

Nov. 1968

345 Whitney Avenue
New Haven, Connecticut 06511
203 624-2566

American Scientist

9 October 1974

Dr. Elizabeth K. Ralph
Museum Applied Science Center for
Archaeology
University Museum
University of Pennsylvania
Philadelphia, PA 19174

Dear Dr. Ralph:

We are returning the art work and negative
for Fig. 2 from your paper on radiocarbon
dating. I believe we are not holding any
more material used in your article.

Sincerely,

Suzanne Gautot

Suzanne Gautot
Editorial Assistant

Enclosure

THE UNIVERSITY MUSEUM
UNIVERSITY OF PENNSYLVANIA
THIRTY-THIRD AND SPRUCE STREETS
PHILADELPHIA 4, PENNSYLVANIA

EXTRA SETS OF GLOSSY PRINTS
AND XEROXES FOR

RALPH-MICHAEL :

CORRECTION FACTORS APPLIED TO
RADIOCARBON DATES

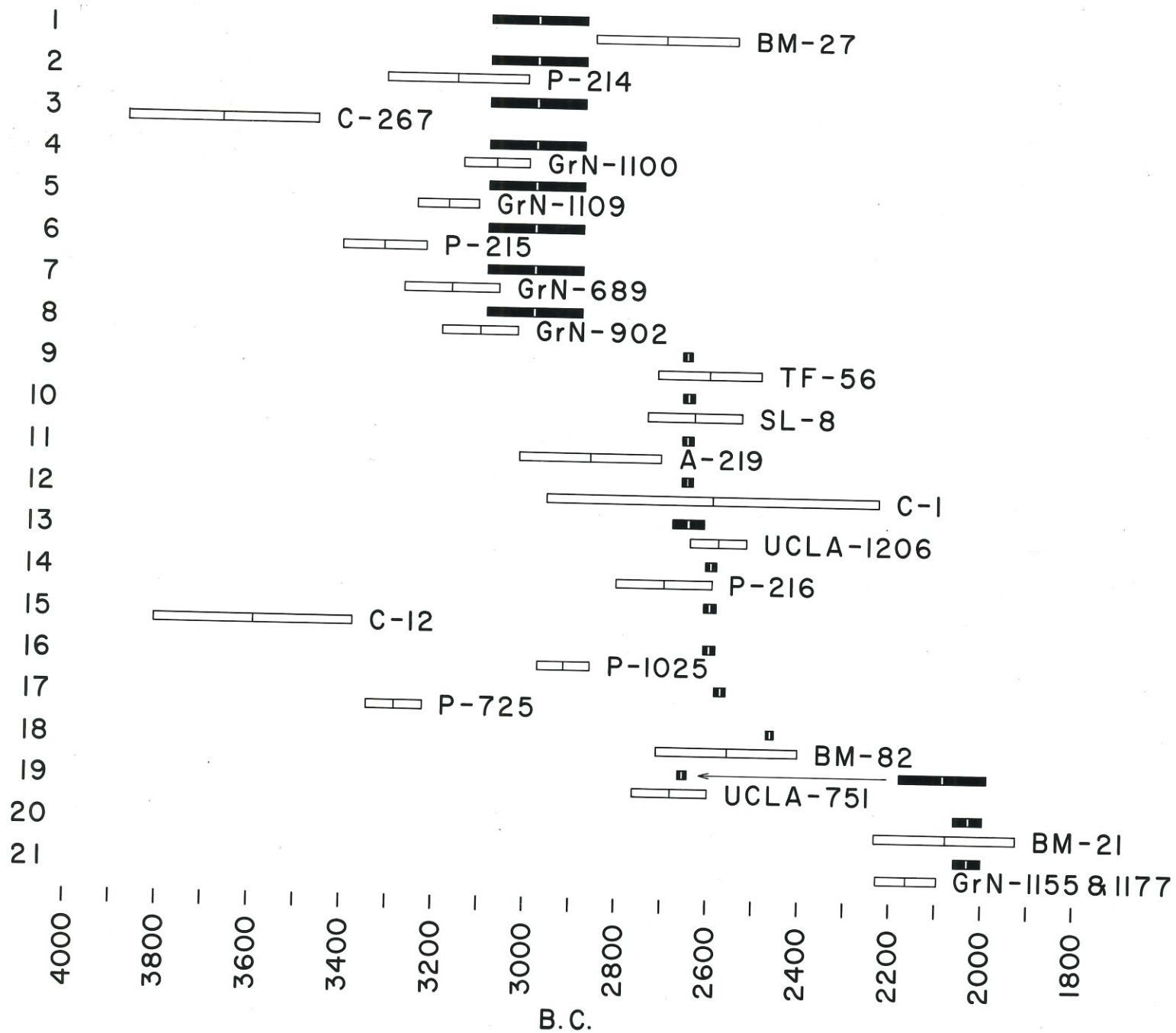
Table I - Correction factor

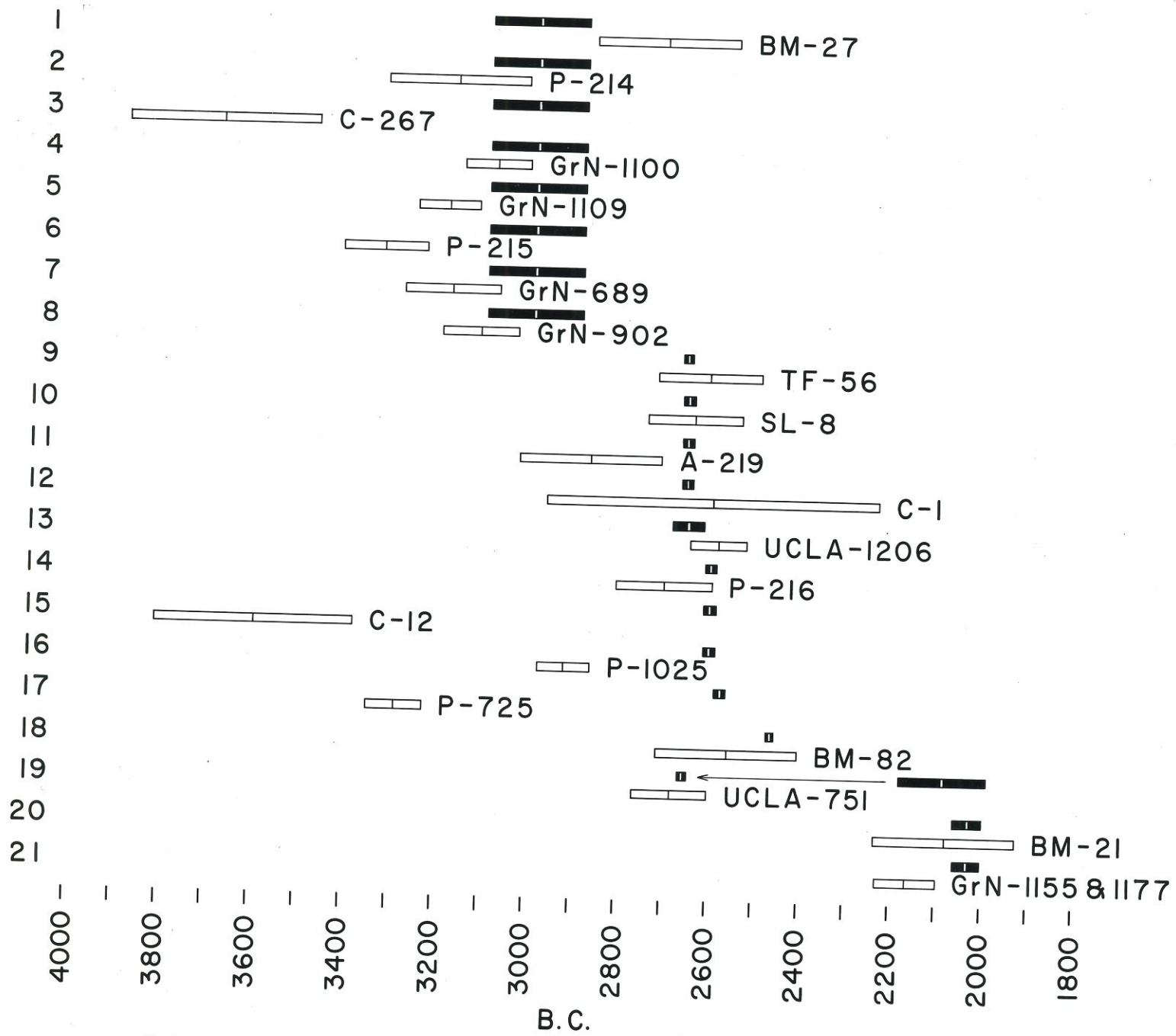
Fig. 1 - Sequoia - bristlecone C-14 vs. dendro,
(Fig. 1a - original & revised) mill. B.C.,

Fig. 2 - short-lived

Fig. 3 - long-lived (2nd mill. B.C.,)

Fig. 4 - " " (2nd & 1st mill. B.C.)





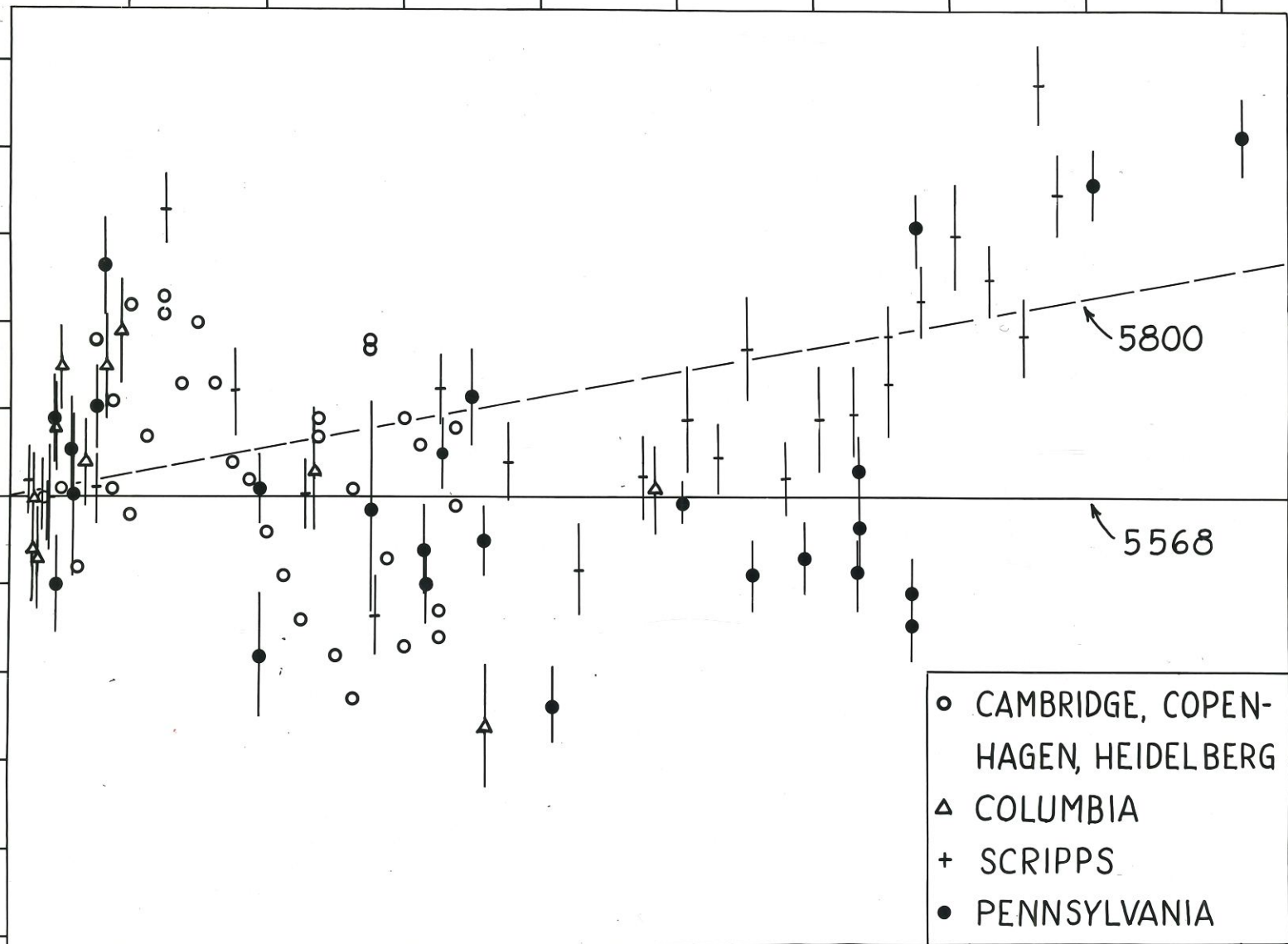
TREE-RING DATED SAMPLES

A.D. YEARS B.C.

