

## APPENDIX 1 LISTING OF DATED SAMPLES BY DYNASTY AND MONUMENTS

## Appendix 1: Radiocarbon Dates

1<sup>st</sup> Dynasty (Early Dynastic Period)

## Tomb 3357 at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
ETH-13612	212	W face of W wall, ~5 m S of NW corner	charcoal	4222	60	-20.0
<b>C14 Age</b>		single sample	<b>BP</b>	<b>4222</b>	<b>60</b>	

## Tomb 3471 at Saqqara

lab nr.	field nr.	Collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
DRI-2970	220	~20 m S of NW corner	reed	4346	36	-22.7
ETH-13620	220	~20 m S of NW corner	reed	4460	52	-18.2
<b>C14 Mean age (weighted)</b>		all data	<b>BP</b>	<b>4383</b>	<b>30</b>	<b>53</b>
		Chi square	3.2490		probability	19.70 %

## Tomb 3504 at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
ETH-13626	226	9th brick course, N & W walls	reed&twig	4236	57	-26.0
DRI-2968	227	9th brick course, N & W walls	reed&twig	4486	89	-23.2
ETH-13627	227	same sample as DRI-2968	reed&twig	4469	52	-21.6
ETH-13629	229	9th brick course, N & W walls	reed&twig	4311	53	-26.3
ETH-13632	232	9th brick course, N & W walls	reed&twig	4319	56	-16.8
<b>C14 Mean age (weighted)</b>		all data	<b>BP</b>	<b>4352</b>	<b>26</b>	<b>46</b>
		Chi square	3.1041		probability	21.18 %

## Tomb 3035 at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
ETH-13605	205	interior of W wall, mid N - S length	charcoal	4242	56	-23.1
ETH-13610	210	interior of E wall, mid N - S length	charcoal	4142	80	-23.4
ETH-13608	208	W face of W wall, between brick rows	reed	4236	56	-16.1
<b>C14 Mean age (weighted)</b>		all data	<b>BP</b>	<b>4210</b>	<b>33</b>	<b>32</b>
		Chi square	0.9132		probability	63.34 %

## Tomb 3505 at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
SMU-1358	ARCE 71	N - NE side of pit, from mud brick	charcoal	4482	37	-26.6
<b>C14 Age</b>		single sample	<b>BP</b>	<b>4482</b>	<b>37</b>	

### 3<sup>rd</sup> Dynasty (Old Kingdom)

#### Step Pyramid of Djoser at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-0323	ARCE 39	E-face, from mortar in core, ~1 m above logs	charcoal	4510	100	-27.3 +
ETH-13660	260	~3.5 m above ground, ~20 m N of SE corner	charcoal	4289	48	-21.5
ETH-13652	252	~3 m above 4th tier, ~5 m E of NW corner	reeds	4077	54	-20.8
ETH-13653	253	same location as 252	straw	4087	51	-20.0
ETH-13654	254	~1 m below location of 252	straw&reed	4224	57	-14.8
ETH-13658	258	same location as 252, in mud mortar	straw	4085	57	-13.7
ETH-13659	259	NW corner, 4th tier, in mud mortar	straw	4141	60	-14.9
SMU-1398	ARCE 38A	E face, 1st log from S, chips from top of log	wood	4206	52	-24.8
ETH-13669	269	same log as ARCE 38A, center rings	wood	4276	54	-22.2
ETH-13672	272	3rd log from S, outer rings	wood	4215	56	-18.8
ETH-13678	278	4th log from S, outer rings	wood	4190	51	-25.5

<b>C14 Mean age (weighted)</b>	all data	<b>BP</b>	<b>4191</b>	<b>17</b>	<b>29</b>
	Chi square	3.0192		probability	22.10 %
<b>C14 Mean age (weighted)</b>	without +	<b>BP</b>	<b>4182</b>	<b>17</b>	<b>25</b>
	Chi square	2.1934		probability	33.40 %

#### Temple Complex associated with Step Pyramid

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-0451	ARCE 67B	earlier chapel on N side of entrance colonade	charcoal	4170	90	-24.8
ETH-0450	ARCE 67A	same mud brick as ARCE 67B	reed	4530	123	-21.2 +
SMU-1397	ARCE 40A	W wall of mortuary temple, E side	wood	4252	137	-26.3
SMU-1350	ARCE 68B	Mort. temple, E-most room, ash layer in floor	charcoal	3950	35	-25.9
ETH-0231	ARCE 68B	same sample as SMU-1350	charcoal	4210	105	-25.1
ETH-0448	ARCE 68B	same sample as SMU-1350	charcoal	4110	100	-26.8
ETH-0449	ARCE 68B	same sample as SMU-1350	charcoal	4055	95	-24.6
SMU-1503	ARCE 69	same location as ARCE 68B	wood	3744	362	-27.3 *
SMU-1382	ARCE 70	N wall of burial shaft in S tomb, NE corner	wood	4289	47	-25.2

<b>C14 Mean age (weighted)</b>	all data	<b>BP</b>	<b>4106</b>	<b>23</b>	<b>59</b>
	Chi square	6.3527		probability	4.17 %
<b>C14 Mean age (weighted)</b>	without + & *	<b>BP</b>	<b>4092</b>	<b>24</b>	<b>60</b>
	Chi square	6.2652		probability	4.36 %

#### Pyramid of Sekhemkhet at Saqqara

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-0325	ARCE 45A	N enclosure wall, N of entrance, clay mortar	charcoal	4545	80	-25.0 +
ETH-13750	350	step above entrance trench, embedded fabric	threads	4209	61	-26.8
ETH-13751	351	extracted with sample 350	charcoal	4135	59	-26.9
SMU-1388	ARCE 46B	3rd tier of masonry, from N, mud brick	grass&straw	4293	192	-23.1

<b>C14 Mean age (weighted)</b>	all data	<b>BP</b>	<b>4254</b>	<b>37</b>	<b>90</b>
	Chi square	5.9616		probability	5.08 %
<b>C14 Mean age (weighted)</b>	without +	<b>BP</b>	<b>4176</b>	<b>41</b>	<b>31</b>
	Chi square	0.5734		probability	75.07 %

**4<sup>th</sup> Dynasty (Old Kingdom)****Tomb 17, reign of Snefru at Meydum**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
SMU-1732	ARCE 66A	W face, ~10 m N of SW corner, mud brick	straw	3978	359	-23.9	
ETH-13892	492	S face, 10 m E of SW corner, mud brick	grass	3925	55	-24.0	
ETH-13893	493	W face, ~50 m N of SW corner, mud brick	grass	4195	61	-13.5 +	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4045</b>	<b>41</b>	<b>94</b>
			Chi square	5.4209	probability	6.65 %	
<b>C14 Mean age (weighted)</b>			without +	<b>BP</b>	<b>3926</b>	<b>54</b>	<b>8</b>
			Chi square	0.0213	probability	98.94 %	

**Bent Pyramid of Snefru at Dhashur**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
ETH-13952	552	about 10th tier, collected in situ from seam	charcoal	4121	57	-27.5	
ETH-13955	555	about same location as 552	charcoal	4146	58	-25.0	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4133</b>	<b>41</b>	<b>12</b>
			Chi square	0.0945	probability	95.38 %	

