MCNP Analysis of Neutrons Released from Jesus' Body in the Resurrection

by Robert A. Rucker

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Presented at the

St. Louis Shroud Conference 2014

www.stlouisshroudconference.com

My Background

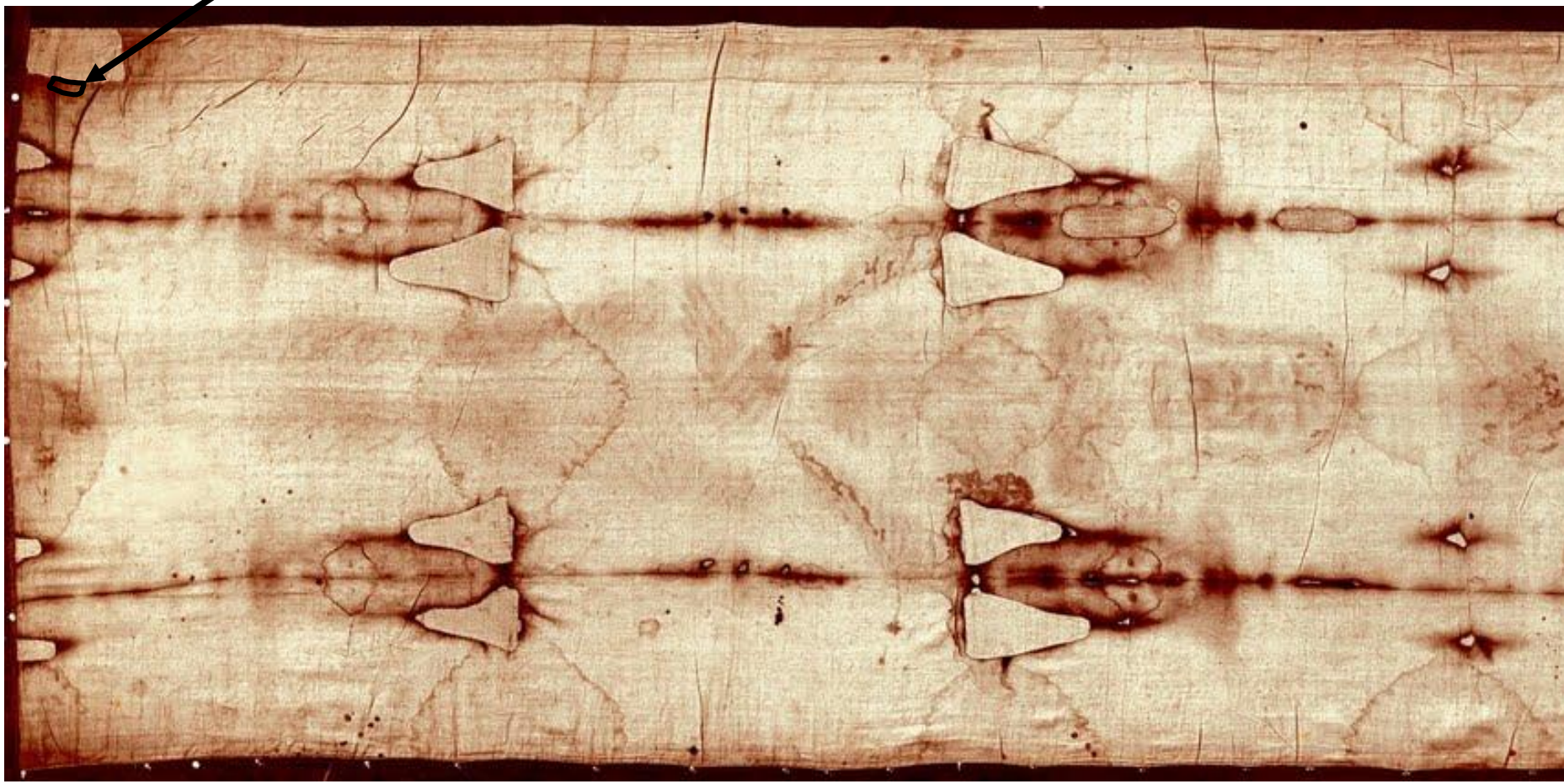
- BS and MS in Nuclear Engineering at the University of Michigan, 1971
- Worked for General Atomics in San Diego for 24 years doing core physics design for advanced nuclear reactors
- Worked at various US Dept. of Energy sites for 14 years primarily doing nuclear criticality safety calculations using MCNP

Outline

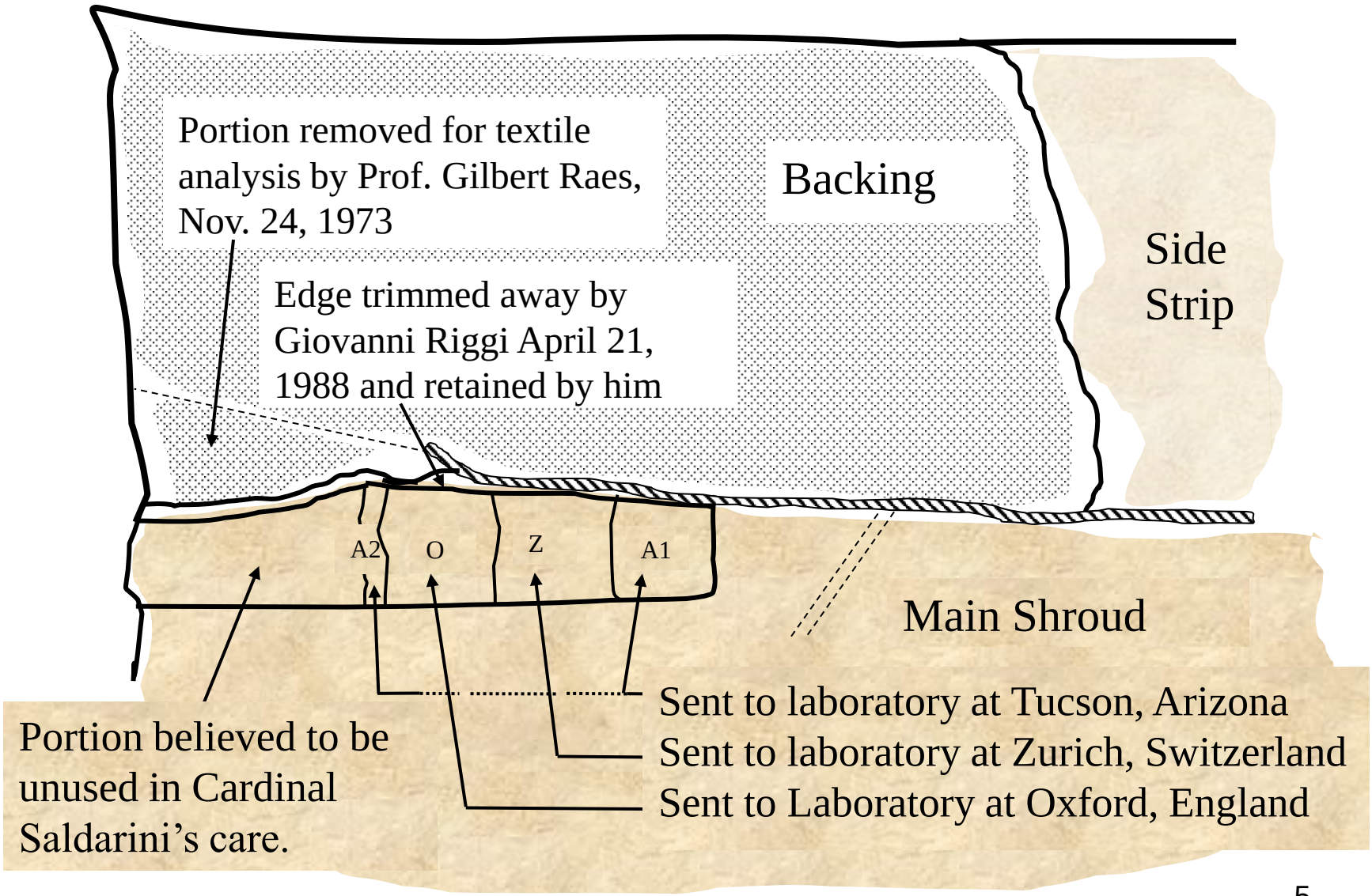
- C^{14} Dating of the SOT in 1988
- Middle Ages date was wrong
- Hypothesis of neutron emission
- MCNP Calculations
- Need for further testing
- Questions

