

SOCONY MOBIL RADIOCARBON DATES I*

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The samples in this list were measured by the methane proportional counter method reported by Burke and Meinschein (1955). Shell samples were mechanically cleaned and washed with water. Where necessary, cold, very dilute HCl was used to remove the powdery exterior. Sedimentary wood and mud or clay samples were treated with hot concentrated HCl and washed with water before burning. Four other types of materials recovered from sediments were dated: (1) the total organic carbon, (2) benzene-soluble organic material, (3) foraminiferal tests, and (4) "dispersed carbonate". The foraminiferal samples were recovered from the sediment by washing on a 120-mesh screen. These were then converted to carbon dioxide by acid treatment. "Dispersed carbonate" was recovered in the form of CO₂ by acid (HCl) treatment of the sediment wash which had been depleted of Foraminifera. The total organic carbon samples were recovered by combustion to CO₂ after all carbonates had been removed by acid treatment. Organic extractables were also converted to CO₂ by combustion.

Unless otherwise stated the samples were collected by members of our Laboratory staff.

The errors given include contributions from the following sources:

- (1) Standard statistical counting error.
- (2) Background variation. This is taken as equal to the rms deviation from the mean of background determinations made during a period of time beginning well before and ending well after the counting of the sample in question.
- (3) Variation in counting rate of the modern standard. This is determined in the same way as (2).

Not included are errors due to doubt about the half-life of C¹⁴ or the correctness of our modern standard. The age calculations are based on a C¹⁴ half-life of 5568 yr. Our modern standard is hackberry wood grown about 1940. This wood gives a counting rate which is $94.6 \pm 1.3\%$ of the National Bureau of Standards oxalic-acid standard.

SAMPLE DESCRIPTIONS

I. MARINE SAMPLES

A. Off-Shore California

Dates are presented for total organic carbon, benzene-soluble organic material, dispersed carbonate, and Foraminifera from recent sediment cores taken in eight marine basins off the coast of southern California. The data permit

* Some dates from this laboratory have been published with the code designation RC (Flint and Gale, 1958, AM. JOUR. SCI., v. 256, p. 698-714). The code designation MP published in volume 1 of the RADIOCARBON SUPPLEMENT (1959, p. 216) has been changed to SM in conformity with the wishes of the laboratory, and is explained by the change of the company's name from Magnolia Petroleum Company to Socony Mobil Oil Company, Inc.

studies on rates of sedimentation and evaluations of different materials for dating the samples. Samples were obtained with a gravity coring device except where otherwise indicated. The gravity coring device and depth corrections for core shortening follow Emery and Dietz (1941).

Catalina Basin series

Samples from three cores (A2, A3, A4) separated by distances of a few hundred ft, North Central Catalina Basin (33° 21' N Lat, 118° 51' W Long), water depth 4314 ft. Coll. July 1956.

SM-132. Catalina A2, 61 to 106 in. 8550 ± 600

Total organic carbon, depth interval 61 to 106 in. below top of sediment. Olive-green mud.

SM-116. Catalina A2, 106 to 118 in. 12,780 ± 700

Total organic carbon, depth interval 106 to 118 in. below top of sediment. Gray clay, very firm, micaceous, slightly sandy, barren of Foraminifera.

SM-43. Catalina A2, 47 in. 18,750 ± 2000

Foraminifera from sand 47 in. below top of sediment. Sand VF-F, moderately to well sorted, subrounded, firm, calcareous, abundant Foraminifera.

SM-130. Catalina A3, 12 to 59 in. 5160 ± 270

Total organic carbon, depth interval 12 to 59 in. below top of sediment. Olive-brown mud with gray beds.

SM-117. Catalina A3, 106 to 118 in. 12,460 ± 700

Total organic carbon, depth interval 106 to 118 in. below top of sediment. Olive-brown mud with gray clay beds. Foraminifera abundant in brown mud. Gray clay is micaceous.

SM-40. Catalina A3, 43 in. 11,840 ± 800

Foraminifera from sand 43 in. below top of sediment. Sand, olive brown, F, medium-well sorted, subrounded, and firm.

SM-128. Catalina A4, 24 to 42 in. 7125 ± 325

Total organic carbon, depth interval 24 to 42 in. below top of sediment. Olive-brown mud. (Piston corer)

SM-131. Catalina A4, 42 to 60 in. 9610 ± 500

Total organic carbon, depth interval 42 to 60 in. below top of sediment. Olive-brown mud. (Piston corer)

SM-86. Catalina A4, 81 to 87 in. 12,300 ± 450

Total organic carbon, depth interval 81 to 87 in. below top of sediment. Olive-brown mud. (Piston corer)

SM-38. Catalina A4, 0 to 6 in. 10,925 ± 850

Foraminifera from mud, depth interval 0 to 6 in. below top of sediment. Soft olive-brown mud. (Piston corer)

SM-91. Catalina A4, 6 to 24 in. 4310 ± 750

Benzene-soluble organic material, depth interval 6 to 24 in. below top of sediment. Olive-brown mud. (Piston corer)

SM-92. Catalina A4, 87 to 120 in. 12,360 ± 2600

Benzene-soluble organic material, depth interval 87 to 120 in. below top of core. Interbedded gray-green mud and blue-green clay. (Piston corer).