**Pyramid of Snefru at Meydum**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
SMU-1412	ARCE 65	burial chamber, log in E wall, outer rings	wood	4807	187	-21.0	
SMU-1392	ARCE 66	E side of shaft to burial chamber, outer rings	wood	4103	148	-19.4	
ETH-13887	487	burial chamber, log nr. NE corner, outer rings	wood	4112	53	-26.9	
ETH-13888	488	from same log as 487	wood	4149	53	-24.4	
ETH-13889	489	from same log as 487	wood	4156	56	-18.6	
ETH-13890	490	from same log as 487	wood	4050	48	-24.6	
ETH-13891	491	burial chamber, strut near ceiling, outer layer	wood	4102	49	-22.4	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4110</b>	<b>23</b>	<b>17</b>
			Chi square	0.5618	probability	75.51 %	

**Royal Production Center at Giza**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
SMU-2240	C-3	area A1, ash midden in East wall, above floor	charcoal	4282	267	-26.5	
SMU-2275	C-4	area A1, feat. 15, compacted mud above floor	charcoal	4232	49	-25.8	
ETH-5331	C-5	area A5, level 14, site of flexed burial	charcoal	4080	55	-23.7	
SMU-2274	C-15	area A5, East wall, below brick veneer of room	charcoal	3982	71	-27.6	
ETH-5330	C-16	area A6, feature 16, charred disk in floor	charcoal	4065	55	-28.1	
ETH-13958	A7a-5	from basal grey pit in unit 11	charcoal	4205	45	-25.1	
ETH-13959	A7a-7	from unit 33 above grey pit, acacia charcoal	charcoal	4005	50	-27.6	
ETH-13960	A7a-9	from unit 6, 9 cm above contact to pit	charcoal	3985	45	-27.5	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4090</b>	<b>19</b>	<b>37</b>
			Chi square	3.7620	probability	15.24 %	

**Pyramid of Khufu at Giza**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil		
ETH-0302	ARCE 1	2nd course, N face, ~26 m W of NE corner	charcoal	4260	80	-24.3		
ETH-0303	ARCE 2	2nd course, N face, ~44 m E of NW corner	charcoal	4300	90	-25.4		
ETH-0304	ARCE 3	2nd course, N face, ~60 m E of NW corner	charcoal	4245	85	-24.2		
ETH-0305	ARCE 4	2nd course, N face, ~60 m E of NW corner	charcoal	4355	90	-23.5		
ETH-4226	ARCE 4	same sample as ETH-0305	charcoal	4195	105	-28.5		
ETH-0306	ARCE 5	2nd course, N face, ~20 m E of NW corner	charcoal	4320	85	-25.0		
ETH-0226	ARCE 13	5th course, near SE corner	charcoal	4350	125	-24.8		
SMU-1418	ARCE 13	same sample as ETH-0226	charcoal	4258	273	-26.7		
ETH-4229	ARCE 13	same sample as ETH-0226	charcoal	4195	105	-26.0		
SMU-1417	ARCE 14	5th course, S face, ~5 blocks E of SW corner	charcoal	4359	241	-25.8		
ETH-0227	ARCE 14	same sample as SMU-1417	charcoal	4360	125	-26.6		
ETH-13762	362	9th course, ~210 m S of NW corner	charcoal	3927	58	-24.5		
ETH-13754	354	10th course, near NW corner	charcoal	3980	57	-22.3		
ETH-13756	356	10th course, ~30 m S of NW corner	charcoal	4143	61	-23.9		
ETH-13757	357	10th course, ~35 m S of NW corner	charcoal	4225	79	-26.5		
ETH-13761	361	10th course, ~200 m S of NW corner	charcoal	3928	54	-30.8		
ETH-13763	363	10th course, above location of ETH-13762 on 9th	charcoal	3937	61	-29.2		
ETH-0307	ARCE 6	between 25th & 26th course, ~4 m S of NW corner	charcoal	4440	90	-21.4		
ETH-4227	ARCE 6	same sample as ETH-0307	charcoal	4215	105	-24.8		
ETH-13770	370	49th course, ~4 m S of NE corner	charcoal	4087	53	-26.3		
ETH-13771	371	same location as ETH-13770, #370	charcoal	4187	60	-25.0		
ETH-13775	375	same location as ETH-13770, #370	charcoal	4190	52	-28.7		
ETH-13777	377	51st course, ~3 m S of NE corner	charcoal	4313	57	-23.0		
ETH-13778	378	52nd course, near NE corner	charcoal	4156	58	-24.6		
ETH-13779	379	52nd course, near NE corner	charcoal	4062	61	-22.7		
ETH-0308	ARCE 7	65th course, near NW corner	charcoal	4300	85	-24.1		
ETH-4228	ARCE 7	same sample as ETH-0308	charcoal	4390	110	-27.9		
ETH-13783	383	76th course, 1.5 m N of SE corner	charcoal	4237	62	-19.6		
ETH-13784	384	same context as sample 383	charcoal	4068	54	-24.8		
ETH-13785	385	same context as sample 383	charcoal	4083	53	-27.7		
ETH-13782	382	77th course, ~2 m N of SE corner	charcoal	3984	55	-25.2		
ETH-13787	387	81st course, 1 block N of SE corner	charcoal	4197	49	-26.4		
ETH-13791	391	86th course, 1 m N of SE corner, surface	charcoal	3810	60	-22.2 *		
ETH-0309	ARCE 8	108th course, near NW corner	charcoal	4420	100	-23.9		
ETH-13800	400	141st course, on SW corner	charcoal	4195	55	-31.1		
ETH-13799	399	143rd course, ~3 m E of SW corner	charcoal	4128	58	-26.5		
ETH-13801	401	same context as sample 399	charcoal	4189	60	-21.2		
ETH-13802	402	145th course, ~3 m E of SW corner	charcoal	4174	61	-27.3		
ETH-13803	403	same context as sample 402	charcoal	4062	60	-25.6		
ETH-13804	404	same context as sample 402	charcoal	4254	59	-27.1		
ETH-13805	405	146th course, 1 m E of SW corner	charcoal	4267	57	-25.5		
ETH-0311	ARCE 10A	198th course, near SW corner (preserved top)	charcoal	4395	85	-24.5		
ETH-0312	ARCE 10B	198th course, near SW corner (preserved top)	charcoal	5020	130	-22.6 +		
ETH-0334	ARCE 10B	same context as ETH-0312	charcoal	4440	320	-19.7		
ETH-0313	ARCE 11	top of pyramid, on S side	reed	4330	125	-24.7		
ETH-13900	500	top of pyramid, on E side	charcoal	4068	60	-21.4		
				mean	1 sigma	variance		
<b>C14 Mean age (weighted)</b>				<b>without +</b>	<b>BP</b>	<b>4147</b>	<b>10</b>	<b>21</b>
				Chi square	4.2246	probability	12.10 %	
<b>C14 Mean age (weighted)</b>				<b>without + &amp; *</b>	<b>BP</b>	<b>4157</b>	<b>10</b>	<b>20</b>
				Chi square	3.5683	probability	16.79 %	