Location of Samples for C^{14} Dating

3 samples cut from here



Location of Samples for C^{14} Dating



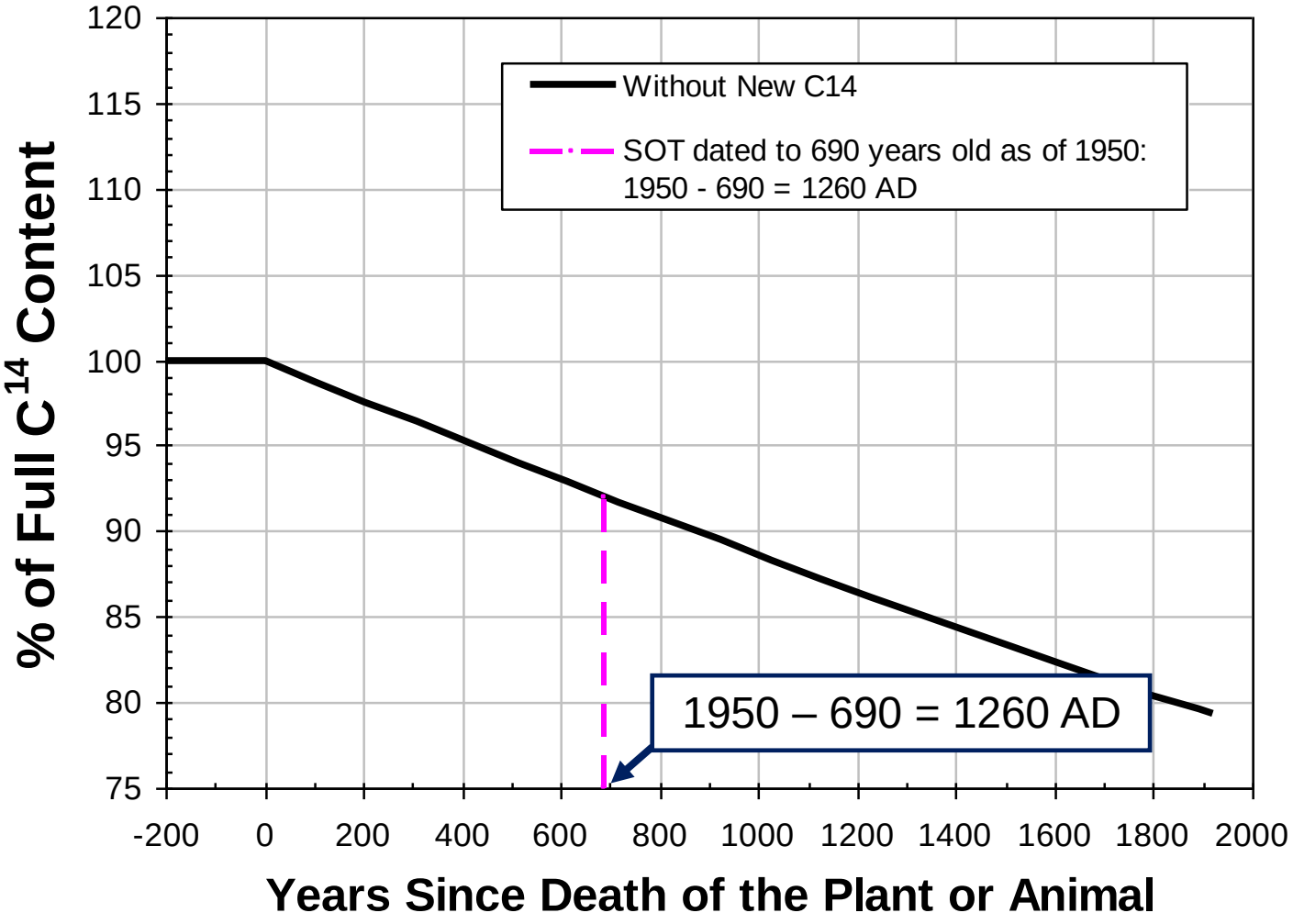
Reference for Statistical Analysis

- Nature, Vol. 337, No. 6208, pages 611-615, February 16, 1989
- “Radiocarbon Dating of the Shroud of Turin” by P. E. Damon, and
- D. J. Donahue, B. H. Gore, A. L. Hatheway, A. J. T. Jull, T. W. Linick, P. J. Sercel, L. J. Toolin, C. R. Bronk, E. T. Hall, R. E. M. Hedges, R. Housley, I. A. Law, C. Perry, G. Bonani, S. Trumbore, W. Woelfli, J. C. Ambers, S. G. E. Bowman, M. N. Leese, and M. S. Tite

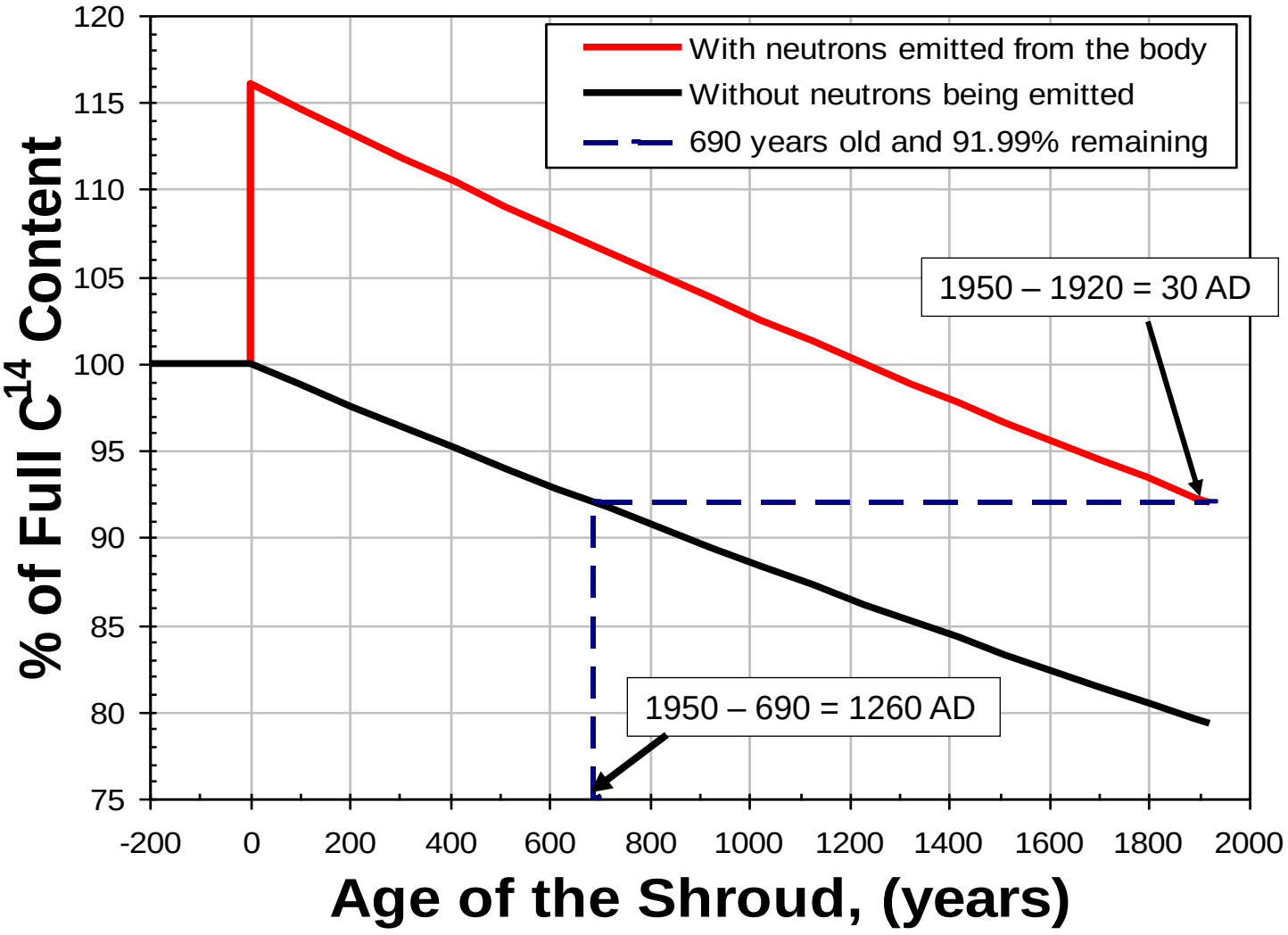
Results of Statistical Analysis

- Calibrated date of 1260 to 1390 AD
- The SOT is not authentic. It is a fake created in the middle ages.
- Uncalibrated date of 1260 AD $\pm$ 31

Normal Decay of C^{14}



Effect of Producing New C^{14}

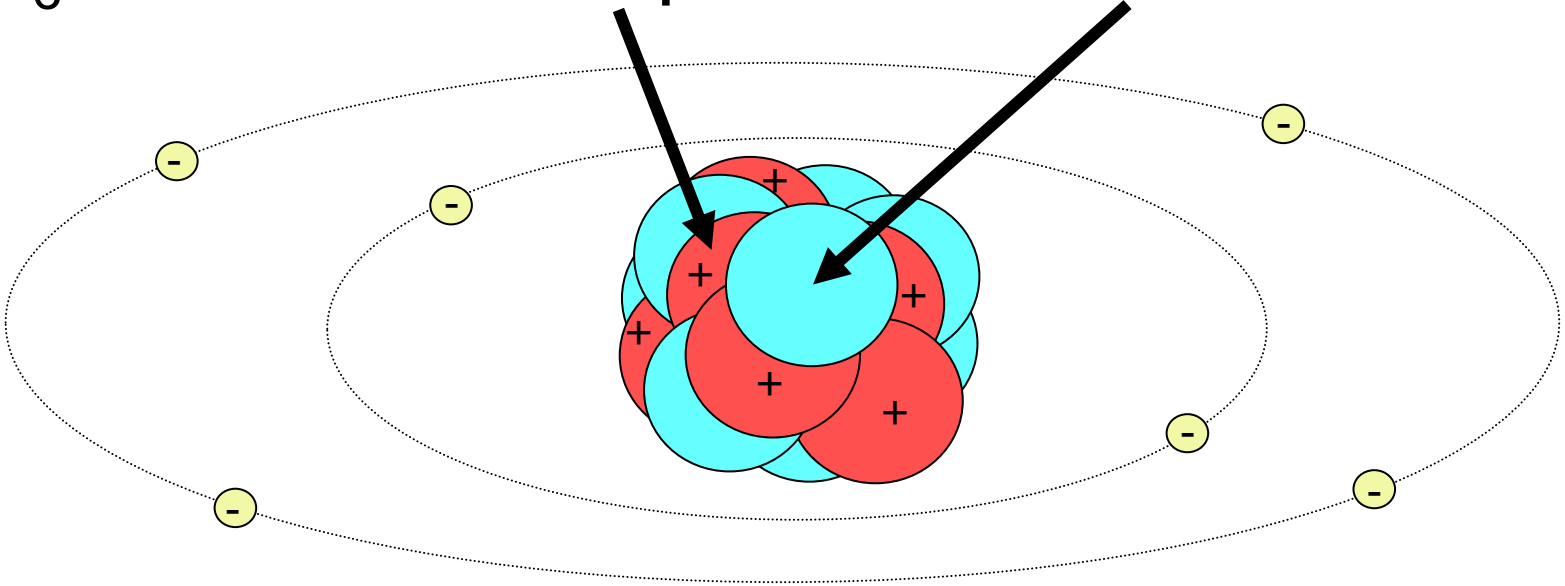


Big Picture

If neutrons were released from Jesus' body in the tomb, then some of them would have been absorbed in N^{14} in the SOT to produce new C^{14} atoms, which would cause the SOT to be C^{14} dated younger than its true age.

Diagram of a C^{14} Atom

- $_{6}C^{12}$ atom has 6 protons and 6 neutrons
- $_{6}C^{14}$ atom has 6 protons and 8 neutrons



Composition of the Human Body

Oxygen	61.4 wt.%
Carbon	22.8 wt.%
Hydrogen	10.0 wt.%
Nitrogen	2.6 wt.%
Calcium	1.4 wt.%
8 others	1.8 wt.%
Many others	0.007 wt.%

In an Average Body

Components of Atoms	Number in the Body	Weight %
Neutrons	2.09×10^{28}	45.1
Protons	2.55×10^{28}	54.9
Electrons	2.55×10^{28}	0.03

In the Resurrection

- Jesus' body disappeared from the tomb
- The atoms (neutrons, protons, electrons) in Jesus' body disappeared from the tomb
- Where did they go?
  - Layman: they went to heaven
  - Physicist: they transitioned to an alternate dimensionality by an unknown process
- There is no reason to rule out the possibility of neutrons being emitted

Need for Detailed Calculations

Computer calculations were performed using the MCNP nuclear analysis code to determine what would happen if neutrons were released from Jesus' body due to the resurrection.

Conclusion

If 3.04×10^{18} thermal neutrons were released during the disappearance of Jesus' body from the tomb in His resurrection, it would increase the average C^{14} content in the SOT samples by 16%. This would shift the C^{14} date for the SOT samples from 30 AD to 1260 AD.

