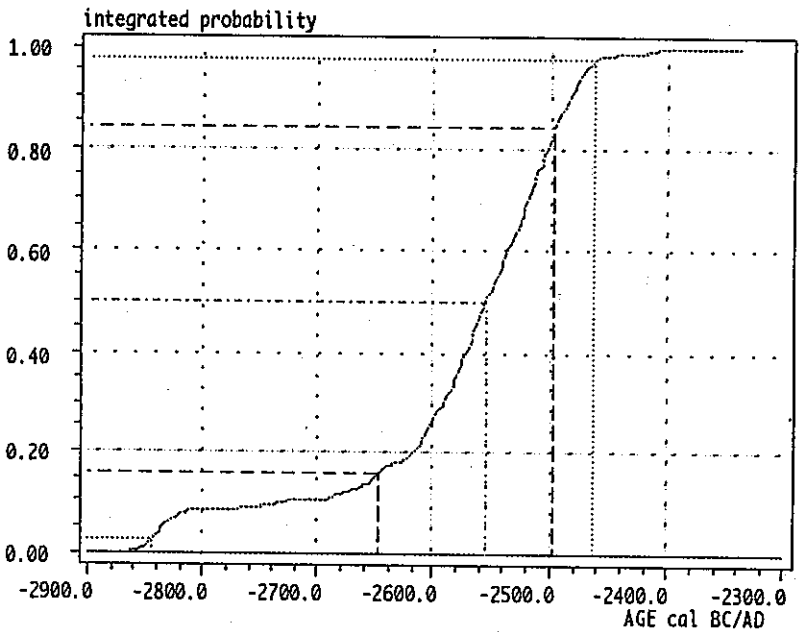
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [2648 BC, 2497 BC]
- Two Sigma (95.44%) : [2846 BC, 2462 BC]
- User Sigma (50.00%) : [2605 BC, 2512 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [2873 BC ... 2340 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 2
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
4300.0
4200.0
4100.0
4000.0
3900.0
3800.0
-2900.0
-2800.0
-2700.0
-2600.0
-2500.0
-2400.0
-2300.0
AGE cal BC/AD


probability density [1/Year]
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
-2900.0
-2800.0
-2700.0
-2600.0
-2500.0
-2400.0
-2300.0
AGE cal BC/AD


probability [%/dYear]
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-2900.0
-2800.0
-2700.0
-2600.0
-2500.0
-2400.0
-2300.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-2900.0
-2800.0
-2700.0
-2600.0
-2500.0
-2400.0
-2300.0
AGE cal BC/AD

C a l i b E T H 1.5b (1991)
Program for Calibration of Radiocarbon Dates
AMS Facility, ETH Hönggerberg
Institute for Intermediate Energy Physics
ETH ZÜrich, Switzerland

Refrerence to calibration curve :
- Filename : 93_TREE1.C14B
- Authors : Kromer and Becker;Linick,Long,Damon and Ferguson, Stuiver and Pearson
- Title : Composed High-Precision Bidecadal Calibration of Radiocarbon Time-Scale, AD 1950 - 9440 BC.
- Article : Radiocarbon 35, 1993, p: tree rings

Calibrated sample :
- Lab. N0. : GX-22732
- Label : Boso-02
- C14-age : 5920 ± 40 BP

Results of calibration :
- Calibrated age. : 4809 ± 49 BC
- Median : 4807 BC
- Intersection(s) : 4793 BC,