**Pyramid Temple of Djedefre at Abu Roash**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil		
DRI-2969	345	N half of temple, ~14 m N of boat pit	straw	4258	89	-22.5		
ETH-13745	345	same sample as DRI-2969	straw	4156	50	-21.7		
ETH-13745a	345	same sample as DRI-2969	straw	4047	58	-21.5		
ETH-13746	346	1 m E of sample 345	straw	4118	63	-21.6		
ETH-13747	347	N part of outermost E wall	straw	4333	53	-22.8		
SMU 1357	ARCE 35A	mudbrick in wall on E side of SE part of temple	straw	4126	147	-24.3		
SMU 1356	ARCE 35B	same mudbrick as ARCE 35A	straw	3915	142	-24.3		
				mean	1 sigma	variance		
<b>C14 Mean age (weighted)</b>				<b>all data</b>	<b>BP</b>	<b>4169</b>	<b>26</b>	<b>46</b>
				Chi square	3.1679	probability	20.52 %	

**Pyramid of Djedefre at Abu Roash**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil		
ETH-13742	342	E face of pyramid, 3 courses from ground	charcoal	4073	56	-27.7		
ETH-13743	343	same location as 342	charcoal	4099	58	-25.2		
ETH-13744	344	same location as 342	charcoal	4187	61	-26.5		
ETH-0317	ARCE 30	W face, s part, 3 or 4 m above ground level	charcoal	4385	85	-25.0		
ETH-4235	ARCE 30	same sample as ETH-0317	charcoal	4330	115	-24.1		
ETH-0321	ARCE 34	W face, ~ 30 m N of SW corner, nr. top of core	charcoal	4410	95	-23.7		
ETH-0319	ARCE 32	various contexts on outside of core masonry	charcoal	4495	100	-22.6		
ETH-0318	ARCE 31	core masonry, N part, 4 to 5 m E of entrance trench	charcoal	4230	85	-25.0		
ETH-0320	ARCE 33	core masonry, ~ 7 m W of E face	charcoal	4360	85	-24.6		
ETH-13739	339	top of pyramid ~11 m from E face, center N to S	charcoal	4230	60	-21.5		
ETH-13741	341	~10 m E of entrance trench, ~40 m S of N face	charcoal	4246	63	-26.1		
				mean	1 sigma	variance		
<b>C14 Mean age (weighted)</b>				<b>all data</b>	<b>BP</b>	<b>4229</b>	<b>22</b>	<b>38</b>
				Chi square	3.0551	probability		21.71 %

**Pyramid of Khafre at Giza**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil		
ETH-0316	ARCE 19	1st or 2nd course, near SW corner	charcoal	4500	90	-23.9		
ETH-13822	422	betw bedrock & 1st course, ~13 m E of SW corner	charcoal	4170	59	-25.8		
SMU-1470	ARCE 17	2nd course, ~20 blocks W of SE corner	charcoal	4511	258	-25.0 +		
ETH-4663	ARCE 17	same sample as SMU-1470	charcoal	4330	95	-32.0		
ETH 0453	ARCE 18A	same general location as ARCE 17	charcoal	4330	90	-24.8		
SMU-1369	ARCE 18B	~30 cm above location of ARCE 17	charcoal	4144	140	-26.5		
SMU-1302	ARCE 15B	3rd course N face, ~ 15 m from passage axis	charcoal	4165	81	-27.1		
ETH-0314	ARCE 15C	same location as ARCE 16B	charcoal	4440	85	-24.6		
ETH-13825	425	6th course, ~31 m E of SW corner	charcoal	4072	60	-26.4		
ETH-13826	426	from the same seam as sample 425	charcoal	4267	65	-26.3		
ETH-13827	427	from the same seam as sample 425	charcoal	3975	58	-28.4		
ETH-13828	428	from the same seam as sample 425	charcoal	4089	57	-26.9		
ETH-13829	429	from the same seam as sample 425	charcoal	4026	56	-27.1		
ETH-13830	430	~6th course, ~30 m E of SW corner	charcoal	4129	60	-23.3		
ETH-13819	419	10th course, near SW corner	charcoal	4005	59	-26.7		
ETH-13834	434	11th course, near NE corner	charcoal	4180	64	-31.7		
ETH-13832	432	12th course, on SE corner	charcoal	4205	60	-26.7		
ETH-0315	ARCE 16	13th course, near SE corner	charcoal	4235	90	-21.9		
ETH-13837	437	13th course, near NE corner	charcoal	4210	59	-26.9		
ETH-13838	438	from the same seam as sample 437	charcoal	4058	53	-27.3		
ETH-13833	433	15th course, near SE corner	charcoal	4216	58	-24.4		
ETH-13937	537	45th course, NE corner	charcoal	4125	52	-27.9		
ETH-13936	536	46th course, 8 m W of NE corner	charcoal	4250	52	-18.6		
ETH-13943	543	84th course, near NE corner	charcoal	4381	70	-23.9		
ETH-0322	ARCE 37	half to 2/3 way to top, SE corner	charcoal	4475	95	-26.1		
				mean	1 sigma	variance		
<b>C14 Mean age (weighted)</b>				<b>all data</b>	<b>BP</b>	<b>4174</b>	<b>13</b>	<b>26</b>
				Chi square	3.8874	probability		14.32 %
<b>C14 Mean age (weighted)</b>				<b>without +</b>	<b>BP</b>	<b>4173</b>	<b>13</b>	<b>27</b>
				Chi square	3.9820	probability		13.66 %

**Sphinx Temple of Khafre at Giza 1)**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-0228	ARCE 20	S side of eastern columned recess	charcoal	4160	125	-26.9
SMU-1416	ARCE 20	same sample as ETH-0228	charcoal	3687	230	-26.9
ETH-4231	ARCE 20	same sample as ETH-0228	charcoal	3895	115	-25.8