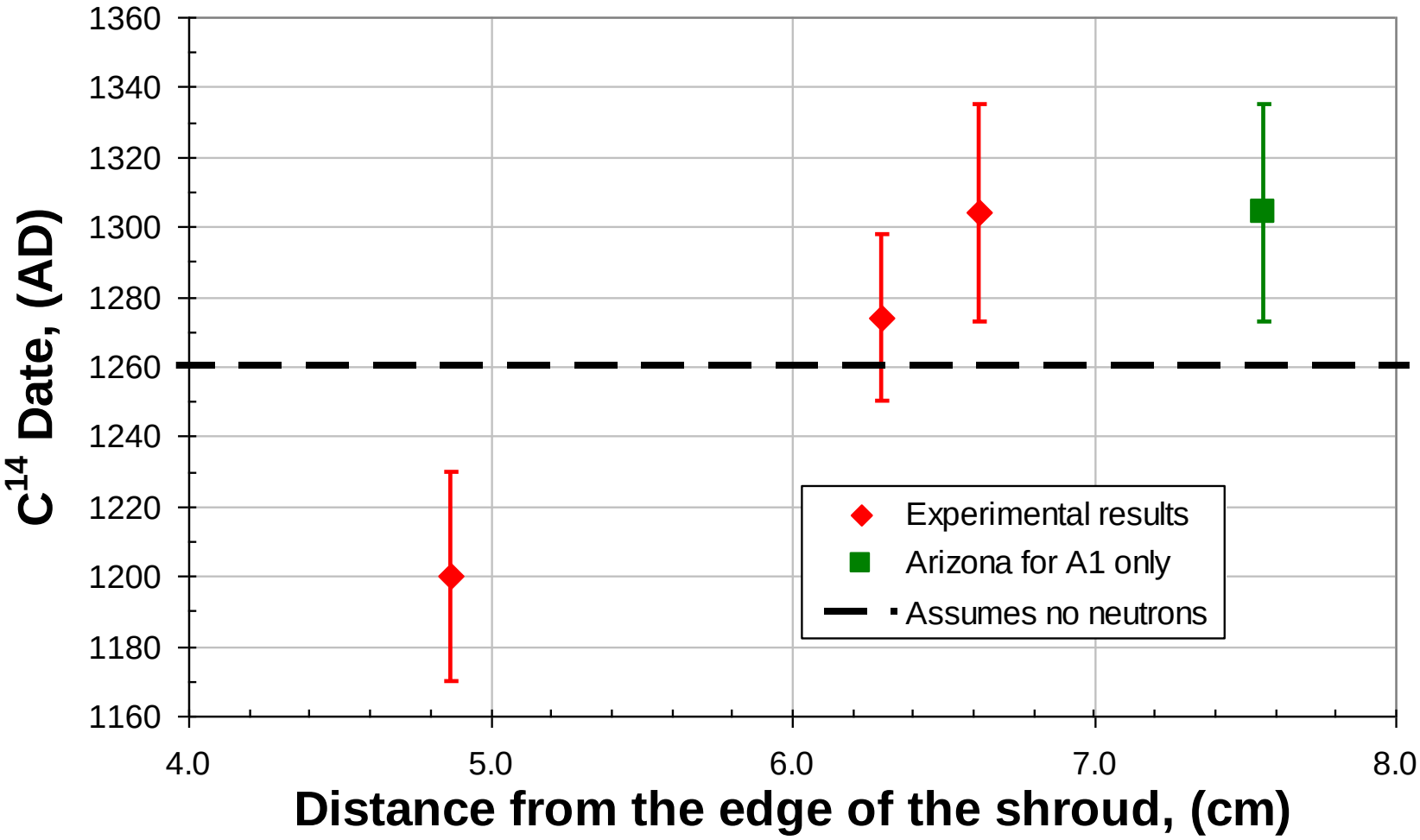
Fraction of Neutrons Emitted

- Since 3.04×10^{18} neutrons must be released in the body to produce a 1260 AD date in the sample region, and there are 2.09×10^{28} neutrons in the body, the fraction of neutrons that must be emitted from body is 1.5×10^{-10} (1.5 in ten billion)
- So in the disappearance of the body, the process by which the neutrons transitioned into the alternate dimensionality was 99.999999985% efficient

Results of Statistical Analysis

- Average date from each laboratory:
  - Arizona = 1304 AD $\pm$ 31
  - Zurich = 1274 AD $\pm$ 24
  - Oxford = 1200 AD $\pm$ 30
- Damon: range of the sample values was probably inconsistent with the stated random measurement error.

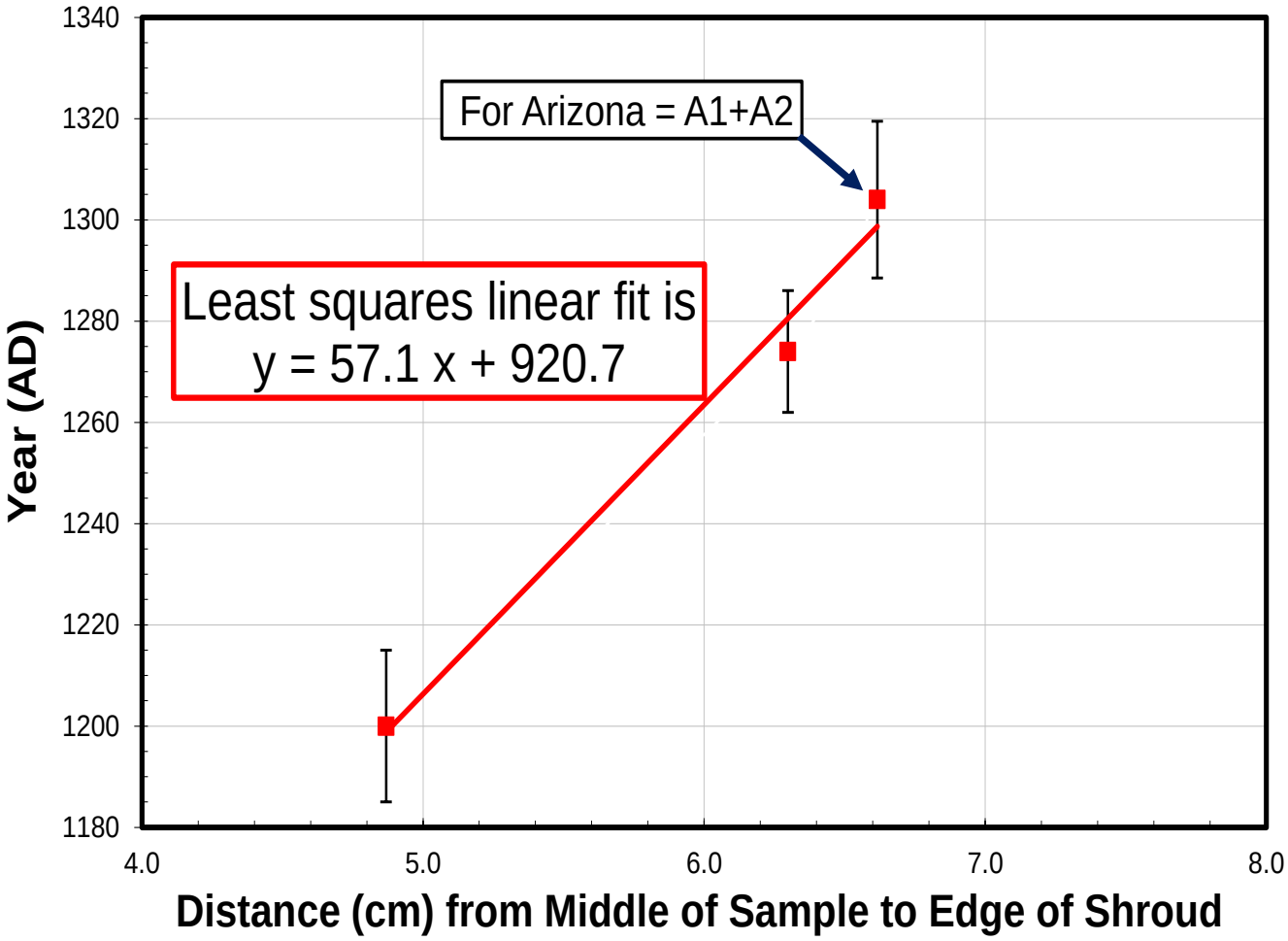
If Three Sample Values are Averaged (Assumes No Neutrons)



The 1999 Richmond Conference

- Bryan J. Walsh: "The 1988 Shroud of Turin Radiocarbon Tests Reconsidered"
- Statistical analysis of variance
  - Kruskal-Wallis Method
  - Bonferoni Pairwise T-Test
- Oxford and Arizona sample values were statistically different

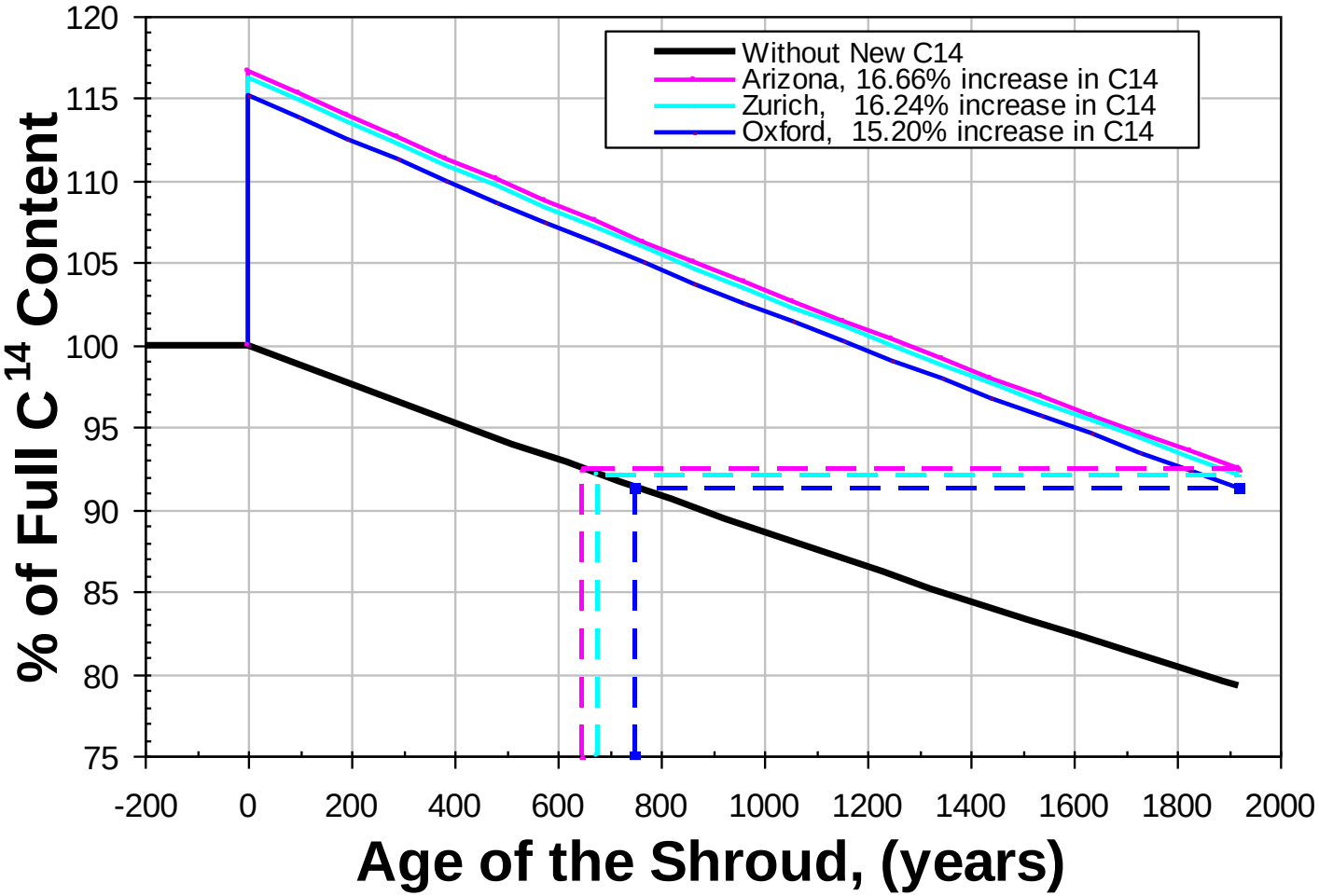
Least Squares Linear Fit Has Slope = 57.1 Years/cm



Proposed Cause of Slope

- True value of the C^{14} in each of the three samples was different due to different amounts of neutron absorption.
- Due to the shape of the neutron distribution in the tomb.