1600 1200 800 400 0 400 800 1200 1600

PERCENTAGE DEVIATION FROM LABORATORY STANDARDS

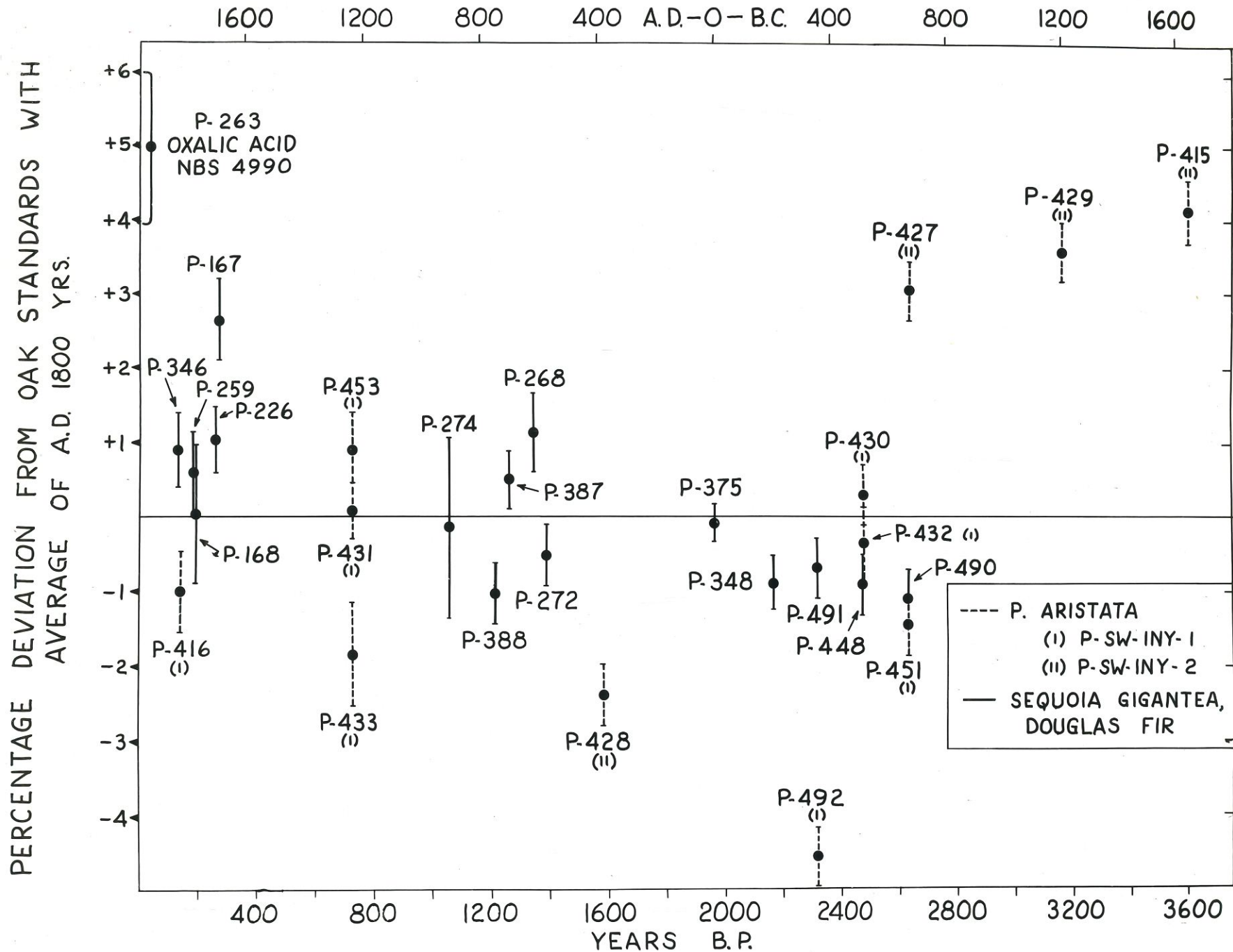
+5
+4
+3
+2
+1
0
-1
-2
-3
-4
-5

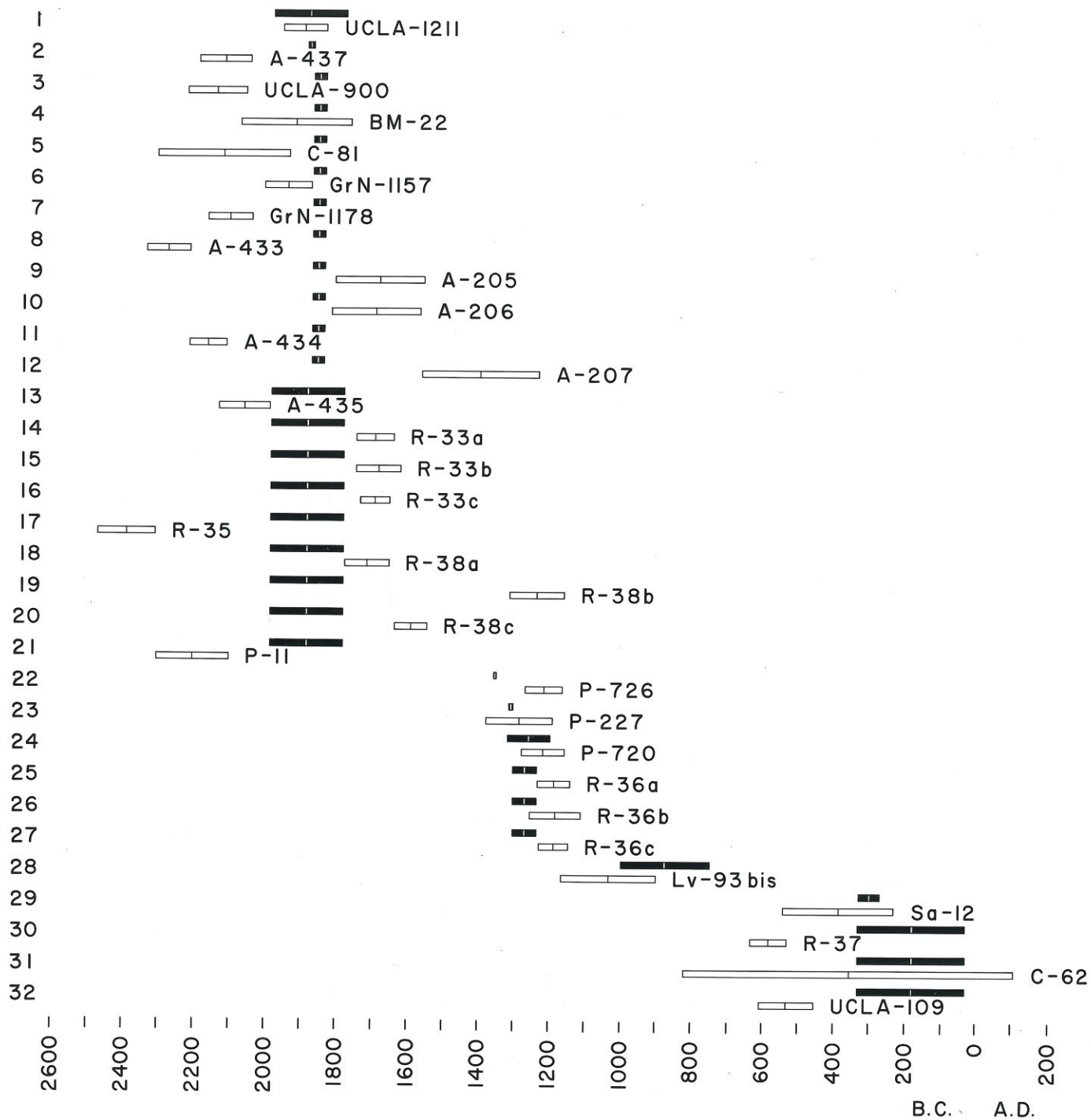


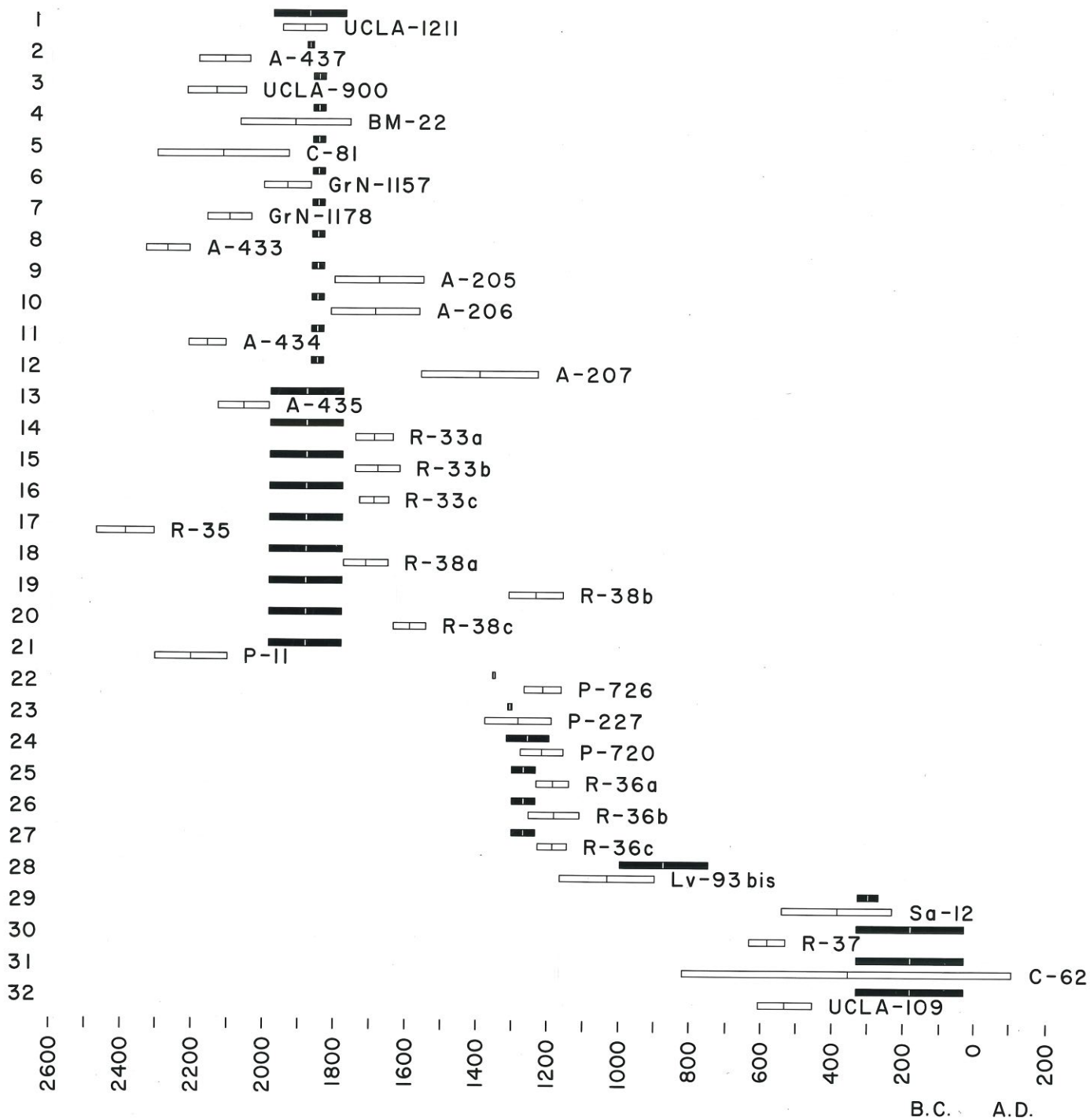
- CAMBRIDGE, COPENHAGEN, HEIDELBERG
- △ COLUMBIA
- + SCRIPPS
- PENNSYLVANIA

400 800 1200 1600 2000 2400 2800 3200 3600
YEARS B.P.

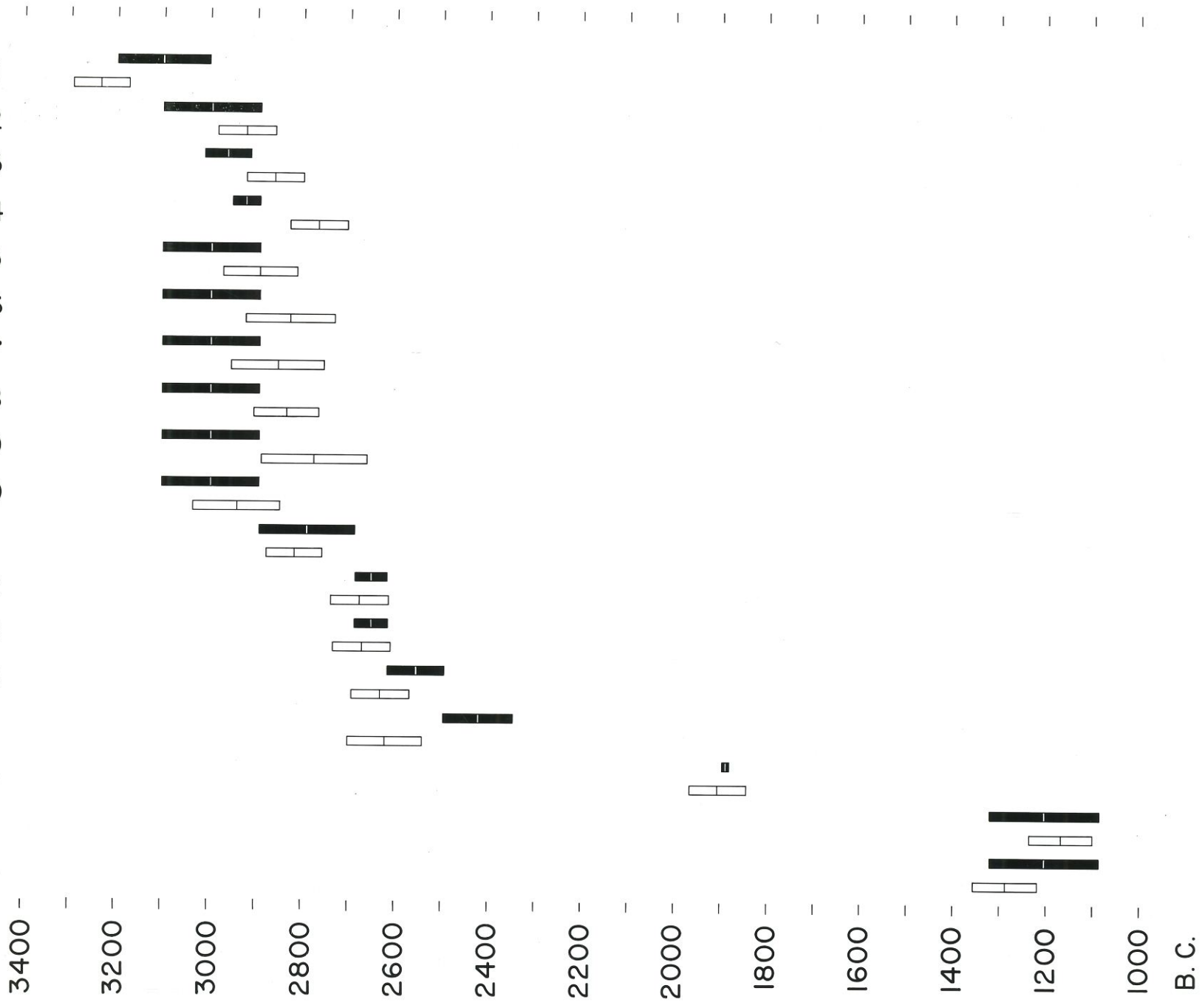
PENNSYLVANIA TREE-RING DATED SAMPLES

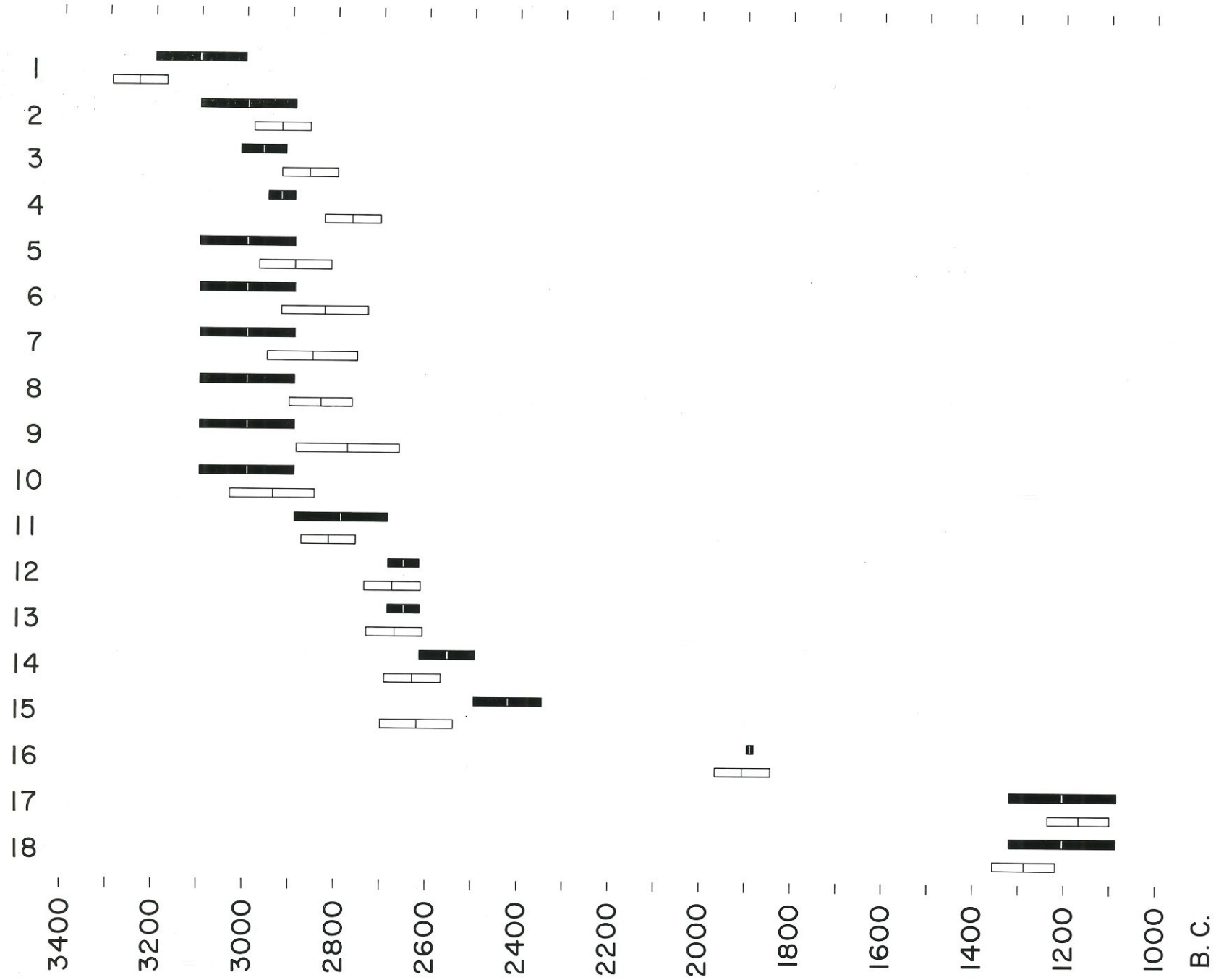






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Aug. 1973

C¹⁴ - Dendro-date graph, A.D. 600-600 B.C.

1) negative

2) glossy print

Remark: Used in MASCA Newsletter, Aug, 1973.

N.B. - not coordinated for composite graph.

Aug. 1973

C-14 Dendro-date graph, A.D. 1850-600

- 1) negative
- 2) glossy print [not found]

Remark: Used in MASCA Newsletter, Aug. 1973 (Fig.)

N.B. - not coordinated for composite graph (q.v)

Aug. 1973

C^{14} -Dendro-date graph 600-1800 B.C.

1) negative

2) glossy print

Remark: Used in MASCA Newsletter, Aug. 1973.

N.B. - not coordinated for composite graph.

Aug. 1973

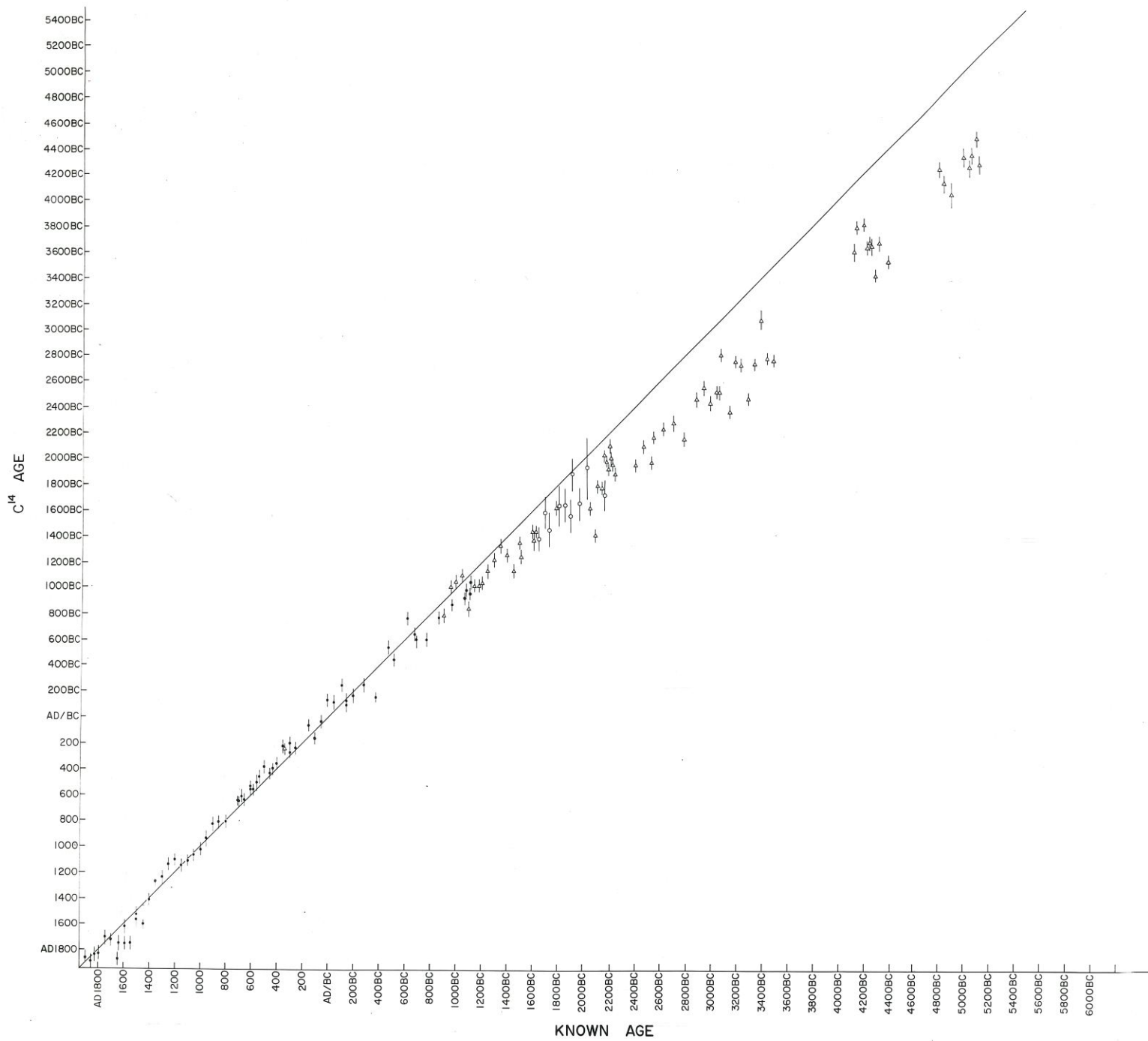
C-14 - Dendro-date graph, 1800-3600 B.C.

1) negative

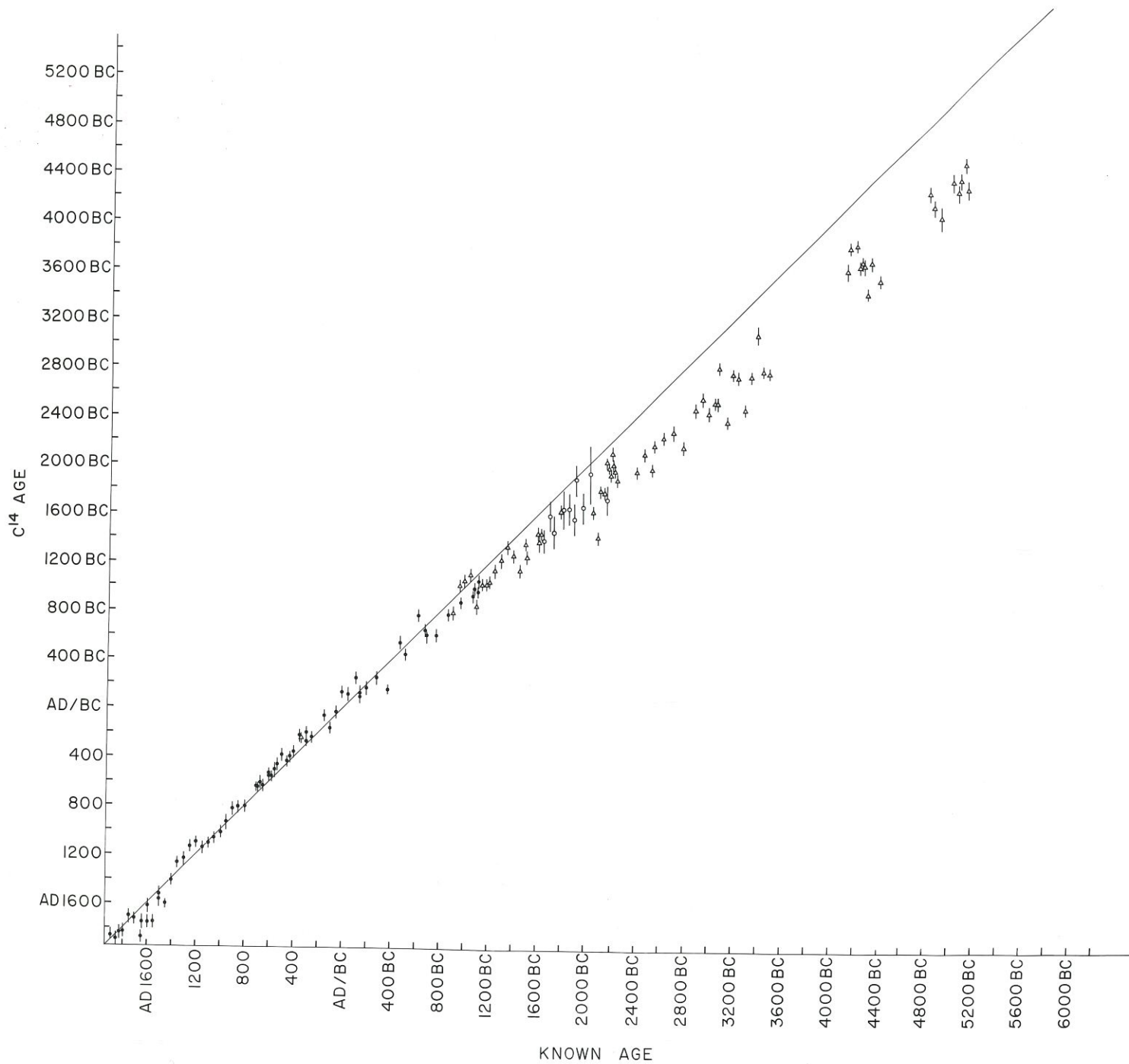
2) glossy

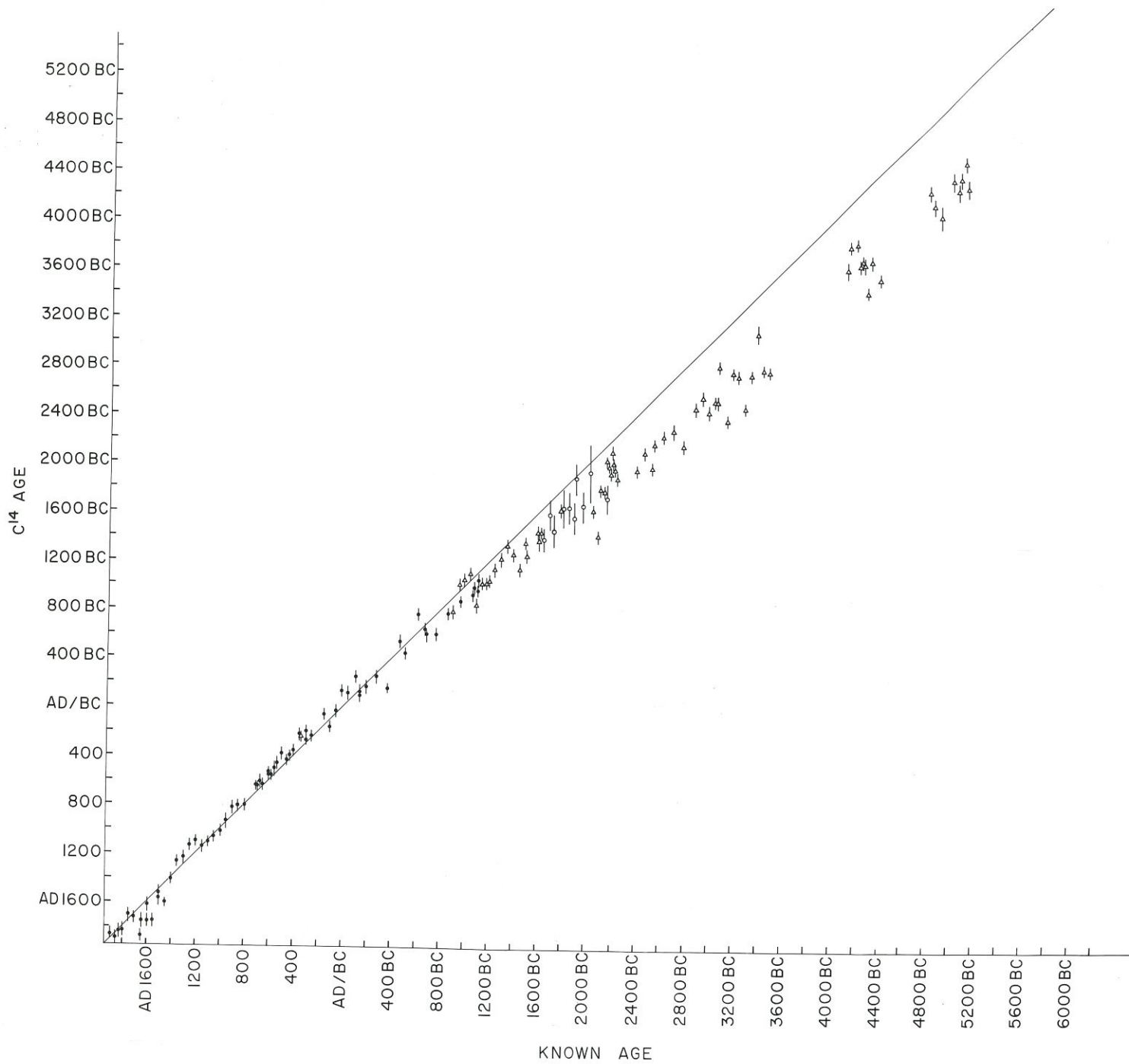
Remarks: Used in MASCA Newsletter, Aug. 1973

N.B. not coordinated for composite graph.