**Pyramid of Menkaure at Giza**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-13850	450	6th course, ~15 m S of NE corner	charcoal	4335	60	-27.0
ETH-4232	ARCE 21	~9th course (~4th above granite casing) E face	charcoal	4145	105	-25.0
ETH-13852	452	10th course, 4 m S of NE corner	charcoal	4489	54	-23.5 +
ETH-13853	453	12th course, ~15 m S of NE corner	charcoal	4074	47	-25.2
ETH-13854	454	12th course, ~15 m S of NE corner	charcoal	4236	53	-22.0
ETH-13855	455	same location as 454	charcoal	3917	48	-28.0
ETH-13857	457	13th course, ~18 m S of NE corner	charcoal	3954	64	-26.5
ETH-0454	ARCE22/1	15th course, near SE corner	charcoal	4420	105	-22.8
ETH-0455	ARCE22/2	same sample as ARCE 22/1	charcoal	4310	105	-28.0
ETH-4233	ARCE 22B	same location as ARCE 22/1	charcoal	4245	95	-28.9
ETH-13859	459	16th course, ~5 m S of NE corner	charcoal	3803	63	-27.6 *
ETH-13861	461	18th course, ~5 m S of NE corner	charcoal	3833	62	-26.7
ETH-13862	462	in same mortar seam as 461	charcoal	3939	55	-27.1
ETH-13863	463	in same mortar seam as 461	charcoal	3994	54	-26.5
ETH-13864	464	in same mortar seam as 461	charcoal	4226	54	-26.4
ETH-13865	465	in same mortar seam as 461	charcoal	4060	54	-26.6
ETH-13867	467	18th course, ~3.5 m S of NE corner	charcoal	4082	55	-26.0
ETH-13868	468	21st course, ~10 m W of NE corner	charcoal	4319	61	-25.1
ETH-13869	469	24th course, near NE corner	charcoal	4115	53	-25.1
ETH-13871	471	27th course, near NE corner	charcoal	4163	56	-23.4
SMU-1370	ARCE 23	37th course, E face near SE corner	charcoal	4048	48	-25.9
ETH-4234	ARCE 23	same sample as SMU-1370	charcoal	4180	90	-29.1
ETH-13910	510	45th course, near NE corner	charcoal	4062	49	-26.7
ETH-13911	511	48th course, near NE corner	charcoal	4186	59	-25.5
SMU-1415	ARCE 25	54th course, S face, 2 blocks W of SE corner	charcoal	4418	250	-26.1
ETH-0229	ARCE 25	same sample as SMU-1415	charcoal	4310	135	-22.0
ETH-13914	514	56th course, E face near SE corner	charcoal	4445	67	-23.4
ETH-13915	515	57th course, E face near SE corner	charcoal	4188	59	-24.4
ETH-13918	518	70th course, E face near SE corner	charcoal	4257	60	-24.5
ETH-13919	519	70th course, E face near SE corner	charcoal	4122	51	-26.6
SMU-1352	ARCE 26A	58th course, near SE corner, gap betw. blocks	brown powder	3735	59	-21.9 *
SMU-1419	ARCE 26B	same as ARCE 26A	brown powder	3685	60	-21.9 *
SMU-1414	ARCE 27A	same general location, below block	brown powder	3768	51	-20.9 *
ETH-13918	518	70th course, E face near SE corner	charcoal	4257	60	-24.5
ETH-13919	519	70th course, E face near SE corner	charcoal	4122	51	-26.6
				mean	1 sigma	variance
<b>C14 Mean age (weighted) without *</b>				<b>BP</b>	<b>4132</b>	<b>11</b>
Chi square				7.2814	probability	2.62 %
<b>C14 Mean age (weighted) without + &amp; *</b>				<b>BP</b>	<b>4127</b>	<b>11</b>
Chi square				5.3294	probability	6.96 %

**Mortuary Temple of Shepseskaf at South Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-13732	332	West retain. wall, interior face, ~25 m N of SW end	charcoal	4041	60	-22.6
ETH-13734	334	~5 m N of sample 332 location	charcoal	4014	58	-26.1
SMU-1395	ARCE 55	West retaining wall, interior face	charcoal	3769	208	-27.0 *
ETH-0233	ARCE 55	same sample as SMU-1395	charcoal	4380	150	-25.9
SMU-1472	ARCE55A	West retaining wall, interior face, amalgamated	charcoal	4265	138	-25.7
ETH-13729	329	East retaining wall, exterior face	straw	4220	59	-22.4
ETH-13729a	329a	same mudbrick as sample 329	straw	4319	63	-5.3
ETH-13729b	329b	same mudbrick as sample 329	reed	4101	59	-22.0
				mean	1 sigma	variance
<b>C14 Mean age (weighted) all data</b>				<b>BP</b>	<b>4140</b>	<b>26</b>
Chi square				3.4788	probability	17.56 %
<b>C14 Mean age (weighted) without *</b>				<b>BP</b>	<b>4146</b>	<b>26</b>
Chi square				3.5191	probability	17.21 %

**Mastaba el-Faraoun of Shepseskaf at South Saqqara 2)**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
SMU-1371	ARCE 54B	1st course on platform, 18 blocks W of SE corner	charcoal	3330	56	-26.8
ETH-0230	ARCE 54C	same location as ARCE 54B	charcoal	4350	170	-20.1
SMU-1396	ARCE 54C	same location as ARCE 54B	charcoal	3792	34	-25.8
ETH-13731	331	3rd course, 20 m W of SE corner	wood	4086	57	-23.8
ETH-0329	ARCE 56	1st course, core masonry, from E and W faces	charcoal	4320	80	-23.5
				mean	1 sigma	variance
<b>C14 Mean age (weighted)</b>				all data	<b>BP 3819</b>	<b>24 148</b>

**5<sup>th</sup> Dynasty (Old Kingdom)****South Pyramid Temple of Userkaf at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
ETH-0326	ARCE 51	bedding of basalt paving blocks, mortar	charcoal	4410	85	-23.0
SMU-1495	ARCE 51	same sample as ETH-0326	charcoal	4316	265	-27.1
ETH-4236	ARCE 51	same sample as ETH-0326	charcoal	3850	95	-27.3 *
ETH-0327	ARCE 52	bedding of basalt paving blocks, mortar	charcoal	4290	100	-17.4
ETH-4237	ARCE 52	same sample as ETH-0326	charcoal	3750	105	-31.9 *
ETH-0328	ARCE 53	bedding of basalt paving blocks, mortar	charcoal	4470	80	-24.0
				mean	1 sigma	variance
<b>C14 Mean age (weighted)</b>				without *	<b>BP 4400</b>	<b>49 41</b>
				Chi square	0.6966	probability 70.59 %
<b>C14 Mean age (weighted)</b>				2 * dates	<b>BP 3805</b>	<b>70 50</b>
				Chi square	0.4988	probability 77.93 %

**Pyramid of Userkaf at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
ETH-13706	306	3 m below top of pyramid, SE corner	charcoal	4067	57	-26.7
ETH-13707	307	same location as sample 306	charcoal	3990	56	-24.8
ETH-13703s	303s	Center of S face, inside packed stone	reed 3)	2521	53	-22.5 *
ETH-13704	304	Center of S face, inside packed stone	reed 4)	2589	53	-18.9 *
ETH-13710	310	S face, 1/3 of way to top, inside packed stone	reed 5)	2432	51	-26.2 *
ETH-13714	314	same location as sample 310	charcoal	4114	55	-28.7
ETH-13715	315	same location as sample 310	charcoal	3859	57	-25.2
				mean	1 sigma	variance
<b>C14 Mean age (weighted)</b>				without *	<b>BP 4009</b>	<b>28 56</b>
				Chi square	3.9068	probability 14.18 %
<b>C14 Mean age (weighted)</b>				3 * dates	<b>BP 2512</b>	<b>30 46</b>
				Chi square	2.3001	probability 31.66 %

