

THE NOTES

ABBREVIATIONS

AEC	Records of Headquarters, U. S. Atomic Energy Commission, Washington, D. C.	JRO	Papers of J. Robert Oppenheimer, Library of Congress, Washington, D. C.
AFSWC	Records of the Armed Forces Special Weapons Center, Kirtland Air Force Base, Albuquerque, New Mexico.	KAPL	Records of the Knolls Atomic Power Laboratory, Schenectady, New York.
ALOO	Records of the Albuquerque Operations Office, U. S. Atomic Energy Commission, Albuquerque, New Mexico.	LAOO	Records of the Los Alamos Area Office, U. S. Atomic Energy Commission, Los Alamos, New Mexico.
ANL	Records of the Argonne National Laboratory, Argonne, Illinois.	LASL	Records of the Los Alamos Scientific Laboratory, Los Alamos, New Mexico.
BNL	Records of the Brookhaven National Laboratory, Upton, New York.	LRL	Records of the Lawrence Radiation Laboratory, Berkeley, California.
CM 1	Commission Meeting 1, U. S. Atomic Energy Commission.	MLC 1	Joint Meeting 1 of the Military Liaison Committee with the U. S. Atomic Energy Commission.
DEL	Papers of David E. Lillenthal, Princeton University Library, Princeton, New Jersey.	NHD	Records of the Naval Historical Division, Department of the Navy, Washington, D. C.
DS	Records of the U. S. Department of State, Washington, D. C.	ORNL	Records of the Oak Ridge National Laboratory, Oak Ridge, Tennessee.
GAC 1	Meeting 1 of the General Advisory Committee to the U. S. Atomic Energy Commission.	OROO	Records of the Oak Ridge Operations Office, U. S. Atomic Energy Commission, Oak Ridge, Tennessee.
HST	Harry S. Truman Library, Independence, Missouri.	OSD	Records of the Office of the Secretary of Defense, Washington, D. C.
JCAE	Records of the Joint Committee on Atomic Energy, National Archives, Washington, D. C.	WNRC	Washington National Records Center, Modern Military Records Division, National Archives and Records Service, Suitland, Maryland.
JFP	James Forrestal Papers, Princeton University, Princeton, New Jersey.		

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1. *New York Times*, *Washington Post*, Jan. 28, 1947; Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), p. 133.
2. Joint Committee on Atomic Energy, *Confirmation of Atomic Energy Commission and General Manager*, Jan. 27-31, Feb. 3-8, 10-12, 17-22, 24-26, Mar. 3-4, 1947 (Washington, 1947), pp. 1-7 (hereafter cited as *Confirmation Hearings*).
3. *New York Times*, Jan. 23, 25, 1947.
4. R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939-1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), pp. 488-509.
5. *Ibid.*, pp. 531-79.
6. *Confirmation Hearings*, p. 7.
7. *Ibid.*, p. 15.
8. Lilienthal, *Atomic Energy Years*, p. 133.
9. *Confirmation Hearings*, p. 26.
10. *Ibid.*, pp. 31-32; Lilienthal, *Atomic Energy Years*, pp. 134-35.
11. Lilienthal, *Atomic Energy Years*, p. 138.
12. Strauss, *Men and Decisions* (Garden City, N. Y., 1962), pp. 1-200; *Confirmation Hearings*, pp. 38-43.
13. Lilienthal, *Atomic Energy Years*, pp. 30-31, 130-32, 136-40; Hewlett and Anderson, *New World*, pp. 556-58; *Confirmation Hearings*, pp. 99-100.
14. Lilienthal to the Commissioners, Jan. 31, Feb. 4, 1947, *AEC*.
15. Lilienthal, *Atomic Energy Years*, pp. 140-41.
16. *Confirmation Hearings*, pp. 111-32.
17. Lilienthal, *Atomic Energy Years*, pp. 142-43.
18. Bridges's complete statement was carried in the *Washington Times-Herald*, Feb. 10, 1947.
19. Lilienthal, *Atomic Energy Years*, pp. 144-45; *Confirmation Hearings*, pp. 317-18.
20. *Washington Post*, Feb. 13-15, 17, 1947; *New York Times*, Feb. 14, 1947.
21. Acheson to Marshall, Feb. 13, 1947, *DS*; *Washington Times-Herald*, Feb. 15, 1947; Lilienthal, *Atomic Energy Years*, p. 151.
22. Arthur H. Vandenberg, Jr., ed., *The Private Papers of Senator Vandenberg* (Boston, 1952), pp. 352-55; *Confirmation Hearings*, pp. 287-91, 691-92.
23. The complete text of Taft's statement appeared in the *Washington Post*, Feb. 22, 1947. Taft's working draft is in the Robert A. Taft Papers, Box 1268, Manuscript Division, Library of Congress.
24. Lilienthal, *Atomic Energy Years*, pp. 145-46, 150; Strauss to Lilienthal, Mar. 3, 1947, *DEL*; *Confirmation Hearings*, pp. 170-73; Marquis Childs in the *Washington Post*, Feb. 19, 1947; Strauss to Lilienthal, Feb. 27, 1947, *AEC*.
25. *Confirmation Hearings*, p. 537.
26. *Washington Post*, Mar. 1, 1947; *Chicago Tribune*, Mar. 1, 1947; Lilienthal, *Atomic Energy Years*, p. 152. A copy of McKellar's letter to members of the Senate, Feb. 24, 1947 is in *DEL*.
27. A stenographic transcript of the Executive Session on Mar. 4, 1947 is in *AEC*. Lilienthal, *Atomic Energy Years*, pp. 154-55.
28. *New York Times*, editorial, Mar. 2, 1947; Lilienthal, *Atomic Energy Years*, pp. 156-57; *New York Herald-Tribune*, Mar. 6, 1947; *Washington Post*, Mar. 6, 1947.
29. Walter Millis, ed., *The Forrestal Diaries* (New York, 1951), p. 255.
30. *Chicago Herald-American*, Mar. 10, 1947; *Washington Post*, Mar. 11, 1947; *New York Times*, Mar. 11, 1947; *Congressional Record*, 80 Cong., 1 sess., p. 1814.
31. U. S. Atomic Energy Commission, *In the Matter of J. Robert Oppenheimer* (Washington, 1954), pp. 179-80, 374-75, 411-12, 415-20.
32. *New York Herald-Tribune*, Mar. 10, 1947.

CHAPTER 2

1. GAC 1, Jan. 3-4, 1947, *AEC*.
2. Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), p. 128.
3. R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939-1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), pp. 644-46.
4. *Ibid.*, pp. 409-11; Bush, *Science, The Endless Frontier* (Washington, 1945), pp. 25-34.
5. Bush to Robert P. Patterson, May 21, 1946, JRDB Doc. AE 4/1, Joint Rules of Procedure, *AEC*.
6. Minutes, Atomic Energy Committee, JRDB, Jan. 4, 1947, *AEC*.
7. Quoted from his book, *TVA—Democracy on the March* (New York, 1944), p. 77; see also pp. 75-78, 125-51. Lilienthal, *Journals*, Vol. I, *The TVA Years, 1939-1945* (New York, 1964), pp. 125, 142, 387, 495-96.
8. Unsigned memorandum re Division of Military Application, Dec. 18, 1946, *AEC*.
9. Niehoff to Wilson, Advisory Panel for Recommendation of Candidate for Position of General Manager, undated, Niehoff to Advisory Panel, Nov. 25, 1946, *AEC*.
10. Niehoff to Wilson, Dec. 24, 1946, *AEC*.
11. John Fischer, "Let's Go Back to the Spoils System," *Harper's* 191 (Oct. 1945), 362-68.
12. Second draft statement of major personnel problems of the AEC, encl., Niehoff to Wilson, Jan. 4, 1947, *AEC*.
13. Niehoff to Wilson, Jan. 8, 1947, *AEC* Press Releases, Jan. 21, 23, 1947, Wilson to Principal Staff, Feb. 1, 1947, *AEC*.
14. Groves to Lilienthal, Nov. 14, 1946, Lilienthal to Groves, Dec. 4, 1946, Groves to Lilienthal, Dec. 19, 1946, *AEC*.
15. Banks to Project Staff, Dec. 26, 1946, *AEC*.
16. CM 20, Jan. 14, 1947, E. E. Kirkpatrick to Area Engineers, Jan. 17, 1947, CM 22, Jan. 21, 1947, *AEC*.
17. Wilson to Washington Personnel, Jan. 27, 1947, Wilson to the Commission, Jan. 27, 1947, Wilson to Heads of All Field Operations, Feb. 14, 1947, *AEC*.
18. Wilson to the Commissioners, Feb. 21, 1947, Jones to Wilson, Feb. 24, 1947, Jones to Heads of All Field Operations, May 14, 1947, *AEC*.
19. Draft contracts, encl., Nichols to Wilson, Dec. 31, 1946, *AEC*.
20. Garrison to Lilienthal, Jan. 3, 1947, *AEC* Press Release, Jan. 3, 1947, Memorandum regarding questions of labor policy, Jan. 4, 1947, CM 19, Jan. 8, 1947, *AEC*.
21. Wilson to Kerr, Jan. 13, 1947, Wilson to Seward, Jan. 14, 1947, Kerr and Flaherty to Wilson, Feb. 9, 1947, Belsley to Wilson, Feb. 8, 1947, Belsley to Niehoff, Mar. 19, 1947, *AEC*. Further discussion of the labor situation at Oak Ridge will be found in Chap. 11, pp. 343-48 and Chap. 14, pp. 459-61.
22. GAC 1, Jan. 3, 1947, CM 21, Jan. 15, 1947, *AEC*. Margaret M. Gowing, *Britain and Atomic Energy, 1939-1945* (London, 1964), pp. 66, 71.
23. K. E. Fields to G. F. Trowbridge, Jan. 13, 1947, *AEC*.
24. Hewlett and Anderson, *New World*, pp. 633-34.
25. Minutes, Argonne Laboratory Executive Committee, Jan. 23, 1947, *ANL*; Report on Research and Development, Feb. 1, 1947, *AEC*.
26. GAC 2, Feb. 2, 1947, Oppenheimer to Lilienthal, Jan. 28, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 137.
27. Proposals for Research and Development in the Field of Atomic Energy, Sept. 28, 1945, *AEC*; Hewlett and Anderson, *New World*, p. 633.
28. GAC 2, Feb. 2-3, 1947, Bradbury to H. C. Gee, Nov. 7, 1946, *AEC*.
29. Hewlett and Anderson, *New World*, pp. 649-50.
30. Patterson to Lilienthal, Dec. 31, 1946, CM 19, Jan. 8, 1947, Lilienthal to the Commissioners, Jan. 30, 1947, Lilienthal to Patterson, Jan. 30, 1947, *AEC*.
31. Manley, Notes on Clinton Laboratories, Feb. 13, 1947, *AEC*.
32. Williams Diary, Feb. 26-28, 1947, *AEC*.