Nov. 1968





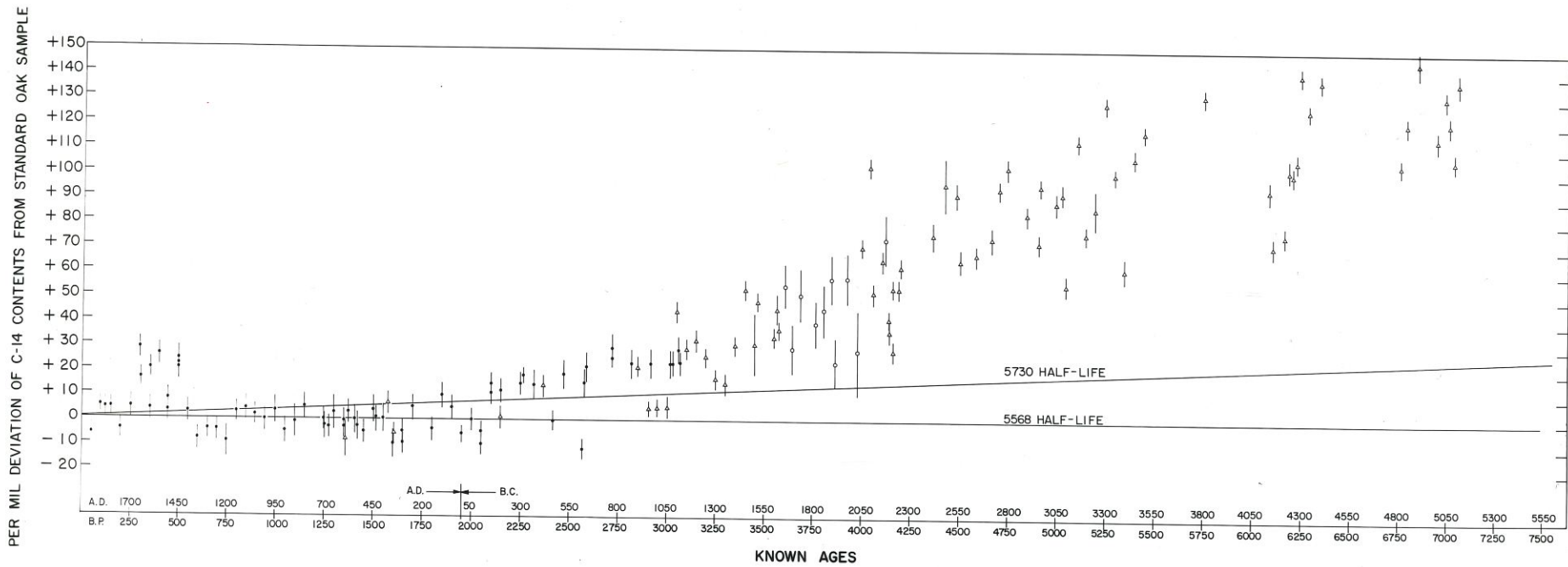


Fig. 1

PER MIL DEVIATION OF C-14 CONTENTS FROM STANDARD OAK SAMPLE

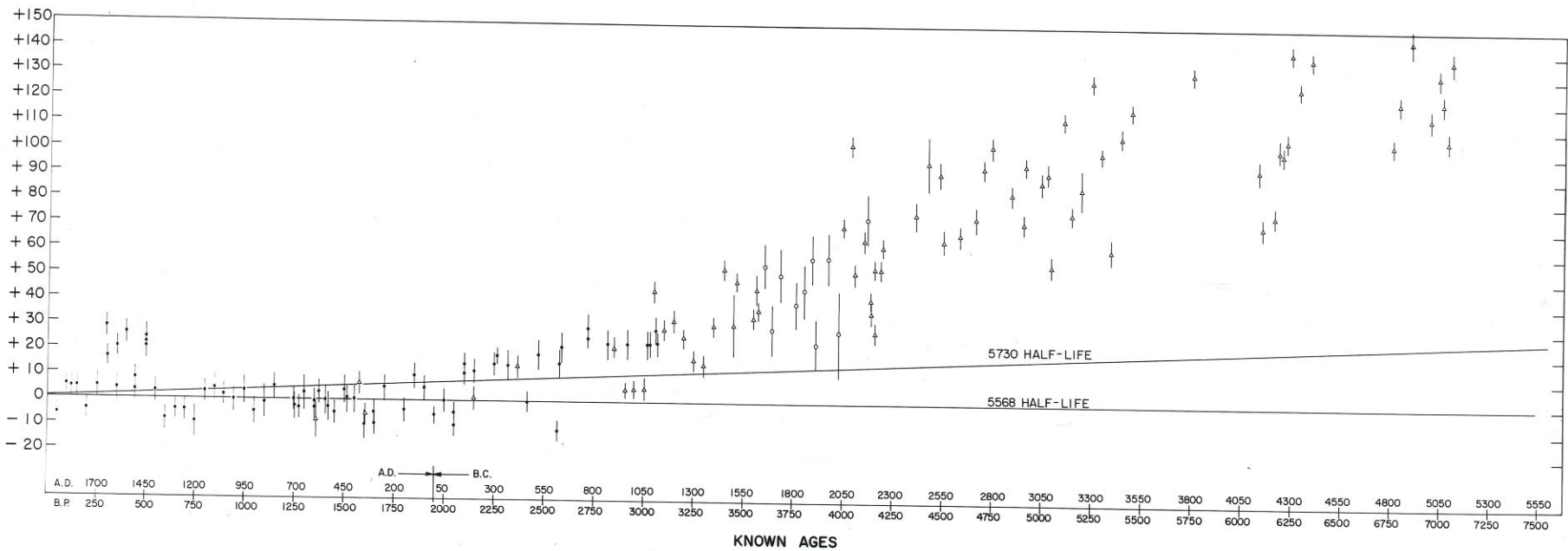
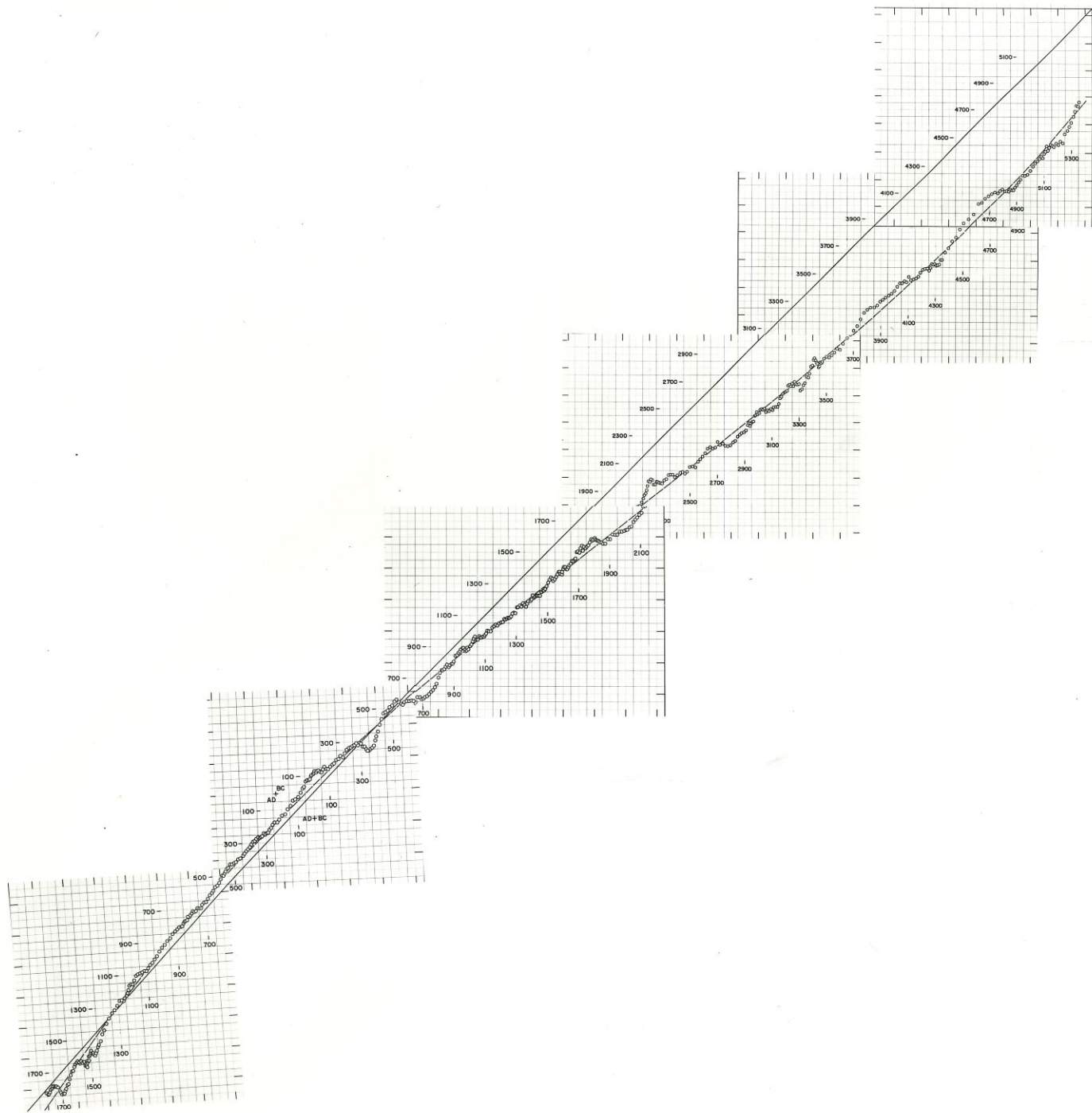
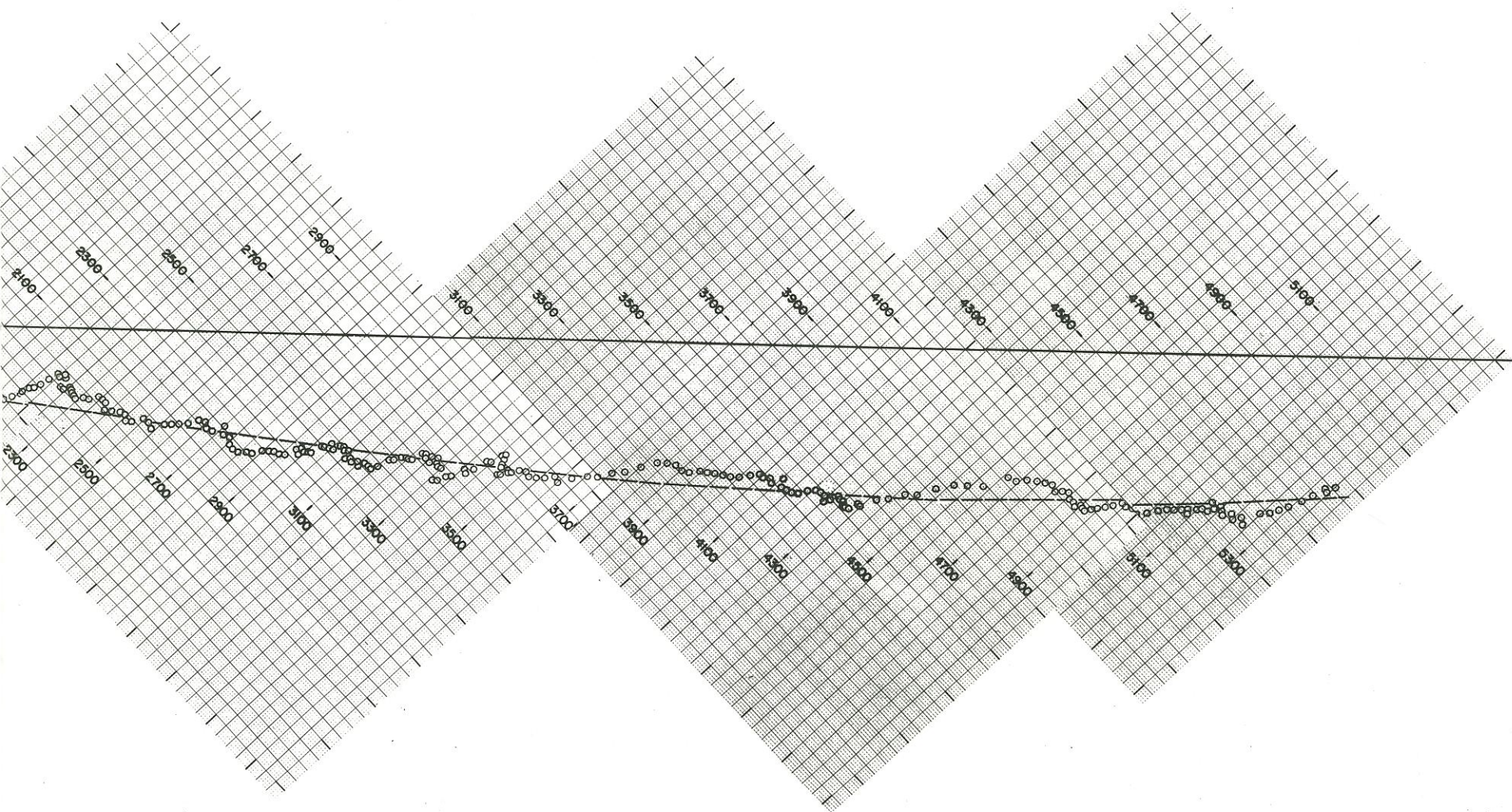