**Queen's Pyramid of Userkaf at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil
SMU-1413	ARCE 50	E of entrance passage, below core blocks	reed&wood 6)	3985	129	-23.7
ETH-13703	303	mudbrick from wall, SE of Quenn's Pyramid	charcoal 7)	2498	51	-23.4 *
ETH-13703a	303a	same mudbrick as 303	charcoal	3884	66	-18.5
				mean	1 sigma	variance
<b>C14 Mean age (weighted)</b>				without *	<b>BP 3905</b>	<b>59 41</b>
				Chi square	0.4858	probability 78.43 %

**Mortuary Temple and Pyramid of Sahure at Abusir**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
ETH-0330	ARCE 60	wall between sanctuary and S storage chambers	charcoal	4260	85	-27.7 +	
ETH-4239	ARCE 60	same sample as ETH-0330	charcoal	3925	125	-28.8	
ETH-0331	ARCE 61	SW corner, S storage chambers, 3rd from W	charcoal	3400	85	-20.0 *	
ETH-13722	322	wall in center of temple, mortar beneath block	charcoal	3447	56	-26.7 *	
ETH-13723	323	same location as 322, different discrete s.	charcoal	3647	50	-26.3	
ETH-13724	324	same location as 322, different discrete s.	charcoal	3618	50	-26.0	
ETH-13725	325	same location as 322, amalgamated s.	charcoal	3760	51	-25.1	
SMU-1372	ARCE 59	S doorway to satellite pyramid, below block	charcoal	4042	99	-26.8	
ETH-13717	317	basalt pavement N of satellite pyramid	charcoal	3918	59	-26.6	
ETH-13718	318	same location as 317	charcoal	4042	51	-23.7	
ETH-13720	320	SE part of temple, top of block S of 2 columns	charcoal	4003	59	-22.9	
ETH-13721	321	SE part of temple, core of wall S of 2 columns	charcoal	3942	58	-23.1	
ETH-13719	319	core or N retaining wall, satellite Pyramid	reed	3821	59	-9.6	
ETH-13726	326	10 m N of SE corner Sahure Pyramid, core	wood	4397	51	-17.8 +	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>3862</b>	<b>16</b>	<b>76</b>
			Chi square	22.1344	probability	0.00 %	
<b>C14 Mean age (weighted)</b>			without + & *	<b>BP</b>	<b>3840</b>	<b>19</b>	<b>52</b>
			Chi square	7.7737	probability	2.05 %	

**Mortuary Temple of Unas at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
ETH-13681	281	SW quadrant, wall E of archaic tomb entrance	charcoal	4058	55	-25.5	
ETH-13682	282	same location and mortar seam as 281	charcoal	4036	55	-27.0	
ETH-13683	283	same location and mortar seam as 281	charcoal	4040	53	-25.1	
ETH-13684	284	same location and mortar seam as 281	charcoal	3921	48	-25.1	
ETH-13685	285	same location and mortar seam as 281	charcoal	4004	51	-25.9	
SMU-1373	ARCE 41	interior of NW corner, paving of temple floor	charcoal	4041	100	-25.9	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4009</b>	<b>23</b>	<b>22</b>
			Chi square	0.9699	probability	61.57 %	

**Pyramid of Unas at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
ETH-0456	ARCE 42	~10 m E of SW corner, mortar under core	charcoal	4255	100	-25.9	
SMU-1475	ARCE43a	~9 m E of SW corner, 1st to 2nd tier, core	charcoal	4101	126	-27.7	
ETH-0324	ARCE 44	~7 m S of NW corner, foundation masonry	charcoal	4290	100	-22.9	
ETH-13686	286	SE corner, about 1/3 way to top, in gypsum	straw	4035	54	-3.8	
ETH-13692	292	SE corner, about 1/2 way to top, small flecks	charcoal	4015	51	-25.4	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>4079</b>	<b>32</b>	<b>50</b>
			Chi square	2.4547	probability	29.31 %	

**Tomb A, reign of Unas at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	$\delta^{13}\text{C}$ permil	
ETH-13693	293	S facing exterior wall, middle course, mudbrick	charcoal	4035	53	-24.6	
ETH-13698	298	same general location than 293	charcoal	3924	54	-22.1	
				mean	1 sigma	variance	
<b>C14 Mean age (weighted)</b>			all data	<b>BP</b>	<b>3981</b>	<b>38</b>	<b>55</b>
			Chi square	2.1521	probability	34.09 %	

**6<sup>th</sup> Dynasty (Old Kingdom)****Pyramid of Teti at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
SMU-1355	ARCE 62a	burial chamber, log under sarcophagus, outer rings	wood	4161	57	-21.0
ETH-0332	ARCE 63	E face, all of 2nd tier, amalgamated sample	charcoal	4520	120	-11.5 +
ETH-4240	ARCE 63	same sample as ETH-0332	charcoal	3829	155	-24.4
ETH-13646	246	E face, ~1/3 way to top, under ext. casing	charcoal	3884	53	-23.1
ETH-13647	247	split of same piece as 246	charcoal	3915	55	-27.1
ETH-13648	248	split of same piece as 246	charcoal	3919	59	-25.4
ETH-13649	249	split of same piece as 246	charcoal	3931	59	-29.9
ETH-13636	236	SW corner, 1/2 to 1/3 way to top, mudbrick	straw	707	44	-24.7 *
ETH-13637	237	same mudbrick as 236	straw	609	48	-21.8 *
ETH-13638	238	S face, 2/3 of way to top, mudbrick under block	straw	4238	55	-20.5
ETH-13639	239	same mudbrick as 238	straw	4134	50	-23.2
ETH-13640	240	SE corner, 2/3 of way to top, mudbrick u. block	straw	4094	53	-19.9
ETH-13541	241	same mudbrick as 240	straw	4018	50	-25.5
ETH-13542	242	same mudbrick as 240	straw	4165	49	-24.0
ETH-13543	243	same mudbrick as 240	straw	4019	55	-23.3
				mean	1 sigma	variance
<b>C14 Mean age (weighted) without *</b>			<b>BP</b>	<b>4055</b>	<b>16</b>	<b>38</b>
			Chi square	5.6119	probability	6.04 %
<b>C14 Mean age (weighted) without + &amp; *</b>			<b>BP</b>	<b>4046</b>	<b>16</b>	<b>35</b>
			Chi square	4.7305	probability	9.39 %

**Mortuary Chapel of Queen Neith (reign of Pepi II) at Saqqara 8)**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-4238	ARCE 57	bedding of pavement	charcoal	3565	135	-23.8
SMU-1469	ARCE 57a	same context as ARCE 57, larger pieces	charcoal	4458	140	-26.6

**Pyramid of Pepi II at Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
SMU-1351	ARCE 58	S face, 1st course, amalgamated sample	charcoal	3900	24	-26.4
<b>C14 Age</b>			<b>BP</b>	<b>3900</b>	<b>24</b>	
			single sample			

**8<sup>th</sup> Dynasty (First Intermediate Period)****Pyramid of Qakare-Iby at South Saqqara**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-13728	328	core of pyramid, mudbrick	straw	3872	54	-17.2
<b>C14 Age</b>			<b>BP</b>	<b>3872</b>	<b>54</b>	
			single sample			