Comment: total organic carbon dates are internally consistent and linear with respect to depth for each, the gravity core, and the piston core. However, the dates for the piston core are of greater age for identical sampling levels. This is probably due to improper timing of the trip mechanism which allowed the piston barrel to penetrate the bottom mud a short distance before taking in sample. Foraminiferal dates are not internally consistent with depth and are of greater age than the total organic carbon, suggesting the possibility of transport from older sediments.

San Nicolas Basin series, Site B

Samples from two cores, B3 and B4, separated by several hundred ft (33° 3' N Lat, 119° W Long). Coll. July 1956, water depth 5917 ft.

SM-44. San Nicolas B3, 8 in. 8265 ± 650

Foraminifera, depth 8 in. below top of core. Soft olive-brown mud. Abundant Foraminifera. (Piston corer)

SM-172. San Nicolas B3, 12 to 30 in. 11,180 ± 550

Total organic carbon, depth interval 12 to 30 in. below top of core. Olive-brown mud. Abundant Foraminifera. (Piston corer)

SM-172C. San Nicolas B3, 12 to 30 in. 11,380 ± 400

Dispersed carbonate, depth interval 12 to 30 in. below top of core. Olive-brown mud. Abundant Foraminifera. (Piston corer)

SM-158. San Nicolas B3, 12 to 30 in. 10,100 ± 500

Foraminifera, depth interval 12 to 30 in. below top of core. Olive-brown mud. (Piston corer)

SM-173. San Nicolas B3, 104 to 116 in. 22,750 ± 1500

Total organic carbon, depth interval 104 to 116 in. below top of core. Olive-brown mud. (Piston corer)

SM-173C. San Nicolas B3, 104 to 116 in. 22,000 ± 1000

Dispersed carbonate, depth interval 104 to 116 in. below top of core. Firm olive-brown mud. (Piston corer)

SM-87. San Nicolas B3, 106 to 116 in. 20,750 ± 1900

Total organic carbon, depth interval 106 to 116 in. below top of core. Firm olive-brown mud. (Piston corer)

SM-46. San Nicolas B4, 0 to 15 in. 4300 ± 1100

Foraminifera, depth interval 0 to 15 in. below top of sediment. Soft olive-brown mud.

SM-129. San Nicolas B4, 15 to 60 in. 12,500 ± 600

Total organic carbon, depth interval 15 to 60 in. below top of sediment. Olive-brown mud. 50 to 52 in., sand, light olive brown, VF-F, rounded, subangular.

SM-47. San Nicolas B4, 102 to 118 in. 24,400 ± 4300

Foraminifera, depth interval 102 to 118 in. below top of core. Firm olive-brown mud.

Comment: the large errors quoted for SM-46 and SM-47 are due to very small quantities of sample. Dates on total organic carbon, dispersed carbonate, and Foraminifera at similar depths agree within experimental error.

San Nicolas series, Site C

One core (32° 56' N Lat, 119° 9.5' W Long). Coll. July 1956, water depth 5360 ft.

SM-74. San Nicolas C1, 0 to 12 in. 4450 ± 200

Total organic carbon, depth interval 0 to 12 in. below top of sediment. Soft light-greenish mud. Very abundant small Foraminifera.

SM-75. San Nicolas C1, 59 to 71 in. 19,350 ± 1200

Total organic carbon, from mud containing thin layers of VF sand, depth interval 59 to 71 in. below top of sediment. Firm light-greenish mud. Abundant Foraminifera.

San Nicolas series, Site D

One core (33° 7' N Lat, 119° 19.5' W Long). Coll. July 1956, water depth 5200 ft.

SM-122. San Nicolas D1, 0 to 11 in. 3550 ± 160

Total organic carbon, depth interval 0 to 11 in. below top of sediment. Soft light-greenish-brown mud. Abundant Foraminifera.

SM-119. San Nicolas D1, 56 to 71 in. 9340 ± 400

Total organic carbon, depth interval 56 to 71 in. below top of sediment. Firm light-greenish-brown mud. Abundant Foraminifera.

Tanner Basin series

Samples from two cores (E1, E2) separated by a distance of several hundred ft (32° 56.5' N Lat, 119° 43' W Long), water depth 5040 ft. Coll. July 1956 .

SM-76. Tanner E1, 0 to 10 in. 5623 ± 200

Total organic carbon, depth interval 0 to 10 in. below top of sediment. Soft light-greenish-brown mud with 2 in. sand containing abundant Foraminifera.

SM-77. Tanner E1, 60 to 70 in. 10,180 ± 300

Total organic carbon, depth interval 60 to 70 in. below top of sediment. Firm light-greenish-brown mud with thin streaks of sand containing abundant Foraminifera.

SM-123. Tanner E2, 0 to 14 in. 6910 ± 300

Total organic carbon, depth interval 0 to 14 in. below top of sediment. Soft light-greenish-brown mud. Abundant Foraminifera.

SM-118. Tanner E2, 54 to 72 in. 10,440 ± 400

Total organic carbon, depth interval 54 to 72 in. below top of sediment. Firm light-greenish-brown mud with thin streaks of VF sand. Abundant Foraminifera.