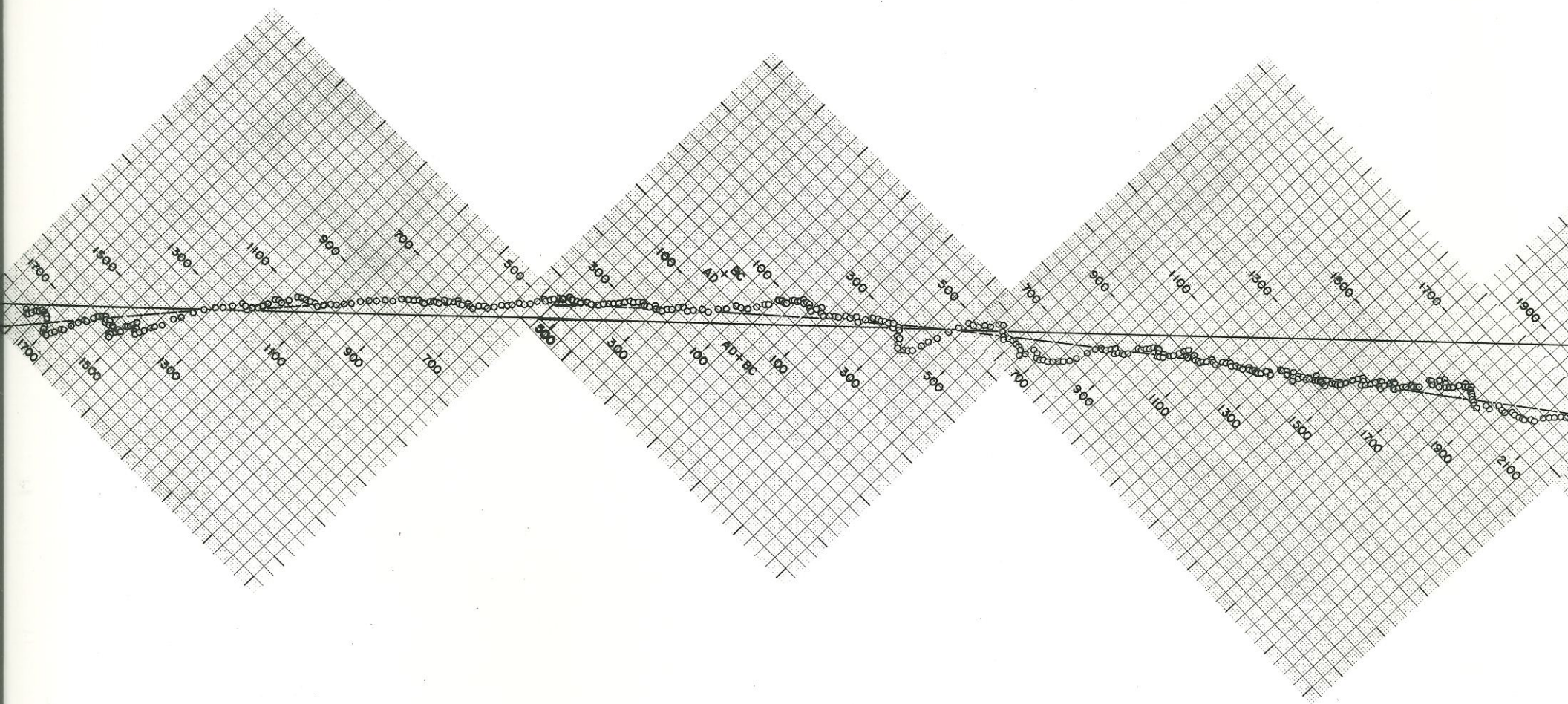
Fig. 1

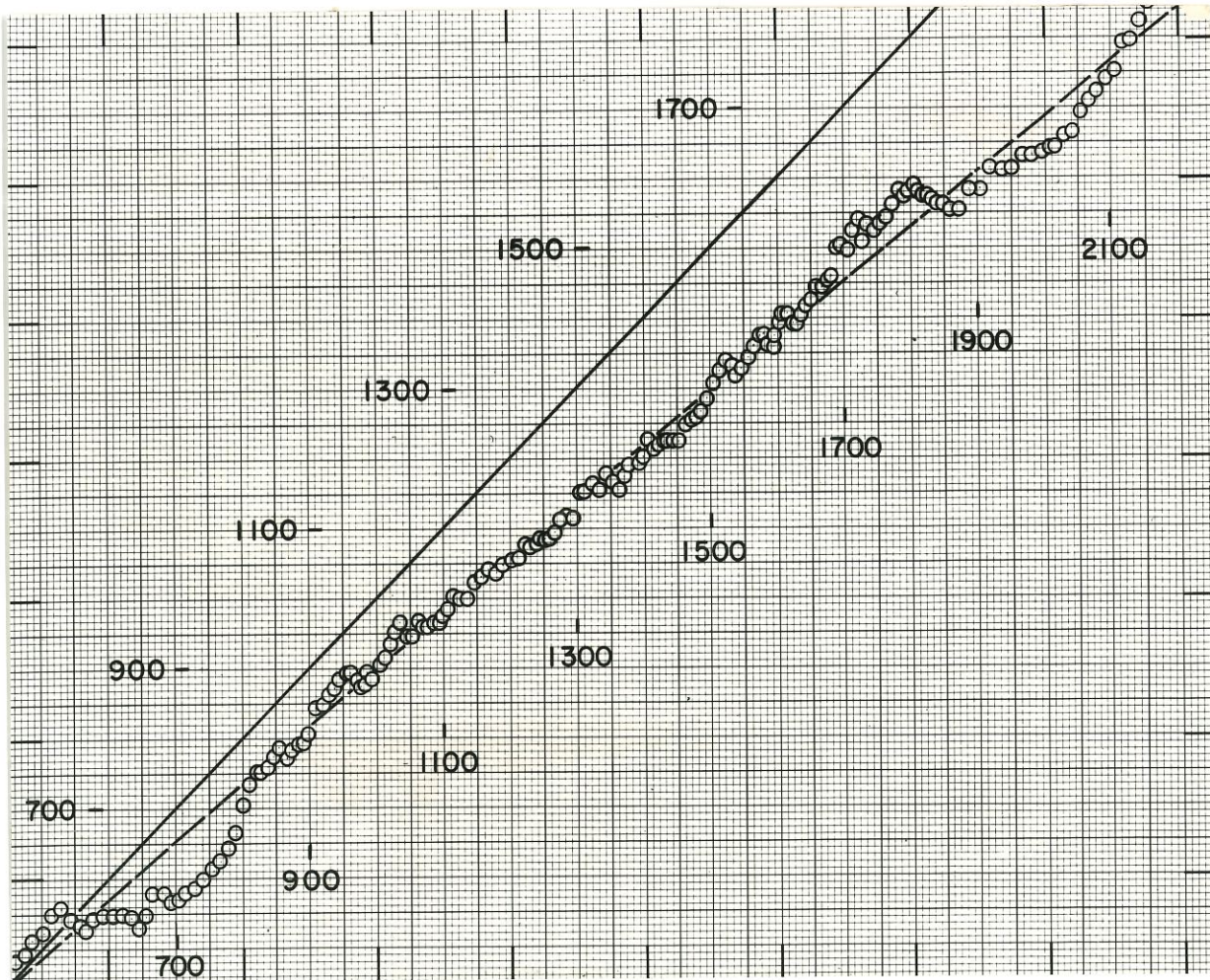
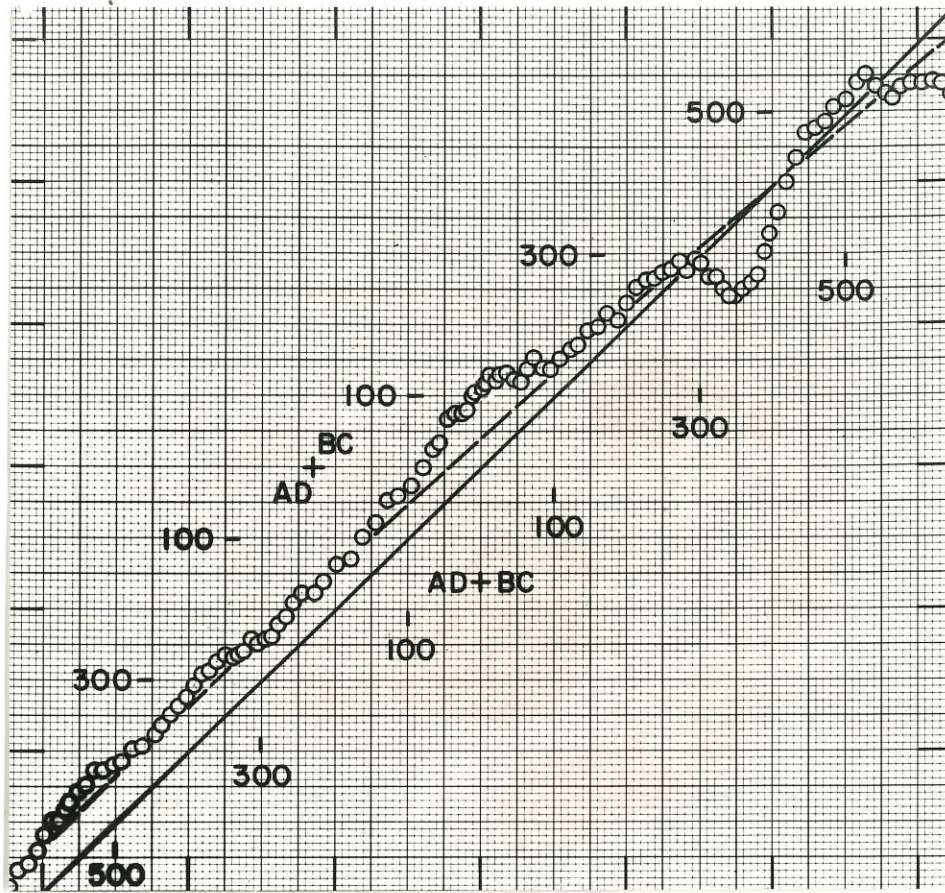


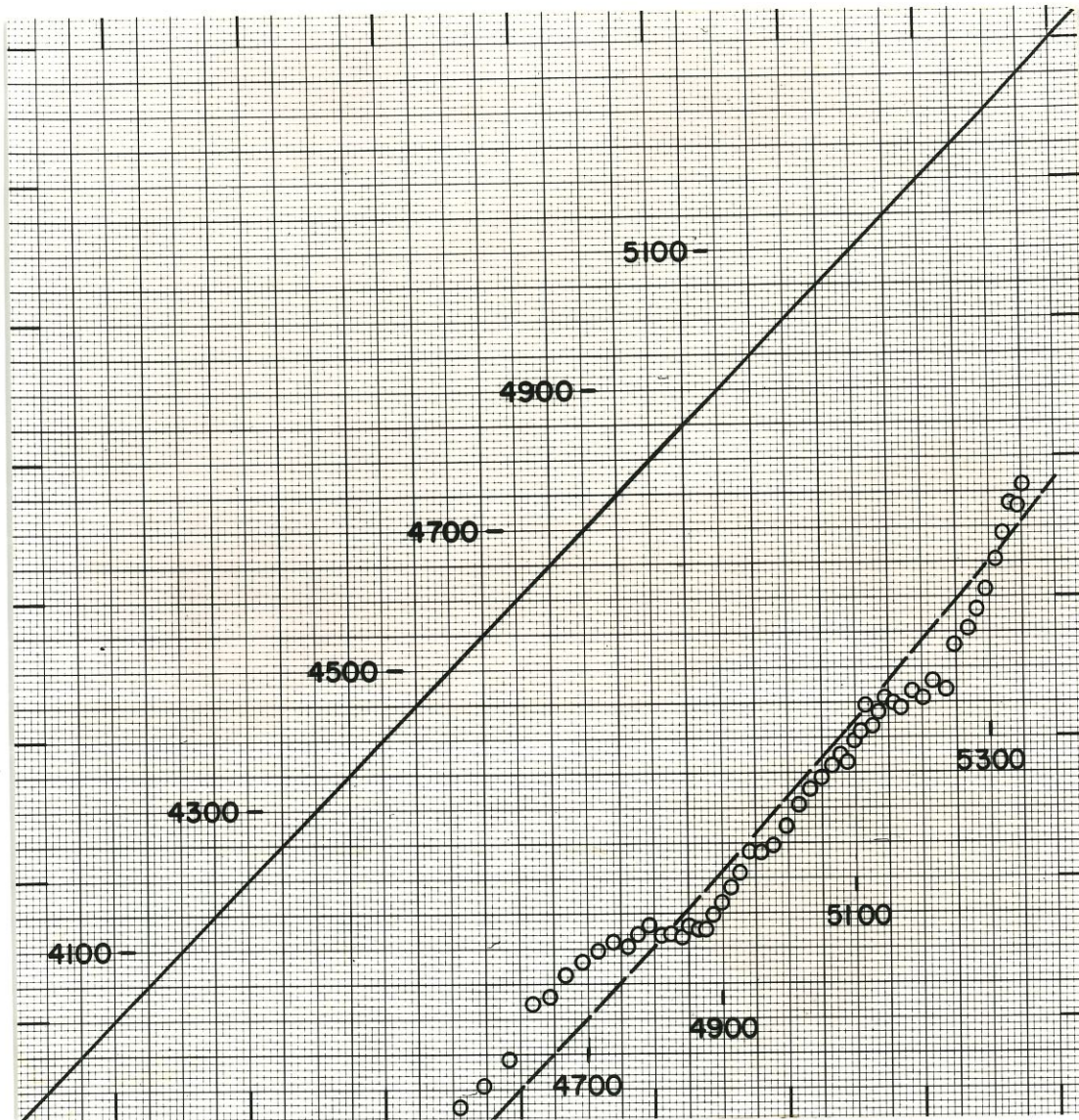
MASCA Newsletter 9(1) 1973

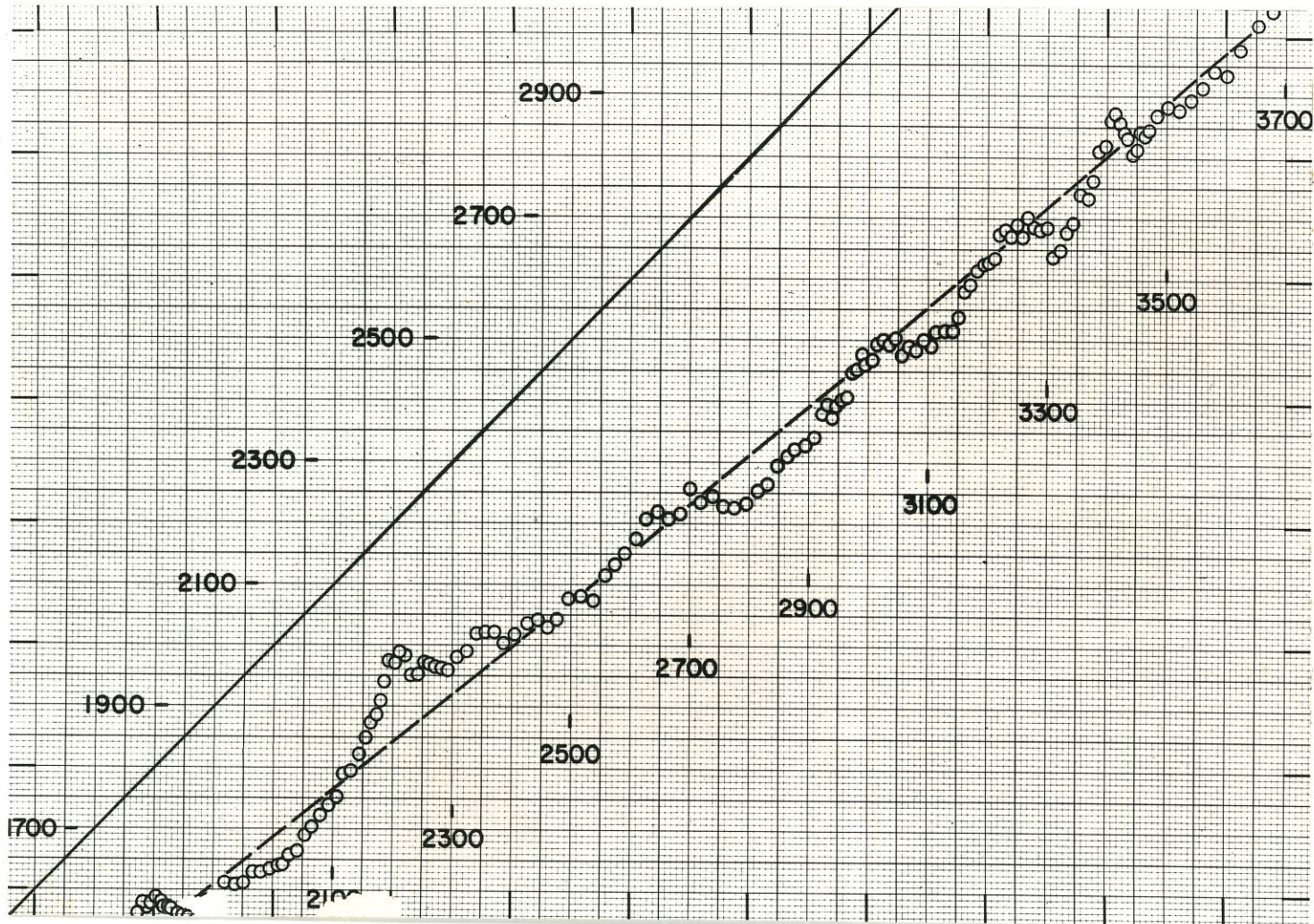
C-14 vs Dendrodates

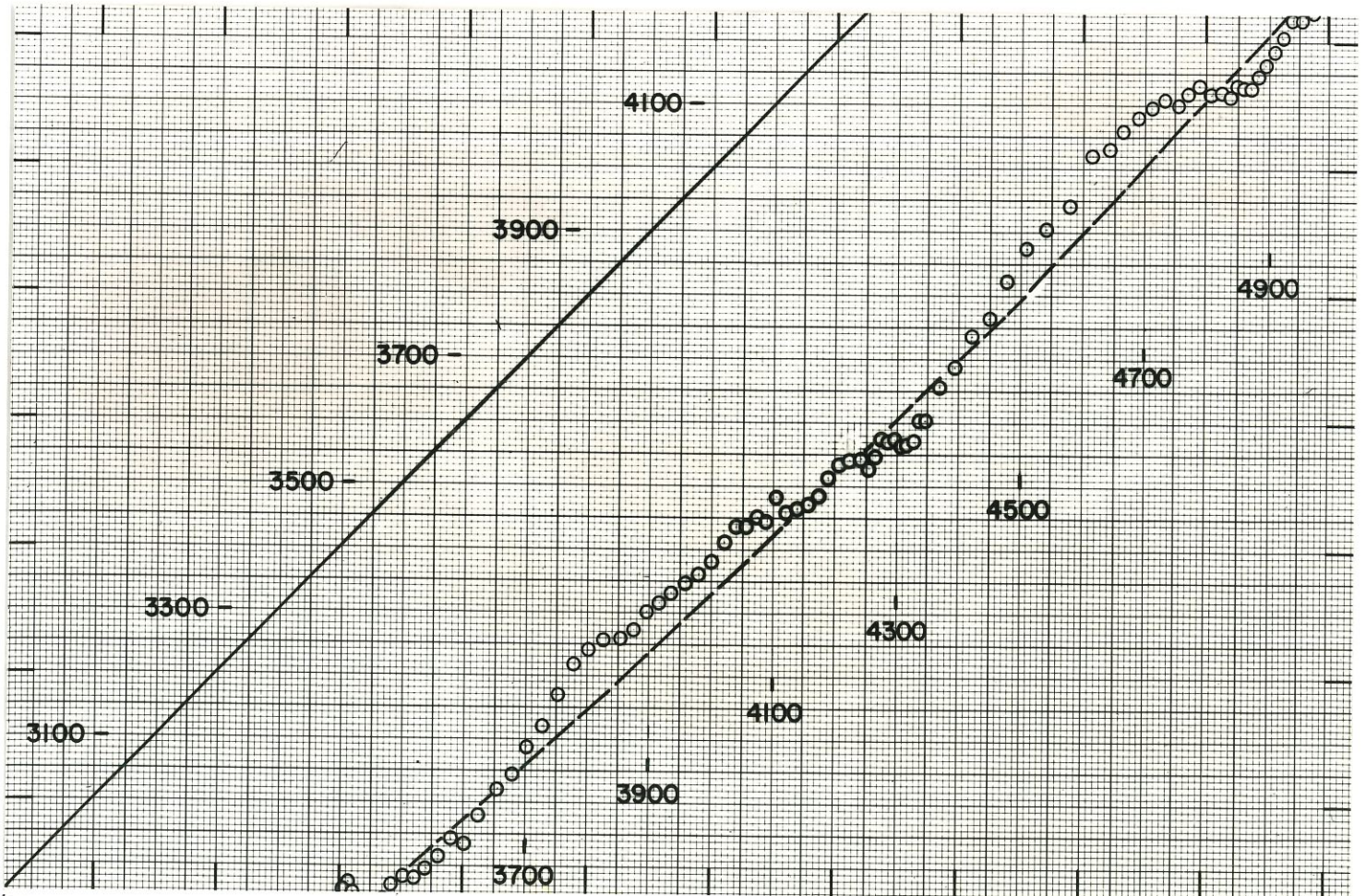
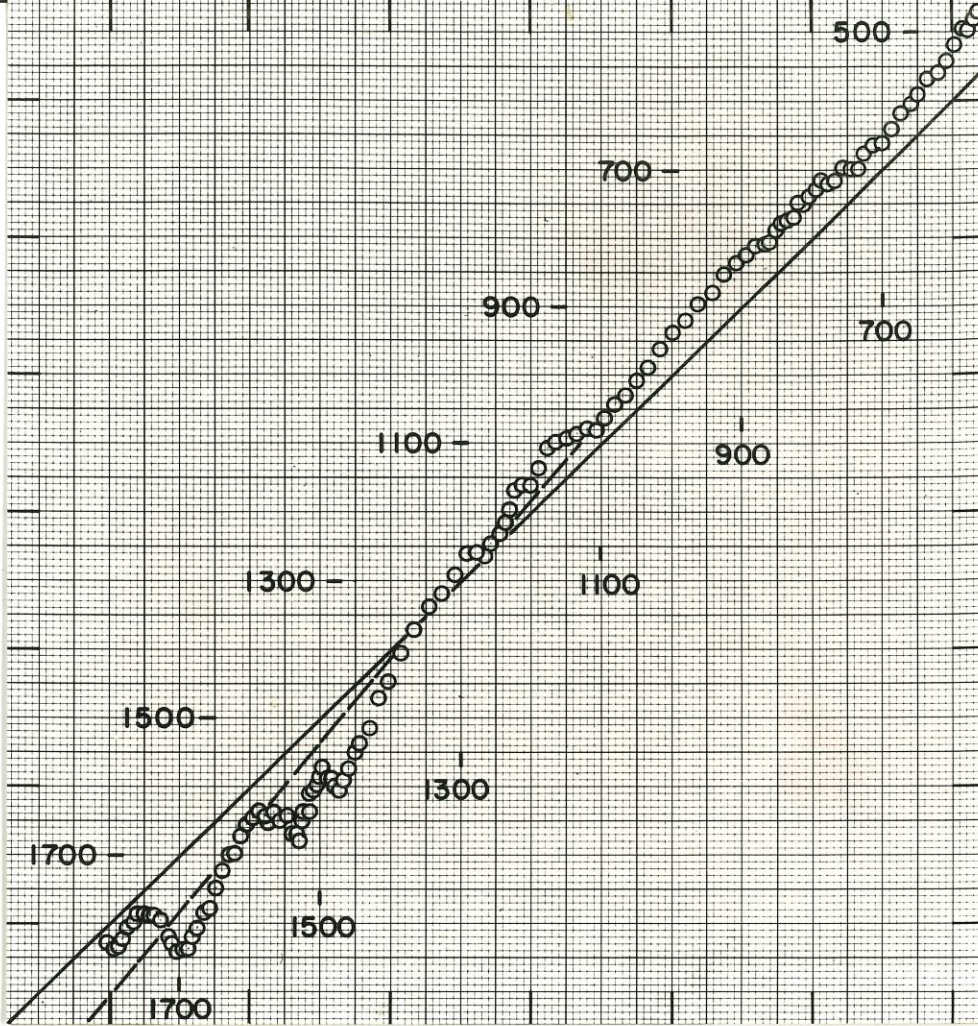