**12<sup>th</sup> Dynasty (Middle Kingdom)****Pyramid of Amenemhet I at Lisht 9)**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
ETH-13885	485	E face, middle, ~5 m above mortuary temple	straw	2916	50	-24.1
ETH-13886	486	N face near NE corner, mud layer in stone core	charcoal	2944	54	-23.9
<b>C14 Mean age) (weighted)</b>				all data	<b>BP</b>	
				Chi square	0.1448	
				mean	1 sigma	variance
					<b>2929</b>	<b>37</b>
					probability	93.02 %

**Pyramid of Senusret II at Illahun**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
DRI-2947	524	SE corner, freshly fallen brick	straw	3580	104	-25.1
ETH-13924	524	same mudbrick sampled for DRI-2947	straw	3545	51	-24.6
ETH-13925	525	SW corner, mud mortar above limestone blocks	straw	3488	54	-24.0
ETH-13926	526	SW corner, mud mortar on limestone blocks	charcoal	3641	55	-28.7
ETH-13927	527	NW corner, mud brick with dense straw content	straw	3538	54	-28.0
ETH-13928	528	N-side, twig in mud brick	wood	3527	54	-11.1
ETH-13931	531	N-side, sandy layer between mud bricks	reed	3582	52	-9.5
ETH-13932	532	N-side, palm wood fragment in mud brick	wood	3534	58	-19.8
DRI-2971	524	same mudbrick sampled for DRI-2947	humates 10)	4342	70	-19.7 +
<b>C14 Mean age (weighted)</b>				without +	<b>BP</b>	
				Chi square	0.6893	
				mean	1 sigma	variance
					<b>3552</b>	<b>20</b>
					probability	70.85 %

**Pyramid of Amenemhet III at Dashur**

lab nr.	field nr.	collection site	material	corr. <sup>14</sup> C age y BP	error 1 sigma	δ <sup>13</sup> C permil
DRI-2948	556	mudbrick from the pyramid	straw	3442	41	-24.2
DRI-2958	556	same mudbrick sampled for DRI-2948	humates 10)	4452	73	-19.6
<b>C14 Age</b>				single sample	<b>BP</b>	
					<b>3442</b>	<b>41</b>

**Remarks and Footnotes**

Errors for δ<sup>13</sup>C values: 0.05 permil for SMU and DRI dates  
1.5 permil for ETH-0200 to ETH-4999 dates  
1.1 permil for ETH-13000 to ETH-13999

+ too old date

\* too young date

- 1) dates reported without evaluation
- 2) most samples are amalgamated: large scatter of dates does not support further analyses
- 3) sample and piece of rope found under rubble
- 4) at level of modern excavated surface
- 5) possible later activity
- 6) loose debris, context?
- 7) may not be related to temple
- 8) data not analyzed
- 9) possibility of later occupation on pyramid debris for both samples; data not further analyzed
- 10) date includes older organic content in clay used for brick making

## APPENDIX 2 LISTING OF CALIBRATED DATES BY DYNASTY AND MONUMENT

## Appendix 2: Calibrated Dates

1<sup>st</sup> Dynasty (Early Dynastic Period)

<b>Tomb 3357 at Saqqara</b>		precise date unknown		
Historical Range of 1st Dynasty		3050 - 2890	BC	
Sample details: number dated:	1			
<b>C14 Age</b> of single sample date		4222	BP	
1 sigma		60		
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2902 - 2857		30.1
		2813 - 2736		49.6
		2732 - 2697		20.3
	two sigma	2919 - 2621		99.4
		2607 - 2602		0.6
<b>Tomb 3471 at Saqqara</b>		precise date unknown		
Historical Range of 1st Dynasty		3050 - 2890	BC	
Sample details: number dated:	2	number used for mean:	2	
<b>C14 Mean age</b> (weighted)		4383	BP	
1 sigma		30		
variance		53	used for calibration	
Chi square		3.2490		
probability		19.70	%	
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	3086 - 3061		15.2
		3035 - 2916		84.8
	two sigma	3326 - 3320		0.5
		3314 - 3231		9.2
		3172 - 3160		1.2
		3118 - 3109		0.7
		3104 - 2888		88.4
<b>Tomb 3504 at Saqqara</b>		precise date unknown		
Historical Range of 1st Dynasty		3050 - 2890	BC	
Sample details: number dated:	5	number used for mean:	5	
<b>C14 Mean age</b> (weighted)		4352	BP	
1 sigma		26		
variance		46	used for calibration	
Chi square		3.1041		
probability		21.18	%	
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	3017 - 2976		40.4
		2973 - 2945		25.1
		2944 - 2907		34.5
	two sigma	3092 - 3056		9.7
		3050 - 2884		90.3
<b>Tomb 3035 at Saqqara</b>		precise date unknown		
Historical Range of 1st Dynasty		3050 - 2890	BC	
Sample details: number dated:	3	number used for mean:	3	
<b>C14 Mean age</b> (weighted)		4210	BP	
1 sigma		33	used for calibration	
variance		32		
Chi square		0.9132		
probability		63.34	%	
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2883 - 2862		26.1
		2808 - 2776		40.0
		2774 - 2758		17.0
		2720 - 2704		16.9
	two sigma	2896 - 2843		26.0
		2815 - 2673		74.0

<b>Tomb 3505 at Saqqara</b>		precise date unknown	
Historical Range of 1st Dynasty		3050 - 2890	BC
Sample details: number dated:	1		
<b>C14 Age</b> of single sample date		4482	BP
1 sigma		37	
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	3332 - 3214	probability of range %
		3187 - 3156	68.0
		3123 - 3096	16.9
	two sigma	3345 - 3082	15.0
		3067 - 3030	91.8
			8.2

### 3<sup>rd</sup> Dynasty (Old Kingdom)

<b>Step Pyramid of Djoser at Saqqara</b>			
Historical Range		2668 - 2649	BC
Sample details: number dated:	11	number used for mean:	10
<b>C14 Mean age</b> (weighted)		4182	BP
1 sigma		17	
variance		25	used for calibration
Chi square		2.1934	
probability		33.40	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2877 - 2860	probability of range %
		2810 - 2753	18.3
		2722 - 2700	58.5
	two sigma	2881 - 2840	23.2
		2816 - 2668	18.9
		2646 - 2642	80.3
			0.8

<b>Temple Complex associated with Step Pyramid</b>			
Historical Range		2668 - 2649	BC
Sample details: number dated:	9	number used for mean:	7
<b>C14 Mean age</b> (weighted)		4092	BP
1 sigma		24	
variance		60	used for calibration
Chi square		6.2652	
probability		4.36	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2858 - 2812	probability of range %
		2743 - 2724	22.1
		2698 - 2570	7.7
		2516 - 2501	63.5
	two sigma	2872 - 2800	6.7
		2784 - 2547	20.2
		2544 - 2489	67.2
		2479 - 2474	11.9
			0.7