Comment: although the ages for similar depths are somewhat greater for core E2 than for E1, the curves of age vs. depth have slopes that are similar within experimental error.

Santa Barbara Basin series, Cores F1, F3

Samples from two cores (F1, F3) separated by a distance of a few hundred ft (34° 17' N Lat, 120° W Long), water depth 1810 ft. Coll. July 1956.

SM-78. Santa Barbara F1, 0 to 8 in. 2490 ± 300
Total organic carbon, depth interval 0 to 8 in. below top of sediment.
Very soft olive-brown mud.

SM-79. Santa Barbara F1, 74 to 82 in. 3520 ± 250
Total organic carbon, depth interval 74 to 82 in. below top of sediment.
Medium-firm olive-brown mud with thin blue-gray beds of mud.

SM-70. Santa Barbara F3, 0 to 13 in. 2000 ± 1000
Foraminifera in mud, depth interval 0 to 13 in. below top of sediment.

SM-138. Santa Barbara F3, 13 to 52 in. 2425 ± 175
Total organic carbon, depth interval 13 to 52 in. below top of sediment.
Medium-firm olive-brown mud with numerous thin blue-gray beds.

SM-139. Santa Barbara F3, 78 to 117 in. 3675 ± 195
Total organic carbon, depth interval 78 to 117 in. below top of sediment.
Firm olive-brown mud with blue-gray beds.
Comment: the Foraminifera and total organic carbon dates from both cores fit on a single age vs depth curve and are linear with depth.

Santa Barbara series, Cores G1, G2

Samples from two cores (G1, G2) separated by a few hundred ft (34° 15' N Lat, 120° 5' W Long), water depth 1900 ft. Coll. July 1956.

SM-96. Santa Barbara G1, 78 to 117 inches 10,500 ± 1000
Benzene-soluble organic material from core, depth interval 78 to 117 in. below top of core.

SM-125. Santa Barbara G1, 117 to 130 in. 5935 ± 300
Total organic carbon, depth interval 117 to 130 in. below top of sediment.
Firm olive-brown mud.

SM-169. Santa Barbara G2, 108 to 118 in. 5300 ± 300
Total organic carbon, depth interval 108 to 118 in. below top of sediment.
Firm olive-brown mud with dark-gray beds. Few Foraminifera.

SM-169C. Santa Barbara G2, 108 to 118 in. 5075 ± 200
Dispersed carbonate, depth interval 108 to 118 in. below top of sediment.
(See preceding sample for lithology.)

Comment: dates for dispersed carbonate and total organic carbon are identical within experimental error for identical samples. The benzene-soluble organic material (SM-96) is suspected of being contaminated with ancient carbon from solvents in the laboratory. This may account for the age being considerably greater than for the total organic carbon.

Santa Barbara Series, Cores H1, H2

Samples from two cores (H1, H2) separated by a few hundred ft (34° 12' N Lat, 120° 5' W Long), water depth 1923 ft. Coll. July 1956.

SM-121. Santa Barbara H1, 0 to 10 in. 2190 ± 180
Total organic carbon, depth interval 0 to 10 in. below top of sediment.
Soft olive-brown mud with gray beds, finely laminated. Some Foraminifera.

SM-124. Santa Barbara H1, 120 to 130 in. 5780 ± 235

Total organic carbon, depth interval 120 to 130 in. below top of sediment.
Firm olive-brown mud with gray beds, finely laminated. Sparse Foraminifera.

SM-82. Santa Barbara H2, 0 to 10 in. 2150 ± 200

Total organic carbon, depth interval 0 to 10 in. below top of sediment.
Soft olive-brown mud with gray beds, finely laminated. Foraminifera present.

SM-83. Santa Barbara H2, 108 to 118 in. 5410 ± 250

Total organic carbon, depth interval 108 to 118 in. below top of sediment.
Firm olive-brown mud with gray beds, finely laminated. Foraminifera present.
Comment: data for similar depth intervals in each of the cores are in close agreement.

Santa Cruz Basin series, Cores I1, I2

Samples from two cores (I1, I2) separated by a few hundred ft (33° 49' N Lat, 119° 42' W Long), water depth 5598 ft. Coll. July 1956.

SM-141. Santa Cruz I1, 61 to 104 in. 5640 ± 200

Total organic carbon, depth interval 61 to 104 in. below top of sediment.
Firm greenish-brown mud, some Foraminifera, massive bedding.

**SM-68. Santa Cruz I1, 0 to 12 in. 3540 + 3200
- 2200**

Foraminifera in mud, depth interval 0 to 12 in. below top of sediment.
Soft greenish-brown mud. Sparse Foraminifera.

**SM-69. Santa Cruz I1, 104 to 116 in. 8575 + 4100
- 2700**

Foraminifera in mud, depth interval 104 to 116 in. below top of sediment.
Firm greenish-brown mud. Sparse Foraminifera.

SM-170. Santa Cruz I2, 0 to 58 in. 4250 ± 175

Total organic carbon, depth interval 0 to 58 in. below top of sediment.
Olive-brown mud, massive bedding, oolitic, micaceous. Sparse Foraminifera.