33. *Ibid.*, Mar. 1, 1947.
34. Kromer to Kirkpatrick, Jan. 15, 1947, *AEC*.
35. Carl McGowan to the Commissioners, Jan. 21, 1947, CM 24, Jan. 23, 1947, C. C. Vogel to Huddleson, Feb. 7, 1947, *AEC*; F. Daniels to A. H. Compton, Jan. 29, 1947, Argonne Report for Feb. 1947, Mar. 7, 1947, *ANL*; Williams Diary, Mar. 11, 1947, *AEC*.
36. Kromer to Files, Mar. 19, 1947, Wigner to Thomas, Mar. 14, 1947, Leber and Kromer to Williams, Mar. 31, 1947, Monsanto, Clinton Laboratories Report for Mar. 1947, p. 5, *OROO*; Williams Diary, Mar. 12-14, 1947, *AEC*.
37. The Los Alamos accident, which resulted in the death of Louis Slotin on May 30, 1946, has been described in Los Alamos Scientific Laboratory, *Manhattan District History, Project Y, The Los Alamos Project*, Report LAMS-2532, II, 17, 51, and in Stewart Alsop and Ralph E. Lapp, "The Strange Death of Louis Slotin," *Saturday Evening Post* (Mar., 1954), pp. 25, 90-92.
38. Williams Diary, Mar. 17, 18, 1947, *AEC*.
39. For background on wartime production plant operations see Hewlett and Anderson, *New World*, pp. 29, 310, 644-46.
40. Williams Diary, Mar. 18, 1947, Kelley to Wilson, Mar. 24, 1947, Pike to the Commission, Mar. 28, 1947, *AEC*.
41. Williams Diary, Mar. 18, 1947, *AEC*. The original letter of intent is Kirkpatrick to Associated Universities, Inc., Jan. 7, 1947, *AEC*. Early plans at Brookhaven were reported in G. W. Beeler to Kirkpatrick, Jan. 17, 1947, *AEC*.
42. Williams Diary, Mar. 19, 20, 1947, Wilson Diary, Mar. 19, 1947, *AEC*.
43. The wartime facilities at Dayton are described in *Manhattan District History*, Bk. VIII, *Los Alamos Project (Y)*, Vol. 3, *Auxiliary Activities*, pp. 4.6-4.13. Wilson to the Commissioners, Mar. 24, 1947, *AEC*.
44. Wilson Diary, Mar. 21, 1947, *AEC*.
45. *Ibid.*, Mar. 22, 1947, Staff Security Officer to Headquarters Building Personnel, Mar. 19, 1947, *AEC*.
46. Wilson Diary, Mar. 24-28, 1947, *AEC*.
47. GAC 3, Mar. 28-30, 1947, *AEC*.
48. The policy papers are each entitled "Memorandum for Consideration by the General Advisory Committee," Mar. 28, 1947, *AEC*.
49. Report of Subcommittee on Reactors, Mar. 28, 1947, Seaborg, Chemical Problems Attendant with Immediate Increased Production of Plutonium, Mar. 17, 1947, *AEC*.
50. CM 19, Jan. 8, 1947, *AEC*.
51. Lilienthal to Brereton, Mar. 7, 1947, Notes of Conference with Military Liaison Committee, Mar. 11, 1947, Bacher, Notes on Meeting with General Groves, Mar. 25, 1947, *AEC*.
52. CM 32, Mar. 27, 1947, Lilienthal *et al.* to Truman, Apr. 2, 1947, *AEC*.
53. Lilienthal, *Atomic Energy Years*, pp. 165-66; Report to the President from the Atomic Energy Commission, Jan. 1-Apr. 1, 1947, *AEC*.
54. *Congressional Record*, 80 Cong., 1 sess., pp. 2449-53.
55. *Ibid.*, pp. 2593-98.
56. *Ibid.*, pp. 2797-2807.
57. *Ibid.*, pp. 3022-34.
58. *Ibid.*, p. 3044.
59. *New York Times*, Apr. 3, 1947.
60. *Washington Post*, Mar. 31, 1947; Hogness to the Authors, July 19, 1963, *AEC*; Alice K. Smith, *A Peril and A Hope* (Chicago, 1965), p. 516.
61. *Congressional Record*, 80 Cong., 1 sess., pp. 3108-11; *New York Times*, Apr. 4, 1947; Waymack to E. R. Clinchy, Apr. 16, 1947, Waymack to F. W. Seymour, Apr. 7, 1947, *AEC*. Correspondence to McMahon concerning confirmation is in Box 59, *JCAE*.
62. *Congressional Record*, 80 Cong., 1 sess., p. 3116. The final vote on Apr. 9 was 50-31, *ibid.*, p. 3241.
63. Lilienthal to the Commissioners, Apr. 23, 1947, *AEC*. The original document, endorsed by the President, is in *AEC*. Lilienthal, *Atomic Energy Years*, p. 172.
64. Pike to the Commissioners, Mar. 28, Apr. 3, 1947, *AEC*; E. A. Gullion to Acheson, Mar. 26, 1947, *DS*.
65. Groves to Byrnes, Apr. 2, 1946, Minutes, CPC, Apr. 15, July 31, 1946, Memorandum of Agreement, May 13, 1946, *AEC*.
66. Lilienthal to the Commissioners, Apr. 23, 1947, *AEC*; Hewlett and Anderson, *New World*, pp. 466-68.
67. Lilienthal, *Atomic Energy Years*, pp.

170-72; AEC Press Release, Lilienthal's Remarks Before American Society of Newspaper Editors, Apr. 19,

1947. The speech was adapted as an article in the *New York Times Magazine*, May 4, 1947.

CHAPTER 3

1. Proposed Agenda for GAC Weapons Subcommittee Meeting, Mar. 22, 1947, *LASL*.
2. Bradbury, Weapon Program of the Los Alamos Laboratory, Jan. 27, 1947, *AEC*.
3. Notes on Weapons Subcommittee Agenda, Apr. 4, 1947, *LASL*; Report of Weapons Subcommittee, May 15, 1947, *AEC*.
4. A good description of early days at Sandia is in Frederic C. Alexander, Jr., "History of Sandia Corporation," an unpublished history prepared in 1962 for the Sandia Corporation.
5. J. G. Armstrong to J. A. Thomas, Apr. 3, 1947, *AFSWC*. Some historical background is also found in the Semi-annual History of AFSWC, for Apr. 1, 1952-Dec. 31, 1952, Vol. I, Narrative Account, *AFSWC*.
6. Notes on Telephone Conversation, Apr. 4, 1947, Oppenheimer to Lilienthal, Apr. 3, 1947, *AEC*.
7. McCormack to J. A. Derry, Apr. 14, 1947, Wilson to the Commission, Apr. 29, 1947, *AEC*.
8. Williams Diary, Apr. 2, 1947, Wilson Diary, Apr. 2, 1947, CM 33, Apr. 2, 1947, Wilson to Commissioners, Apr. 8, 9, 1947, *AEC*.
9. Williams Diary, Apr. 4, 7, 12, 14, 21, 22, 1947, Fisk, draft of letter to General Electric, Apr. 24, 1947, *AEC*. The draft was discussed at CM 40, Apr. 25, 1947, and the revised letter, Lilienthal to Winne, was dispatched on May 6, 1947.
10. Warner to Wilson, June 8, 1947, Report of Activities—Santa Fe Project, Apr.-June 1947, *AEC*; R. W. Henderson to H. C. Gee, Apr. 25, 1947, *LASL*.
11. T. A. Solberg to Lilienthal, Apr. 15, 1947, Lilienthal to Solberg, Apr. 25, 1947, Lilienthal to Brereton, Apr. 29, 1947, with long-term Commission agenda, Wilson to the Commissioners, Apr. 21, 1947, *AEC*.
12. Teletype, Washington headquarters to AEC Santa Fe, Apr. 15, 1947, and reply, Apr. 25, 1947, *LASL*.
13. Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), p. 174. Notes on AEC-MLC Meeting, Apr. 30, 1947, *AEC*. Strauss, *Men and Decisions* (Garden City, N. Y., 1962), pp. 201-03.
14. Don Z. Zimmerman to Lilienthal, May 19, 1947, McCormack to Lilienthal, May 28, 1947, McCormack to Belsley, Apr. 22, 1947, McCormack to Wilson, May 29, 1947, *AEC*.
15. Warner to K. E. Fields, handwritten notes, June 2, 1947, McCormack, draft memorandum, Coordination Between the AEC and AFSWP in the Field, June 3, 1947, *AEC*.
16. CM 33, 34, Apr. 2, 7, 1947, *AEC*.
17. Transcript of meeting with the Commission, Mar. 30, 1947, *AEC*.
18. Wilson to the Commissioners, Apr. 8, 1947, Wilson Diary, Apr. 7-8, 1947, *AEC*.
19. Draft, Wilson to the Commissioners, Mar. 24, 1947, CM 35, Apr. 8, 1947, *AEC*.
20. CM 36, 37, Apr. 9, 10, 1947, *AEC*.
21. Wigner, "My Impressions of Clinton Laboratories During 1946-1947." Dr. Wigner kindly provided the Authors with a copy of his paper, written in 1947.
22. The general background is described in S. Untermyer, High Pressure Water Cooled Power Pile, Oct. 8, 1947, AEC Report M-4211. See also L. A. Ohlinger, Notes on Meeting of May 24, 1944, AEC Report N-1729s, *AEC*.
23. M. C. Leverett and J. R. Huffman, Preliminary Process Design Report, 1000 Project, May 15, 1946, AEC Report MonN-108, *AEC*.
24. A. M. Weinberg and F. H. Murray, High Pressure Water as a Heat Transfer Medium in a Nuclear Power Reac-

- tor, Apr. 10, 1946, AEC Report Mon P-93, *AEC*.
25. Leverett, Monthly Progress Reports for the Technical Division, July 20, Aug. 20, and Sept. 20, 1947, AEC Reports MonN-140, MonN-148, Mon N-175. The first full summary of the new design is in Physics of a High Flux Pile, Mar. 27, 1947, AEC Report Mon P-272, *AEC*.
 26. Daniels to A. H. Compton, Feb. 7, 1946, *ANL*; K. D. Nichols to C. A. Thomas, May 16, 1946, Thomas to Nichols, May 31, 1946, *ORNL*. Daniels's files, containing a detailed record of the project, are in *ANL*.
 27. Wigner to Daniels, Oct. 22, 1946, Wigner to Thomas, Oct. 25, 1946, *ANL*; Leverett to Wigner, Nov. 22, 1947, *ORNL*.
 28. Daniels to McCullough, Jan. 2, Jan. 23, 1947, *ANL*; Thomas to Wigner, Feb. 3, 1947, Wigner to Thomas, Feb. 6, 1947, Daniels to McCullough, Feb. 6, 1947, *ORNL*.
 29. Wigner to Leber, Mar. 5, 1947, Daniels to Wigner, Mar. 17, 1947, *ORNL*; W. B. Daume, Minutes of Power Pile Division Meeting with Wigner, Mar. 3, 1947, *ANL*.
 30. D. J. Keirn to Files, History of ANP Program, May 31, 1949, C. Spaatz to Groves, Mar. 25, 1946, Groves to Spaatz, Apr. 2, 1946, C. E. LeMay to Groves, Aug. 19, 1946, with first endorsement, Nichols to LeMay, Sept. 11, 1946, LeMay to Groves, Oct. 31, 1946, with first endorsement, Nichols to LeMay, Nov. 27, 1946, *AEC*.
 31. Oak Ridge Press Release, Feb. 6, 1947, *AEC*.
 32. NEPA Status Report, Nov. 1, 1946, NEPA Subcontract Program, Jan. 1, 1947, Meeting of the Board of Consultants, Fairchild, in Washington, Jan. 28, 1947, *OROO*; A. V. Peterson to All Concerned, NEPA Program, Feb. 7, 1947, *AEC*.
 33. Minutes, Committee on Atomic Energy, JRDB, Mar. 10, 31, 1947, *AEC*.
 34. R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939-1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), pp. 66, 168-73; Gunn to Secretary of the Navy, Sept. 30, 1944, *NHD*.
 35. H. G. Bowen to Chief of Naval Operations, Feb. 7, 1946, W. P. Blandy to Chief of Naval Operations, Mar. 5, 1946, Bowen to Secretary of the Navy, Mar. 12, 1946, *NHD*; Russell S. Greenbaum, "Nuclear Power for the Navy, the First Decade (1939-1949)" (Washington, unpublished, n.d.), pp. 38-43, *NHD*.
 36. Cochrane to Chief of Naval Operations, Mar. 29, 1946, *NHD*; Greenbaum, "Nuclear Power for the Navy," pp. 70-79, *NHD*; Abelson, R. E. Ruskin, and C. J. Raseman, Atomic Energy Submarine, Mar. 28, 1946 (NRL Letter Report S-109-36/46), *AEC*.
 37. Examples of work by the group are found in the following AEC reports: M-3216, The Shielding of Power Piles, Aug. 14, 1946, M-3219, The Daniels Pile, n.d., M-3535, Abstracts from Information Meeting Papers Presented at Argonne, Apr. 21-23, 1947, M-3552, Discussion of Design Factors for Gas Cooled Pile Steam Boilers, Apr. 1, 1947. For Rickover's recollections of early days at Oak Ridge, see Senate Committee on Armed Forces, Preparedness Investigating Subcommittee, *Inquiry Into Satellite and Missile Programs*, Jan. 6-22, 1958 (Washington, 1958), pp. 1382-88.
 38. Mills to Groves, Aug. 12, 1946, Groves to Mills, Aug. 20, 1946, *WNNRC*; Conference Report, MIT, Dec. 24, 1946, Report M-3349, Rickover, Report on Conferences at General Electric, Jan. 20-22, 1947, Report M-3557, Survey of Atomic Power Plants for Naval Ship Propulsion, May, 1947, Report A-4208, *AEC*.
 39. Williams Diary, May 2, 1947, CM 44, May 6, 1947, *AEC*.
 40. Wilson to Thomas, May 6, 1947, *AEC*.
 41. Williams Diary, May 8, 1947, Clinton Laboratories, Outline for Meeting, May 8, 1947, *AEC*.
 42. CM 49-51, May 13-14, 1947, Thomas to Wilson, May 22, 1947, *AEC*; Lillienthal, *Atomic Energy Years*, pp. 182-83; AEC Press Release, May 28, 1947, *AEC*.
 43. GAC 4, May 30-June 1, 1947, *AEC*.
 44. For examples of scientific opinion in the spring of 1947, see L. W. Nordheim, "Comment from Oak Ridge" and Philip N. Powers, "The Organization for Science in the Federal Gov-