<b>Pyramid of Sekhemkhet at Saqqara</b>			
Historical Range		2649 - 2643	BC
Sample details: number dated:	4	number used for mean:	3
<b>C14 Mean age</b> (weighted)		4176	BP
1 sigma		41	used for calibration
variance		31	
Chi square		0.5734	
probability		75.07	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2877 - 2856	probability of range %
		2814 - 2696	14.9
		2690 - 2681	79.7
	two sigma	2882 - 2828	5.3
		2823 - 2658	20.2
		2652 - 2623	72.2
		2605 - 2604	7.3
			0.3

**4<sup>th</sup> Dynasty (Old Kingdom)****Tomb 17, reign of Snefru at Meydum**

Historical Range		2613 - 2589	BC
Sample details:	number dated: 3	number used for mean: 2	
<b>C14 Mean age (weighted)</b>		3926	BP
1 sigma		54	used for calibration
variance		8	
Chi square		0.0213	
probability		98.94	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2486 - 2485	probability of range %
		2473 - 2332	93.5
		2321 - 2310	5.7
	two sigma	2570 - 2516	9.5
		2501 - 2280	87.0
		2251 - 2231	2.4
		2219 - 2209	1.0

**Bent Pyramid of Snefru at Dashur**

Historical Range		2613 - 2589	BC
Sample details:	number dated: 2	number used for mean: 2	
<b>C14 Mean age (weighted)</b>		4133	BP
1 sigma		41	used for calibration
variance		12	
Chi square		0.0945	
probability		95.38	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2862 - 2826	probability of range %
		2824 - 2809	21.5
		2757 - 2720	9.1
		2703 - 2657	21.2
		2653 - 2622	27.6
		2606 - 2603	18.6
	two sigma	2875 - 2797	1.9
		2788 - 2617	28.3
		2612 - 2581	63.5
			6.2

**Pyramid of Snefru at Meydum**

Historical Range		2613 - 2589	BC
Sample details:	number dated: 7	number used for mean: 6	
Sample details			
<b>C14 Mean age (weighted)</b>		4110	BP
1 sigma		23	used for calibration
variance		17	
Chi square		0.5618	
probability		75.51	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2855 - 2850	probability of range %
		2844 - 2815	3.8
		2675 - 2619	27.8
		2610 - 2597	50.4
		2591 - 2583	11.7
	two sigma	2860 - 2810	6.3
		2753 - 2722	27.8
		2700 - 2616	8.4
		2614 - 2579	46.6
			17.1

**Royal Production Center at Giza**

Historical Range	not established		
Sample details:	number dated: 8	number used for mean: 8	
<b>C14 Mean age (weighted)</b>		4090	BP
1 sigma		19	
variance		37	used for calibration
Chi square		3.7620	
probability		15.24	%

		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2855 - 2853	1.3
		2844 - 2815	19.7
		2674 - 2573	73.4
	two sigma	2512 - 2502	5.6
		2863 - 2808	20.2
		2777 - 2773	0.5
		2759 - 2719	7.7
		2704 - 2558	62.9
		2537 - 2494	8.8

**Pyramid of Khufu at Giza**

Historical Range 2589 - 2566 BC  
 Sample details: number dated: 46 number used for mean: 45

**C14 Mean age (weighted)** 4147 BP  
 1 sigma 10  
 variance 21 used for calibration  
 Chi square 4.2246  
 probability 12.10 %

		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2862 - 2837	19.7
		2818 - 2808	8.1
		2776 - 2774	1.8
	two sigma	2758 - 2719	32.1
		2704 - 2664	32.0
		2647 - 2638	6.3
		2871 - 2828	19.2
		2823 - 2801	8.8
		2783 - 2658	60.0
		2653 - 2623	11.4
		2606 - 2604	0.5

**Pyramid Temple of Djedefre at Abu Roash**

Historical Range 2566 - 2558 BC  
 Sample details: number dated: 7 number used for mean: 7

**C14 Mean age (weighted)** 4189 BP  
 1 sigma 26  
 variance 46 used for calibration  
 Chi square 3.1679  
 probability 20.52 %

		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2876 - 2855	13.2
		2849 - 2844	3.1
		2815 - 2675	83.7
two sigma		2882 - 2621	98.7
		2608 - 2601	1.3

**Pyramid of Djedefre at Abu Roash**

Historical Range 2566 - 2558 BC  
 Sample details: number dated: 11 number used for mean: 11

**C14 Mean age (weighted)** 4229 BP  
 1 sigma 22  
 variance 38 used for calibration  
 Chi square 3.0551  
 probability 21.71 %

		r a n g e s	probability of range %	
<b>Calibrated Age BC</b>	one sigma	2896 - 2864	40.9	
		2807 - 2778	34.9	
		2772 - 2760	12.3	
	two sigma		2718 - 2706	11.9
			2912 - 2855	36.4
		2850 - 2844	0.7	
		2814 - 2676	62.9	

**Pyramid of Khafre at Giza**

Historical Range 2558 - 2532 BC  
 Sample details: number dated: 25 number used for mean: 24

**C14 Mean age (weighted)** 4173 BP  
 1 sigma 13  
 variance 27 used for calibration  
 Chi square 3.9820  
 probability 13.66 %

		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2876 - 2857		16.1
		2813 - 2738		59.7
		2725 - 2697		24.2
two sigma	2879 - 2835		18.6	
	2819 - 2663		78.4	
	2648 - 2634		3.0	

**Pyramid of Menkaure at Giza**

Historical Range 2532 - 2504 BC  
 Sample details: number dated: 35 number used for mean: 30

**C14 Mean age (weighted)** 4127 BP  
 1 sigma 11  
 variance 25 used for calibration  
 Chi square 5.3294  
 probability 6.96 %

		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2858 - 2827		24.4
		2823 - 2812		9.0
		2741 - 2724		11.9
	two sigma	2698 - 2658		30.6
		2652 - 2623		23.5
		2605 - 2605		0.6
two sigma	2864 - 2806		28.8	
	2779 - 2770		1.8	
	2761 - 2717		17.0	
	2708 - 2618		45.4	
	2611 - 2595		4.7	
	2594 - 2582		2.3	

**Mortuary Temple of Shepseskaf at South Saqqara**

Historical Range 2504 - 2500 BC  
 Sample details: number dated: 8 number used for mean: 7

**C14 Mean age (weighted)** 4146 BP  
 1 sigma 26  
 variance 48 used for calibration  
 Chi square 3.5191  
 probability 17.21 %

		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2865 - 2831		19.0
		2821 - 2806		8.5
		2780 - 2770		5.5
		2761 - 2717		25.0
		2710 - 2680		28.0
two sigma	2650 - 2624		14.0	
	2878 - 2618		93.6	
	2611 - 2595		3.9	
	2594 - 2582		2.5	

### 5<sup>th</sup> Dynasty (Old Kingdom)

#### South Pyramid Temple of Userkaf at Saqqara

Historical Range		2498 - 2491	BC
Sample details:	number dated: 6	number used for mean: 4	
<b>C14 Mean age</b> (weighted)		4400	BP
1 sigma		49	used for calibration
variance		41	
Chi square		0.6966	
probability		70.59	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	3089 - 3058	probability of range %
		3045 - 2921	19.9
			80.1
	two sigma	3327 - 3225	13.8
		3174 - 3159	1.8
		3119 - 2902	84.4