SM-170C. Santa Cruz I2, 0 to 58 in. 5260 ± 260

Dispersed carbonate, depth interval 0 to 58 in. below top of sediment.
(Lithology identical to SM-170.)

SM-170F. Santa Cruz I2, 0 to 58 in. 7130 ± 600

Foraminifera in mud, depth interval 0 to 58 in. below top of sediment.
(Lithology identical to SM-170.)

SM-171. Santa Cruz I2, 58 to 107 in. > 30,000

Total organic carbon, depth interval 58 to 107 in. below top of sediment.
Firm olive-brown mud. Bottom 12 in. contained alternating dark and light .25-in. layers of grayish-olive-brown sand, VF-F, well sorted, subangular.

SM-171C. Santa Cruz I2, 58 to 107 in. > 30,000

Dispersed carbonate, depth interval 58 to 107 in. below top of sediment.
(Lithology identical to SM-171.)

SM-171F. Santa Cruz I2, 58 to 107 in. > 30,000

Foraminifera, depth interval 58 to 107 in. below top of sediment.
(Lithology identical to SM-171.)

Comment: large errors quoted for SM-68 and SM-69 are due to small samples. The cores were taken in the vicinity but beyond the limits of the mouth of Santa Cruz submarine Canyon. Turbidity currents in this area may account for the extreme differences between cores 1 and 2. There are also large differences between total organic carbon, dispersed carbonate, and Foraminifera dates for the same sample.

Santa Cruz Basin series, Cores J1, J2

Samples from two cores (J1, J2) separated by a few hundred ft ($33^{\circ} 30'$ N Lat, $119^{\circ} 26'$ W Long), water depth 5525 ft. Coll. July 1956.

SM-84. Santa Cruz J1, 0 to 11 in. 3380 ± 300

Total organic carbon, depth interval 0 to 11 in. below top of sediment. Soft olive-brown mud. Abundant Foraminifera.

SM-142. Santa Cruz J1, 17 to 59 in. 3800 ± 150

Total organic carbon, depth interval 17 to 59 in. below top of sediment. Medium-firm olive-brown mud, öolitic. Abundant Foraminifera, massive bedding.

SM-85. Santa Cruz J1, 106 to 118 in. $10,320 \pm 700$

Total organic carbon, depth interval 106 to 118 in. below top of sediment. Firm olive-brown mud, öolitic. Abundant Foraminifera, massive bedding.

SM-143. Santa Cruz J2, 59 to 106 in. 7100 ± 260

Total organic carbon, depth interval 59 to 106 in. below top of sediment. Firm olive-brown mud, öolitic. Abundant Foraminifera, massive bedding.

SM-73. Santa Cruz J2, 106 to 118 in. 9800 ± 750

Foraminifera in mud, depth interval 106 to 118 in. below top of sediment.

SM-72. Santa Cruz J2, 0 to 11 in. 3925 ± 800

Foraminifera in mud, depth interval 0 to 11 in. below top of sediment.

Comment: dates on Foraminifera are consistent with total organic carbon dates at the same depth.

Santa Cruz Basin series, Cores K1, K2

Samples from two cores (K1, K2) separated by a few hundred ft ($33^{\circ} 29'$ N Lat, $119^{\circ} 20'$ W Long), water depth 5608 ft. Coll. July 1956.

SM-88. Santa Cruz K1, 0 to 12 in. 2435 ± 200

Total organic carbon 0 to 12 in. below top of sediment. Soft olive-brown mud. Very abundant Foraminifera.

SM-89. Santa Cruz K1, 106 to 112 in. 9950 ± 385

Total organic carbon, depth interval 106 to 112 in. below top of sediment. Firm olive-brown mud. Very abundant Foraminifera, massive bedding.

SM-110. Santa Cruz K1, 12 to 80 in. 5170 ± 900

Benzene-soluble organic material from core, depth interval 12 to 80 in. below top of sediment. Firm olive-brown mud. Very abundant Foraminifera, massive bedding.

SM-111. Santa Cruz K1, 80 to 106 in. 8780 ± 1300

Benzene-soluble organic material from core, depth interval 80 to 106 in.

below top of sediment. Firm olive-brown mud. Very abundant Foraminifera, massive bedding.

SM-145. Santa Cruz K2, 12 to 47 in. 3580 ± 175

Total organic carbon, depth interval 12 to 47 in. below top of sediment. Medium-firm olive-brown mud. Very abundant Foraminifera, massive bedding.

SM-144. Santa Cruz K2, 59 to 106 in. 7260 ± 260

Total organic carbon, depth interval 59 to 106 in. from bottom of sediment. Firm olive-brown mud. Very abundant Foraminifera, massive bedding.

SM-57. Santa Cruz K2, 0 to 11 in. 8080 ± 600

Foraminifera in mud, depth interval 0 to 11 in. below top of sediment. Soft olive-brown mud. Very abundant Foraminifera.

SM-58. Santa Cruz K2, 106 to 118 in. 11,280 ± 875

Foraminifera, depth interval 106 to 118 in. below top of sediment. Firm olive-brown mud. Very abundant Foraminifera. 111 to 113 in. olive-brown sand VF-F, well sorted, subangular, firm.