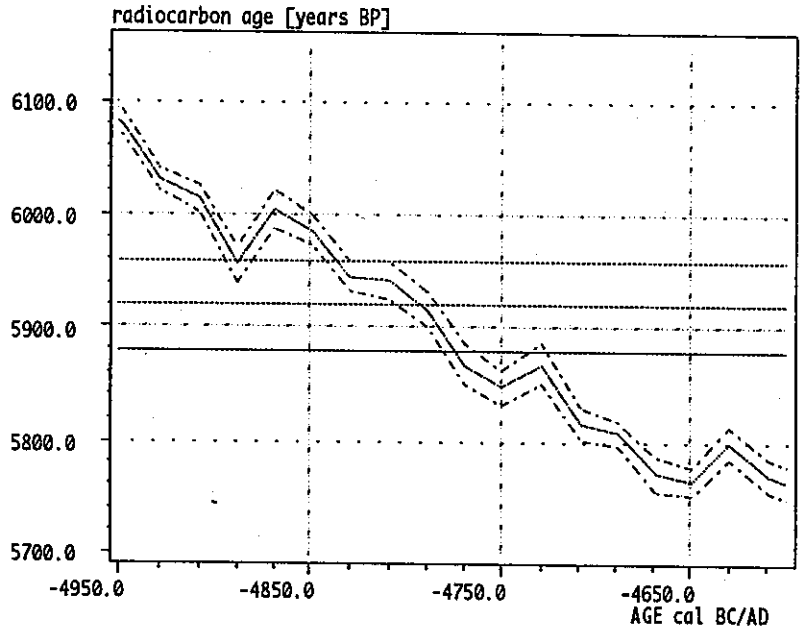
Calibrated age ranges from probability density :
- One Sigma (68.26%): 68.91 % , limit : 4.51E-03
  4896 BC , 4883 BC / (11.2%) : 4890 ± 4 BC
  4843 BC , 4768 BC / (86.2%) : 4805 ± 20 BC
  4732 BC , 4729 BC / (2.6%) : 4731 ± 1 BC

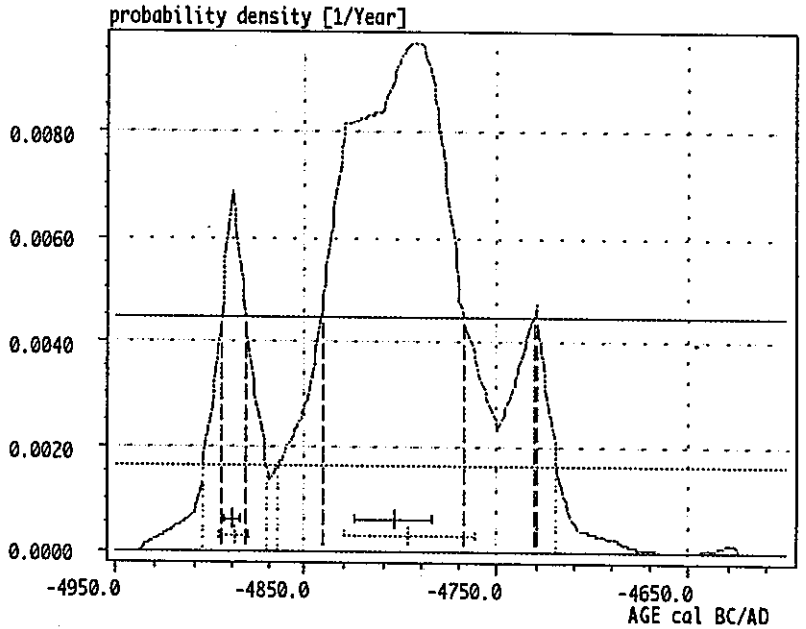
- Two Sigma (95.44%): 95.48 % , limit : 1.65E-03
  4905 BC , 4871 BC / (14.1%) : 4889 ± 8 BC
  4866 BC , 4719 BC / (85.9%) : 4797 ± 34 BC