Different Increases in C^{14} for Each Sample Cause Different Dates



There are Three Mysteries

- How can the SOT be authentic if C^{14} dating placed its origin in the middle ages?
- Why was there such poor agreement between the C^{14} dates for the three SOT samples?
- How can the Sudarium of Oviedo be authentic if C^{14} dated it to about 700 AD?

Objective

- To explain these three mysteries with one hypothesis
- Hypothesis: Neutrons were released from Jesus' body in the tomb

Reasons for Neutron Emission

- Explains the three mysteries
- Consistent with:
  - Disappearance of the body
  - Formation of the image by particles
- First published explanation for C^{14} date: Phillips, Nature, 2-16-89

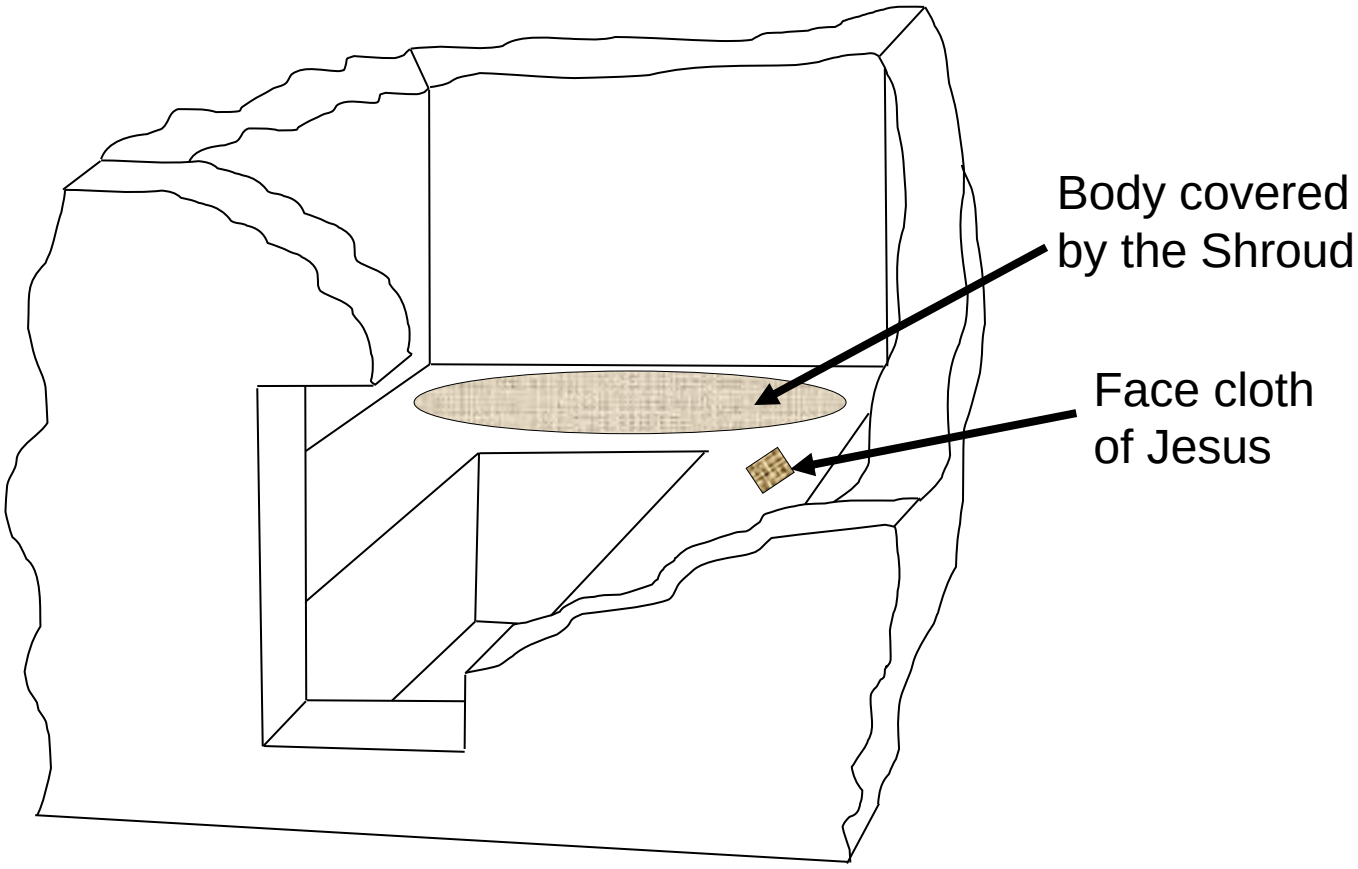
Nature, Feb. 16, 1989, p.594

- “Shroud Irradiated with Neutrons?” by Thomas J. Phillips of the High Energy Physics Laboratory, Harvard University, said:
- The body ... “may also have radiated neutrons, which would have irradiated the shroud and changed some of the nuclei to different isotopes by neutron capture. In particular, some C^{14} could have been generated”

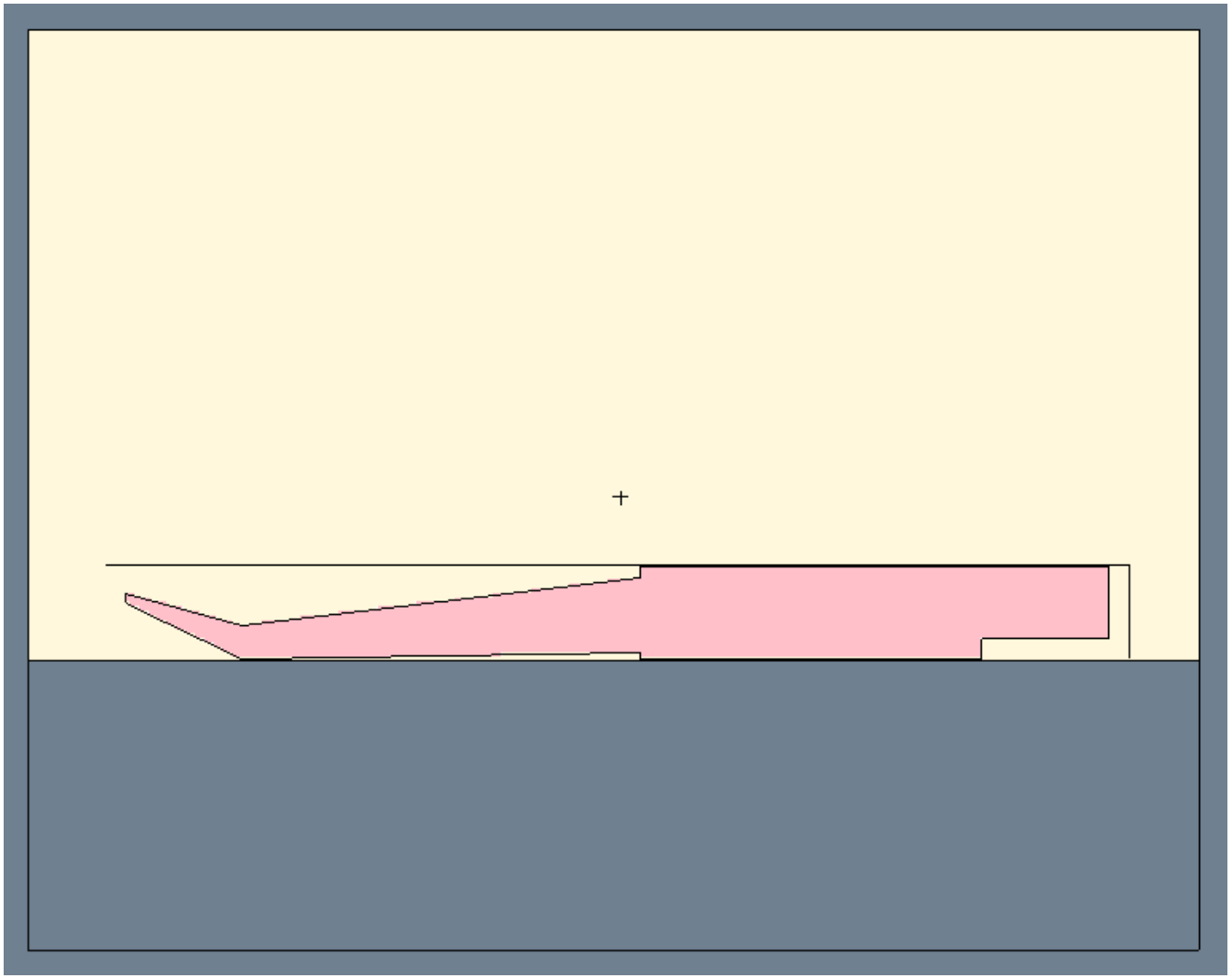
Nature and History of MCNP

- MCNP = Monte Carlo Neutron Particle
- Developed over the past six decades by the Los Alamos National Laboratory
- It is used worldwide
- Verified to be accurate by comparison of calculated results with nuclear experiments