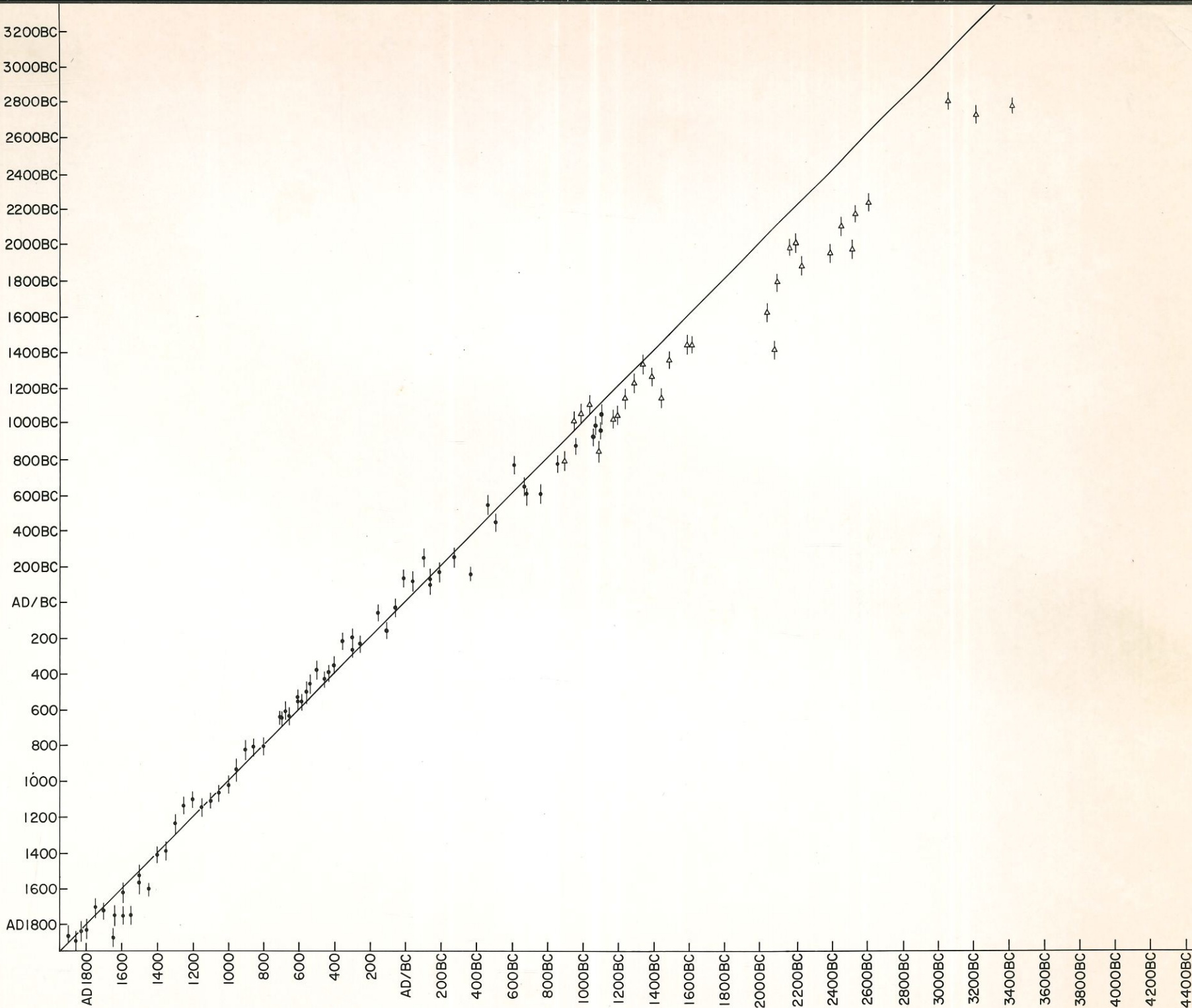


C¹⁴ AGE

3200BC
3000BC
2800BC
2600BC
2400BC
2200BC
2000BC
1800BC
1600BC
1400BC
1200BC
1000BC
800BC
600BC
400BC
200BC
AD/BC
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600
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1000
1200
1400
1600
AD1800

AD1800 1600 1400 1200 1000 800 600 400 200 AD/BC 200BC 400BC 600BC 800BC 1000BC 1200BC 1400BC 1600BC 1800BC 2000BC 2200BC 2400BC 2600BC 2800BC 3000BC 3200BC 3400BC 3600BC 3800BC 4000BC 4200BC 4400BC