- ernment," *Bulletin of the Atomic Scientists* 3 (April-May, 1947), 122-24.
45. Memorandum No. 5, For Consideration of the General Advisory Committee, May 29, 1947, *AEC*.
 46. P. F. Lee to Lilienthal, Apr. 28, 1947, Wilson to Lee, May 9, 1947, *AEC*.
 47. R. D. Evans to Bacher, Dec. 31, 1946, encl., Bacher to Wilson, Jan. 7, 1947, Wilson to E. E. Huddleson, Jan. 9, 1947, Nichols to Wilson, Jan. 21, 1947, G. F. Trowbridge to Wilson, Jan. 29, 1947, Huddleson to Wilson, Mar. 5, 1947, *AEC*.
 48. E. T. Booth *et al.* to Bacher, Apr. 2, 1947, Bacher to A. O. Nier, May 10, 1947, W. A. Higinbotham and P. M. Morse, draft letter to the Commission, May 10, 1947, *AEC*.
 49. Strauss to Bacher, May 23, 1947, Wilson to the General Advisory Committee, May 29, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 190-91.
 50. GAC 4, May 30-June 1, 1947, Oppenheimer to Lilienthal, June 1, 1947, Report of Subcommittee on Research, June 1, 1947, *AEC*.
 51. Verbatim Transcript of Discussion of the General Advisory Committee and the Atomic Energy Commission, May 31, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 186.
 52. CM 61, June 5, 1947, Draft letter, Atomic Energy Commission to Chief of Naval Research, July 17, 1947, encl., Fisk to Wilson, July 17, 1947, *AEC*.
 53. Lilienthal to Lawrence, May 7, 1947, *LRL*; Fisk to Zinn, May 8, 1947, Minutes, Board of Governors, Argonne National Laboratory, May 5, 1947, *ANL*.
 54. Lilienthal to Brereton, Apr. 25, 1947, Notes of MLC Meeting, May 21, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 196-99.
 55. K. E. Fields, handwritten notes on AEC-MLC Meeting, June 18, 1947, *AEC*; Lilienthal to Lovett, July 18, 1947, *DS*; Second Semiannual Report, July, 1947, p. 7; Lilienthal, *Atomic Energy Years*, pp. 202, 212-14.
 56. Williams Diary, May 16, 1947, *AEC*.
 57. Williams Diary, July 7-12, 1947, Schlemmer, Report on Hanford Inspection, July 14, 1947, *AEC*.
 58. Williams to Wilson, July 16, 1947, MLC 12, July 18, 1947, *AEC*.
 59. CM 63, June 11, 1947, Fields to McCormack, June 3, 1947, CM 71, July 2, 1947, *AEC*.
 60. Williams Diary, Apr. 14, May 15, 20, June 6, 1947, Wilson Diary, May 15, 1947, Draft GM Bulletin, June 9, 1947, *AEC*.
 61. Lilienthal, *Atomic Energy Years*, pp. 207-09, 221; Niehoff to Wilson, June 6, 1947, Wilson, Study of AEC-CSC Relationships, May 6, 1947, Outline for Conference with Civil Service Commission, May 28, 1947, *AEC*.
 62. Lilienthal to J. E. Hoover, Apr. 9, Apr. 25, 1947, T. O. Jones to Files, Sept. 3, 1947, *AEC*.
 63. Lilienthal, *Atomic Energy Years*, pp. 180-81, 189.
 64. CM 43, May 5, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 176. An excellent example of the thinking of many scientists is found in the *Washington Post*, Sec. II, Atomic Supplement, Aug. 3, 1947.
 65. Thomas, "Russia Grabs Our Inventions," *American* 143 (June, 1947), 16-19; Thomas and S. V. Jones, "Reds in Our Atom-Bomb Plants," *Liberty*, June 21, 1947, pp. 15 ff.
 66. Lilienthal Appointment Book, June 5, 1947, Physical Security at Oak Ridge, encl., F. B. Rhodes to T. O. Jones, June 16, 1947, *AEC*.
 67. Lilienthal, *Atomic Energy Years*, pp. 189-90; Patterson to Lilienthal, Apr. 7, May 6, 1947, CM 61, 62, June 5, 1947, Lilienthal to Patterson, June 5, 1947, *AEC*.
 68. Lilienthal, *Atomic Energy Years*, p. 191; MLC 10, July 14, 1947, *AEC*.
 69. Williams Diary, June 6, 9, 16, 1947, *AEC*.
 70. The pending bills had been introduced by Representatives G. W. Landis (H.R. 2543) on Mar. 13, 1947, *Congressional Record*, 80 Cong., 1 sess., p. 2051, T. A. Jenkins (H.R. 2791) on Mar. 26, 1947 (p. 2685), and W. A. Winstead (H.R. 3217) on Apr. 25, 1947 (p. 4115) and by Senators W. F. Knowland (S. 1004) on Mar. 31, 1947 (p. 2853), K. D. McKellar (S. 1118) on Apr. 16, 1947 (p. 3466), and Z. N. Ecton, G. W. Malone, J. H. Overton, J. R. McCarthy, and E. D. Thomas (S. 979) on Mar. 25, 1947 (p. 2530).

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71. Summary of Proceedings, Executive Meeting, JCAE, June 17, 1947, *AEC*.
 72. Marks to Files, June 30, 1947, Justice Department Conference on Security Problems, CM 70, July 1, 1947, *AEC*.
 73. A. S. Alexander and R. L. Finley, Personnel Security Clearance, June 13, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 176; CM 76, 77, July 10, 15, 1947, *AEC*.
 74. New York *Sun*, July 9, 1947; Washington *Post*, July 10, 1947; Washington *Times-Herald*, July 10, 1947; *PM*, July 10, 1947; *Congressional Record*, 80 Cong., 1 sess., pp. 8494-95; Lilienthal, *Atomic Energy Years*, pp. 221-22.
 75. New York *Times*, July 9, 1947; New York *Sun*, July 10, 1947; Washington *Post*, July 11, 13, 1947; Washington *Times-Herald*, July 12, 1947; *Newsweek*, July 21, 1947, p. 22; *The Na-*
 - tion*, July 19, 1947, pp. 60-61, Aug. 2, 1947, pp. 117-19.
 76. Lilienthal, *Atomic Energy Years*, pp. 222-23; MLC 9, July 2, 1947, *AEC*.
 77. Lilienthal, *Atomic Energy Years*, p. 224; Washington *Times-Herald*, July 2, 1947.
 78. MLC 10, July 14, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 203. This entry is dated June 15, 1947, but it is clear from the Lilienthal appointment book and internal evidence that the correct date is July 15, 1947.
 79. New York *Post*, July 15, 1947; E. R. Trapnell to the Commissioners, July 23, 1947, *AEC*.
 80. JCAE, Minutes of Executive Session, July 22, 1947, Lilienthal to Joint Committee, July 21, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 227-28, 231.
 81. *Congressional Record*, 80 Cong., 1 sess., pp. 9770-74.

CHAPTER 4

1. GAC 5, July 28-29, 1947, *AEC*.
2. On June 1, Wilson completed a revised staff recommendation (AEC 47-53), complete with a draft letter to the Department of State and a draft press release announcing the decision. Manley to Wilson, June 24, 1947, R. E. Marshak *et al.*, Federation of American Scientists to the Commission, June 6, 1947, C. C. Lauritsen to Bacher, June 25, 1947, Albert Stone to P. M. Morse, July 1, 1947, encl., Morse to Fisk, July 10, 1947, *AEC*; New York *Herald Tribune*, July 21, 1947.
3. GAC 5, July 28-29, 1947, Oppenheimer to Bacher, Aug. 6, 1947, *AEC*.
4. Bacher to Oppenheimer, July 22, 1947, Box 18, *JRO*; Items of Interest to the GAC, July 24, 1947, *AEC*.
5. GAC 5, July 28-29, 1947, *AEC*.
6. Strauss to Bacher, July 29, 1947, *AEC*; Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), pp. 229-30.
7. GAC 5, July 28-29, 1947, Draft Note on Atomic Power, Draft #1, July 29, 1947, encl., Oppenheimer to the Commissioners, July 29, 1947, *AEC*.
8. GAC 5, July 28-29, 1947, Draft Note on Atomic Power, Draft #2, July 29, 1947, Strauss to Bacher, July 29, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, p. 229.
9. CM 83, July 23, 1947, CM 87, July 29, 1947, CM 91, Aug. 5, 1947, CM 92, Aug. 6, 1947, J. A. Derry to the Commissioners, Aug. 4, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 230, 233-34.
10. Lilienthal to Hickenlooper, July 25, 1947, Wilson to the Commissioners, July 28, 1947, AEC Press Release, Aug. 9, 1947, *AEC*.
11. Williams Diary, June 23, July 1, 1947, Wilson to Williams, Aug. 15, 1947, *AEC*.
12. Souers to the Commissioners, July 2, 1947, CM 89, July 31, 1947, *AEC*; Strauss, *Men and Decisions* (Garden City, N. Y., 1962), pp. 259-60; Lilienthal, *Atomic Energy Years*, p. 230.
13. P. W. Sandidge, Memo of telephone conversation with S. G. English, Aug. 6, 1947, *ORNL*; Fisk and Marks to Derry, Aug. 6, 1947, CM 90, Aug. 5, 1947, Waymack to the Commissioners, Aug. 4, 1947, *AEC*.
14. Wilson to the Commissioners, undated but about Sept. 5, 1947, Minutes of