#### South Pyramid Temple of Userkaf at Saqqara

Sample details:	two younger samples		
<b>C14 Mean age</b> (weighted)		3805	BP
1 sigma		70	used for calibration
variance		50	
Chi square		0.4988	
probability		77.93	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2398 - 2383	probability of range %
		2346 - 2139	5.5
			94.5
	two sigma	2461 - 2115	91.0
		2099 - 2038	9.0

#### Pyramid of Userkaf at Saqqara

Historical Range		2498 - 2491	BC
Sample details:	number dated: 7	number used for mean: 4	
<b>C14 Mean age</b> (weighted)		4009	BP
1 sigma		28	
variance		56	used for calibration
Chi square		3.9068	
probability		14.18	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	2619 - 2611	probability of range %
		2596 - 2593	4.4
		2582 - 2464	1.6
			94.0
	two sigma	2856 - 2814	3.7
		2695 - 2691	0.2
		2681 - 2397	92.6
		2383 - 2345	3.5

#### Pyramid of Userkaf at Saqqara

Sample details:	three intrusive younger samples		
<b>C14 Mean age</b> (weighted)		2512	BP
1 sigma		30	
variance		46	used for calibration
Chi square		2.3001	
probability		31.66	%
		r a n g e s	
<b>Calibrated Age BC</b>	one sigma	787 - 757	probability of range %
		695 - 541	15.8
			84.2
	two sigma	796 - 502	93.8
		490 - 484	0.8
		464 - 449	2.1
		440 - 427	1.8
		423 - 413	1.4

**Queen's Pyramid of Userkaf at Saqqara**

Historical Range		2498 - 2491	BC
Sample details:	number dated: 3	number used for mean: 2	
<b>C14 Mean age (weighted)</b>		3905	BP
1 sigma		59	used for calibration
variance		41	
Chi square		0.4858	
probability		78.43 %	
		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2467 - 2305	100.0
	two sigma	2560 - 2535	3.3
		2534 - 2524	1.0
		2496 - 2265	85.8
		2264 - 2203	9.9

**Mortuary Temple and Pyramid of Sahure at Abusir**

Historical Range		2491 - 2477	BC
Sample details:	number dated: 14	number used for mean: 10	
<b>C14 Mean age (weighted)</b>		3840	BP
1 sigma		19	
variance		52	used for calibration
Chi square		7.7737	
probability		2.05 %	
		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2401 - 2377	12.9
		2351 - 2201	87.1
	two sigma	2462 - 2193	93.9
		2176 - 2142	6.1

**Mortuary Temple of Unas at Saqqara**

Historical Range		2375 - 2345	BC
Sample details:	number dated: 6	number used for mean: 6	
<b>C14 Mean age (weighted)</b>		4009	BP
1 sigma		23	used for calibration
variance		22	
Chi square		0.9699	
probability		61.57 %	
		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2566 - 2546	33.2
		2545 - 2520	41.6
		2498 - 2488	16.7
		2479 - 2474	8.5
	two sigma	2575 - 2509	67.8
		2504 - 2469	32.2

**Pyramid of Unas at Saqqara**

Historical Range		2375 - 2345	BC
Sample details:	number dated: 5	number used for mean: 5	
<b>C14 Mean age (weighted)</b>		4079	BP
1 sigma		32	
variance		50	used for calibration
Chi square		2.4547	
probability		29.31 %	
		r a n g e s	probability of range %
<b>Calibrated Age BC</b>	one sigma	2856 - 2814	20.3
		2695 - 2695	0.4
		2678 - 2563	66.0
		2522 - 2497	13.4
	two sigma	2864 - 2807	16.9
		2778 - 2771	0.9
		2760 - 2718	7.9
		2705 - 2485	72.6
		2485 - 2472	1.7

**Tomb A, reign of Unas at Saqqara**

Historical Age not established

Sample details: number dated: 2 number used for mean: 2

<b>C14 Mean age (weighted)</b>		3981	BP	
1 sigma		38		
variance		55	used for calibration	
Chi square		2.1521		
probability		34.09	%	
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2578 - 2456		90.7
		2421 - 2404		7.1
		2359 - 2354		2.2
	two sigma	2826 - 2824		0.2
		2658 - 2652		0.5
		2622 - 2606		2.5
		2605 - 2304		96.8

**6<sup>th</sup> Dynasty (Old Kingdom)**

**Pyramid of Teti at Saqqara**

Historical Range

Sample details: number dated: 15 number used for mean: 12

<b>C14 Mean age (weighted)</b>		4046	BP	
1 sigma		16		
variance		35	used for calibration	
Chi square		4.7305		
probability		9.39	%	
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2620 - 2609		11.1
		2598 - 2588		8.6
		2584 - 2554		31.5
		2539 - 2493		48.8
	two sigma	2836 - 2818		3.4
		2664 - 2646		3.9
		2637 - 2469		92.6

**Pyramid of Pepi II at Saqqara**

Historical Range

Sample details: number dated: 1 2278 - 2184 BC

<b>C14 Age of single sample date</b>		3900	BP	
1 sigma		24		
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2458 - 2400		64.5
		2380 - 2348		35.5
	two sigma	2464 - 2326		92.9
		2324 - 2306		7.1

**8<sup>th</sup> Dynasty (First Intermediate Period)**

**Pyramid of Qakare-Iby at South Saqqara**

Historical Range

Sample details: number dated: 1 2181 - 2161 BC

<b>C14 Age of single sample date</b>		3872	BP	
1 sigma		54		
		r a n g e s		probability of range %
<b>Calibrated Age BC</b>	one sigma	2457 - 2415		23.9
		2414 - 2289		76.1
	two sigma	2471 - 2198		98.8
		2161 - 2149		1.2

**12<sup>th</sup> Dynasty (Middle Kingdom)****Pyramid of Senusret II at Illahun**

Historical Range	1897 - 1878	BC
Sample details: number dated: 9	number used for mean: 8	
<b>C14 Mean age (weighted)</b>	3552	BP
1 sigma	20	used for calibration
variance	17	
Chi square	0.6893	
probability	70.85 %	

<b>Calibrated Age BC</b>	one sigma	r a n g e s		probability of range %
		1935 - 1934		2.1
		1922 - 1879		79.4
		1839 - 1829		17.5
		1785 - 1785		1.0
	two sigma	1949 - 1874		70.2
		1843 - 1810		19.5
		1800 - 1776		10.3

**Pyramid of Amenemhet III at Dashur**

Historical Range	1842 - 1797	BC
Sample details: number dated: 2	number used for mean: 1	

<b>C14 Age of single sample date</b>	3442	BP		
1 sigma	41			
<b>Calibrated Age BC</b>	one sigma	r a n g e s		probability of range %
		1864 - 1843		16.9
		1808 - 1802		4.7
		1774 - 1688		78.4
	two sigma	1880 - 1837		19.1
		1831 - 1680		76.0
		1670 - 1658		2.4
		1651 - 1637		2.6