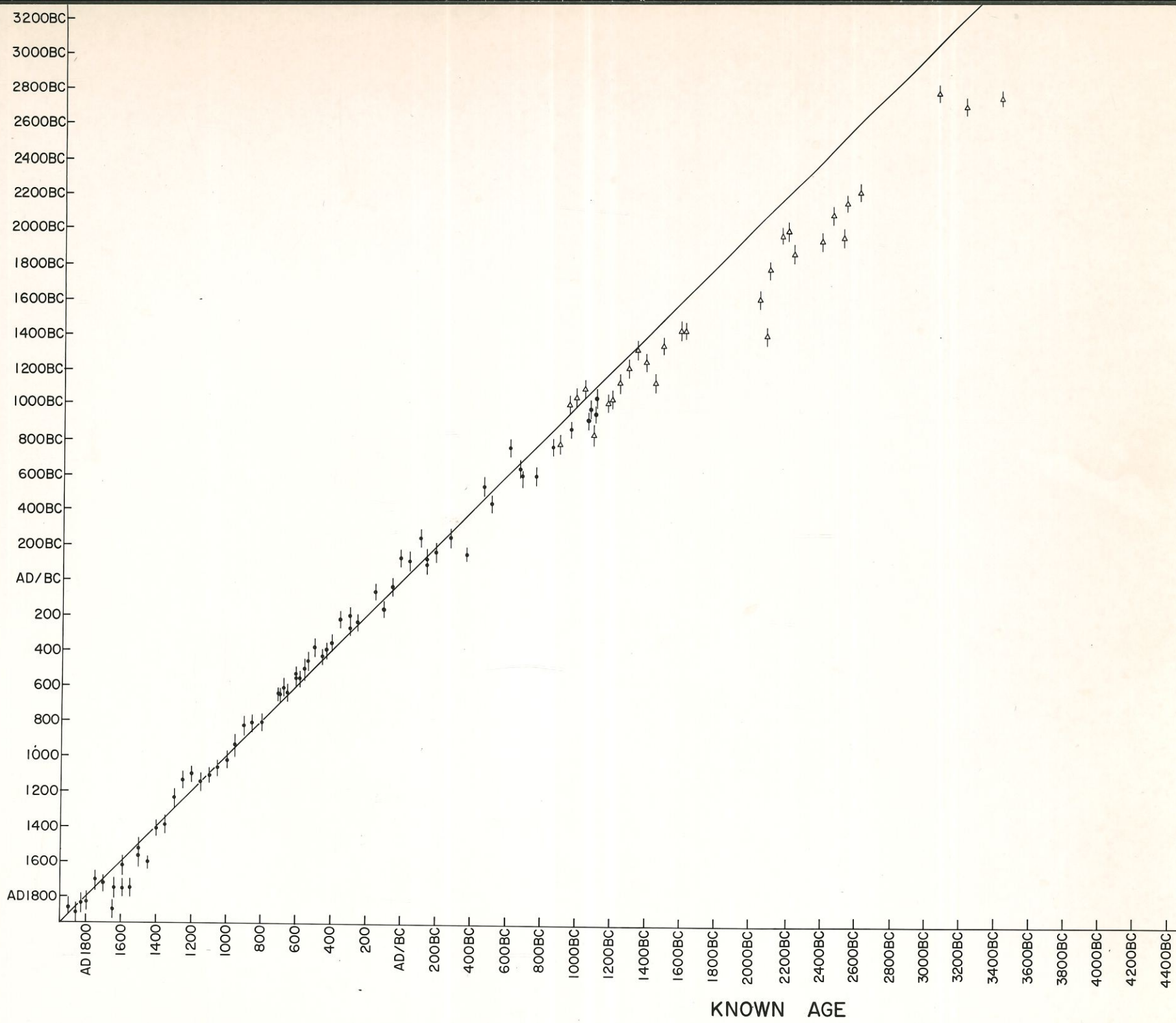
KNOWN AGE



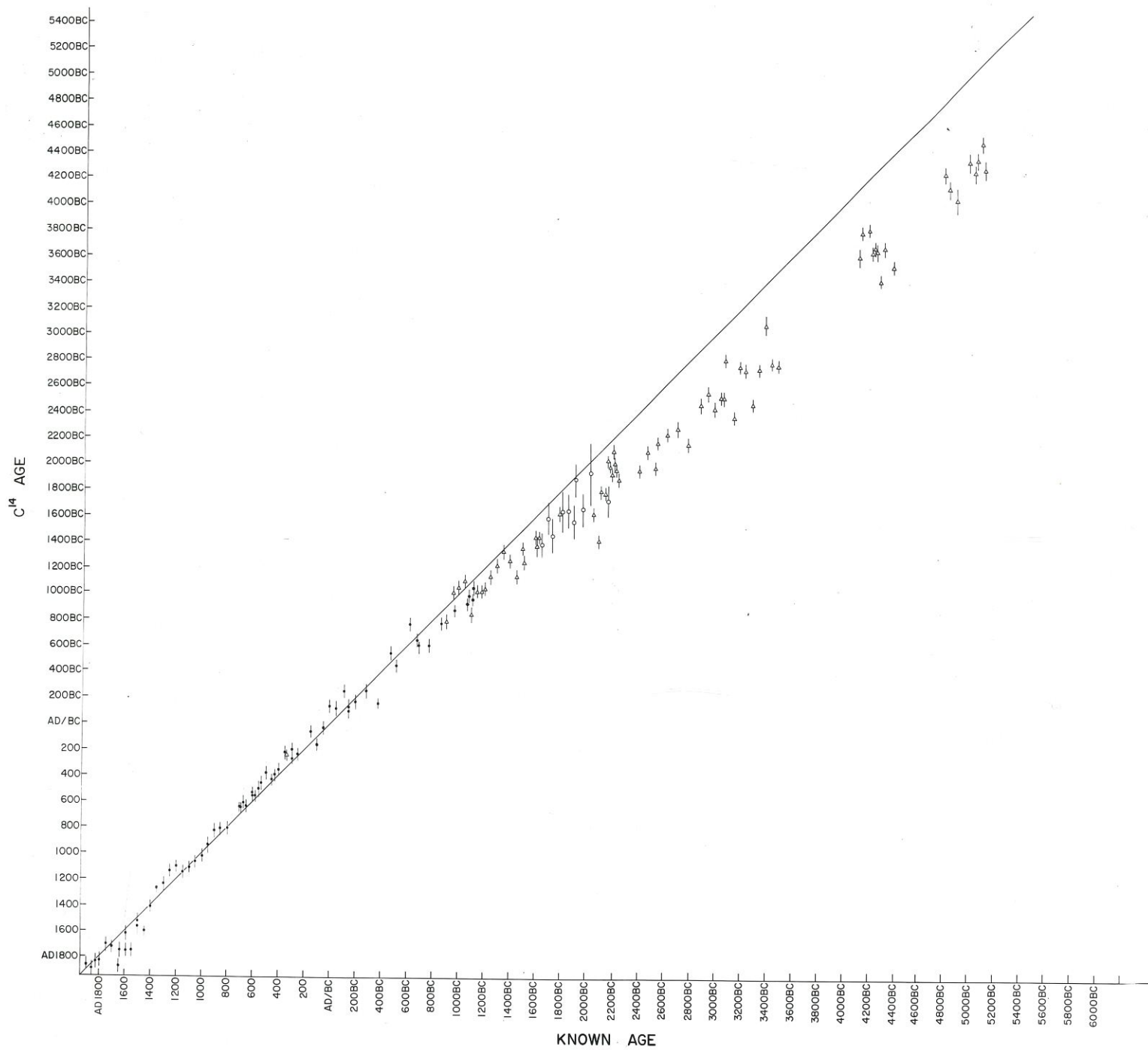
April 1967

Fig 4 — to be replaced
by up-to-date one

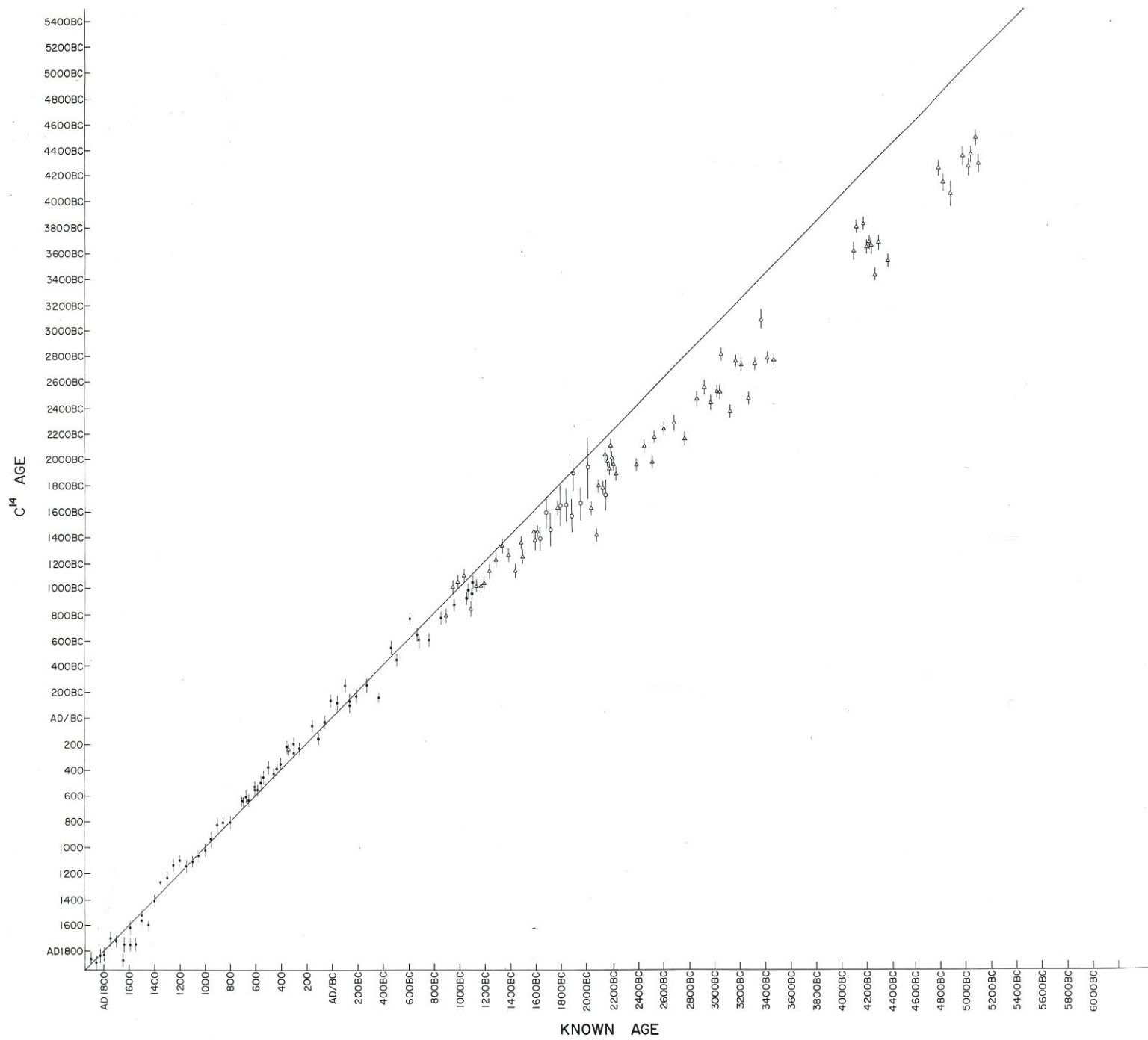
C¹⁴ AGE

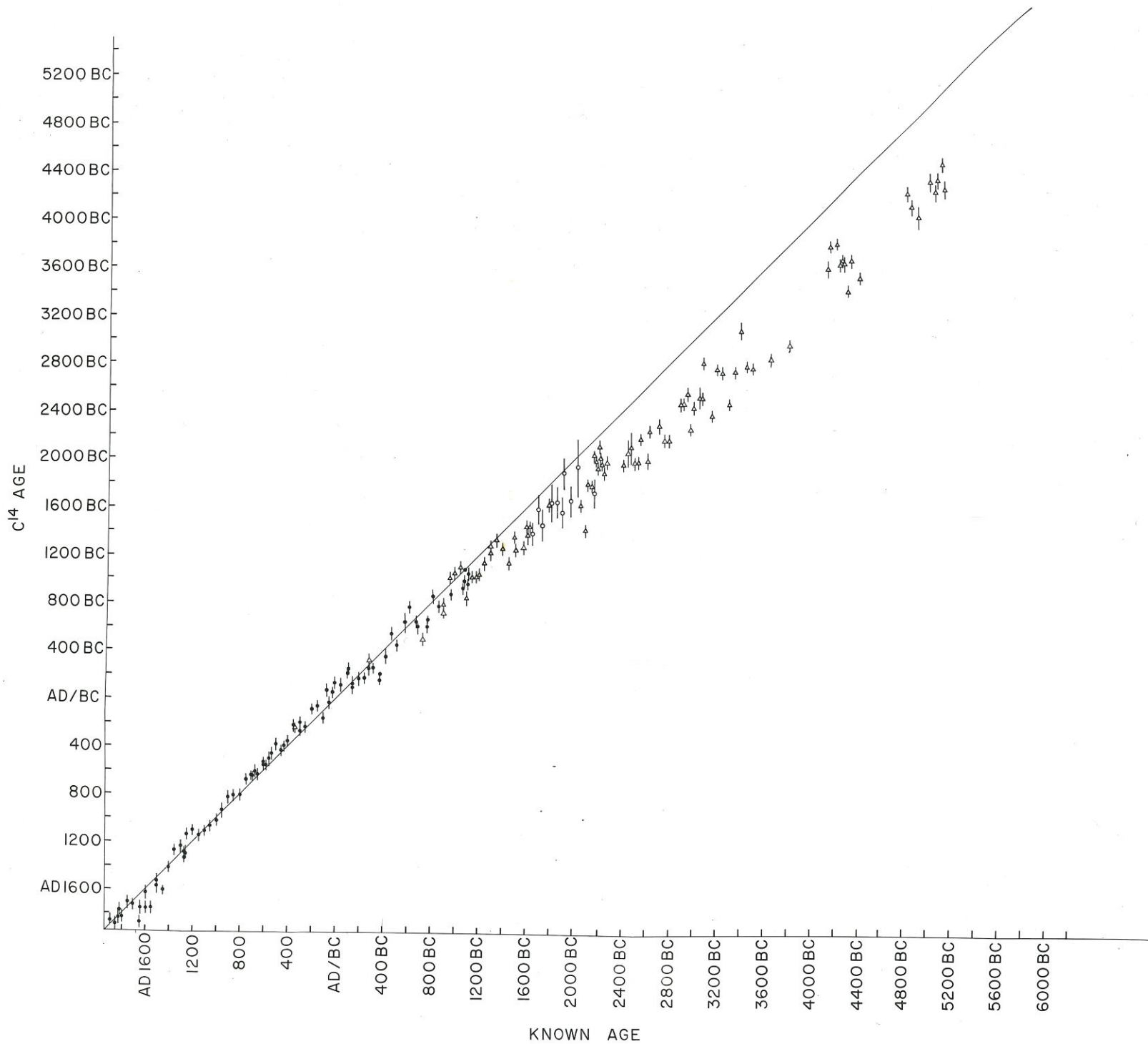


April 1967



Nov. '68





C^{14} DATES

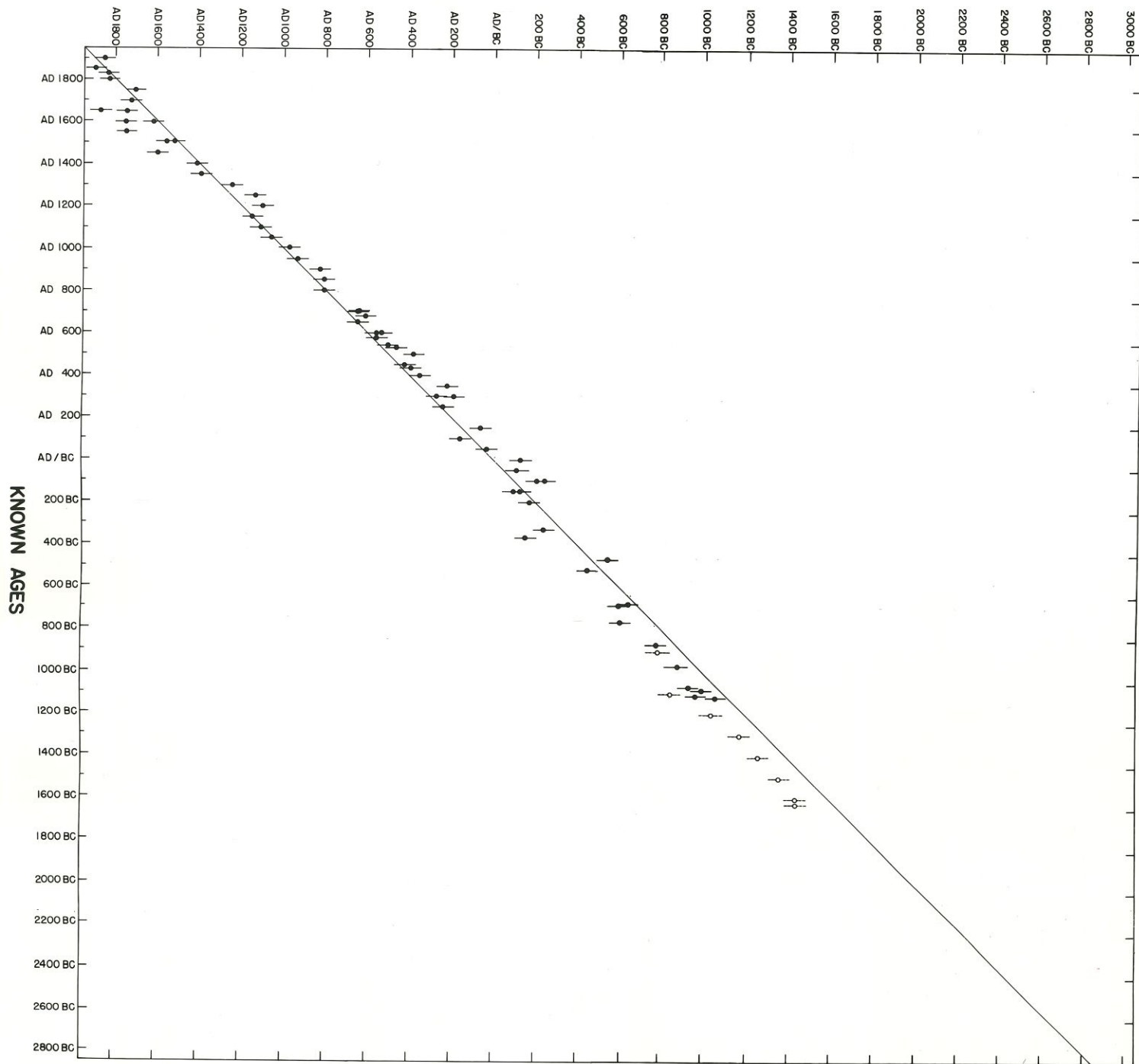
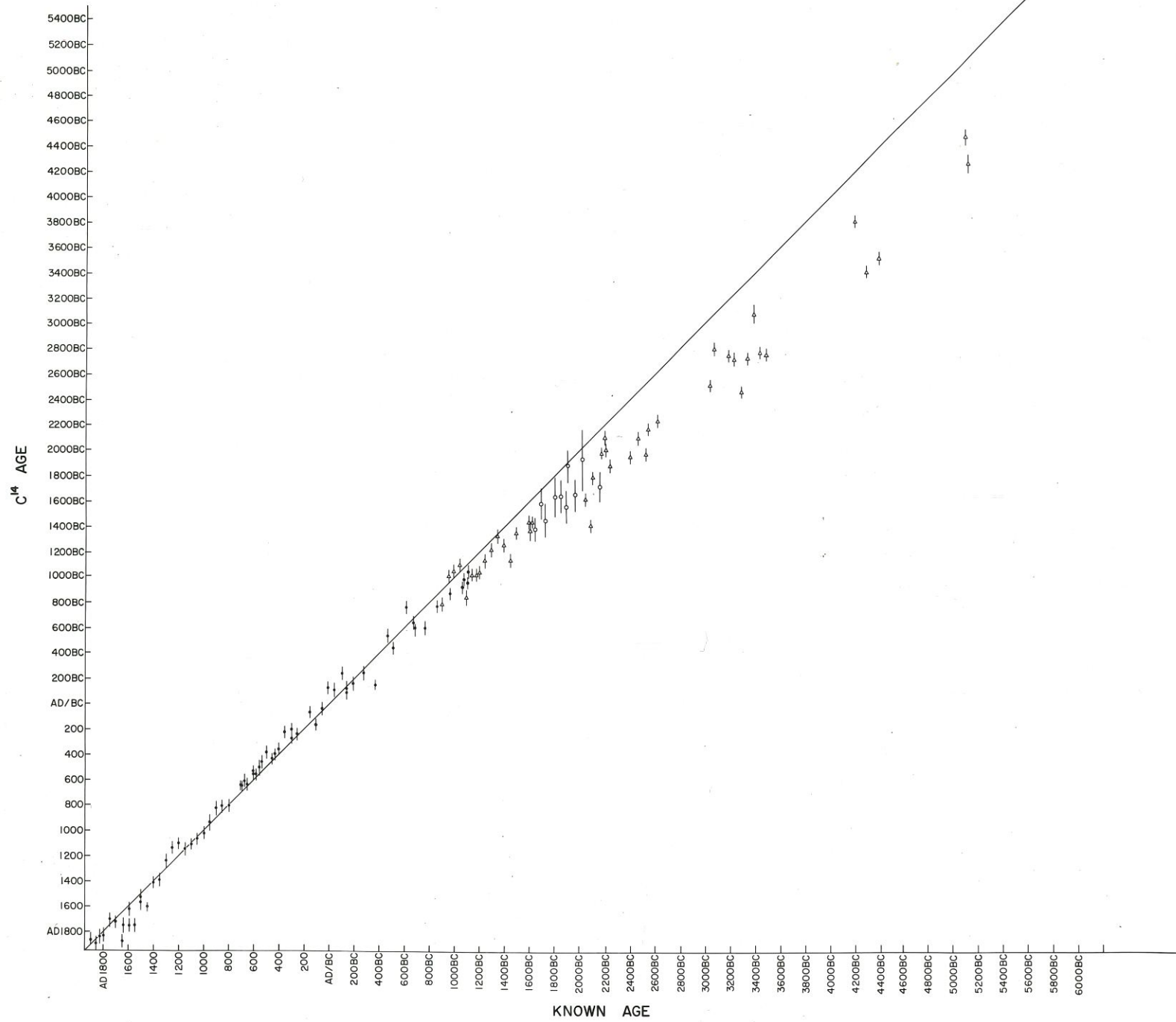
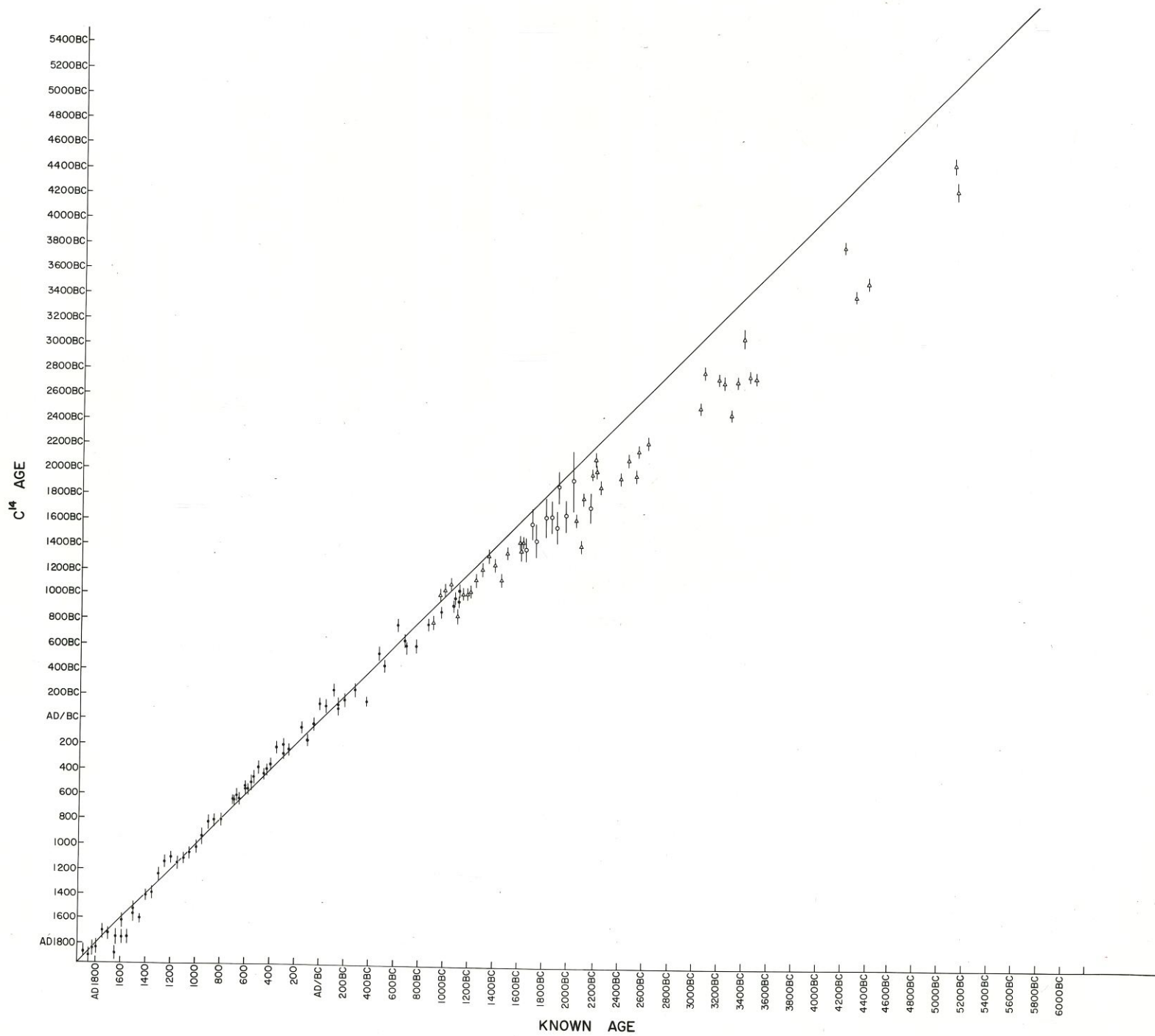


Fig. 1

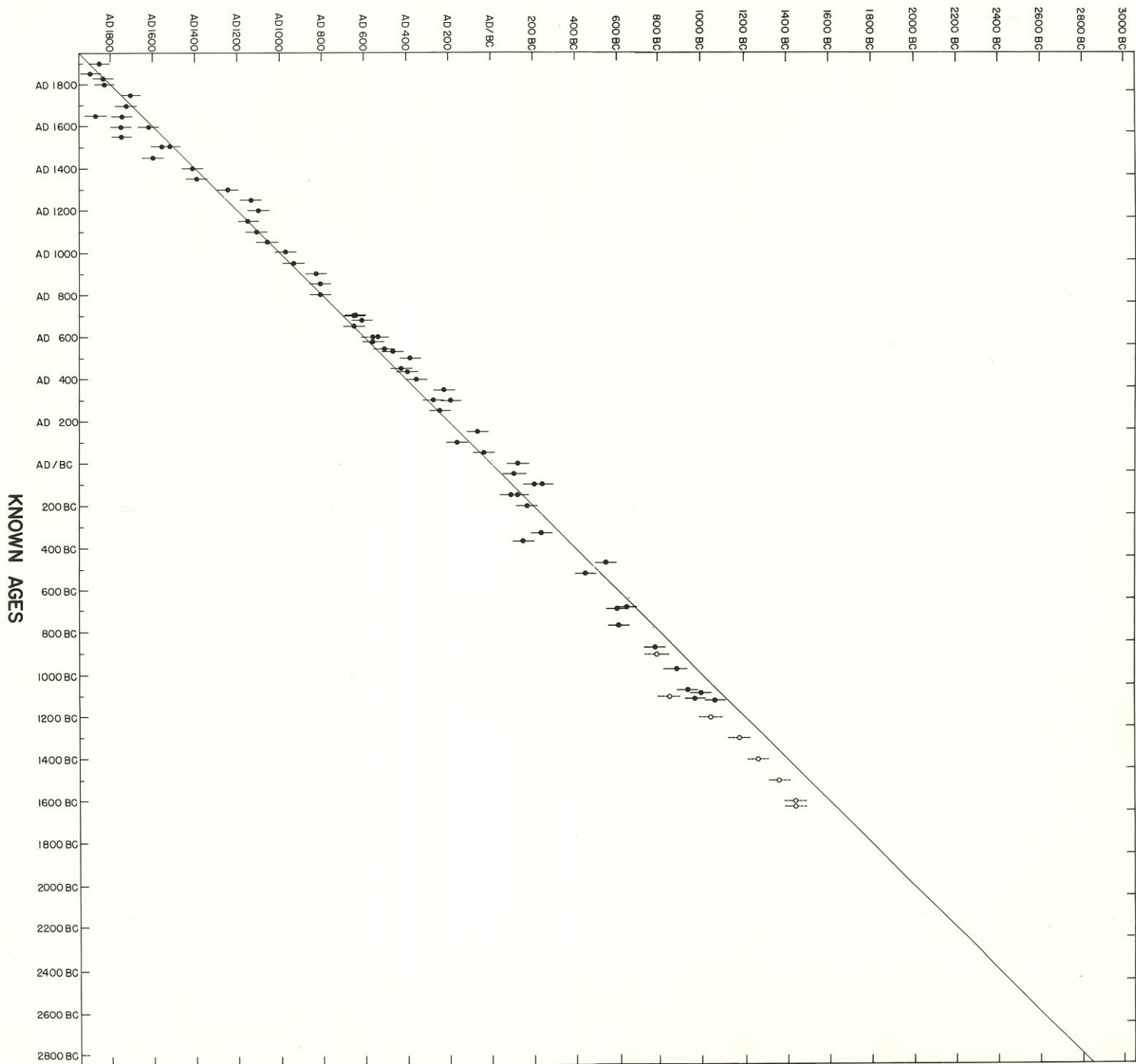
(New one is being
prepared with ^{more} dates - some
back to 3200 B.C.)

5730 $\frac{1}{2}$ -life

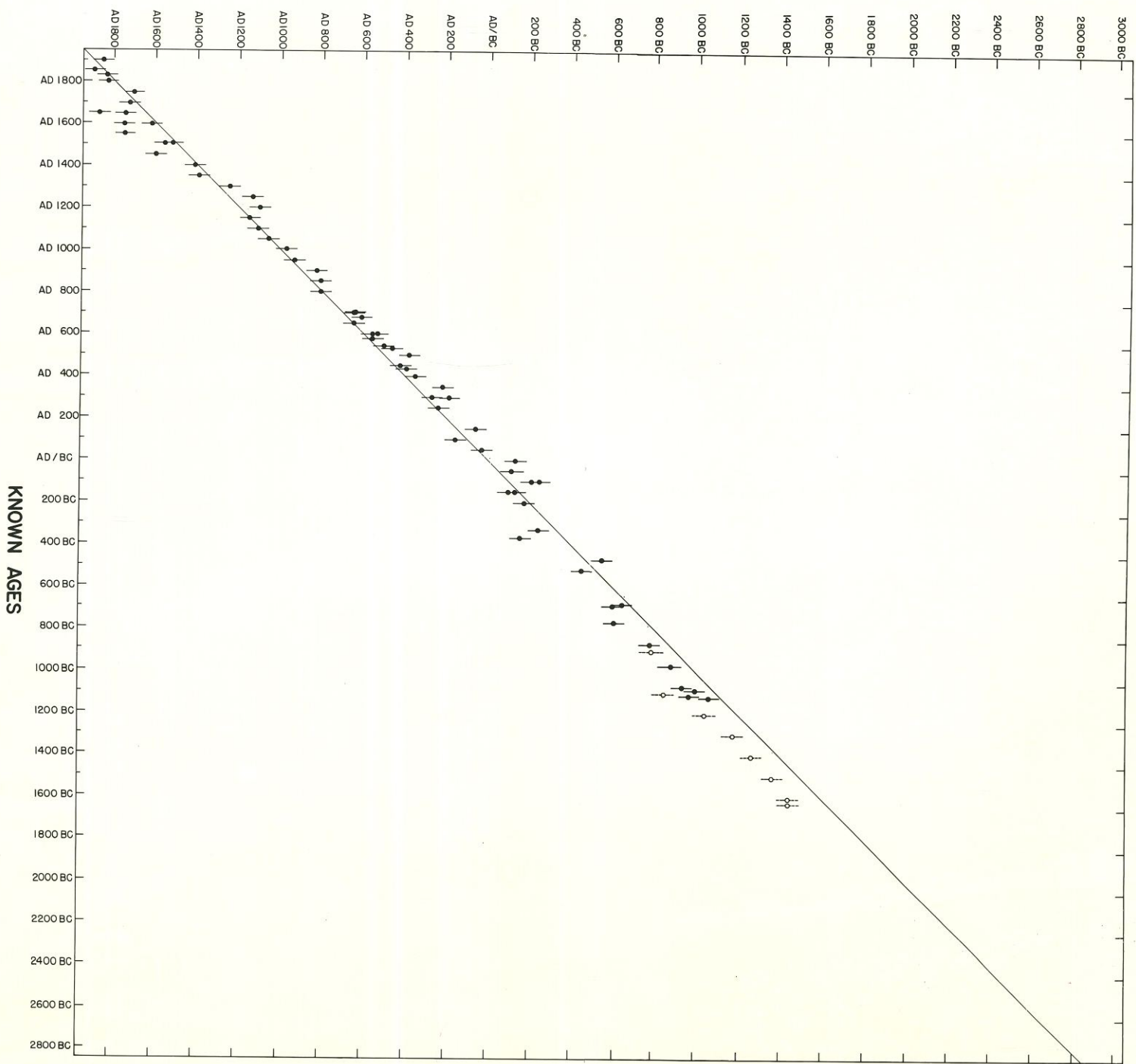




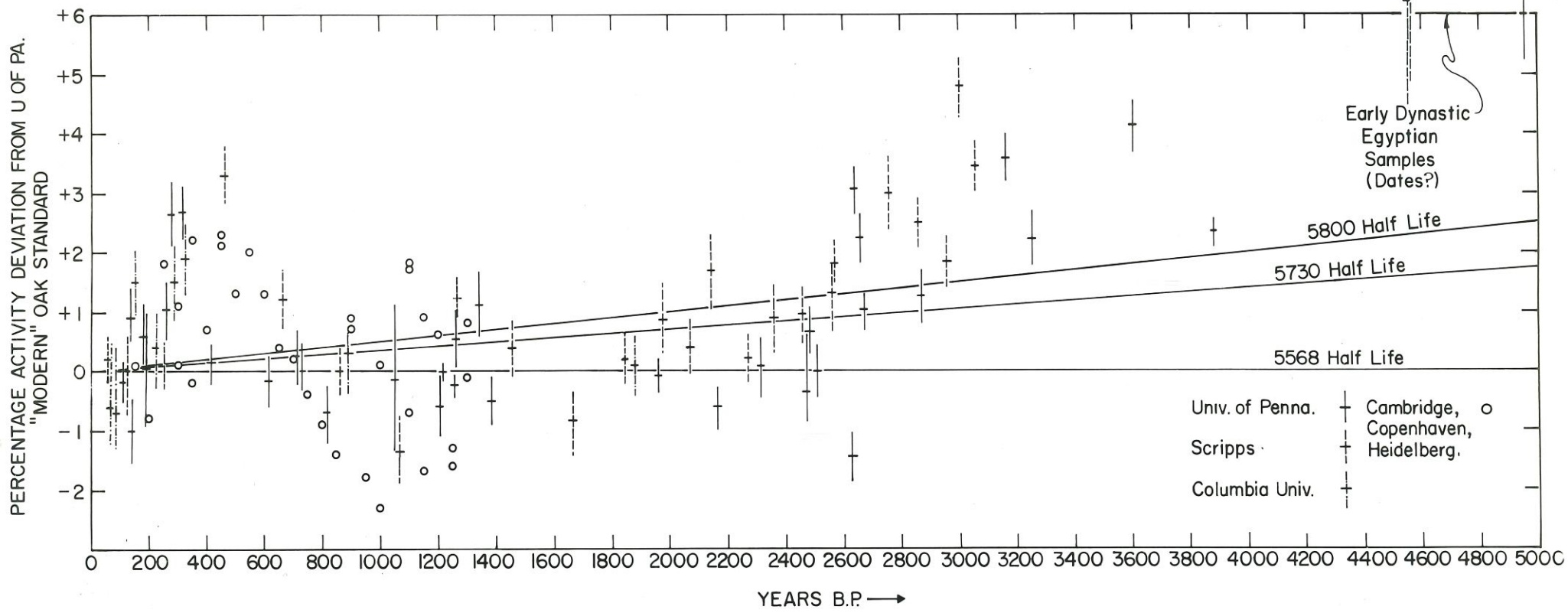
C¹⁴ DATES



C¹⁴ DATES



C-14 MEASUREMENTS OF KNOWN AGE SAMPLES



Early Dynastic
Egyptian
Samples
(Dates?)