- Conference, Aug. 28, 1947, Wilson to the University of Chicago, Aug. 28, 1947, W. B. Harrell to Wilson, Sept. 2, 1947, Draft AEC Press Release, Sept. 14, 1947, Draft, Mr. Hutchins' Clinton Lab Statement, all encls., Belsley to the Commissioners, Sept. 8, 1947, *AEC*.
15. H. M. Roth to Williams, July 9, 1947, *AEC*.
 16. Daniels to Fisk, May 29, 1947, McCullough and Daniels to Thomas, June 9, 1947, Thomas to Wilson, June 9, 1947, Thomas to Wilson, June 11, 1947, J. R. Dietrich to McCullough, June 16, 1947, Daniels to Lilienthal, June 16, 1947, *ANL*.
 17. Lilienthal to Daniels, June 19, 1947, Thomas to Daniels, June 20, 1947, McCullough to Daniels, June 29, 1947, *ANL*.
 18. CM 74, July 8, 1947, *AEC*; Daniels to McCullough, July 8, 1947, Daniels to Wilson, July 9, 1947, *ANL*; Johnson to Fisk, July 10, 1947, *AEC*.
 19. Williams Diary, July 29, 1947, *AEC*.
 20. MLC 11, July 16, 1947, Committee on Atomic Energy to Joint Research and Development Board, July 30, 1947, McCormack to Wilson, Sept. 26, 1947, *AEC*.
 21. Committee on Atomic Energy to Joint Research and Development Board, July 30, 1947, *AEC*.
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 24. *Science*, 104 (Aug. 15, Sept. 12, 1947), 141, 236-39; *Bulletin of the Atomic Scientists*, 3 (Oct., 1947), 290-94, 310.
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 26. CM 95, Aug. 19, 1947, *AEC*.
 27. AEC Press Release, Sept. 3, 1947, *AEC*; New York Times, Sept. 4, 1947; Lilienthal, *Atomic Energy Years*, pp. 234-35.
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 29. GAC 6, Oct. 3-5, 1947, pp. 14, 18, 20, GAC Report on Support of Basic Science, Oct. 5, 1947, *AEC*.
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 31. S. L. Warren, Report of the 23-24 January Meeting of the Interim Medical Committee, encl., Warren to Wilson, Jan. 28, 1947, *AEC*.
 32. Lilienthal to Jewett, Mar. 18, 1947, AEC Press Release, June 16, 1947, *AEC*.
 33. Report of the Medical Board of Review, June 20, 1947, encl., Loeb to Lilienthal, June 20, 1947, *AEC*.
 34. CM 68, June 25, 1947, CM 75, July 9, 1947, Gregg to Derry, July 15, 1947, AEC Press Release 55, Sept. 12, 1947, *AEC*.
 35. Minutes, Advisory Committee for Biology and Medicine, Sept. 12, Oct. 11, 1947, CM 100, Sept. 24, 1947, AEC Press Release, Oct. 24, 1947, AEC Information Memorandum 48-23, Feb. 10, 1948, *AEC*.
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 37. Trapnell to R. P. Johnson, Sept. 23, 1947, encl., Wilson to the Commissioners, Sept. 23, 1947, *AEC*.
 38. MLC 15, Sept. 24, 1947, *AEC*.
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 43. CM 109, Oct. 14, 1947, *AEC*.
 44. AEC Doc. 47-157, Oct. 24, 1947, CM 120, Nov. 6, 1947, *AEC*.
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 53. J. T. Bobbitt and P. Sandidge to Clinton Employees, Dec. 23, 1947, Transcript of Managers' Conference, Part II, Dec. 4–6, 1947, p. 34, *AEC*.
 54. Wilson Diary, Dec. 22–24, 26, 27, 1947, CM 136, Dec. 26, 1947, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 271–72. Zinn's understanding of the Chicago negotiations is recorded in Special Meeting of the Argonne Board of Governors, Jan. 4, 1948, *ANL*. The General Advisory Committee supported the change in contractors as a step toward centralization, but resented the implication of the AEC press release which made the committee responsible for the decision. Oppenheimer to Lilienthal, Jan. 2, 1948, Oppenheimer to members of General Advisory Committee, Jan. 3, 1948, AEC Press Release 80, Jan. 1, 1948, *AEC*.
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CHAPTER 5

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3. See Chaps. 1, 3, 4.
4. CM 49, May 13, 1947, CM 52, May 15, 1947, MLC 4, Apr. 30, 1947, Pike to Brereton, May 16, 1947, McCormack to Belsley, June 12, 1947, Lilienthal to Brereton, Oct. 14, 1947, *AEC*.
5. W. S. Hutchinson, Jr., to McCormack, Apr. 16, 1947, encl., McCormack to Wilson, Apr. 16, 1947, CM 57, May 27, 1947, Lilienthal to Brereton, Oct. 14, 1947, *AEC*.
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7. CM 52, May 15, 1947, McCormack to Belsley, June 28, 1947, *AEC*.
8. Eisenhower and Nimitz to Groves, draft and final versions, July 8, 1947, *AEC*; Groves to Adm. D. C. Ramsey, July 10, 1947, *WNRRC*.
9. Report of the Manager, Santa Fe Operations, July 1947–July 1950, Nov. 1, 1950, L. H. Bayer to C. L. Wilson, Los Alamos Community Development Under AEC Management, July 9, 1947, CM 78, July 15, 1947, *AEC*.
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11. Detailed accounts of activities at Los Alamos are found in the monthly reports issued by Los Alamos under the prefix LAMS. These reports are classified, almost entirely technical in content, and purposely written in cryptic language for security reasons. For a general survey see Laboratory Annual Progress Report for 1947, LAMS-653, Dec. 3, 1947, *AEC*.
12. Frederic C. Alexander, Jr., "History of Sandia Corporation," pp. 7–24; Underhill to Bradbury, June 24, 1947, *LASL*.
13. Wilson to Tyler, Custody of Stockpile and Active Materials, July 2, 1947, CM 90, Aug. 5, 1947, Draft Statement on Military Custodianship, undated, encl., J. S. Russell to Belsley, Aug. 7, 1947, *AEC*.
14. Draft memo, J. A. Derry to Tyler, Aug. 6, 1947, MLC 14, Aug. 13, 1947, *AEC*.
15. Draft memo, Groves and Wilson to Tyler and Montague, encl., Wilson to Tyler, Aug. 14, 1947, Montague to Groves, Aug. 19, 1947, Tyler to Wilson, Aug. 21, 1947, *AEC*.
16. Brereton to Royall and Sullivan, Sept. 4, 1947, Sullivan to Brereton, Sept. 18, 1947, Eisenhower to Brereton, Oct. 16, 1947, *AEC*.
17. S. V. Hasbrouck to Groves, Sept. 30, 1947, *WNRRC*; Brereton to Lilienthal, Nov. 12, 1947, *AEC*.
18. Detailed accounts of technical activities at Sandia are found in the monthly progress reports for Z Division—e.g., for Aug. 1947, LAMS-607, *AEC*.
19. Monthly progress reports for Z Division, LAMS-637, Oct., 1947, LAMS-649, Nov., 1947, *AEC*; Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945–1950* (New York, 1964), p. 250.
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24. MLC 12, July 18, 1947, *AEC*.
25. MLC 14, Aug. 13, 1947, Parsons to Brereton, Aug. 26, 1947, *AEC*.
26. Solberg, Highlights of Inspection Trip to Hanford, Aug. 29, 1947, *AEC*.
27. Report to GAC on Redox Development, July 23, 1947, *AEC*. For background on solvent extraction research, see: R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939–1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), pp. 185, 205, 211–12; John F. Hogerton et al., *The Atomic Energy Deskbook* (New York, 1963), pp. 518–19; Glenn T. Seaborg, *The Transuranium Elements* (New Haven, 1958), pp. 95–99.
28. Brereton to Lilienthal, Aug. 28, 1947, *AEC*.
29. Williams Diary, Sept. 23, 1947, *AEC*.
30. CM 100, Sept. 24, 1947, *AEC*.
31. MLC 15, Sept. 24, 1947, *AEC*.
32. W. E. Kelley to Wilson, Aug. 21, 1947, Fisk to Wilson, Sept. 11, 1947, Wilson to the Commissioners, Sept. 24, 29, 1947, AEC Press Release 62, Oct. 16, 1947, *AEC*.
33. Hanford activities are described in monthly status and progress reports submitted to the general manager. Summaries of these reports were included in the consolidated Monthly Status and Progress Reports, prepared

- in the Washington headquarters. See also Williams to Wilson, Oct. 7, 1947, AEC Doc. 47-156, Oct. 31, 1947, AEC.
34. CM 107, Oct. 7, 1947, CM 108, Oct. 8, 1947, MLC 16, Oct. 8, 1947, CM 111, Oct. 15, 1947, AEC.
 35. Solberg to Military Liaison Committee, Oct. 16, 1947, MLC 17, Oct. 22, 1947, S. G. English to Fisk, Nov. 12, 1947, AEC. Shugg expressed his frustrations on Redox in Transcript of Managers' Conference, Dec. 4-6, 1947, AEC.
 36. Oak Ridge Monthly Status and Progress Reports, Sept.-Dec., 1947, AEC. On the labor dispute in Dec. 1947, see Chap. 4.
 37. Wilson, Memorandum of Discussion with Mr. Sengier, Mr. Storke, and Mr. Gray in New York, Oct. 6, 1947, DS; Wilson to E. Sengier, Oct. 11, 1947, CM 112, Oct. 21, 1947, Gustafson to D. R. McLaughlin, Dec. 16, 1947, AEC.
 38. Office of Budgets, Monthly Summary of Activities, Nov. 1947, Dec. 1948, AEC.
 39. *Congressional Record*, 80 Cong., 1 sess., pp. 10595-97; *New York Times*, Nov. 18, 1947.
 40. *New York Times*, Nov. 11, 12, 1947. A mimeographed copy of the President's Air Policy Commission, Stenographic Report of Proceedings, is in the Library of Congress.
 41. Eisenhower's testimony appears in the President's Air Policy Commission, Stenographic Report of Proceedings, pp. 2244-75, Spaatz's on pp. 2340-71. On McCone's contacts with the Commission, see Symington to Lilienthal, Oct. 21, 1947 and Parsons to Lilienthal, Dec. 9, 1947, AEC.
 42. Brereton to Lilienthal, Nov. 12, 1947, CM 122, Nov. 14, 1947, AEC.
 43. MLC 19, Nov. 19, 1947, CM 122, Nov. 14, 1947, AEC.
 44. Bradbury to Tyler, Nov. 24, 1947, LASL.
 45. Lilienthal reported his conversation with Royall in a memorandum to the Commission, Dec. 1, 1947, AEC.
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CHAPTER 6

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2. Custody of Atomic Weapons, Jan. 20, 1948, encl., Wilson to Oppenheimer, Feb. 3, 1948, GAC 8, Feb. 6, 1948, McCormack to Wilson, Jan. 30, 1948, AEC.
3. Strauss to Forrestal, Feb. 10, 1948, JFP.
4. CM 151, Feb. 18, 1948, Lilienthal to Groves, Feb. 17, 1948, AEC; McCormack to Tyler, Feb. 19, 1948, LASL.
5. MLC 25, Feb. 18, 1948, Parsons to Brereton, Feb. 17, 1948, McCormack to Brereton, Feb. 18, 1948, AEC.
6. Forrestal, Report of Telephone Conversation with Carpenter, Feb. 17, 1948, JFP; Forrestal, Report of Telephone Conversation with Greenewalt, Feb. 23, 1948, WNRRC.
7. A. G. Wedemeyer to Eisenhower, Mar. 3, 1948, Groves to Spaatz, Feb. 28, 1948, WNRRC.
8. *New York Times*, Feb. 24, 25, 1948. Walter Millis, ed., *The Forrestal Diaries* (New York, 1951), pp. 382-87.
9. Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), pp. 302-03; Millis, *Forrestal Diaries*, p. 387.
10. *New York Times*, Mar. 2, 11, 18, 1948; Millis, *Forrestal Diaries*, pp. 389-98; *Congressional Record*, 80 Cong., 1 sess., pp. 1915-20; Lilienthal, *Atomic Energy Years*, p. 303.
11. Royall, Sullivan, and Symington to Forrestal, Mar. 13, 1948, W. D. Leahy to Forrestal, Mar. 20, 1948, Bacher to File, Mar. 18, 1948, AEC.
12. Clay, *Decision in Germany* (New