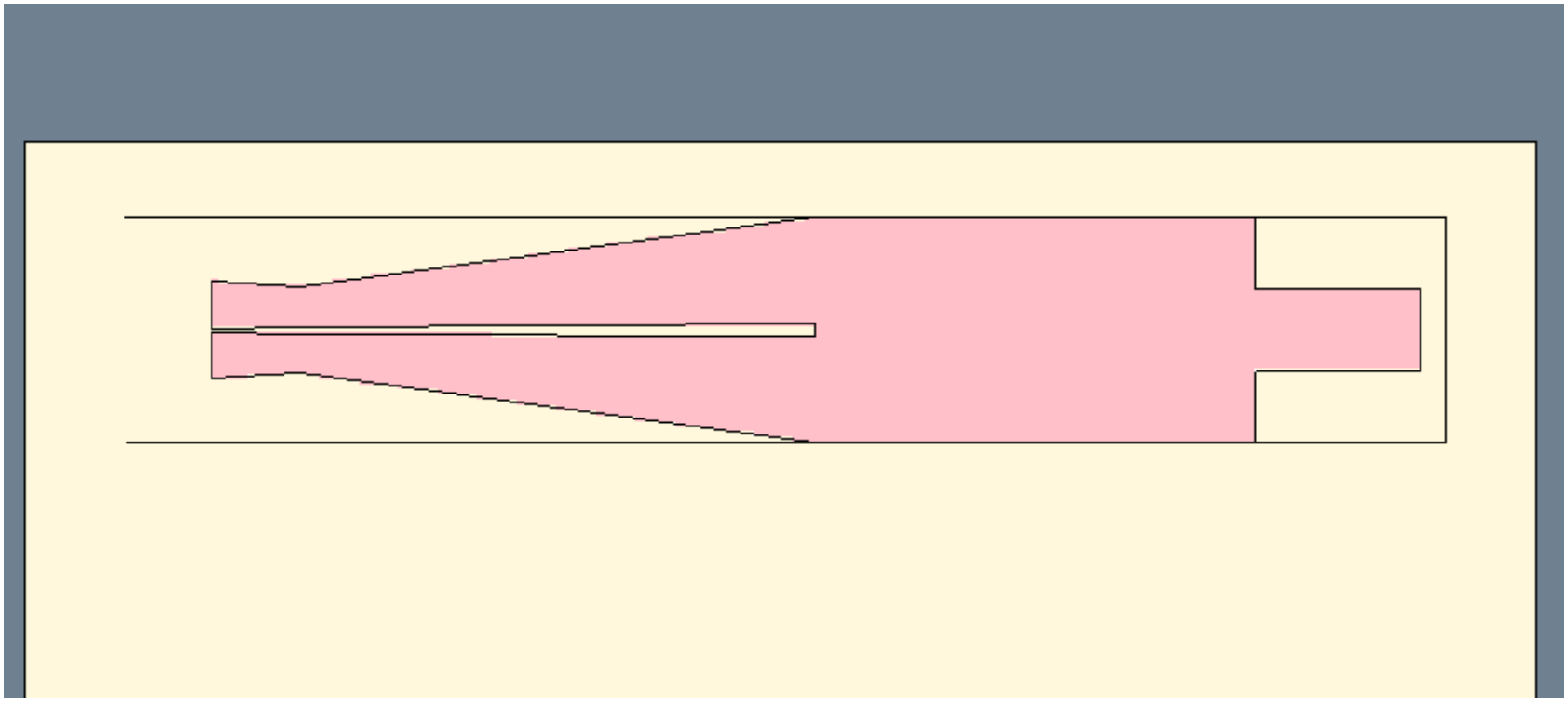
3D View Inside the Tomb



Side View of the Body



Top View of the Body



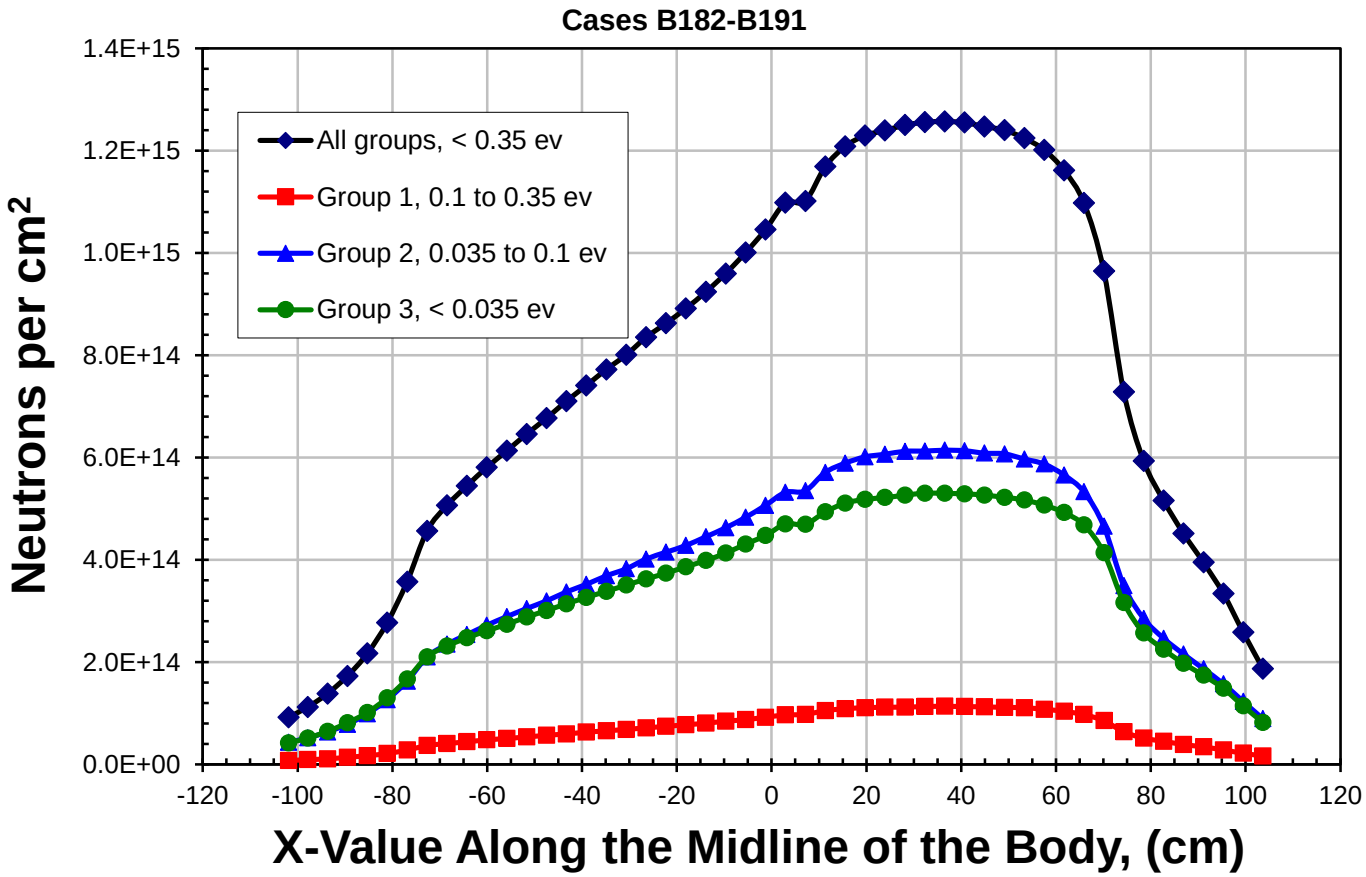
Conditions for the Following Calculations

- 3.04×10^{18} neutrons were emitted from Jesus' body in the tomb
- During the disappearance of the body in the resurrection
- Neutrons were emitted from random locations in the body

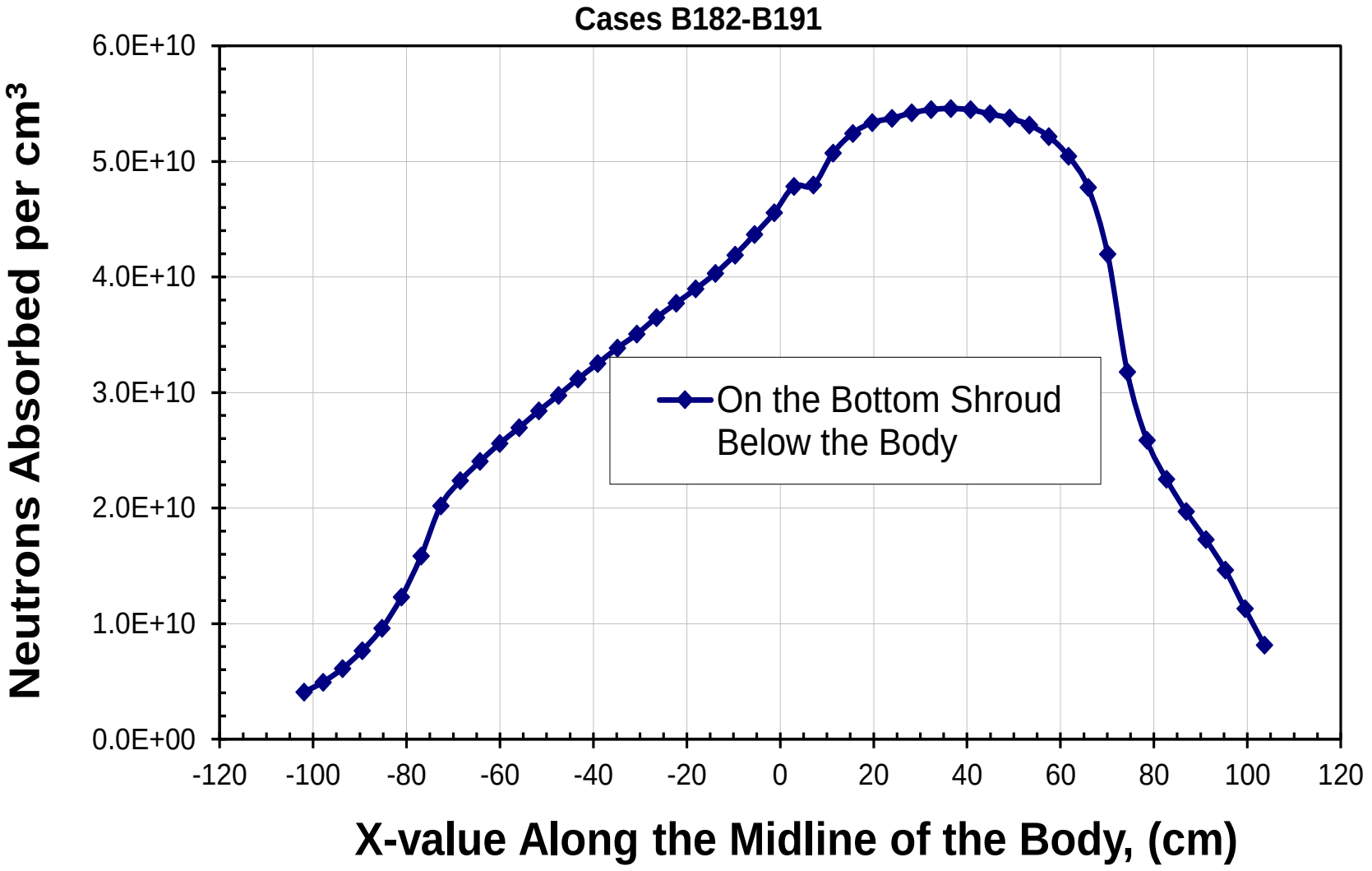
Conditions for the Following Calculations

- Neutrons were emitted with random initial directions
- Initial neutron energy = 0.0253 ev
- 20 cm between the limestone wall and the sample region on the SOT