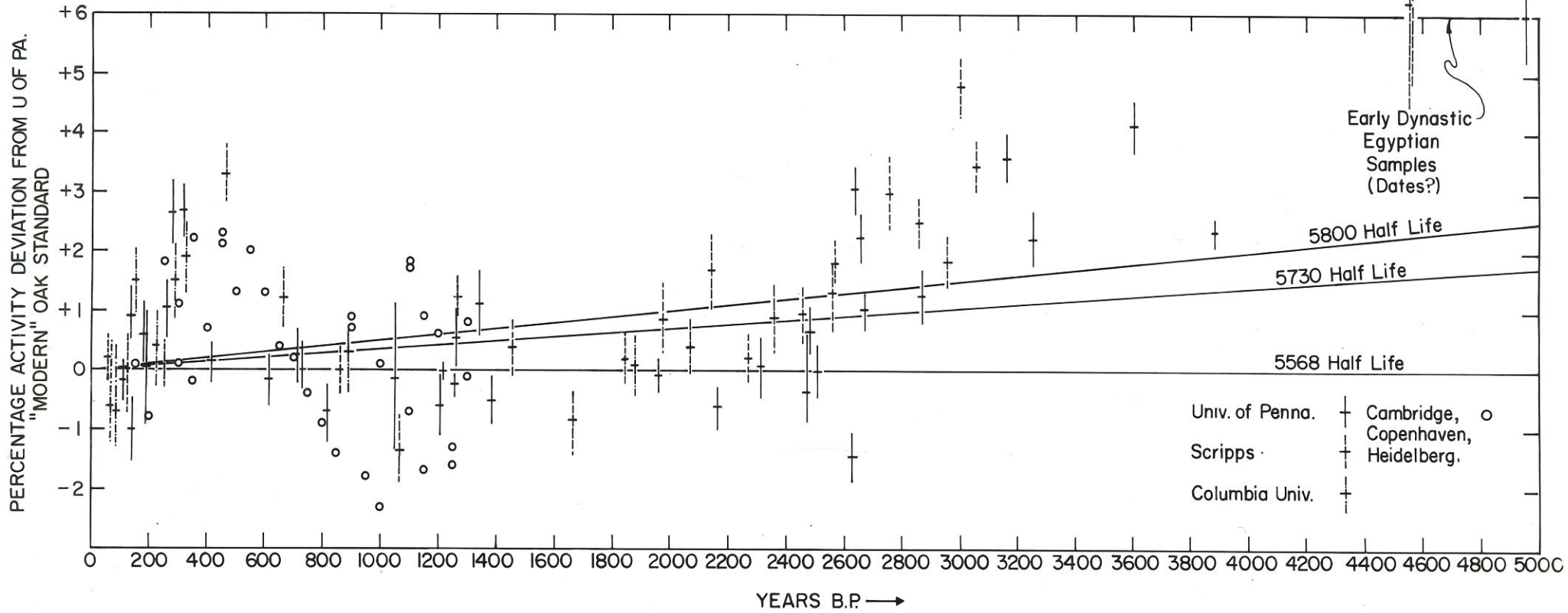
5800 Half Life

5730 Half Life

5568 Half Life

Univ. of Penna.	+	Cambridge,	o
Scripps	+	Copenhagen,	
Columbia Univ.	+	Heidelberg.	

C-14 MEASUREMENTS OF KNOWN AGE SAMPLES



Early Dynastic
Egyptian
Samples
(Dates?)

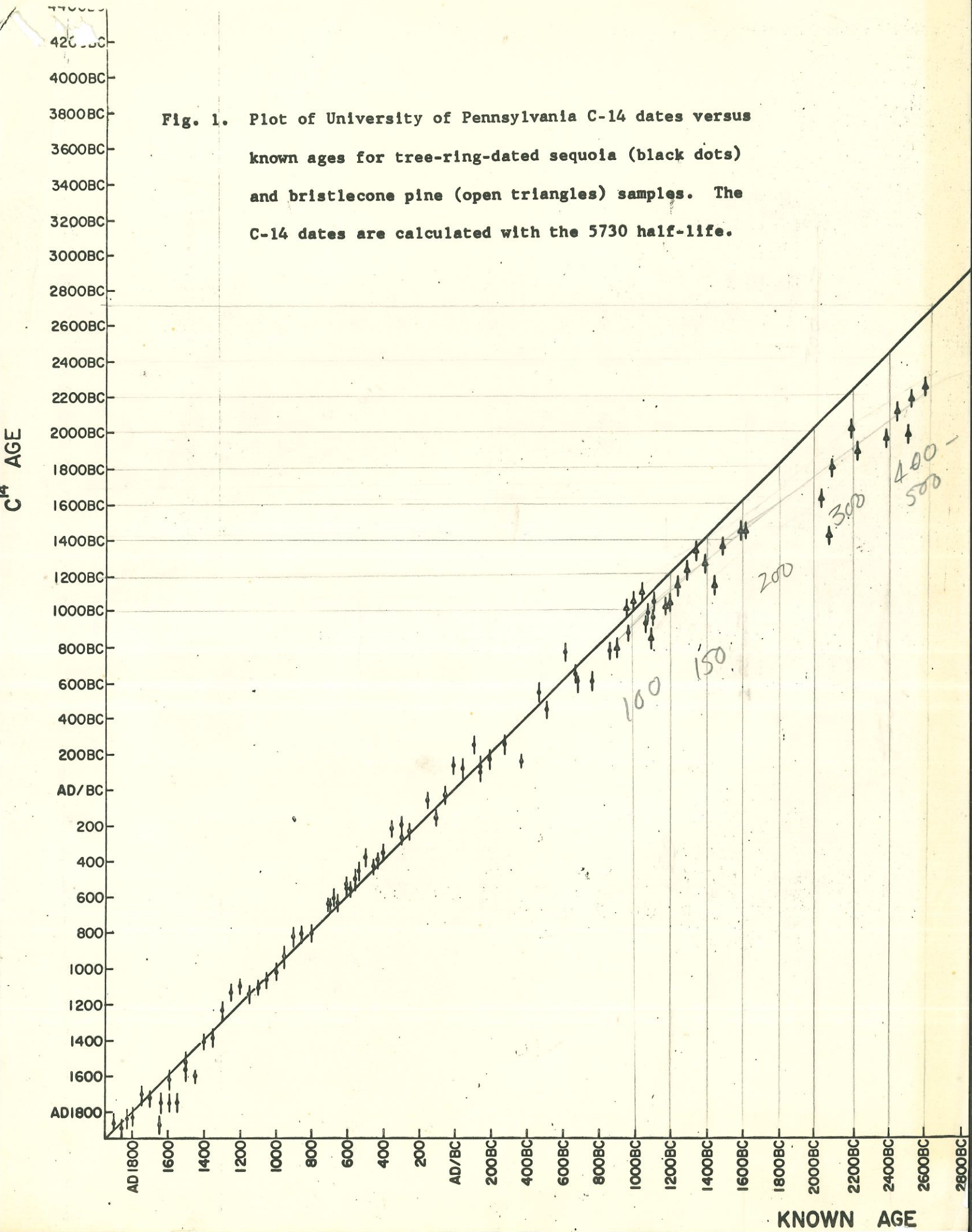
5800 Half Life

5730 Half Life

5568 Half Life

Univ. of Penna.	+	Cambridge,	o
Scripps	+	Copenhagen,	
Columbia Univ.	+	Heidelberg.	

Fig. 1. Plot of University of Pennsylvania C-14 dates versus known ages for tree-ring-dated sequoia (black dots) and bristlecone pine (open triangles) samples. The C-14 dates are calculated with the 5730 half-life.



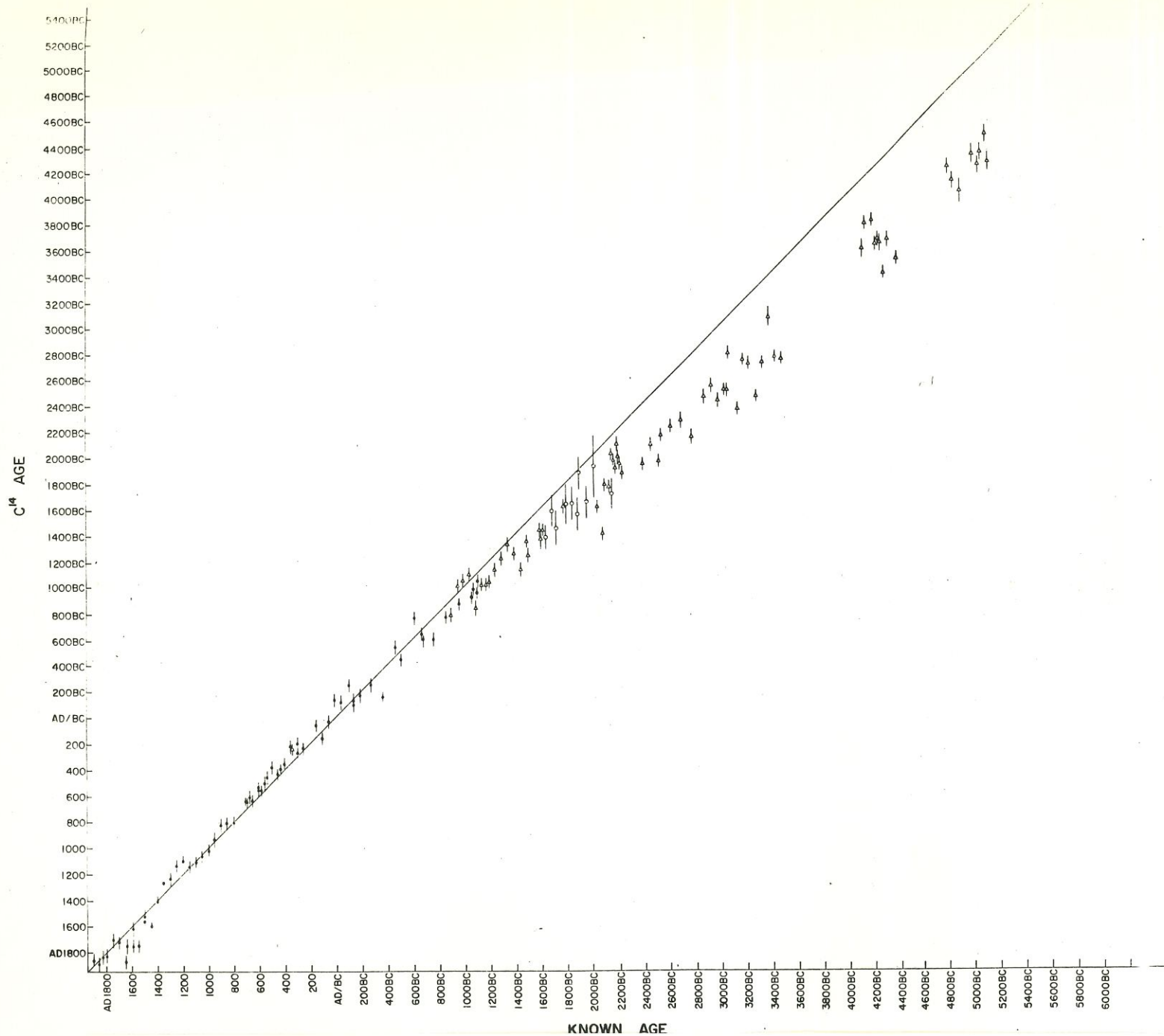
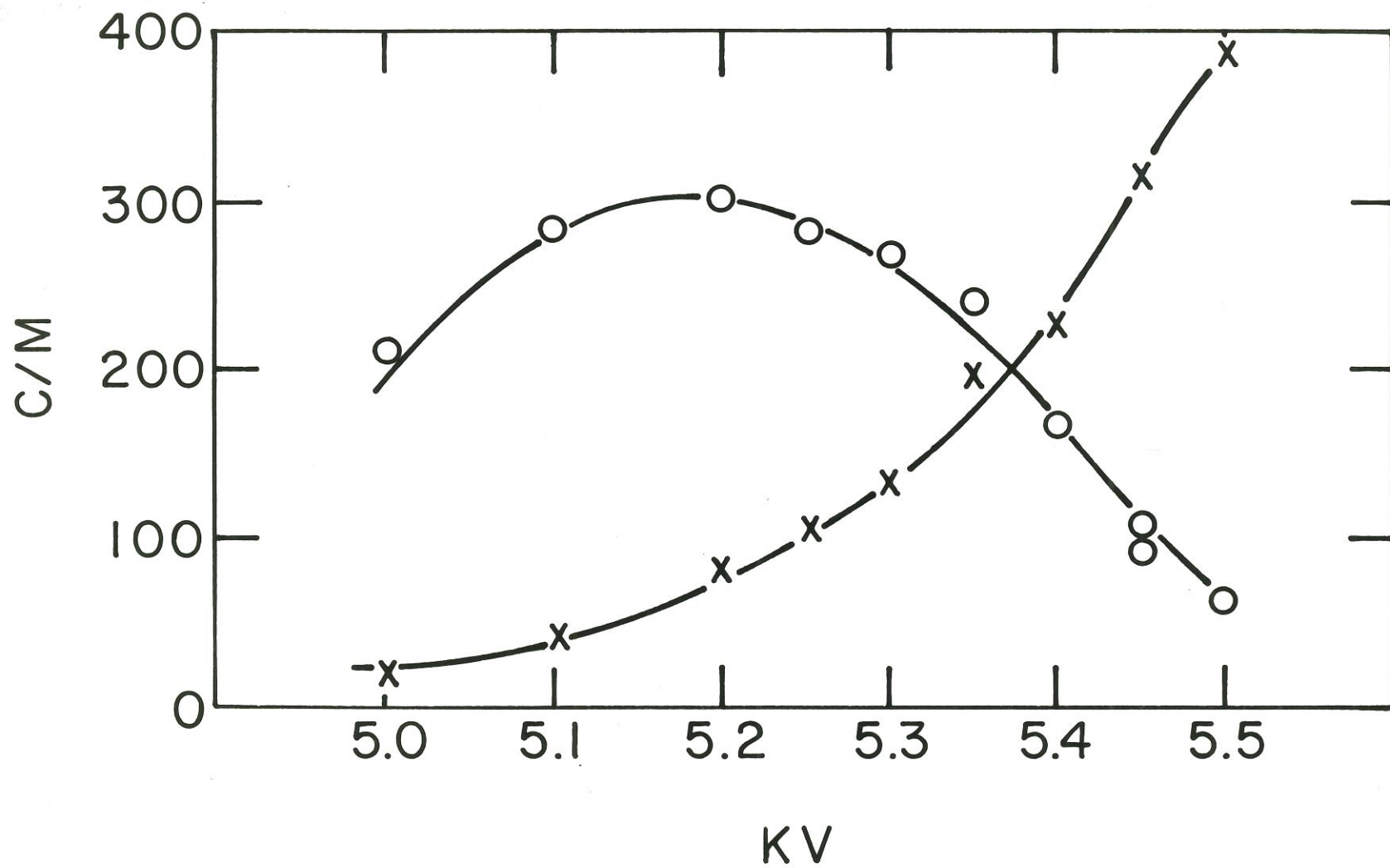


FIG. 1. Carbon-14 dates for all sequoia and bristlecone pine tree-ring samples processed by the Radiocarbon Laboratory at the University of Pennsylvania. Dates for sequoia samples are shown with solid dots. Bristlecone pine samples are represented by open symbols—triangles for those counted at the University of Pennsylvania, and circles for the ten samples counted by Isotopes, Inc. Carbon-14 dates have been calculated with the 5730 half-life and have been corrected for possible isotopic fractionation by means of C^{13} — C^{12} ratios.



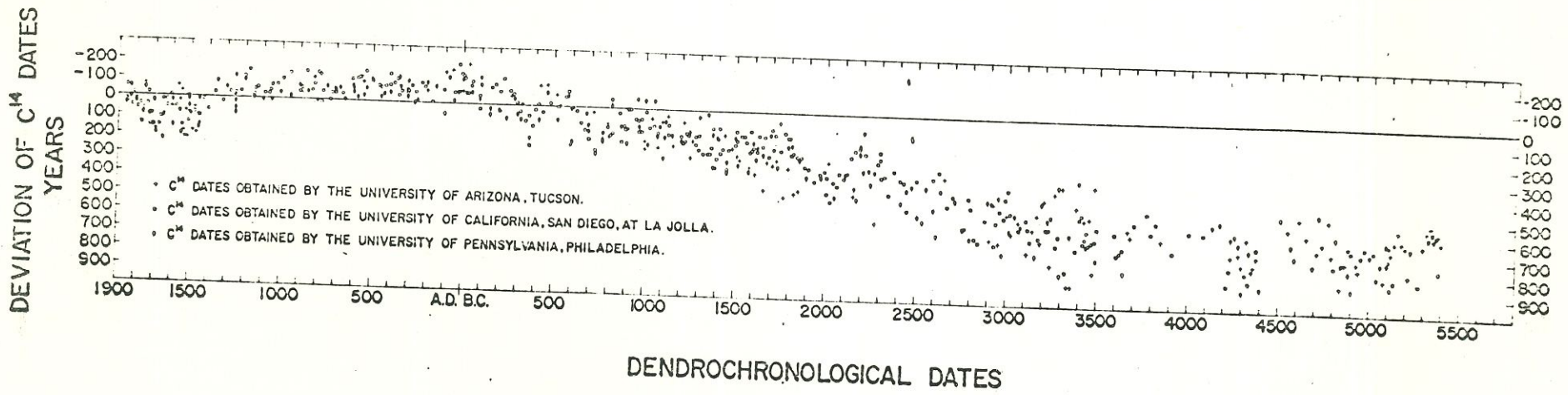


Fig.1. Individual C¹⁴ dates for dendro-dated samples, 5730 half-life.