Comment: benzene-soluble material and total organic carbon dates are internally consistent, showing linear increase in age with depth. Foraminifera at top of core 2 are very much older than total organic carbon at the same depth in core 1, suggesting transport of the Foraminifera from older sediment.

Santa Monica Basin series

Samples from two cores (L1, L2) separated by a few hundred ft (33° 40' N Lat, 118° 48' W Long), water depth 2975 ft. Coll. July 1956.

SM-140. Santa Monica L2, 0 to 12 in. 3615 ± 190

Total organic carbon, depth interval 0 to 12 in. below top of sediment. Soft dark-gray mud with brown streaks.

SM-146. Santa Monica L1, 36 to 72 in. 5850 ± 400

Total organic carbon, depth interval 36 to 72 in. below top of sediment. Dark-gray sand VF, silty, well sorted, subangular, firm. Mica, carbonized wood fragments.

West Cortez Basin series

Samples from two cores (M1, M2) separated by several hundred ft (32° 17' N Lat, 119° 17' W Long), water depth 5745 ft. Coll. July 1956.

SM-61. West Cortez M1, 0 to 14 in. 4500 ± 600

Foraminifera in mud, depth interval 0 to 14 in. below top of sediment. Soft olive-brown mud. Abundant Foraminifera.

SM-147. West Cortez M1, 67 to 119 in. 17,050 ± 600

Total organic carbon, depth interval 67 to 119 in. below top of sediment. Firm olive-brown mud. Abundant Foraminifera.

SM-115. West Cortez M2, 67 to 119 in. > 25,000

Benzene-soluble organic material from core, depth interval 67 to 119 in. below top of sediment. Firm olive-brown mud with abundant Foraminifera. Massive bedding.

SM-134. West Cortez M2, 38 to 64 in. 17,200 ± 450
Total organic carbon, depth interval 38 to 64 in. below top of sediment.
Medium-firm olive-brown mud with abundant Foraminifera. Massive bedding.

SM-135. West Cortez M2, 64 to 82 in. 18,500 ± 500
Total organic carbon, depth interval 64 to 82 in. below top of sediment.
Firm olive-brown mud with abundant Foraminifera. Massive bedding.
Comment: samples SM-115 and SM-147 are suspected of being contaminated by ancient carbon from laboratory solvents.

West Cortez Basin series, Core N1

Samples from one core (N1) (32° 11' N Lat, 119° 18' W Long), water depth 5313 ft. Coll. July 1956.

SM-176. West Cortez N1, 13 to 65 in. 21,900 ± 800
Total organic carbon, depth interval 13 to 65 in. below top of sediment.
Olive-brown, öolitic mud. Abundant Foraminifera.

SM-176C. West Cortez N1, 13 to 65 in. 25,900 ± 1850
Dispersed carbonate, depth interval 13 to 65 in. below top of sediment.
(Lithology identical to SM-176.)

SM-162. West Cortez N1, 13 to 65 in. 24,100 ± 1300
Foraminifera in mud, depth interval 13 to 65 in. below top of sediment.
(Lithology identical to SM-176.)

SM-177. West Cortez N1, 65 to 117 in. > 30,000
Total organic carbon, depth interval 65 to 117 in. below top of sediment.
Firm, olive-brown, öolitic mud. Abundant Foraminifera.

SM-177C. West Cortez N1, 65 to 117 in. > 30,000
Dispersed carbonate, depth interval 65 to 117 in. below top of sediment.
(Lithology identical to SM-117.)

SM-163. West Cortez N1, 65 to 117 in. > 30,000
Foraminifera in mud, depth interval 65 to 117 in. below top of sediment.
(Lithology identical to SM-117.)

SM-65. West Cortez, N1, 0 to 13 in. 12,520 ± 1200
Foraminifera in mud, depth interval 0 to 13 in. below top of sediment.
Soft, olive-brown, öolitic mud. Abundant Foraminifera.

SM-66. West Cortez N1, 117 to 130 in. > 25,000
Foraminifera in mud, depth interval 117 to 130 in. below top of sediment. Firm, olive-brown, öolitic mud. Very abundant Foraminifera.

SM-137. San Pedro Basin, 60 to 118 in. 6070 ± 170
Total organic-carbon sample from one core (33° 34.5' N Lat, 118° 24.5' W Long). Coll. July 1956. Depth interval 60 to 118 in. below top of core.

B. Gulf of Mexico

Continental Shelf series

Samples from short cores of recent sediment obtained on the continental shelf in the Gulf of Mexico. Coll. June 1954.

SM-364. Site A, 0 to 3 ft **3120 ± 220**

Total organic carbon from mud, depth interval 0 to 3 ft (29° 8' N Lat, 90° 01' W Long), water depth 48 ft.

SM-365. Site A, 3 to 7 ft **4950 ± 350**

Total organic carbon from mud, depth interval 3 to 7 ft (29° 8' N Lat, 90° 01' W Long), water depth 48 ft.

SM-366. Site B, 0 to 8 ft. **7880 ± 520**

Total organic carbon from mud, depth interval 0 to 8 ft (28° 59' N Lat, 91° 29' W Long), water depth 42 ft.