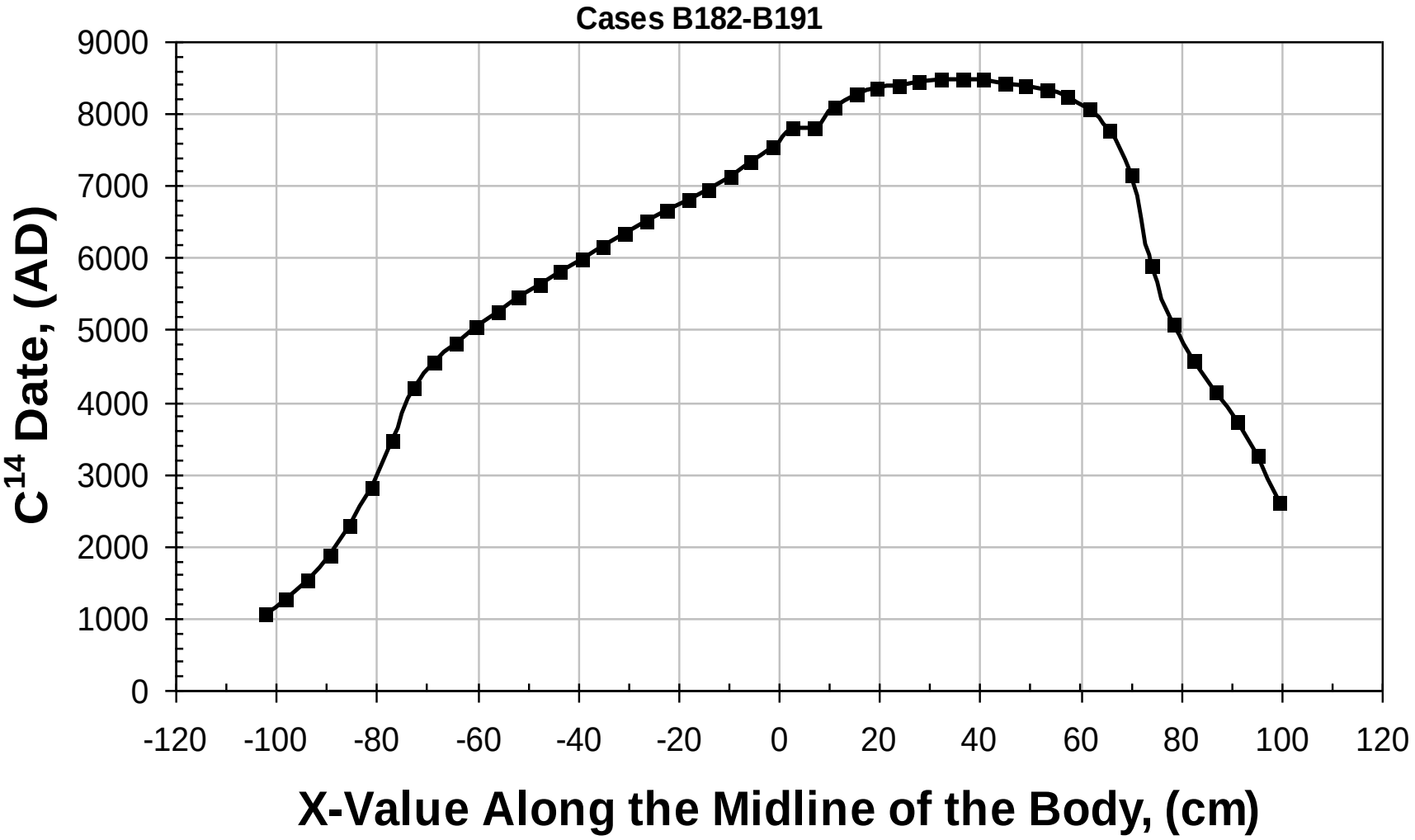
Neutron Distribution in Shroud Below the Body



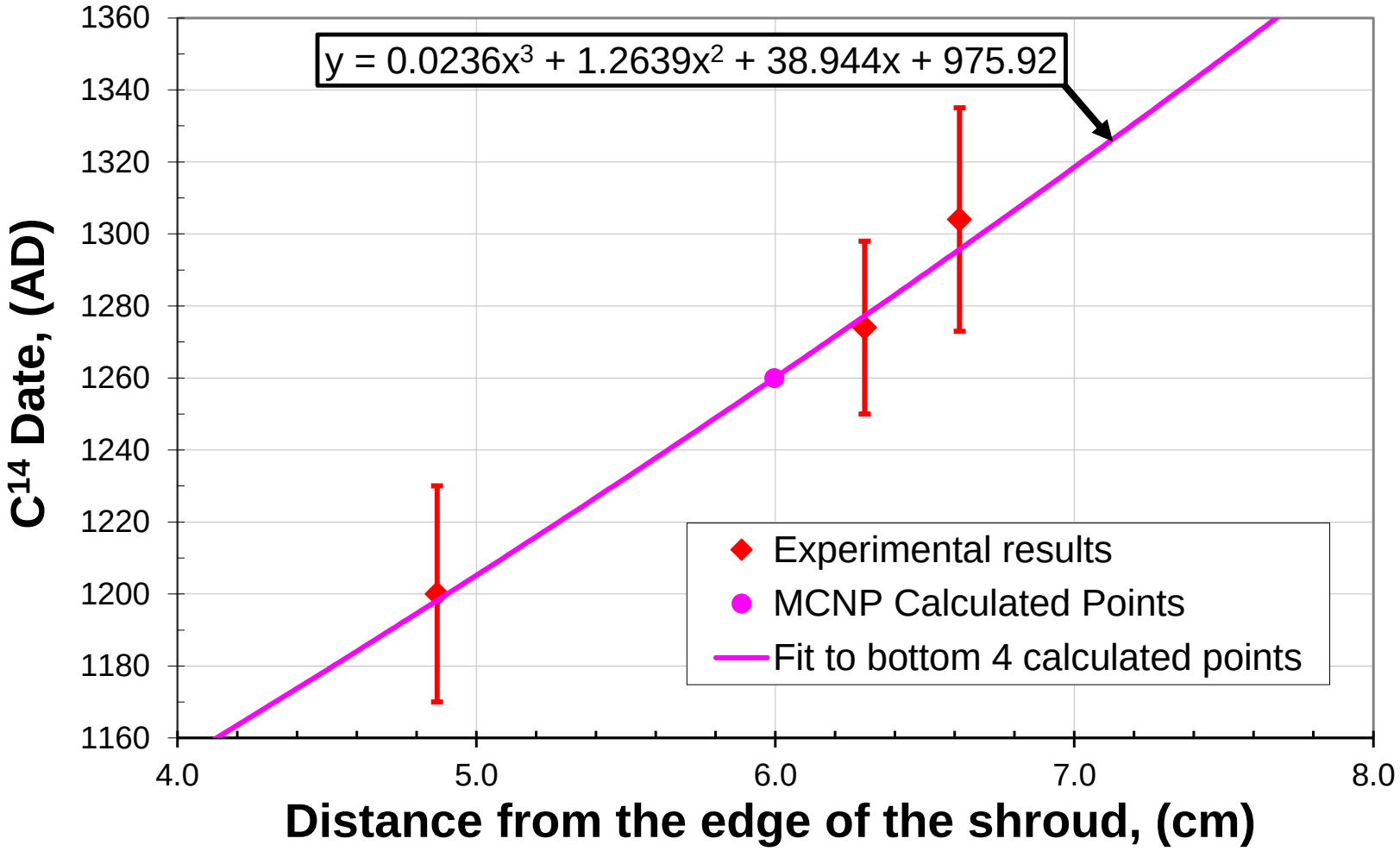
Neutrons Absorbed in N^{14} in the Shroud



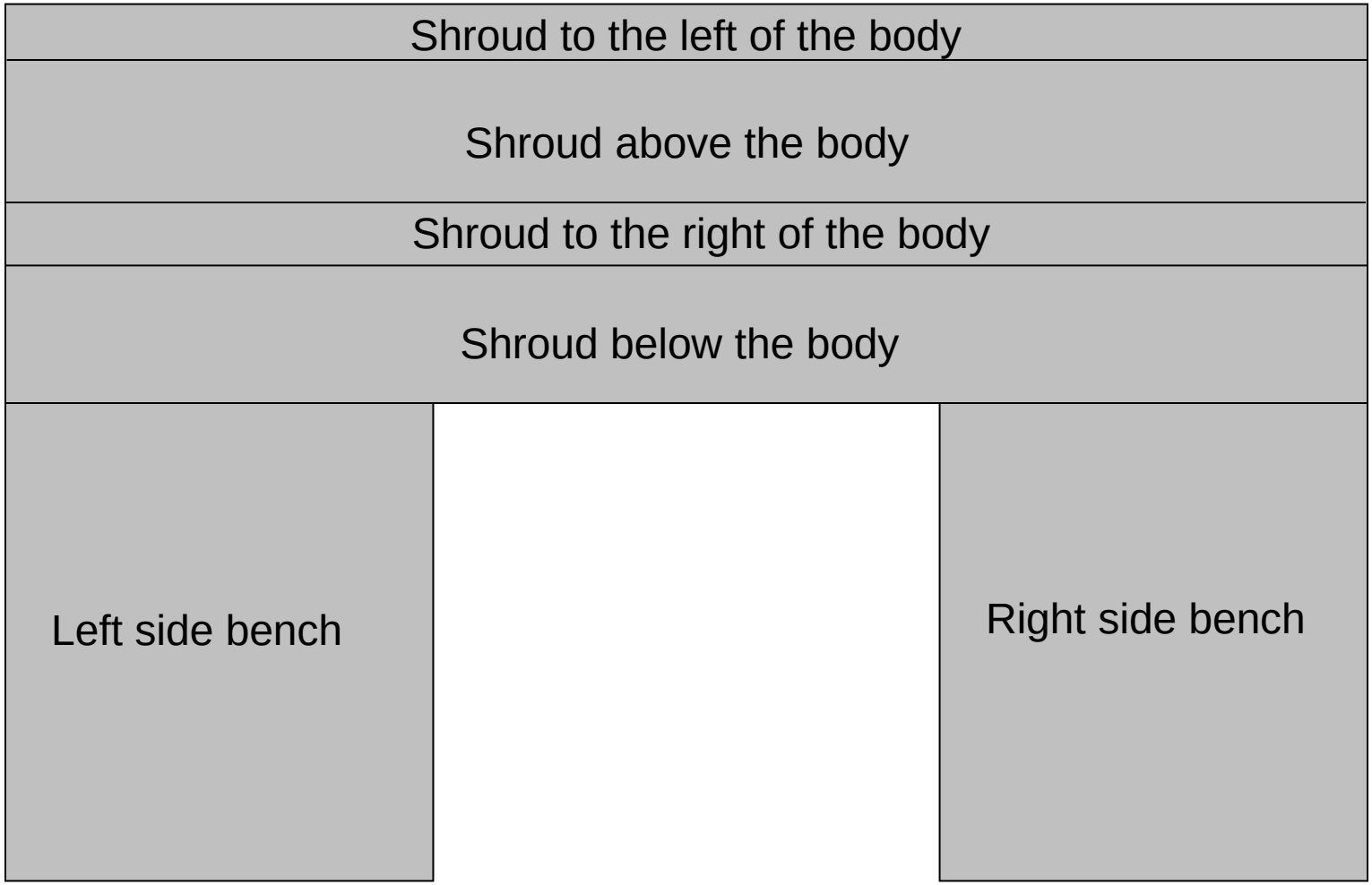
C^{14} Date in Shroud Below the Body



Calculated C^{14} Date Curve for Neutron Emission in the Body



Large Tally Regions in the Tomb



Predicted C^{14} Dates (AD)