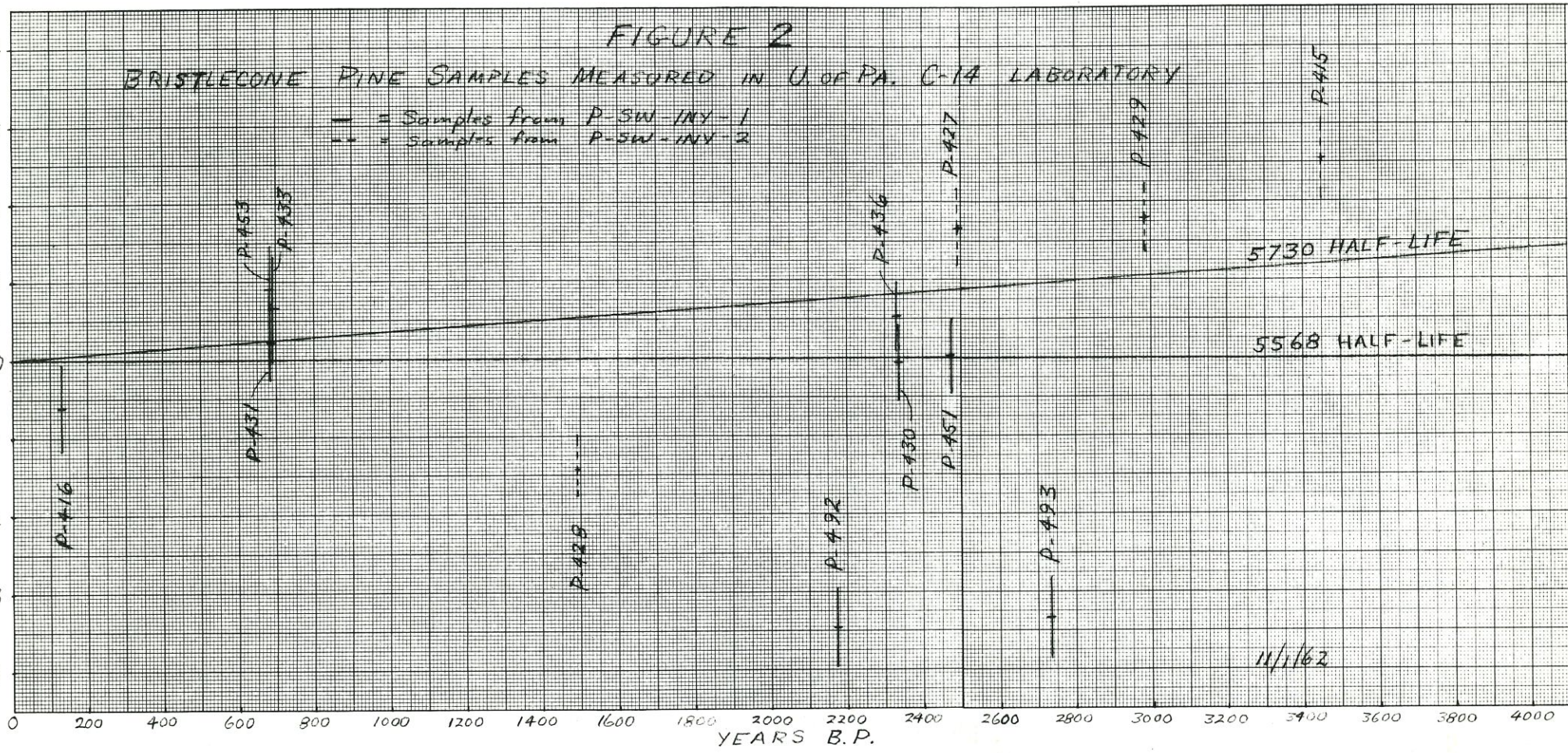
Time Period Represented By Radiocarbon Dates			Average Deviation of C-14 Dates (+ = younger, - = older)	Calendric Period Represented By Precisely Dated Tree-Ring Samples	Number of Samples
A.D. 1525	-	1879	+50	A.D. 1500 - 1829 (329 years)	12
A.D. 1250	-	1524	0	A.D. 1250 - 1499	7
A.D. 975	-	1249	0	A.D. 1000 - 1249	8
A.D. 700	-	974	-50	A.D. 750 - 999	4
A.D. 450	-	699	-50	A.D. 500 - 749	11
A.D. 200	-	449	-50	A.D. 250 - 499	9
25 B.C. to A.D. 200			-50	A.D. 1 - 249	7
225 B.C. -		26 B.C.	0	249 to 1 B.C.	7
450	-	226 B.C.	+50	499 to 250 B.C.	7
675	-	451 B.C.	+50	749 to 500 B.C.	7
900	-	676 B.C.	+100	999 to 750 B.C.	8
1125	-	901 B.C.	+100	1249 to 1000 B.C.	10
1325	-	1126 B.C.	+150	1499 to 1250 B.C.	4
1550	-	1326 B.C.	+200	1749 to 1500 B.C.	9
1750	-	1551 B.C.	+200	1999 to 1750 B.C.	6
1900	-	1751 B.C.	+300	2249 to 2000 B.C.	12
2050	-	1900 B.C.	+400	2499 to 2250 B.C.	4
2225	-	2051 B.C.	+500	2749 to 2500 B.C.	6
2450	-	2226 B.C.	+550	2999 to 2750 B.C.	6
2650	-	2451 B.C.	+550	3249 to 3000 B.C.	7
2850	-	2651 B.C.	+650	3499 to 3250 B.C.	5
[3700	-	2951 B.C.]	+700	[4395 to 3645 B.C.] (750 years)	11
[4366	-	4060 B.C.]	+750	[5116 to 4810 B.C.] (306 years)	9
Total					176

Percentage C-14 Activity Deviation from "Modern" Oak Standard

FIGURE 2

BRISTLECONE PINE SAMPLES MEASURED IN U. OF PA. C-14 LABORATORY

— = Samples from P-SW-1NY-1
- - = Samples from P-SW-1NY-2



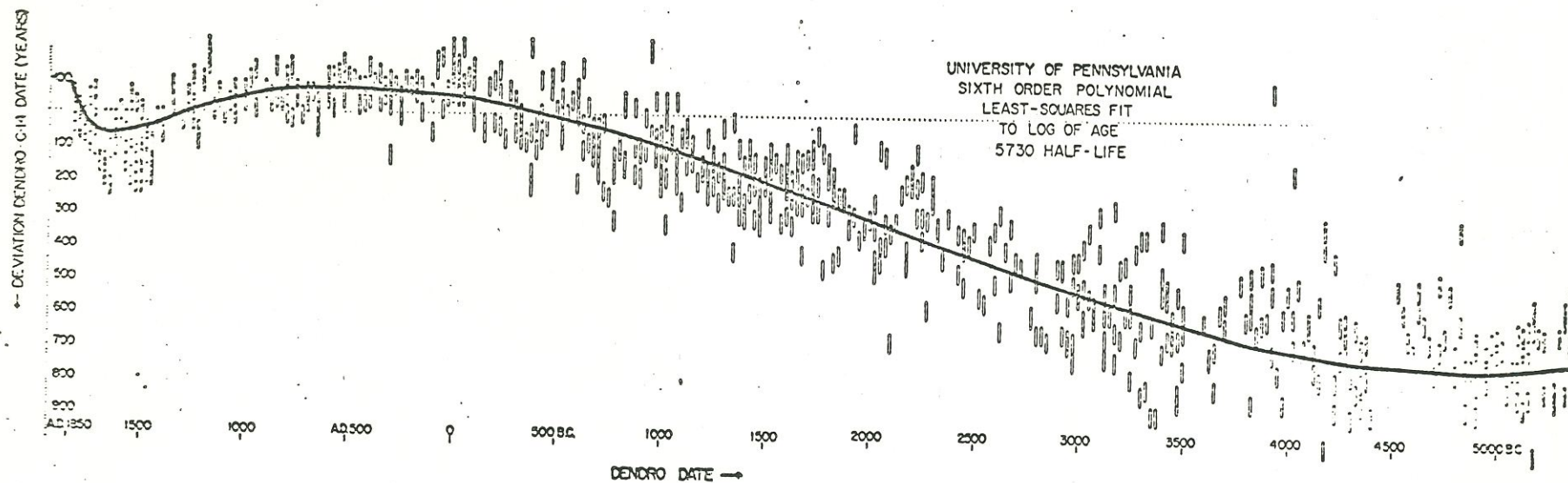


Fig. 4. Sixth order polynomial least squares fit to log of age and unaveraged dates. 5730 half-life.

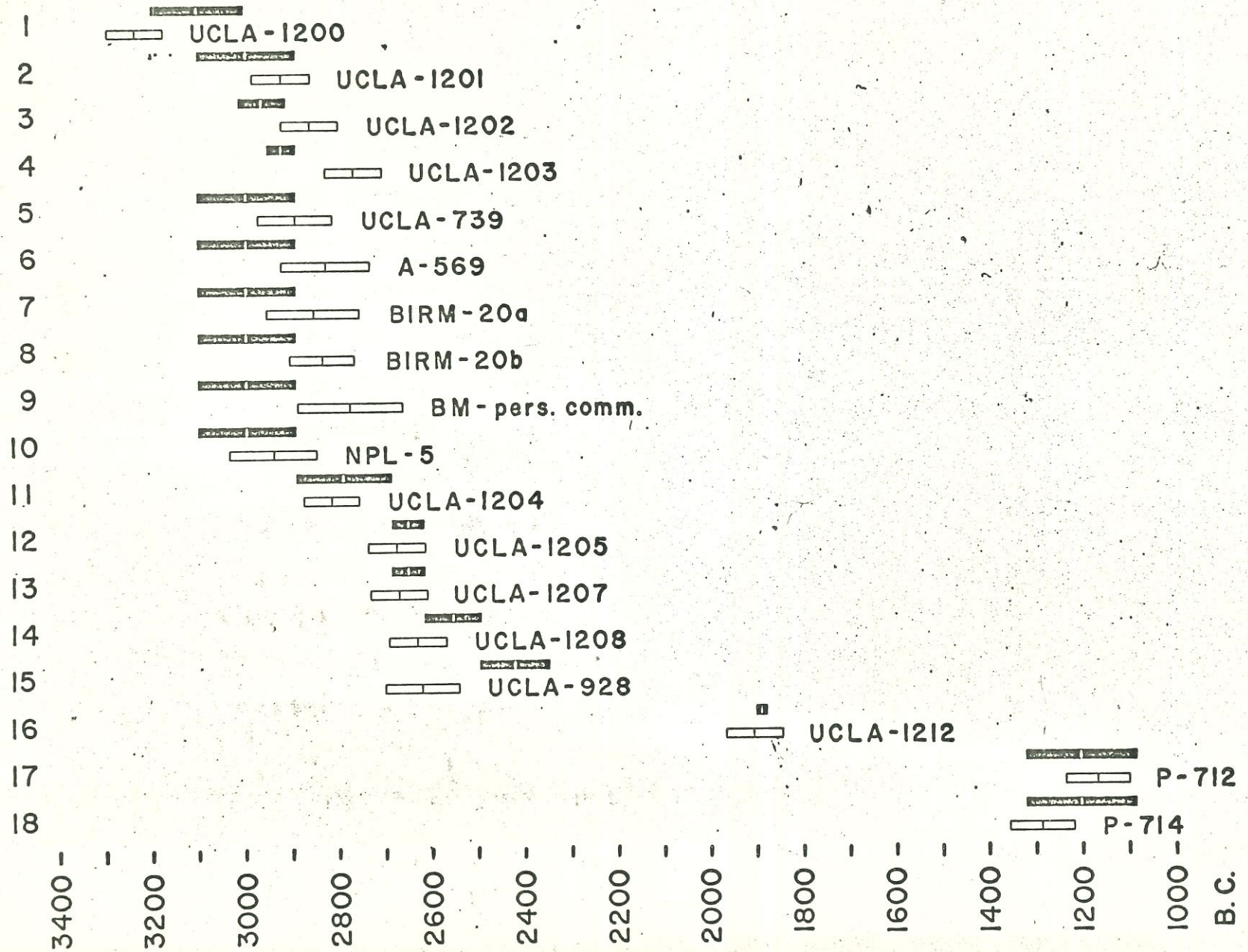


Fig. # 2

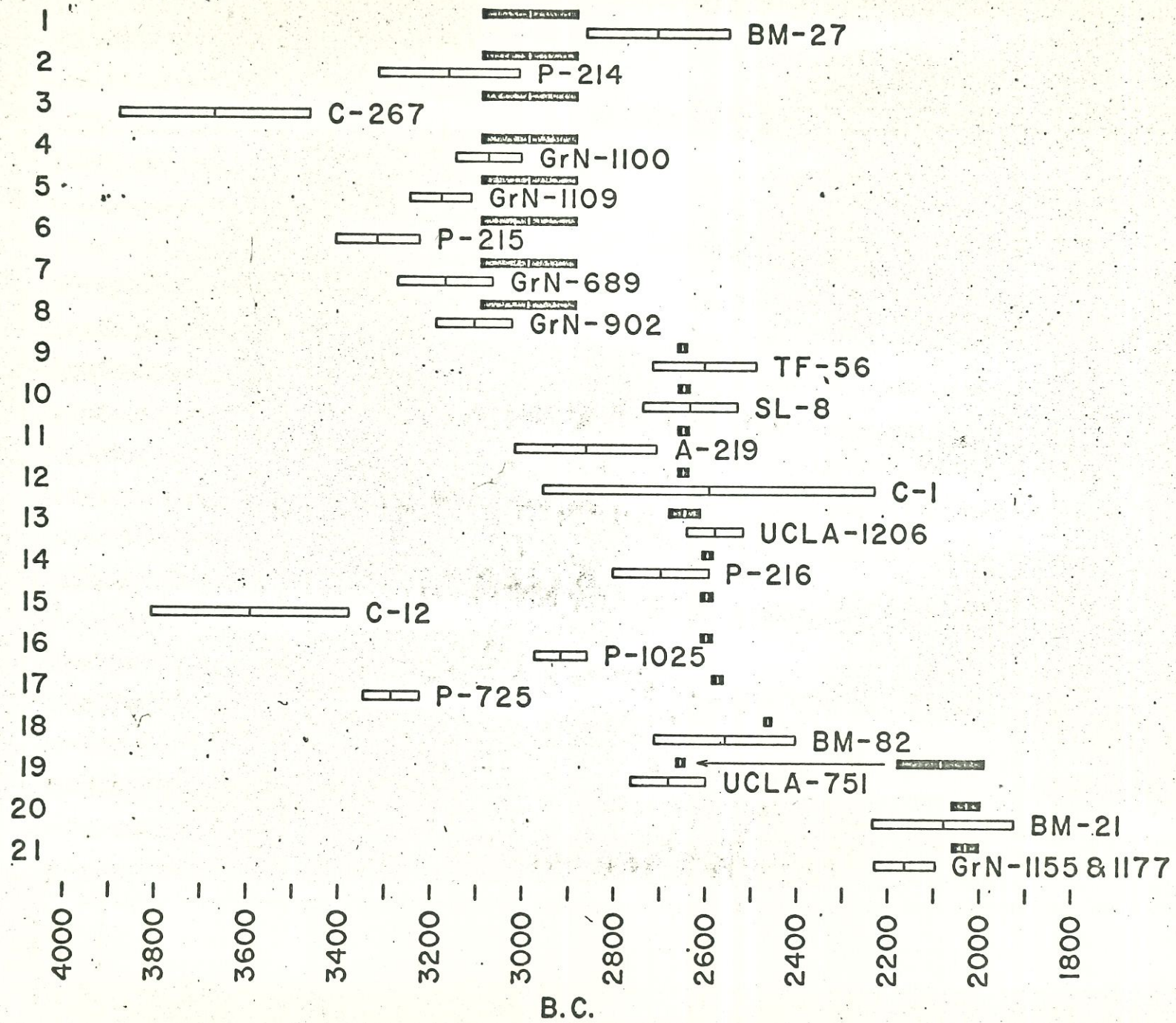


Fig. 3

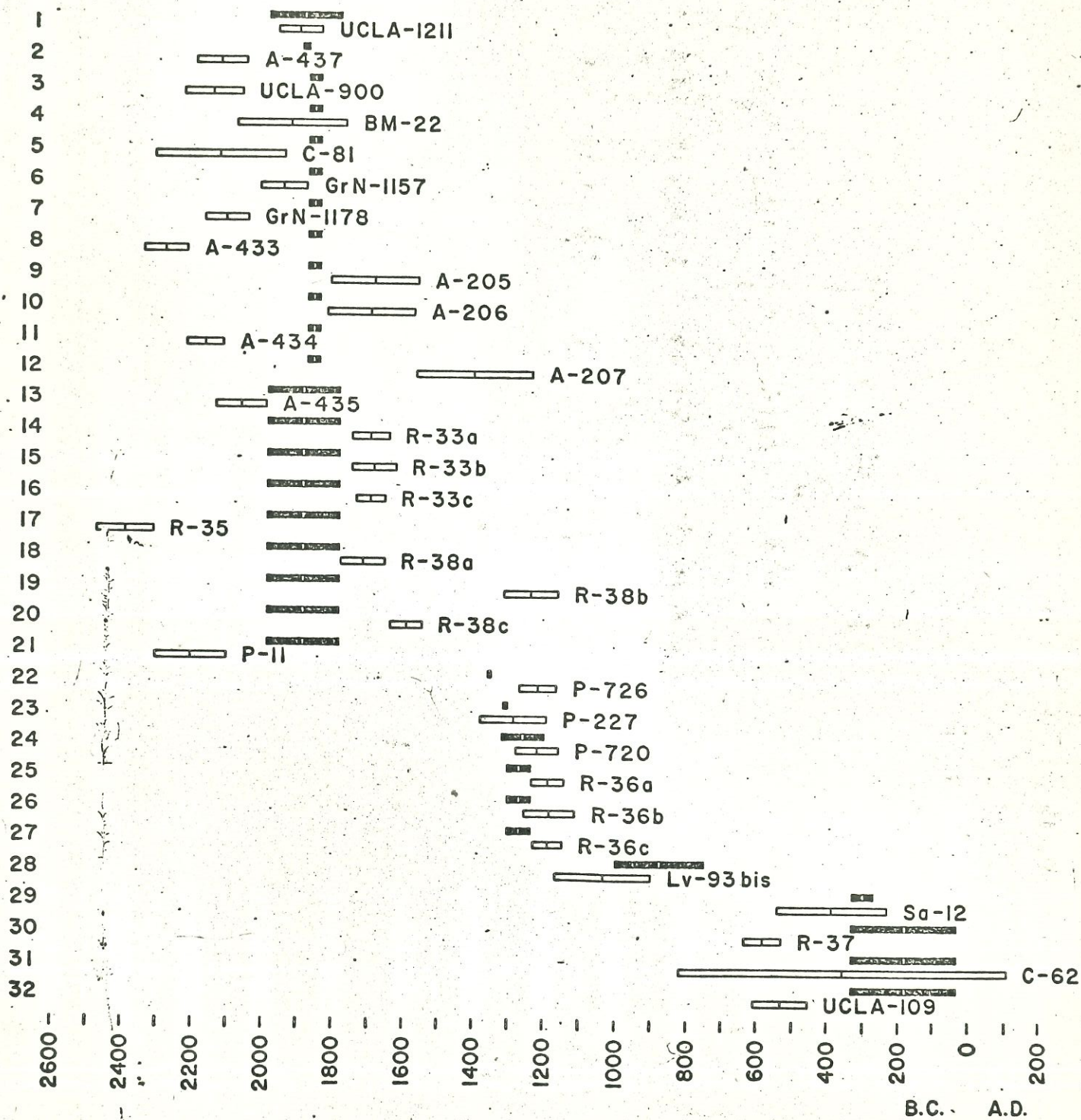


Fig. 4

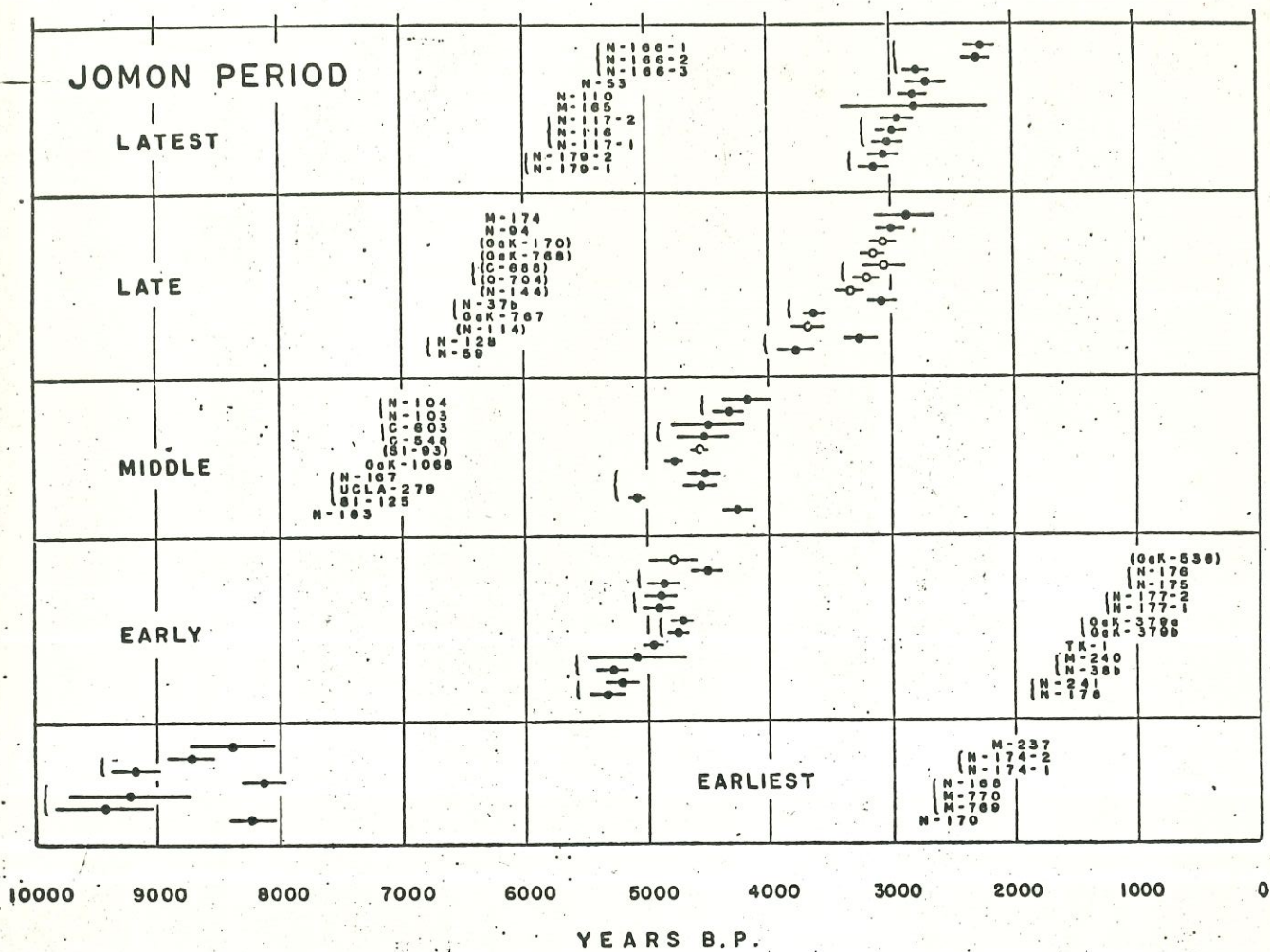


Fig. 1. Radiocarbon dates of the Jomon and Yayoi periods of Honshu and the relevant periods in Hokkaido published by the fall of 1966.