SM-367. Site C, 2 to 5 ft **12,180 ± 620**

Total organic carbon from stiff gray clay, depth interval 2 to 5 ft (29° 28' N Lat, 93° 13' W Long), water depth 42 ft.

SM-368. Site D, 0 to 2 ft **>30,000**

Shells from stiff gray clay, depth interval 0 to 2 ft (29° 25' N Lat, 94° 21' W Long), water depth 43 ft.

Comment: the age of organic carbon for sample SM-367 at site C appears much too young, since the weathered appearance of the stiff gray clay suggests that this sample antedates the last major regression of the sea (Stevens, Bray, and Evans, 1956). Also, data on shells from a similar stiff clay at site D (SM-368) indicate the sample to be of greater age. This anomalous age for the organic material may have resulted from the deposition of biological residue in the soil during the time the Pleistocene surface was exposed.

Block 126 Salt Dome series

Samples obtained from a test piling core located on the Block 126 salt dome, comprised of Blocks 119, 120, 125, and 126 Eugene Island area, Gulf of Mexico. Water depth was 37 ft. Approximate location 29° 2' N Lat, 90° 31' W Long. Coll. 1955.

SM-369. 69 ft to 70 ft 8 in. **11,950 ± 650**

Total organic carbon from recent mud, depth interval 69 ft to 70 ft 8 in. below top of sediment.

SM-370. 74 ft 7 in. to 75 ft 2 in. **27,700 + 3400
- 2300**

Total organic carbon from Beaumont clay, depth interval 74 ft 7 in. to 75 ft 2 in. below top of sediment.

Comment: the data show a break in deposition consistent with a Pleistocene-Recent contact (Bray and Nelson, 1956). The date determined for the Beaumont clay is regarded as a minimum rather than an absolute age. The reduced age is believed to result from contamination by biological activity in the soil during the time the Pleistocene surface was exposed.

San Antonio Bay series, Texas, Site XS-384

Shells from coring of oyster reef (Shepard and Moore, 1955), West Central San Antonio Bay (28° 17' N Lat, 96° 46' W Long), water depth 5 ft. Subm. by F. P. Shepard, Scripps Institution of Oceanography, La Jolla, California.

SM-357. Shells, 12 ft sub-sea	2100 ± 300
SM-358. Shells, 21 ft sub-sea	5100 ± 550
SM-359. Shells, 56 ft sub-sea	8900 + 2000 - 1500

San Antonio Bay series, Texas, Site XS-383

Shells and wood fragments from coring of Recent sediments, Southwest San Antonio Bay (28° 14' N Lat, 96° 46' W Long), water depth 6 ft. Subm. by F. P. Shepard, Scripps Institution of Oceanography, La Jolla, California.

SM-360. Shells, 77 ft sub-sea **9300 ± 1300**

SM-361. Wood fragments, 90 ft sub-sea **9800 ± 350**

Comment: Shepard and Moore (1955) indicate the coring was from what may have been a former river valley which was filled with recent sediments. The wood fragments (SM-361) were from a dark-brown, crumbly, silty clay, showing lamination in some places. This was interpreted as a river-bottom or fresh-water marsh deposit, belonging to an earlier deposition cycle. The 9300 years found in the upper sample of this coring (SM-360) at a sediment depth of 69 ft gives a mean subsequent deposition rate of .74 ft per century.

SM-362. San Antonio Bay, Texas **6100 ± 800**

Shell, 49 ft sub-sea, from coring of oyster reef, North Central San Antonio Bay, Site XS-386 (Shepard and Moore, 1955) (28° 21' N Lat, 96° 45' W Long), water depth 5 ft. Subm. by F. P. Shepard, Scripps Institution of Oceanography, La Jolla, California.

SM-363. St. Joseph Island, Texas **6500 ± 300**

Shell fragments, 46 to 46.5 ft below top of sediment, in coring located on the beach, SE St. Joseph Island, Site SXJ-56 (Shepard and Moore, 1955) (27° 56' N Lat, 96° 59' W Long). Subm. by F. P. Shepard, Scripps Institution of Oceanography, La Jolla, California.

Corpus Christi Bay series, Texas, Site H

Organic carbon from recent sediment core, West Central Corpus Christi Bay, taken from an old Pleistocene channel of the Nueces River (27° 48' 51" N Lat, 97° 17' 39" W Long), water depth 12 ft. Coll. January 1955. The sediment from each depth interval was homogenized, and the date for the total organic carbon is presumed to be an average for the depth interval.

SM-339. Corpus Christi, Site H, 0 to 5 ft **550 ± 220**

Total organic carbon, depth interval 0 to 5 ft below top of sediment. Soft gray, creamy clay mud.

SM-340. Corpus Christi, Site H, 8 to 18 ft **1900 ± 200**

Total organic carbon, depth interval 8 to 18 ft below top of sediment. Gray, slightly firm, creamy clay mud.

SM-341. Corpus Christi, Site H, 18 to 28 ft **4350 ± 250**

Total organic carbon, depth interval 18 to 28 ft below top of sediment. Gray, slightly firm, creamy clay mud.