Uncorrected C-14 Date (AD), Cases B182-B191								Uncorrected C-14 Date (AD), Cases B182-B191								
828	1017	1262	1542	1871	2252	2669	3085	3459	3676	3716	3719	3619	2954	2326	1683
824	1018	1202	1367	1542	1740	1976	2290	2836	3136	3171	3174	3130	2611	2156	1627
875	1086	1272	1436	1638	1841	2075	2408	2762	3012	3038	3033	2995	2525	2068	1571
983	1267	1477	1733	2044	2396	2783	3248	3534	3818	3862	3861	3785	3157	2348	1756
1067	1388	1618	1918	2293	2713	3133	3626	3750	3994	4048	4033	3958	3546	3057	2280
1005	1300	1541	1821	2159	2546	2937	3396	3654	3951	3984	3980	3912	3269	2547	1913
904	1154	1381	1612	1871	2141	2441	2829	3130	3392	3424	3409	3322	2825	2423	1826
866	1110	1363	1613	1884	2204	2590	3089	3897	4316	4379	4341	4166	3416	2620	1952
877	1123	1447	1831	2294	2813	3379	3954	4514	4819	4884	4849	4632	3746	2802	2025
958	1265	1659	2144	2692	3430	4326	5262	6141	6556	6620	6583	6320	4799	2994	2065
1197	1869	2985	4031	4950	5714	6341	6943	7603	8056	8147	8096	7811	5970	3679	2378
1317	2452	4260	5130	5745	6281	6779	7334	7909	8343	8459	8404	8115	6381	4235	2677
1143	1770	2880	3909	4819	5572	6200	6805	7477	7923	8023	7977	7697	5853	3468	2197
894	1136	1454	1853	2320	2997	3841	4760	5699	6081	6168	6161	5936	4462	2623	1789
581	637	693	754	838							1507	1364	1200	1060	925
557	601	638	682	747							1095	1022	947	876	802
532	569	599	627	679							888	843	803	760	700
506	543	566	588	630							764	734	704	678	636
486	514	536	554	588							680	660	640	616	577
458	490	504	523	546							619	599	579	562	534
442	466	480	494	516							568	550	533	520	490
419	441	455	468	491							522	508	496	485	459
405	423	434	444	465							491	478	464	455	429
384	408	416	425	447							460	448	439	429	411
371	393	401	412	426							440	432	420	409	391
356	374	385	393	411							424	411	401	392	374
343	363	372	383	402							410	398	387	376	356
322	344	359	370	391							401	387	374	357	333

One Sigma Uncertainty (Years)

One Sigma Uncertainty (Years) for the Above Dates due to Counting Statistics in MCNP, Cases B155-B164

4.79	5.33	5.46	5.83	6.28	6.63	7.19	7.74	8.51	8.76	8.77	8.85	8.62	8.14	6.90	6.37
4.67	5.01	5.39	5.67	6.17	6.35	6.71	7.19	8.00	8.30	8.34	8.37	8.38	7.75	6.58	6.31
5.70	6.06	6.39	6.70	7.11	7.45	7.79	8.11	8.85	9.34	9.54	9.42	9.34	8.78	8.03	7.25
5.81	6.36	6.65	7.03	7.37	7.75	8.17	8.66	9.24	9.68	9.74	9.79	9.78	9.29	8.60	7.72
5.82	6.57	7.00	7.13	7.49	7.86	8.26	8.66	9.49	9.90	9.98	9.80	9.69	9.60	9.36	8.61
5.83	6.27	6.70	7.06	7.45	7.85	8.28	8.70	9.46	9.87	9.98	9.87	9.98	9.51	8.83	8.08
6.00	6.17	6.68	7.10	7.37	7.76	8.24	8.57	9.36	9.71	9.78	9.78	9.73	9.20	8.43	7.78
4.97	5.28	5.71	6.10	6.52	6.88	7.42	7.85	8.56	8.92	8.93	8.93	8.84	8.27	7.04	6.54
4.97	5.32	5.67	6.38	6.82	7.16	7.59	8.17	8.93	9.10	9.09	9.06	9.05	8.66	7.32	6.70
6.72	7.60	8.57	9.48	10.00	10.65	11.21	11.49	12.42	13.07	12.81	12.90	13.01	12.42	9.96	9.04
7.11	8.88	11.32	12.06	12.23	12.01	11.94	11.69	12.27	12.65	12.73	12.64	12.73	12.66	10.28	9.45
7.53	9.87	12.71	12.70	12.21	11.90	11.50	11.31	12.16	12.56	12.53	12.55	12.70	12.54	10.54	9.62
7.15	8.63	11.23	12.05	12.17	12.00	11.85	11.62	12.39	12.69	12.61	12.68	12.86	12.70	10.19	9.18
6.53	7.32	8.18	8.86	9.65	10.42	11.11	11.51	12.51	12.97	12.95	12.92	13.03	12.53	9.56	8.64
4.94	5.13	5.65	5.69	6.05							7.66	7.19	6.57	6.30	6.03
5.23	5.50	5.48	5.61	6.11							6.71	6.35	6.21	5.92	5.70
5.69	5.10	5.25	5.33	5.71							6.34	6.24	5.62	5.55	5.46
5.13	5.50	5.22	5.25	5.56							5.72	5.58	5.79	5.25	5.60
4.98	4.84	5.79	4.83	5.25							5.92	5.40	5.60	5.37	5.24
4.22	4.79	4.99	5.61	4.87							5.61	5.08	4.97	4.87	5.10
4.45	4.87	5.24	4.63	5.68							5.91	5.26	5.13	4.58	5.71
4.91	4.84	4.91	4.59	4.58							5.02	5.24	4.76	4.34	5.90
4.04	4.30	4.76	4.65	4.54							4.56	4.65	4.24	4.40	6.32
3.98	4.11	4.35	4.36	4.40							5.43	4.43	4.37	4.21	4.35
3.96	4.34	4.40	4.20	4.95							4.37	4.89	4.24	4.17	4.38
3.83	4.19	4.23	4.08	4.97							4.23	4.34	4.24	4.08	4.17
4.09	4.10	3.70	4.02	4.51							4.57	4.11	4.65	3.91	4.13
4.22	3.94	3.63	3.99	4.12							4.43	4.31	4.12	3.78	3.78

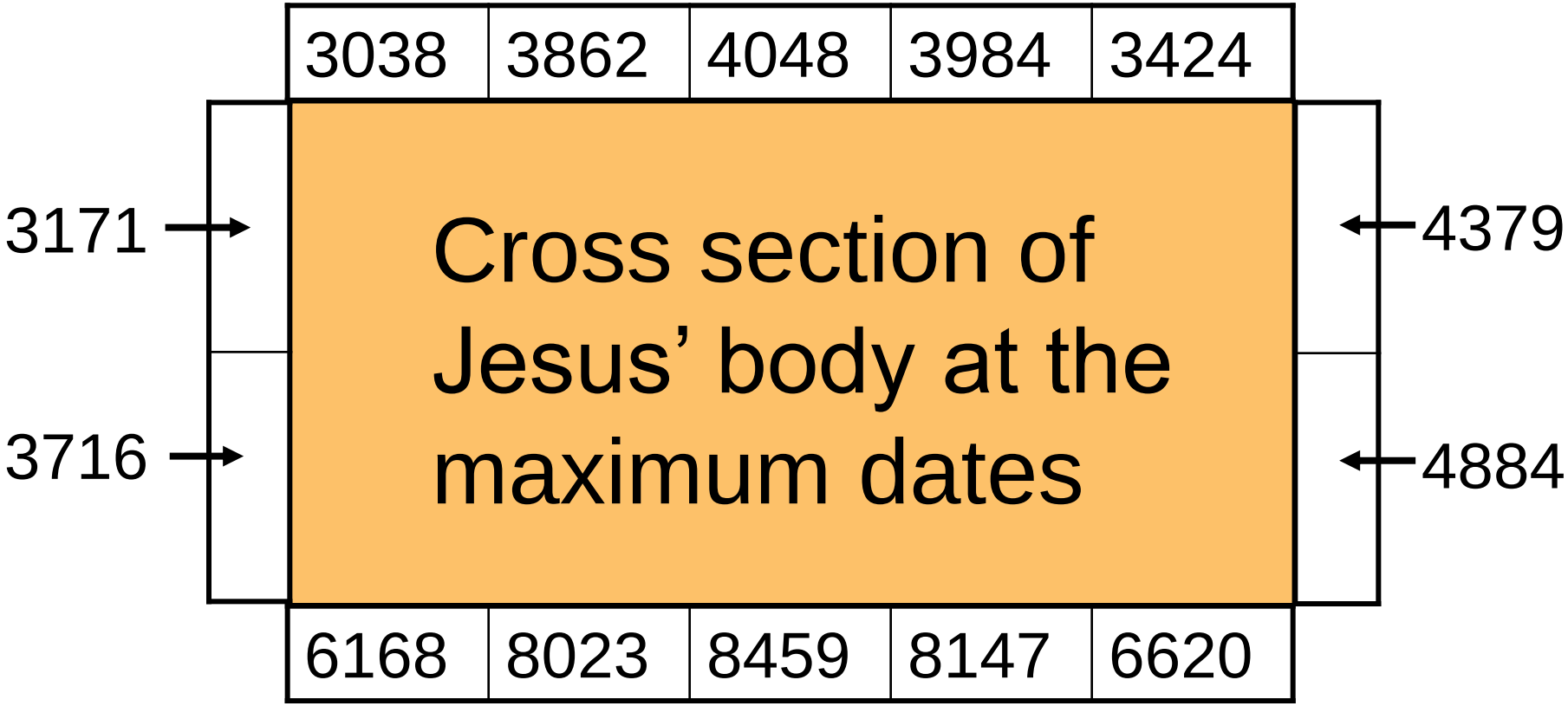
Predicted C^{14} Dates - Left Side of Shroud

Uncorrected C-14 Date (AD), Cases B182-B191							
828	1017	1262	1542	1871	2252	2669	3085
824	1018	1202	1367	1542	1740	1976	2290
875	1086	1272	1436	1638	1841	2075	2408
983	1267	1477	1733	2044	2396	2783	3248
1067	1388	1618	1918	2293	2713	3133	3626
1005	1300	1541	1821	2159	2546	2937	3396
904	1154	1381	1612	1871	2141	2441	2829
866	1110	1363	1613	1884	2204	2590	3089
877	1123	1447	1831	2294	2813	3379	3954
958	1265	1659	2144	2692	3430	4326	5262
1197	1869	2985	4031	4950	5714	6341	6943
1317	2452	4260	5130	5745	6281	6779	7334
1143	1770	2880	3909	4819	5572	6200	6805
894	1136	1454	1853	2320	2997	3841	4760