- York, 1950), pp. 355-59; MLC 28, Apr. 1, 1948, Lucille Lemons, History of J Division, Los Alamos, Operation Sandstone Report OS-40 (Dec. 1, 1948), pp. 116-17, *AEC*; Strauss to Forrestal, Mar. 17, 1948, *WNNRC*; Millis, *Forrestal Diaries*, p. 386.
13. Wilson's trip is reported as background in Plan for Emergency Joint Action by the Armed Forces and the AEC, Apr. 26, 1948, *AEC*. See also Wilson Diary, Apr. 1-2, 1948, *AEC*; Carpenter, Report of Conversation with Wilson, Apr. 12, 1948, *WNNRC*.
 14. Carpenter, Report of Conversation with Royall, Apr. 9, 1948, with Vandenberg, Symington, and Spaatz, Apr. 10, 1948, with Spaatz and Norstad, Apr. 12, 1948, *WNNRC*.
 15. Carpenter, Report of Conversation with Lilienthal and Wilson, Apr. 12, 1948, with Forrestal and Bush, Apr. 13, 1948, *WNNRC*; Carpenter to Lilienthal, Apr. 23, 1948, *AEC*.
 16. Operation Sandstone was extensively documented in a series of technical reports under the general title Test Director, Joint Task Force 7, Report to the U. S. Atomic Energy Commission on Operation Sandstone, available in *AEC*. Part I, a summary of the entire project in 2 volumes, is supplemented by annexes covering in detail the activities of each group in the task force.
 17. Froman to McCormack, Mar. 25, 1948, *AEC*.
 18. CM 165, Apr. 14, 1948, CM 166, Apr. 15, 1948, *AEC*.
 19. AEC Press Release 98, Apr. 19, 1948, Office of the Secretary of Defense, Press Release 71-48, May 18, 1948, *AEC*; Carpenter, Record of Conversation with Bacher, May 12, 1948, *WNNRC*.
 20. F. L. Ashworth to Personnel Concerned, Sandia Trip, May 20, 1948, *AEC*; Bradbury, Draft Memorandum on Weapon Custody, May 20, 1948, J. H. Manley, Custody of Atomic Weapons, May 20, 1948, *LASL*. Manley recorded his reaction in a letter to Oppenheimer, May 27, 1948, Box 49, *JRO*.
 21. Minutes of Joint AEC-MLC Meeting, May 26-27, 1948, *AEC*. Statements by Nichols, Montague, and Brereton are attached as appendices.
 22. *Ibid.*, for Carpenter's views. Strauss to the Commission, June 2, 1948, *AEC*; Carpenter to Nichols, June 2, 1948, *WNNRC*.
 23. CM 175, June 4, 1948, R. B. Snapp to File, June 4, 1948, Bradbury to McCormack, June 2, 1948, *AEC*.
 24. GAC 10, June 4, 1948, *AEC*.
 25. MLC 29, June 18, 1948, Carpenter to the Commission, June 14, 1948, *AEC*; Carpenter, Memorandum of Meeting with Subcommittee of the Hoover Committee, June 8, 1948, J. H. Ohly to Carpenter, June 17, 1948, *WNNRC*.
 26. MLC 29, June 18, 1948, CM 180, June 17, 1948, Notes for Discussion with MLC, June 17, 1948, *AEC*; M. Leva to Forrestal, June 18, 1948, *WNNRC*; Lilienthal, *Atomic Energy Years*, p. 362.
 27. Lilienthal, *Atomic Energy Years*, pp. 350-51, 363-64; Carpenter, Statement of Broad Issues, June 21, 1948, Lilienthal to the Commissioners, June 23, 1948, *AEC*.
 28. W. Phillips Davison, *The Berlin Blockade* (Princeton, 1948), pp. 90-103; Millis, *Forrestal Diaries*, pp. 454-55.
 29. Nichols to Ohly, July 2, 1948, *OSD*, reports one version of the meeting. For another, see Lilienthal, *Atomic Energy Years*, pp. 373-77.
 30. Lilienthal, *Atomic Energy Years*, pp. 384-86; Lilienthal to Forrestal, July 2, 1948, Oppenheimer to Lilienthal, July 21, 1948, *AEC*; Carpenter, Memorandum of Items of Interest at Berkeley, July 15, 1948, *WNNRC*.
 31. Millis, *Forrestal Diaries*, p. 461; Lilienthal, *Atomic Energy Years*, pp. 388-92; Forrestal to Truman, July 21, 1948, Lilienthal to Truman, July 21, 1948, *AEC*.
 32. Millis, *Forrestal Diaries*, p. 461; Lilienthal, *Atomic Energy Years*, p. 392; *Public Papers of Harry S. Truman*, 1948 (Washington, 1964), pp. 414-16; Carpenter to Forrestal, July 26, July 28, 1948, *WNNRC*; Truman to Forrestal, Aug. 6, 1948, *AEC*.
 33. Millis, *Forrestal Diaries*, pp. 461-63; *Washington Daily News*, July 8, 17, 1948; *Washington Evening Star*, July 9, 1948; Symington to Sullivan, July 21, 1948, *WNNRC*.
 34. Millis, *Forrestal Diaries*, pp. 461-68; Sullivan to Symington, Aug. 9, 1948,

- Ohly to Forrestal, Aug. 14, 1948, *WNRC*.
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35. Agreed Final Version of Minutes of Newport Meeting, Aug. 20-22, 1948, Carpenter to Forrestal, July 30, 1948, Aug. 2, 1948, *WNRC*; Millis, *Forrestal Diaries*, pp. 476-78.
 36. Carpenter to D. M. Schlatter, Aug. 28, 1948, F. J. Terry to Forrestal, Aug. 27, 1948, C. F. Brown to J. B. Conant, Aug. 31, 1948, Schlatter to Carpenter, Sept. 3, 14, 1948, Carpenter to Forrestal, Sept. 19, 1948, *WNRC*.
 37. Brereton to the Commission, Military Requirements for Atomic Bombs, Nov. 25, 1947, CM 143, Jan. 21, 1948, Lilienthal to Joint Chiefs of Staff, Jan. 29, 1948, Lilienthal and Forrestal to Truman, Annual Production Program for 1948, Mar. 16, 1948, CM 167, Apr. 22, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, p. 286.
 38. A comprehensive summary of raw materials activities is in Domestic Raw Materials Program—Report No. 1—Uranium, Mar. 31, 1948, *AEC*. The report was discussed at CM 162, Apr. 2, 1948, *AEC*. Negotiations with the British are described in Chap. 9.
 39. The incentives program was announced in *AEC* Press Release No. 96, Apr. 10, 1948, and in Domestic Uranium Program Circulars Nos. 1-3, issued on the same date, *AEC*.
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 50. Millis, *Forrestal Diaries*, pp. 523-24, 537-38.
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59. CM 283, June 23, 1949, CM 284, June 24, 1949, Wilson Diary, June 27, 1949, Lilienthal to Webster, June 28, 1949, *AEC*. The Hickenlooper investigation is described in Chap. 11.
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61. CM 292, July 20, 1949, Truman to Souers, July 26, 1949, *AEC*; Lilienthal, *Atomic Energy Years*, p. 559.
62. *Time* 54 (July 4, 1949), 5.

CHAPTER 7

1. Weinberg to Oppenheimer, Jan. 6, 1948, *ORNL*.
2. Weil to Zinn, Jan. 9, 1948, *ANL*; Zinn to Fisk, July 23, 1948, *AEC*.
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6. Teller, Report . . . on the Proposed High Neutron Flux, Water Cooled Thermal Reactor, Feb. 10, 1948, *AEC*.
7. Zinn's analysis is in Zinn to Weil, Apr. 22, 1948, Report of the GAC Subcommittee on Reactors on the Safeguards for the High Flux Reactor, Apr. 24, 1948, *AEC*.
8. Spaatz to Bush, Jan. 7, 1948, *WNRRC*; Bush to AEC, Dec. 23, 1947, Spaatz to Chairman, AEC, Dec. 30, 1947, *AEC*.
9. Hafstad to Commission, Jan. 9, 1948, Mills to Commission, Jan. 20, 1948, *AEC*. The date of the General Electric meeting is not known. The subjects covered are in "Notes on Conference with General Electric Company," dictated by Rickover and dated in pencil Jan. 5, 1948; the Westinghouse reference is in J. A. Hutcheson, Memorandum, Jan. 15, 1948. Both are in *AEC*.
10. GAC 8, Feb. 6-8, 1948, Program Council, Program to Develop Nuclear Engines for Aircraft, Feb. 3, 1948, *AEC*. References to negotiations between the Commission and the Bureau of Ships are in Director of Military Application, Nuclear Propulsion of Ships—Status of Bureau of Ships, Apr. 16, 1948, *AEC*. On Feb. 5, 1948, Mills presented his plans to Conant's committee. The comments Conant read to the GAC were circulated to the Research and Development Board on Feb. 17, 1948, as advisory. The Conant committee met again on Mar. 4, 1948, and concluded that it need take no more action since the staffs of the Commission, the MLC, and the

- Bureau of Ships had begun to develop a plan. See Committee on Atomic Energy to Research and Development Board, Mar. 5, 1948, *AEC*.
11. CM 151, Feb. 18, 1948. A good summary of negotiations with MIT shortly before conclusion of the contract is in McCormack to Wilson, Apr. 30, 1948, *AEC*.
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 13. There is some doubt as to what Mills actually said. An unclassified version is in Mills, "Navy Bureau of Ships Nuclear Power Program," Joint Committee on Atomic Energy, *Atomic Power and Private Enterprise* (Washington, 1952), pp. 203-206. *AEC* files contain a complete copy, but there is no indication whether this version was used at the symposium or reconstructed afterwards. Parts are taken from an earlier speech written by Rickover for Groves on Feb. 23, 1948, and portions can be identified from correspondence in *AEC*. For various and not always consistent accounts of the meeting see Ridenour to Lilienthal, Apr. 16, 1948, *AEC*; Ralph E. Lapp, *The New Force, The Story of Atoms and People* (New York, 1953), p. 168; Clay Blair, Jr., *The Atomic Submarine and Admiral Rickover* (New York, 1954), pp. 108-12.
 14. CM 167, Apr. 22, 1948, Pike to Chief of Bureau of Ships, Apr. 27, 1948, *AEC*.
 15. Division of Military Application, Nuclear Propulsion of Ships—Status of Bureau of Ships, Apr. 16, 1948, Pike to Chief of the Bureau of Ships, Apr. 27, 1948, Solberg, Report of Conference Held . . . on May 4, 1948, May 5, 1948, *AEC*; Tammaro to Zinn, Apr. 27, 1948, *ANL*.
 16. Mills to Lilienthal, May 12, 1948, McCormack to Program Council, May 12, 1948, Weil to Fisk, May 12, 1948, *AEC*.
 17. Wilson Diary, May 6, 1948, Winne to Wilson, June 3, 1948, *AEC*. The Winne letter mistakenly refers to the meeting as being held on May 21, 1948.
 18. GAC 10, June 4-6, 1948, *AEC*.
 19. D. B. Langmuir, Minutes of Meeting To Discuss Nuclear Energy for Propulsion of Submarines, June 16, 1948, *AEC*.
 20. Wilson to Mills, July 28, 1948, Mills to Lilienthal, Aug. 2, 1948, *AEC*. Rickover reported to Wilson on July 26, 1948; see McCormack to Wilson, July 23, 1948, Wilson Diary, July 26, 1948, Mills to Secretary of the Navy, Aug. 3, 1948, *AEC*.
 21. Mills summarized the status of his efforts in Mills to Sullivan, Aug. 3, 1948, *WNR*C. The memorandum received the endorsement of Admiral Denfeld, Chief of Naval Operations, that same day, with the comment that the Commission should be asked to provide views on how to make the greatest progress on submarine nuclear propulsion.
 22. Weinberg to Rucker, Mar. 10, 1948, in Tentative Proposal . . . ORNL Program, undated but about Mar. 22, 1948, *AEC*. Useful on the status of zirconium research at Oak Ridge is W. L. Sibbitt, An Evaluation of Zirconium as a Structural Material for High Temperature Thermal Piles, ORNL-11, Jan. 9, 1948, *AEC*.
 23. Leverett, The Poor Man's Pile—First Approximation, ORNL-26, Mar. 26, 1948, Weinberg to Rucker, Apr. 22, 1948, Weinberg and Peterson to Rucker, May 12, 1948, *ORNL*. A reflection of the feeling at Oak Ridge is evident in a remark by L. B. Emlet on the X-10 reactor, "In my opinion, the only reason the Atomic Energy Commission continues the Laboratory in Oak Ridge is because the pile is located here." Emlet to Rucker, Apr. 14, 1948, *ORNL*.
 24. Weinberg to Zinn, May 20, 1948, *ANL*.
 25. R. P. Johnson, Memorandum for Record, June 1, 1948, *AEC*; F. H. Belcher to R. W. Cook, June 2, 1948, *OROO*; Fisk to Zinn, June 9, 1948, *ANL*.
 26. Weinberg to Rucker, June 16, 1948, *ORNL*.
 27. Rucker to F. H. Belcher, June 18, 1948, *ORNL*.
 28. Zinn to Weil, June 10, 1948, Weil to Fisk, May 26, 1948, Fisk to Manley, June 3, 1948, *AEC*.
 29. Records of the RSC show no formal discussion of the high-flux reactor during the Hanford meeting. How-