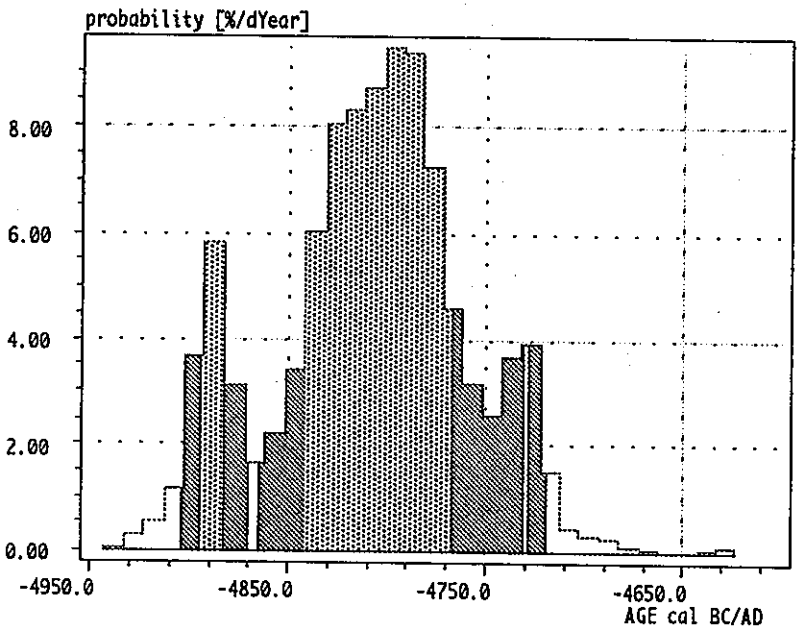
- User Sigma (50.00%): 50.07 % , limit : 7.01E-03
  4834 BC , 4777 BC / (1.0E+02%) : 4805 ± 16 BC

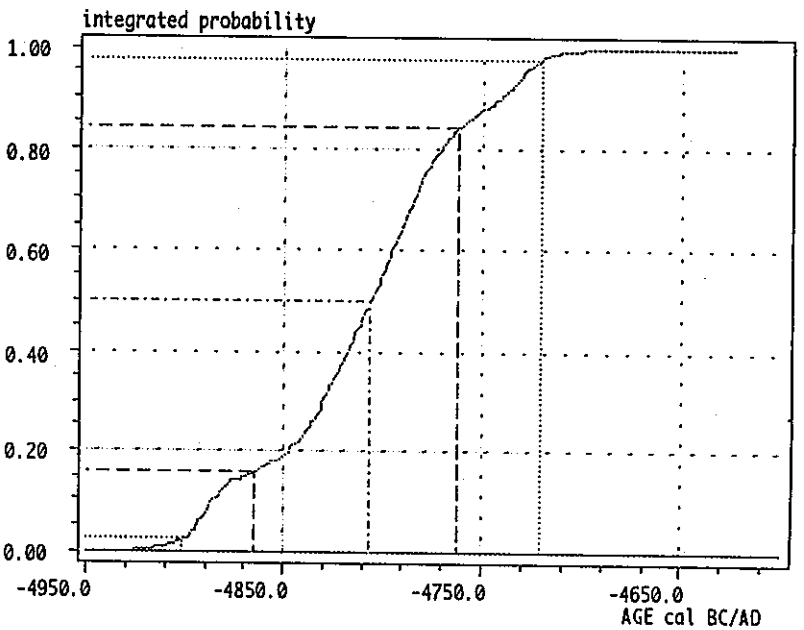
Calibrated age ranges from cumulative probability :
- One Sigma (68.26%) : [4866 BC, 4763 BC]
- Two Sigma (95.44%) : [4902 BC, 4721 BC]
- User Sigma (50.00%) : [4838 BC, 4780 BC]

CalibETH Configuration :
Standard calibration curve error : 15.0
Sigma multiplier for integration range : 3.00
Integration range : [4938 BC ... 4626 BC]
Width of bar in histogram plot : 10
Resolution of probability density : 1
Integration ranges are fixed by : autoscaling
Interpolation of calibration function : linear
Interpolation of calib. function error : linear
Short references of calibration curve : Radiocarbon 1993, Tree Rings


radiocarbon age [years BP]
6100.0
6000.0
5900.0
5800.0
5700.0
-4950.0
-4850.0
-4750.0
-4650.0
AGE cal BC/AD


probability density [1/Year]
0.0080
0.0060
0.0040
0.0020
0.0000
-4950.0
-4850.0
-4750.0
-4650.0
AGE cal BC/AD


probability [%/dYear]
8.00
6.00
4.00
2.00
0.00
-4950.0
-4850.0
-4750.0
-4650.0
AGE cal BC/AD


integrated probability
1.00
0.80
0.60
0.40
0.20
0.00
-4950.0
-4850.0
-4750.0
-4650.0
AGE cal BC/AD