Predicted C^{14} Dates - Right Side of Shroud

Uncorrected C-14 Date (AD), Cases B182-B191							
3459	3676	3716	3719	3619	2954	2326	1683
2836	3136	3171	3174	3130	2611	2156	1627
2762	3012	3038	3033	2995	2525	2068	1571
3534	3818	3862	3861	3785	3157	2348	1756
3750	3994	4048	4033	3958	3546	3057	2280
3654	3951	3984	3980	3912	3269	2547	1913
3130	3392	3424	3409	3322	2825	2423	1826
3897	4316	4379	4341	4166	3416	2620	1952
4514	4819	4884	4849	4632	3746	2802	2025
6141	6556	6620	6583	6320	4799	2994	2065
7603	8056	8147	8096	7811	5970	3679	2378
7909	8343	8459	8404	8115	6381	4235	2677
7477	7923	8023	7977	7697	5853	3468	2197
5699	6081	6168	6161	5936	4462	2623	1789

Predicted C^{14} Dates (AD)
Around the Body



C^{14} Dates Above Left Bench

Cases B182-B191

581	637	693	754	838
557	601	638	682	747
532	569	599	627	679
506	543	566	588	630
486	514	536	554	588
458	490	504	523	546
442	466	480	494	516
419	441	455	468	491
405	423	434	444	465
384	408	416	425	447
371	393	401	412	426
356	374	385	393	411
343	363	372	383	402
322	344	359	370	391

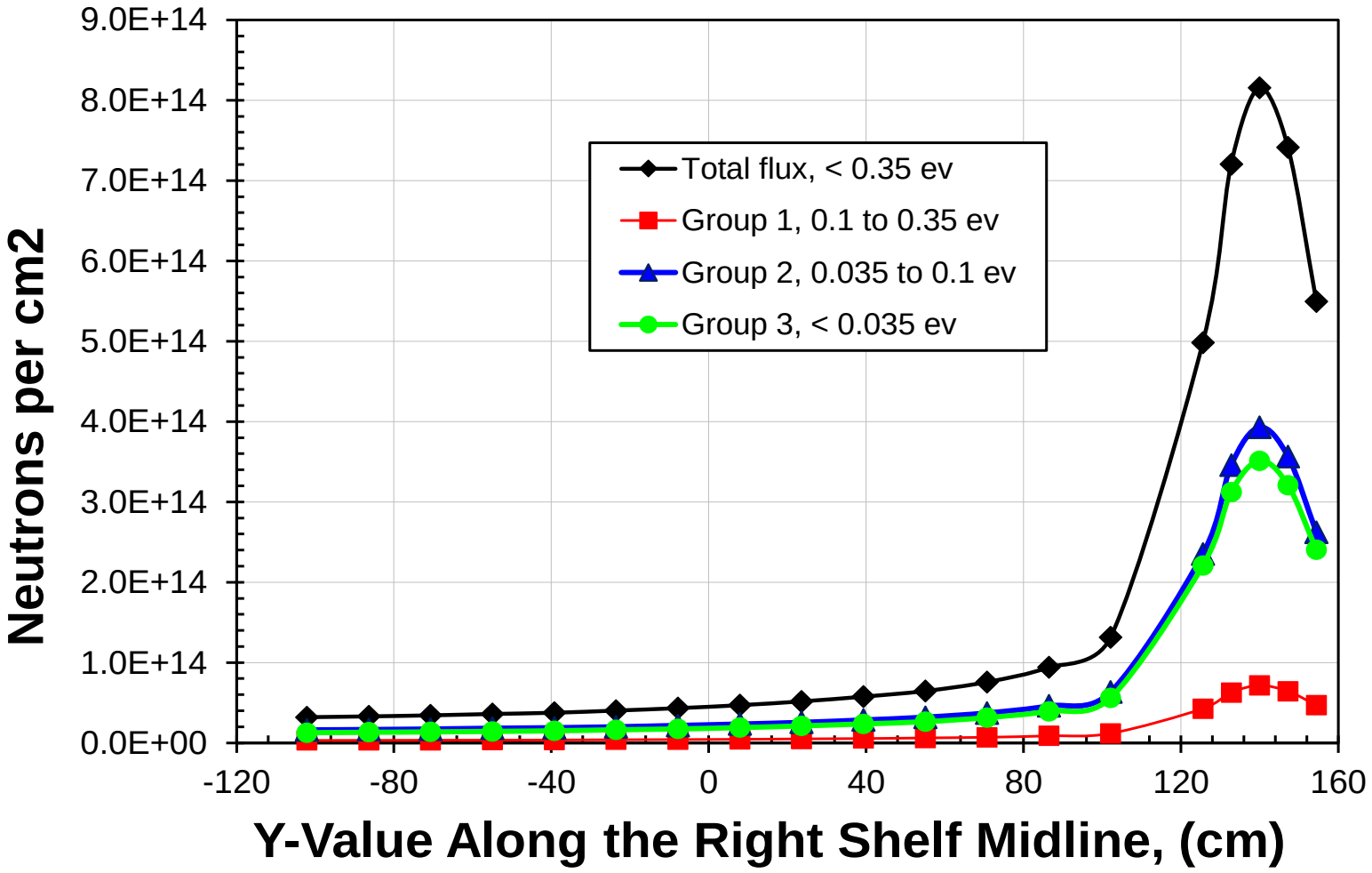
C^{14} Dates Above Right Bench

Cases B182-B191

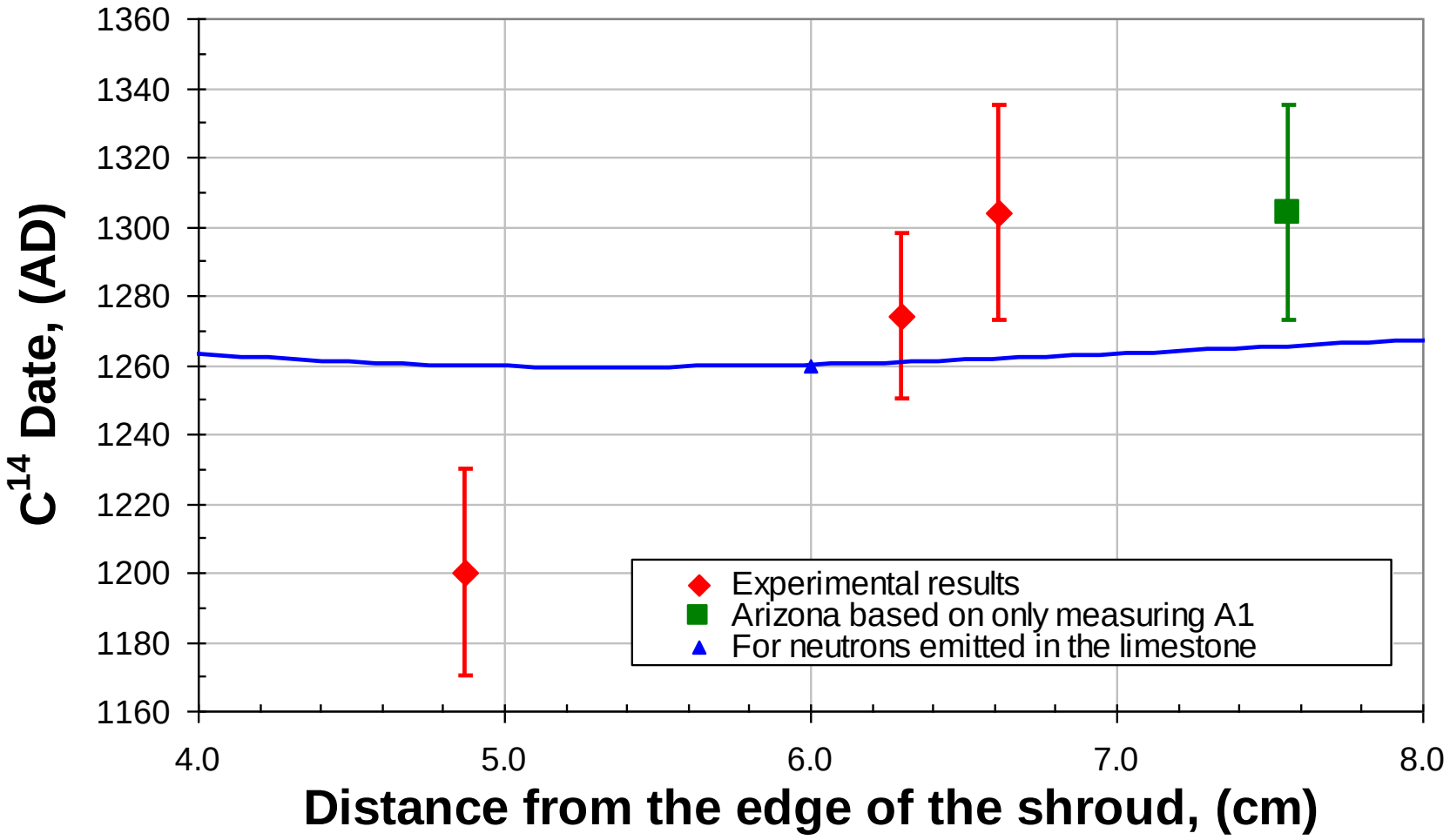
1507	1364	1200	1060	925
1095	1022	947	876	802
888	843	803	760	700
764	734	704	678	636
680	660	640	616	577
619	599	579	562	534
568	550	533	520	490
522	508	496	485	459
491	478	464	455	429
460	448	439	429	411
440	432	420	409	391
424	411	401	392	374
410	398	387	376	356
401	387	374	357	333

Neutron Distribution Along the Midline of the Right Shelf

(Cases B182-B191)



Calculated C^{14} Date Curve for Neutron Emission in the Limestone



Right Side Bench for Neutrons Emitted in Limestone

1255	1287	1232	1239	1272
1256	1270	1229	1210	1224
1223	1222	1249	1247	1237
1219	1251	1249	1254	1257
1236	1256	1228	1270	1246
1291	1259	1226	1254	1243
1271	1227	1241	1225	1221
1236	1212	1220	1246	1233
1243	1227	1244	1245	1265
1233	1174	1240	1215	1264
1180	1216	1217	1260	1260
1221	1228	1261	1238	1267
1250	1242	1226	1243	1279
1245	1251	1264	1263	1251

For Neutrons Emitted in Limestone

- Depending on energy of the neutrons, 8.0 to 9.0 x 10^{11} neutrons/cm^3 must be emitted in the limestone to produce a 1260 AD date in the sample region
- The calculated C^{14} date curve does not match the sample dates
- Side benches do not contain a 700 AD date for the Sudarium.

Where Were Neutrons Emitted?

- In the body
- Not in the limestone

Summary

The nuclear analysis computer code MCNP was used to show that if 3.04×10^{18} neutrons were released at random locations in Jesus' body, either prior to or during the disappearance of the body, it explains three things:

- The incorrect C^{14} date for the shroud
- The slope of C^{14} dates across samples
- The incorrect C^{14} date for the face cloth

Summary

- Explaining these three things by one hypothesis (neutrons were released from Jesus' body in the tomb) is strong evidence that the hypothesis is true.
- But additional sampling and testing is required to prove that the hypothesis is true.

Summary

- If the MCNP predictions are validated by testing, it would:
  - Prove that neutrons were released from Jesus' body in the tomb
  - Invalidate the conclusion of the C^{14} dating: the SOT is from the middle ages
  - Indicate that the SOT is circumstantial evidence for Jesus' resurrection