- ever, Zinn asked that the results of the natural convection test, which Teller witnessed, be called to the committee's attention and Zinn later stated that the committee did review possibilities of reducing the hazards. Zinn to Weil, June 10, 1948, Zinn to Fisk, July 23, 1948, *AEC*. The first mention of the exclusion formula is in Weil to Wilson *et al.*, June 21, 1948, and enclosures which describe the Hanford meeting, *AEC*. In his letter to Fisk, July 23, 1948, Zinn describes the formula as recently developed. The radius in miles of the three areas is derived by multiplying the square root of the power level expressed in kilowatts by 0.01 for the area of complete control; 0.1 for the area of less than 100,000 population; and 0.3 for the area in which there must be no vital installations.
30. Zinn to Fisk, July 23, 1948, *AEC*.
 31. CAC 8, Feb. 6-8, 1948, CAC 10, June 4-6, 1948, *AEC*.
 32. Harter to Parker, Aug. 9, 1948, *AEC*.
 33. Carpenter, Memorandum of Visit to Argonne Laboratory, Aug. 13, 1948, *AEC*.
 34. Memorandum of Discussion with Admiral Mills, Captain Rickover, and General Wilson, Aug. 13, 1948, *AEC*.
 35. Minutes of Bureau of Ships, MLC-AEC Conference on NEPS, Aug. 25, 1948, Carpenter to Wilson, Mills, and Parsons, Sept. 2, 1948, *AEC*. The statements which Rickover read at the meeting were from Burriss to Johnston, Aug. 24, 1948, and Memorandum of Telephone Conversation with Mr. George Bucher of Westinghouse, Aug. 25, 1948, *AEC*.
 36. Rickover, Memorandum Report of Travel, Sept. 8, 1948, Rickover to Mills, Sept. 9, 1948, *AEC*. Rickover's questions about General Electric's motives stemmed in part from the fact that Winne was a member of the long-range objectives panel.
 37. Wilson to Program Council, Sept. 20, 1948, Bacher to the Commission, Sept. 20, 1948, *AEC*.
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 39. Wilson Diary, Oct. 11, 1948, Greenewald to Wilson, Oct. 14, 1948, *AEC*.
 40. Franklin to Wilson, Oct. 14, 1948, *AEC*.
 41. Zinn to Weil, Aug. 13, 1948, *AEC*.
 42. Franklin to Center, Aug. 23, 1948, Weinberg, Research Pile at ORNL, Aug. 17, 1948, *AEC*; Rucker to Weil, Aug. 24, 1948, *OROO*; Weil to Weinberg, Aug. 26, 1948, *ORNL*.
 43. Teller, Report . . . on Intermediate Neutron Energy Metal-Cooled Reactor, May 12, 1948, C. H. Giroux, Further Remarks . . . , Nov. 18, 1947, Wilson to Shugg, Feb. 13, 1948, Report on Reactor Site Study for Knolls Atomic Power Laboratory, July 30, 1948, SNY LEJ-1, *AEC*.
 44. K. H. Kingdon and H. Brooks, Objectives of the KAPL Reactor, Sept. 7, 1948, Winne to L. E. Johnston, Sept. 7, 1948, *AEC*.
 45. English to Fisk, June 14, 1948, Weil to Zinn, July 9, 1948, *AEC*; Zinn to Weil, Aug. 11, 1948, *ANL*.
 46. Teller *et al.* to Weil, Sept. 10, 1948, *AEC*.
 47. Huffman to Zinn, Sept. 14, 1948, *ANL*; GAC 9, Apr. 23-25, 1948, *AEC*. Possible safety features were summarized for the committee in J. R. Huffman and S. Untermyer, Information for Reactor Safeguard Committee Meeting, Sept. 9, 1948 (High-Flux Research Pile), Aug. 26, 1948, CF-48-8-348, *AEC*.
 48. Huffman to Zinn, Sept. 14, 1948, *ANL*.
 49. Teller, Statement on Danger Area Regulations and on Schenectady Intermediate Reactor, Nov. 17, 1948, *AEC*.
 50. Division of Engineering, Acquisition of Land for Location of Intermediate Reactor, Aug. 30, 1948, Winne to Johnston, Sept. 3, 1948, CM 191, Sept. 10, 1948, Wilson Diary, Sept. 2, 1948, Trapnell to Commissioners, Sept. 16, 1948, CM 195, Sept. 17, 1948, and CM 197, Sept. 21, 1948, *AEC*.
 51. Weil to Weinberg, Sept. 9, 1948, *OROO*; Transcript, Reactor Meeting, Oct. 5, 1948, *ANL*.
 52. Weinberg to Weil, Sept. 17, 1948, *AEC*; Weinberg to Shugg, Oct. 12, 1948, *ORNL*; Weinberg to Zinn, Oct. 12, 1948, *ANL*.
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56. Etherington *et al.*, Study of a Water-Cooled Pile for Naval Application, Sept. 1, 1948, *ORNL-133*, *AEC*. The other studies were not completed until the first quarter of 1949. See Members of the Naval Reactor Division, Level I Report, A Helium-Cooled Beryllium-Moderated Reactor for Naval Application, Feb. 1, 1949, *ANL-4242*, E. K. Falls, R. K. Winkleblack, S. Untermyer, Preliminary Study of NaK Cooled Thermal Reactor for Naval Propulsion, Mar. 1, 1949, *ANL-4256*, Falls *et al.*, Preliminary Study of Bi-Alloy Cooled Thermal Reactor, Mar., 1949, *ANL-4267*, *AEC*.
57. An account of Westinghouse interest in nuclear propulsion and relations with the Navy is in Russell S. Greenbaum, "Nuclear Power for the Navy, the First Decade (1939-1949)" (Washington, unpublished, n.d.), pp. 154-56. A copy is in *NHD*. The Mills-Rickover views are in a memorandum from a staff member of the Joint Committee, E. L. Heller, Memorandum for the Record, Aug. 27, 1948, *JCAE*; Wilson to Program Council, Sept. 20, 1948, *AEC*.
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59. Shugg Diary, Nov. 16, 1948, Letter contract, Dec. 10, 1948, signed by A. Tammaro and C. H. Weaver, Fine to Bacher, Jan. 13, 1949, *AEC*.
60. Suits to Johnston, Sept. 30, 1948, Kingdon to Johnston, Oct. 27, 1948, cited in D. Cochran *et al.*, Nuclear Power Submarine, A Comparison of Development Program, *KAPL-132*, Apr. 15, 1949, Shugg Diary, Nov. 3, 17, Dec. 2, 1948, L. E. Johnston and H. G. Rickover, Conference Memorandum, Dec. 9, 1948, *AEC*.
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62. GAC 11, Oct. 21-23, 1948, *AEC*.
63. Franklin to Files, Sept. 15, 1948, Holland to R. P. Johnson, Dec. 13, 1948, *OROO*.
64. CM 215, Nov. 10, 1948, *AEC*.
65. General Manager's Bulletin 22, Division of Reactor Development, Sept. 15, 1948, Wilson Diary, Oct. 12, 1948, Murphree to Wilson, Dec. 17, 1948, Wilson to Hafstad, Jan. 12, 1949, *AEC*.
66. Smith, Hinchman and Grylls, Survey on Fort Peck, Montana and Pocatello, Idaho Sites . . . Interim Report, Feb. 5, 1949, *AEC*. The final report was Survey Report Fort Peck, Montana—Pocatello, Idaho, Sites, March, 1949, *AEC*. Warner to Snapp, Feb. 10, 1949, Minutes, Program Council, Feb. 14, 1949, Division of Engineering, Site Selection for Reactor Testing Station, Feb. 15, 1949, Teller to Weil, Feb. 17, 1949, CM 246, Feb. 18, 1949, Minutes, Executive Meeting of the Joint Committee, Mar. 14, 1949, Warner to All Division Directors, Mar. 29, 1949, Snapp to Hafstad, Mar. 23, 1949, *AEC*. Commission approval of Feb. 18, 1949, was contingent upon certain revisions of the paper. These revisions were circulated for the information of the Commission on Mar. 1, 1949. Technically the Commission could be said to have approved the Pocatello site on Mar. 1, 1949, rather than on Feb. 18, 1949. *AEC* Press Release 162, Mar. 22, 1949, Press Release 165, Apr. 1, 1949, Press Release 174, May 13, 1949, Press Release 176, May 18, 1949, *AEC*; Idaho Falls *Post-Register*, May 18, 1949; Joint Committee, *Selection of Site for Reactor Test Station*, Apr. 14, May 10, 1949 (Washington, 1949).
67. Wilson to Webster, Dec. 8, 1948, Webster to Joint Chiefs of Staff, Mar. 25, 1949, *AEC*; Carpenter to Files, June 26, 1948, *WNRC*; T. A. Sims to Commanding General, Air Materiel Command, Jan. 6, 1948, *OROO*; Borden to Hafstad, Mar. 25, 1949, Hafstad to Borden, Apr. 15, 1949, *AEC*. Oppenheimer and Conant opinions are