SM-342. Corpus Christi, Site H, 32 to 38 ft **6200 ± 300**

Total organic carbon, depth interval 32 to 38 ft below top of sediment. Gray, stiff, creamy clay. At 35.5 ft, 10 in. of clean sand with shell debris.

Comment: rates of deposition increase with age and with depth from 550 yr down to the bottom-most sample. This could mean that a greater sediment load was deposited in the bay in earlier times or that, as the sealevel rose and the bay filled, the same volume of sediment was spread more thinly over a larger area, thereby decreasing the rate at which sediments were deposited in a unit area.

Corpus Christi Bay series, Texas, Site J

Organic carbon from recent sediment core taken from the Pleistocene channel of the Nueces River, West Central portion of Corpus Christi Bay (27° 48' 51" N Lat, 97° 18' 28" W Long), water depth 12 ft. Coll. January 1955. Homogenized as in samples from Site H.

SM-344. Corpus Christi, Site J, 25 to 30 ft **4000 ± 250**

Total organic carbon, depth interval 25 to 30 ft below top of sediment. Gray, firm, creamy mud.

SM-345. Corpus Christi, Site J, 45 to 50 ft **7700 ± 600**

Total organic carbon, depth interval 45 to 50 ft below top of sediment. Soft, gray, plastic shelly mud.

SM-346. Corpus Christi, Site J, 51 to 55 ft **8450 ± 450**

Total organic carbon, depth interval 51 to 55 ft below top of sediment. Gray, soft, plastic clay mud.

SM-347. Corpus Christi, Site J, 60 to 65 ft **8950 ± 350**

Total organic carbon, depth interval 60 to 65 ft below top of sediment. Gray plastic clay mud with a few small brown plant fibers. Immediately above Beaumont clay.

Comment: the 8950 yr found in this coring for 62.5 ft of sediment gives a mean deposition rate of .70 ft per century. This is similar to the mean deposition rate of .74 ft per century in the San Antonio Bay as calculated for boring XS-383 (Shepard and Moore, 1955).

Corpus Christi Bay series, Texas, Site K

Organic carbon from recent sediment core taken from the Pleistocene channel of the Nueces River, SE portion of Corpus Christi Bay (27° 45' N Lat, 97° 14' 30" W Long), water depth 14 ft. Coll. January 1955. Homogenized as in samples from Site H.

SM-348. Corpus Christi, Site K, 0 to 5 ft **1500 ± 200**

Total organic carbon depth interval 0 to 5 ft below top of sediment. Very soft, gray, plastic shelly mud. No bedding.

SM-349. Corpus Christi, Site K, 10 to 15 ft **3800 ± 200**

Total organic carbon, depth interval 10 to 15 ft below top of sediment. Very soft, gray, plastic clay mud. No bedding.

SM-350. Corpus Christi, Site K, 20 to 30 ft **6150 ± 200**

Total organic carbon, depth interval 20 to 30 ft below top of sediment. Very soft, gray, plastic clay mud.

Comment: the rate of deposition at this site was smaller than for the Corpus Christi Bay sites H and J, above. This is expected since site K is farther downstream in the old Nueces River channel and farther from the source of sedi-

ments. Contrary to prediction based on the lower rate of deposition, the age for the same absolute depth below sealevel is greater at this site, suggesting either uplift or a topographic irregularity in the underlying Pleistocene surface.

LAKE AND BOG DEPOSITS

Grassy Lake series

Recent sediment core, taken with piston corer from south-central part of Grassy Lake (46° 4' N Lat, 89° 45' W Long), Vilas County, Wisconsin. Coll. 1955. Grassy Lake is a large bog lake with shallow water ranging to a maximum of 6 or 7 ft in depth. At the core site the sediments above the "bottom sand" were about 30 ft thick. The upper 10 ft of sediment was very thin and liquid and was not recovered in the sampling.

SM-13. Grassy Lake, 19.5 to 14.5 ft **2300 ± 200**

Total organic carbon, depth interval 19.5 to 14.5 ft above "bottom sand". Dark-green- to yellowish-brown gyttja with some plant matter. Numerous diatoms, sponge spicules, and pollen grains.

SM-14. Grassy Lake, 14.5 to 9.5 ft **3150 ± 200**

Total organic carbon, depth interval 14.5 to 9.5 ft above "bottom sand". Yellowish-brown- to black gyttja with fragments of plant fibers, diatom tests, sponge spicules, and pollen grains.

SM-15. Grassy Lake, 9.5 to 4.5 ft **4110 ± 250**

Total organic carbon, depth interval 9.5 to 4.5 ft above "bottom sand". Yellowish-brown- to black gyttja with plant fragments of fibers, diatom tests, sponge spicules, and pollen grains.

SM-16. Grassy Lake, 4.5 to 0ft **7650 ± 250**

Total organic carbon, depth interval 4.5 to 0 ft above "bottom sand". Yellowish-brown- to black gyttja and dark-gray- to black gyttja.

Comment: prior to ca. 4000 B.P., the data show a lower rate of deposition on and above a red sand ("bottom sand"), which was suggested by Twenhofel, Carter, and McKelvey (1942) to represent the bottom of the lake when the Wisconsin glacier receded. The "bottom sand" was used as datum, as neither top of sediment nor water level is fixed in position over a period of time. The sediment from each depth interval collected was homogenized; the date for the total organic carbon is presumed to be an average for the depth interval.