- in Russell to McCormack, Dec. 20, 1948, *AEC*.
68. S. Naymark, Summary of Fuel Element Conference, ANL-HE-22, Dec. 16, 1948, *AEC*; Etherington, Program for Development of a Nuclear Reactor for Submarine Propulsion, ANL-HE-27, Feb. 17, 1949, *ANL*.
 69. Etherington *et al.*, Study of a Water-Cooled Pile for Naval Application, ORNL-133, Sept. 1, 1948, *AEC*; Etherington to Zinn, May 12, 1949, *ANL*. See also Note 66.
 70. Brooks, A Review of the Breeding Problem in Nuclear Reactors, KAPL-48, Mar. 29, 1948, W. R. Kanne, F. A. White, I. H. Dearnley, S. B. Dunham, Preparatory Work for the Plutonium Alpha Experiments, KAPL-64, May 7, 1948, Brooks, Status of Alpha for Plutonium in Relation to Reactor Design Progress, KAPL-136, Mar. 30, 1949, *AEC*.
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 74. Shugg Diary, Jan. 3, 7, 25, 26, Feb. 13, 18, 28, Mar. 1, 1949, CM 256, Apr. 7, 1949, *AEC*.
 75. Hafstad to Zinn, Mar. 28, 1949, Zinn to Hafstad, Apr. 1, 1949, *ANL*; McLain, Materials Testing Reactor, Estimated Capital and Operating Costs of Project, Apr. 26, 1949, *AEC*. The steering committee estimate was \$16.1 million, which was corrected to \$18.1 million. McLain to Hafstad, Aug. 15, 1949. A good description of the Oak Ridge meeting is in M. H. Studier to W. M. Manning, May 9, 1949, *ANL*.
 76. Wende to Hafstad, May 16, 1949, *AEC*.
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 78. R. G. Hewlett, "The Experimental Breeder Reactor No. 1, The Life Story of a Nuclear Reactor" (Washington, unpublished, n.d.), *AEC*.
 79. GAC 14, June 2-4, 1949, Oppenheimer to Lilienthal, June 6, 1949, *AEC*.
 80. Shugg Diary, June 6, 1949, CM 279, June 14, 1949, *AEC*. The June 13, 1949, meeting was informal and does not appear in the Commission minutes.
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 82. GAC 15, July 14-15, 1949, *AEC*.
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 84. Rickover to Files, Oct. 4, 1949, *AEC*.
 85. Zinn to Hafstad, Oct. 13, 1949, *AEC*.
 86. Hafstad to Zinn, Oct. 25, 1949, Shugg to Winne, Nov. 9, 1949, *AEC*.
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3. R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939-1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), p. 633.
4. Discussion of ORNL, Mar. 1948, C. N. Rucker to J. C. Franklin, May 20, 1948, *ORNL*.
5. Minutes, Board of Governors, ANL, Mar. 13, 1948, *ANL*; Notes on Discussions at Chicago, unsigned, Apr. 9, 1948, *AEC*.
6. Brookhaven Report, The Founding of Brookhaven National Laboratory, Jan. 15, 1948, N. F. Ramsey, Early History of Associated Universities and Brookhaven National Laboratory, Report BNL 992, Mar. 30, 1966, *AEC*.
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8. Lawrence to Groves, Oct. 17, 1946, E. B. Kelly to Lawrence, Mar. 7, 1947, *LRL*.
9. This reasoning is reflected in R. P. Johnson to L. L. Strauss, Jan. 16, 1948, *AEC*.
10. The nontechnical reader will find the best general explanation of accelerators in Robert R. Wilson and Raphael Littauer, *Accelerators, Machines of Nuclear Physics* (Garden City, N. Y., 1960). For a good technical survey see M. Stanley Livingston and John P. Blewett, *Particle Accelerators* (New York, 1962). Philip Morrison reviewed the status of nuclear physics in 1946 in *Journal of Applied Physics* 18 (1947), 135-43.
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12. Wilson and Littauer, *Accelerators*, pp. 104-16; Livingston and Blewett, *Particle Accelerators*, pp. 193-235.
13. V. I. Veksler, "Concerning Some New Methods of Acceleration of Relativistic Particles," *Physical Review* 69 (1946), 244; E. M. McMillan, "The Synchrotron—A Proposed High Energy Particle Accelerator," *Physical Review* 68 (1945), 143-44.
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15. McMillan to Lawrence, July 4, 1945, *LRL*.
16. J. Reginald Richardson, "Frequency Modulated Cyclotron," *Physical Review* 69 (1946), 669-70; Lawrence to Weaver, Nov. 2, 1946, *LRL*; Livingston and Blewett, *Particle Accelerators*, pp. 352-54; W. M. Brobeck *et al.*, "Initial Performance of the 184-Inch Cyclotron," *Physical Review* 71 (1947), 449-50.
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18. Alvarez's early considerations are described in Alvarez *et al.*, "Berkeley Proton Linear Accelerator," *The Review of Scientific Instruments* 26 (1955), 111-12. See also Livingston and Blewett, *Particle Accelerators*, pp. 310-12, 328-29.
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 27. Seaborg, *Transuranium Elements*, pp. 79-81.
 28. Seaborg, *Man-Made Transuranium Elements*, pp. 16-17; Seaborg, R. A. James, and L. O. Morgan, "The New Element Americium (Atomic Number 95)," *Research Papers*, pp. 1525-29.
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 61. *AEC* Press Release 122, Aug. 5, 1948, Wilson, Organization of the Washington Headquarters and Field Operations Offices, and the Appointment of Certain Key Personnel, Aug. 31, 1948, Wilson to R. B. Snapp, Sept. 10, 1948, Revision of Reorganization Plan, Sept. 13, 1948, with drafts of GM Bulletins 21 and 32, Functions and Delegations, Division of Research and Biology and Medicine, *AEC*.
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 65. Warren, Research by Direct Contracts in the Fields of Biology, Medicine, and Biophysics, Mar. 10, 1949, Pitzer, Administration of Basic Research Program in Physical Sciences by Direct Contract, Mar. 11, 1949, CM 252, Mar. 14, 1949, *AEC* Press Release 164, Apr. 5, 1949, *AEC*.
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 67. Minutes, Argonne Board of Governors, Dec. 6, 1949, *ANL*. R. P. Johnson summarized the situation at Oak Ridge at CM 235, Jan. 19, 1949, *AEC*. Weinberg, "Oak Ridge National Laboratory," *Science* 109 (Mar. 1949), 245-48; GAC 13, Apr. 5, 1949, *AEC*; Weinberg, Research Program at ORNL, Mar. 22, 1949, *ORNL*; Oppenheimer to Lilienthal, Apr. 7, 1949, *AEC*.

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1. *Congressional Record*, 80 Cong., 1 sess., pp. 1932-81; *Time*, Mar. 24, 1947; *Newsweek*, Mar. 24, 1947; *Washington Evening Star*, Mar. 12, 1947; *Washington Post*, Mar. 13, 1947.
2. A proposal by Byrnes to aid Greece and Turkey was favorably considered by Forrestal and Patterson at a State, War, Navy Coordinating Committee meeting of Sept. 25, 1946; Walter Millis, ed., *The Forrestal Diaries* (New York, 1951), p. 210. Truman's account of the crisis is in his *Memoirs*, Vol. II, *Years of Trial and Hope* (Garden City, N. Y., 1956), pp. 97-109. Vandenberg's role is described in Arthur H. Vandenberg, Jr., ed., *The Private Papers of Senator Vandenberg* (Boston, 1952), pp. 338-52. Marshall's interview with reporters is in the *Washington Post*, Mar. 5, 1947.
3. For the Quebec meeting and postwar Anglo-American relations on atomic energy through 1946, see R. G. Hewlett and O. E. Anderson, Jr., *The New World, 1939-1946*, Vol. I of *A History of the U. S. Atomic Energy Commission* (University Park, Pa., 1962), pp. 277-80, 455-81. Accounts differ as to when various people learned of the agreements. Lilienthal to the Commissioners, Apr. 23, 1947, *AEC*, described a meeting with Truman, Patterson, Forrestal, and Leahy during which the agreements were mentioned. The description leaves some doubt whether implications of the agreements were understood. According to *The Private Papers of Senator Vandenberg*, p. 359, Vandenberg and Hickenlooper learned of the agreements in the late spring or early summer of 1947. Hickenlooper wrote to Marshall on Aug. 29, 1947, that he had learned of the agreements only a short time before. The letter is one of several documents in a binder: U.S.-U.K.-Canada Negotiations, Book 1, Oct. 31, 1947, *W/NRC*. Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), pp. 175-76, 182, states that on May 5, 1947, he informed the Joint Committee of the existence of the agreements but that details should come from the State Department. Acheson spoke at an executive session of the Joint Committee on May 12, 1947. Little more than a reference to the meeting is in Joint Committee, *Summary of Proceedings on JCAE Meetings, May 5, 1947, through May 28, 1948, AEC*. Acheson's prepared statement is in U. S.-U. K.-Canada Negotiations, Book 1, Oct. 31, 1947, *W/NRC*. Although Minutes, American Members, CPC, Nov. 26, 1947, *AEC*, contains a reference to a meeting informing the Joint Committee on Mar. 12, 1947, nothing has been found to substantiate that date. The evidence indicates that Truman, Forrestal, and Patterson had a general idea of the agreements, but the Congressional leaders did not learn of them until May 12, 1947.
4. Lilienthal to Byrnes, Dec. 30, 1946, Lilienthal to Commissioners, Jan. 31, 1947, *AEC*.
5. Expressions of concern about the U.N. role in Greece were voiced by Marquis Childs and Walter Lippmann, Mar. 17, 1947, *Washington Post*. Lippmann's condemnation of containment is in his *The Cold War: A Study in U. S. Foreign Policy* (New York, 1947). Vandenberg's concern can be noted in *The Private Papers of Senator Vandenberg*, pp. 340-51. Connally was also worried. Tom Connally with Alfred Steinberg, *My Name Is Tom Connally* (New York, 1954), pp. 317-18.
6. Background information on international control is in Hewlett and Anderson, *New World*, Chaps. 15 and 16, and United Nations, Department of Public Information, *Yearbook of the United Nations, 1946-47*, (New York, 1947), pp. 444-47.
7. U. S. Department of State, *International Control of Atomic Energy, The First Report of the United Nations Atomic Energy Commission to the Security Council* (Washington, 1947).

- For Baruch and the veto see Hewlett and Anderson, *New World*, pp. 562-63; Truman, *Years of Trial and Hope*, p. 10; Bernard M. Baruch, *Baruch, the Public Years* (New York, 1960), pp. 366-67; Lilienthal, *Atomic Energy Years*, p. 60 n. Lilienthal records Acheson's and Trygve Lie's misgivings on the veto in *Atomic Energy Years*, pp. 131, 401. Baruch to Lilienthal, Apr. 28, 1947, *AEC*.
8. On the Baruch relations see *Baruch, the Public Years*, pp. 316-63, 367-68; Truman, *Years of Trial and Hope*, pp. 8-10; Lilienthal, *Atomic Energy Years*, pp. 130-31.
 9. Harry S. Truman, *Memoirs*, Vol. I, *Year of Decisions* (Garden City, N. Y., 1955), pp. 145, 156; U. S. Department of State, *International Control of Atomic Energy—Policy at the Crossroads* (Washington, 1948), pp. 34-63; *Yearbook of the United Nations, 1946-47*, pp. 139-43.
 10. On Jan. 8, 1947, the Commission authorized Lilienthal to offer its technical assistance to State in providing guidance for the U. S. representatives on the UNAEC. See CM 19, Jan. 8, 1947, *AEC*. Earlier at CM 9, Dec. 11, 1946, and at CM 18, Jan. 2, 1947, *AEC*, the Commission approved Richard C. Tolman as consultant for the UNAEC. Lilienthal describes the meeting with Acheson in *Atomic Energy Years*, p. 132. An account of Marshall's meeting with Patterson and Forrestal is in Millis, *Forrestal Diaries*, p. 241, and *Forrestal Diary, JFP*.
 11. *Yearbook of the United Nations, 1946-47*, pp. 377-78.
 12. Voting on the resolution was not completed until Feb. 13, 1947. *Yearbook of the United Nations, 1946-47*, pp. 377-81.
 13. Commission consultation on Austin's instruction was perfunctory. "The Statement of Position of the United States" was sent to Herbert Marks on Feb. 14, 1947, by J. E. Johnson of the State Department, with the remark that the pace of events left little time for consideration. Feb. 14 was a Friday, and Marks could not contact the Commissioners. However, Marks was familiar with Commission views and thought the position was acceptable. Marks to Commission, Feb. 17, 1947, *AEC*. The position did not differ greatly from one sent by Gullion to Marks, Jan. 14, 1947, *AEC*.
 14. *Yearbook of the United Nations, 1946-47*, p. 448. Text of the Soviet draft amendments and additions to the first UNAEC report, and the Mar. 5 speech of Gromyko are in U. S. Department of State, *Documents on Disarmament 1945-1959*, Vol. I, 1945-1956 (Washington, 1960), pp. 61-82. See also *Policy at the Crossroads*, pp. 72-77; *New York Times*, Mar. 6, 1947.
 15. *Yearbook of the United Nations, 1946-47*, p. 448. The State Department proposed an executive committee on the regulation of armaments on Feb. 20, 1947, and it became effective Mar. 3, 1947, Acheson to Lilienthal, Feb. 20, 1947, Marshall to Lilienthal, Mar. 3, 1947, *AEC*. Lilienthal, *Atomic Energy Years*, pp. 158-60.
 16. Osborn to Oppenheimer, Mar. 13, 1947, Box 194, *JRO*; U. S. Atomic Energy Commission, *In the Matter of J. Robert Oppenheimer* (Washington, 1954), pp. 342-46.
 17. Osborn met with Bacher on Mar. 24, 1947, and with Bacher and Oppenheimer on Mar. 29, 1947. See Bacher's memorandums to files, Mar. 25 and Mar. 29, 1947, *AEC*. Forrestal's and Lilienthal's opinions were given in meetings of the executive committee on the regulation of armaments and are described in Lilienthal, *Atomic Energy Years*, pp. 166-67, and Millis, *Forrestal Diaries*, pp. 258-60. Guidance to Austin and Osborn is in John C. Elliott, Memorandum to the Secretaries of State, War, and Navy, Apr. 2, 1947, and encl., United States Policy in the United Nations Atomic Energy Commission, *AEC*.
 18. *Yearbook of the United Nations, 1946-47*, pp. 448-49; *Policy at the Crossroads*, pp. 85-88; Frederick Osborn, "Negotiating on Atomic Energy," in Raymond Dennet and Joseph C. Johnson, eds., *Negotiating with the Russians* (World Peace Foundation, 1951), pp. 222, 229.
 19. Lilienthal, *Atomic Energy Years*, pp. 213-16; Gullion to Rusk and Johnson, July 9, 1947, *DS*.
 20. Osborn to Bacher, Aug. 5, 1947, Op-