Trout Lake series

Sediment coring from a basin in the NW portion of South Trout Lake. Approximate location (46° 2' N Lat, 89° 45' W Long), Vilas County, Wisconsin. Coll. August 1955, water depth 58 ft.

SM-17. South Trout Lake, 13 to 10 ft **620 ± 100**

Total organic carbon, depth interval 13 to 10 ft above bottom sand, Dark-greenish-gray- to black gyttja.

SM-18. South Trout Lake, 10 to 5 ft **2000 ± 200**

Total organic carbon, depth interval 10 to 5 ft above bottom sand, Dark-greenish-gray- to black gyttja.

SM-19. South Trout Lake, 5 to 0 ft **3600 ± 200**

Total organic carbon, depth interval 5 to 0 ft above botetom sand. Dark-greenish-gray- to black gyttja. Small amount of sand.

Comment: the pattern of deposition for Trout Lake is similar to that for Grassy Lake in that the deposition was abruptly more rapid after about 4000 B.P. Most of the sediment in each of the lakes has been deposited since that time. Trout Lake, however, had a lower deposition rate than Grassy Lake. Trout Lake is a very large lake with deep water ranging up to 120 ft in depth. The transition from water to sediment is more abrupt than that in Grassy Lake (Twenhofel and others, 1945).

Quebec-Labrador series

Peat cored from three bogs in the Quebec-Labrador area. Samples coll. 1953 and subm. 1954 by J. F. Grayson, University of Michigan, Ann Arbor.

SM-352. Camp #224 (No. 71-3) **1350 ± 500**

Total organic carbon from sediment composite for the depth interval 2 to 3 ft below water level, core site 52° 59' N Lat, 66° 15' W Long.

SM-353. Camp #224 (No. 74-6) **3400 ± 600**

Total organic carbon from sediment composite for the depth interval 5 to 6 ft below water level, core site 52° 59' N Lat, 66° 15' W Long.

SM-354. Camp #224 (No. 80-12) **5250 ± 800**

Total organic carbon from sediment composite of the bottom core sample. The depth interval was 11 to 12 ft below water level. Core site 52° 59' N Lat, 66° 15' W Long.

SM-355. Greenbush Lake (No. 48-9) **5300 ± 800**

Total organic carbon from sediment composite of the bottom sample of a bog. The depth interval was 8 to 9 ft below water level. Core site 54° 59' N Lat, 67° 14' W Long.

SM-356. Marymac Lake (No. 57-11) **6400 ± 900**

Total organic carbon from the lowermost sample (10 to 11 ft below water level) containing organic material.

Comment: the Greenbush Lake sample (SM-355) was from very near the bottom of the basin. The basin contains little or no inorganic sediment, indicating that it was probably ice-blocked, with vegetation surrounding it. On the assumption that organic sediments began to accumulate immediately after melting of the ice block, sample SM-355 may approximately date the last of the Laurentide Ice Sheet in this locality (Grayson, 1956). On similar assumptions, bottom samples SM-354 and SM-356 should approximately date the last ice at their respective localities.

Searles Lake series, California

Samples of cores from Searles Lake, San Bernardino County, California, subm. by R. F. Flint, Yale University. Approximate location of core site 35° 43' N Lat, 117° 17' W Long. The data were discussed by Flint and Gale (1958) using the code designation RC.

- SM-1-8. Depth 65.8 to 66.5 ft** **22,400 ± 1000**
 Total organic carbon from core GS-18-11. Lowest portion of parting mud.
 Average of four samples, each run in duplicate.
- SM-33. Depth 85.7 to 86.2 ft** **22,800 ± 1400**
 Total organic carbon from core X-16. Lowest portion of parting mud.
- SM-34. Depth 131.2 to 131.7 ft** **> 30,000**
 Total organic carbon from core X-16. Uppermost portion in the bottom
 mud immediately below Lower Salt.
- SM-35. Depth 81.4 to 81.8 ft** **22,600 ± 1400**
 Total organic carbon from core X-16. Parting mud, 9.2 to 9.6 ft below
 top of parting mud.
- SM-36. Depth 26.3 to 26.5 ft** **10,270 ± 450**
 Total organic carbon from core X-16. Mud from 26.3 ft to 26.5 ft below
 top of Upper Salt.
- SM-50. Depth 33.0 to 33.3 ft** **11,400 ± 600**
 Total organic carbon from core X-16. Mud seam 33.0 to 33.3 ft below top
 of Upper Salt.
- SM-50C. Depth 33.0 to 33.3 ft** **9900 ± 500**
 Dispersed carbonate from core X-16.

Comment: Searles Lake stratigraphy includes two pairs of major stratigraphic units, young enough to date by C^{14} , within the uppermost 200 ft of section. These are the Parting Mud-Upper Salt pair and the Bottom Mud-Lower Salt pair (Flint and Gale, 1958). Each pair represents a deep lake that subsequently evaporated to saturation or dryness as the climate changed (Flint and Gale, 1958).

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