- penheimer to Bacher, Aug. 6, 1947, *AEC*. Reference to Conant's ideas are in Lilienthal, *Atomic Energy Years*, p. 216. Conant made them the subject of his Oct. 2, 1947, lecture to the War College, "The Atomic Age: A Preview—1947 Edition," *DS*. Others had similar ideas, as Cuthbert Daniel and Arthur M. Squires, "The International Control of Safe Atomic Energy," *Bulletin of the Atomic Scientists* 3 (1947), 111-16, 135.
21. Kennan to Lovett, Aug. 21, 1947, and encl., General United States Policy with Respect to International Control of Atomic Energy, *AEC*; Rusk, Memorandum for the Record, Sept. 9, 1947, *DS*.
- 632 22. Minutes, Meeting of the Secretaries of State, War, and Navy, Sept. 8, 1947, *AEC*.
23. *Ibid.*, Sept. 11, 1947.
24. Department of State, *The Second Report of the United Nations Atomic Energy Commission to the Security Council*, Sept. 11, 1947 (Washington, 1947).
25. *Department of State Bulletin*, Sept. 28, 1947.
26. *The Third Report of the United Nations Atomic Energy Commission to the Security Council*, May 17, 1948 (Washington, 1948), p. 61. Truman to Lilienthal, Sept. 22, 1947, *AEC*.
27. Lilienthal to Commissioners, Jan. 29, 1947, *AEC*.
28. Acheson, British Request for Cooperation in the Field of Atomic Energy, Feb. 1, 1947, Acheson to Lilienthal, Feb. 3, 1947, *AEC*; Acheson to Marshall, Feb. 3, 1947, *DS*.
29. Marshall to Forrestal, Feb. 11, 1947, Marshall to Patterson, Feb. 11, 1947, Patterson to Marshall, n.d., from a collection of documents in U.S.-U.K.-Canada Negotiations, Book 1, Oct. 31, 1947, *WNRC*.
30. The account of this meeting is based mainly on Lilienthal, *Atomic Energy Years*, pp. 175-76. A very brief summary is in Joint Committee, *Summary of Proceedings*, May 5, 1947, *AEC*.
31. No detailed accounts of the May 12, 1947, meeting have been found. Acheson's prepared statement and Hickenlooper's letter to Marshall are in U.S.-U.K.-Canada Negotiations, Book 1, Oct. 31, 1947, *WNRC*. The Hickenlooper letter refers to a move by Vandenberg to take up the matter with Truman or Marshall. *The Private Papers of Senator Vandenberg*, pp. 359-60, states that both senators in late spring or early summer contacted Truman, Marshall, and Forrestal.
32. Meeting of the Secretaries of State, War, and Navy, Sept. 11, 1947, *AEC*. In Forrestal's opinion, Roosevelt had exceeded his authority. See Forrestal Diary, Sept. 11, 1947, *JFP*.
33. CM 98, Sept. 18, 1947, CM 101, Sept. 25, 1947, Wilson to Commissioners, Sept. 25, 1947, Lilienthal to Marshall, Oct. 1, 1947, *AEC*.
34. Recommendations Concerning a Program of Negotiations with the British and Canadian Governments, Oct. 24, 1947, *AEC*.
35. Minutes, American Members, CPC, Nov. 5, 1947, *AEC*.
36. Lilienthal, *Atomic Energy Years*, p. 259; Lewis L. Strauss, *Men and Decisions* (Garden City, N. Y., 1962), pp. 255-56, stresses the ambiguity of Section 10.
37. Wilson explored in July the legal basis for a meeting on classification with the British and Canadians. Marks to Wilson, July 3, 1947, Wilson to the Commissioners, July 14, 1947, *AEC*. Those attending the November, 1947, meeting are listed in *AEC Press Release* 68, Nov. 14, 1947, *AEC*. Wilson referred to the conversations in the Minutes, American Members, CPC, Nov. 24, 1947 and Nov. 26, 1947, *AEC*.
38. Minutes, American Members, CPC, Nov. 24, 1947, *AEC*.
39. Forrestal Diary, Sept. 26, 1947, *JFP*. Forrestal, Meeting with Lovett, Vandenberg, and Hickenlooper, Nov. 16, 1947, *AEC*; Vandenberg, ed., *The Private Papers of Senator Vandenberg*, p. 360.
40. Forrestal, Meeting with Lovett, Vandenberg, and Hickenlooper, Nov. 16, 1947, *AEC*, mentions Lovett's plan on informing Congress. Lilienthal refers to Hickenlooper's reasons for confining the discussion to himself and Vandenberg during Commission consideration of the negotiating position, CM 125, Nov. 25, 1947, *AEC*. For the Nov. 26, 1947, meeting see Minutes, Ameri-

- can Members, CPC, Nov. 26, 1947, *AEC*.
41. Lilienthal, *Atomic Energy Years*, pp. 260, 265; Joint Committee, *Summary of Proceedings*, Dec. 5, 1947, *AEC*; Forrester Diary, Dec. 5, 1947.
 42. Minutes, CPC, Dec. 10, 1947, *AEC*. When the State Department informed the British and Canadians of the proposed negotiations is not clear. Forrester records Lovett as saying on Nov. 16, 1947, to Vandenberg and Hickenlooper that the British and Canadians were prepared to negotiate. Forrester, Meeting with Lovett, Vandenberg, and Hickenlooper, Nov. 16, 1947, *AEC*.
 43. Summary of Discussion of U.K.-Canada-U. S. Sub-group on Technical Cooperation, Dec. 12, 1947, *AEC*.
 44. Memoranda to the CPC, Dec. 12, 15, 1947, *AEC*.
 45. Minutes, CPC, Dec. 15, 1947, *AEC*.
 46. Memorandum of Discussion Within the Group Designated by CPC To Work out Allocation Arrangements, Dec. 18, 1947, *AEC*.
 47. Conference between Mr. Bohlen and Mr. Kennan, Dec. 17, 1947, *DS*; Gullion, U. S.-U. K.-Canada Negotiations on Atomic Energy, Dec. 20, 1947, *AEC*.
 48. The terms of agreement are taken from Allocations, Jan. 7, 1948, and appended to the Minutes, CPC, Jan. 7, 1948, *AEC*.
 49. Memorandum of Conversation, Jan. 7, 1948, *AEC*.
 50. CM 139, Jan. 7, 1948, Farley, Notes on Commission Meeting of Jan. 7, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 281-82.
 51. Minutes, CPC, Jan. 7, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 281-82; Millis, ed., *Forrester Diaries*, pp. 338-39.
 52. The full Joint Committee was briefed on the conclusions of the negotiations on Jan. 21, 1948. Unsigned memorandum, Outcome of CPC Negotiations and an Explanation of the Eniwetok Test, Jan. 21, 1948, *AEC*.

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CHAPTER 10

1. Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), p. 282; Minutes, CDA, Jan. 29, 1948, *AEC*.
2. CM 152, Feb. 19, 1948, Provisional Minutes of First Meeting of the CPC Subgroup of Scientific Advisors, Feb. 21, 1948, *AEC*.
3. Gullion, Memorandum of Conversation, Mar. 19, 1948, *AEC*.
4. Walter Millis, ed., *The Forrester Diaries* (New York, 1951), pp. 406-407.
5. *Parliamentary Debates*, Commons, May 12, 1948, Vol. 450, 2128-29.
6. Weil, Wende, and Zinn, Report of Visit to Harwell and Risley, May 28-June 4, 1948, *AEC*.
7. CM 183, June 30, 1948, *AEC*.
8. Lilienthal to Marshall, July 2, 1948, Minutes, American Members, CPC, July 6, 1948, *AEC*; Carpenter, Memorandum of Discussion, July 9, 1948, *WNRC*; Lilienthal, *Atomic Energy Years*, pp. 380-81.
9. Forrester Diary, July 8, 1948, *JFP*.
10. CM 184, July 8, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 382-83.
11. Lilienthal, *Atomic Energy Years*, pp. 384-85; Strauss, Memorandum to the Commissioners, July 15, 1948, Bacher, Pike, Waymack, Lilienthal, Memorandum, July 23, 1948, Strauss, Memorandum for the Commission, July 29, 1948, *AEC*.
12. Lilienthal, *Atomic Energy Years*, pp. 399-401; Lilienthal, Human Relations and the Atom, Aug. 21, 1948, *AEC*; *New York Times*, Aug. 22, 1948; *New York Journal American*, Aug. 22, 1948; Strauss and Hickenlooper thought the speech implied too much cooperation. Golden, Rough Notes of Telephone Comments by Mr. Strauss, Aug. 19, 1948, Henderson to Golden, Aug. 25, 1948, *AEC*.
13. CM 177, June 9, 1948, Office of Special Projects, Technical Cooperation on Fundamental Properties of Reactor Materials, June 7, 1948, *AEC*. For Lilienthal's and Marks's views on legality of cooperation see Minutes,

- American Members, CPC, Nov. 5, 1947, *AEC*. The query to Bush and the reply are in Fisk to Bush, June 11, 1948, Carpenter to Fisk, June 15, 1948, *AEC*. Efforts of the Commission to reach an understanding with the Department of Defense on technical cooperation are referred to in CM 180, June 17, 1948, CM 183, June 30, 1948, Wells to Snapp, June 30, 1948, Fisk to Carpenter, July 8, 1948, *AEC*.
14. Longair to Hobbs, June 22, 1948, CM 183, June 30, 1948, CM 184, July 8, 1948, Fisk to Smith, July 26, 1948, *AEC*.
 15. Carpenter to Forrestal, Lilienthal, Lovett, Fisk, Webster, Aug. 3, 1948, *AEC*.
 16. Carpenter, Memorandum of Conversation with Senator Hickenlooper at 4:00 P.M., 4 Aug. 1948, Aug. 6, 1948, *WNRC*; Wilson and Lilienthal had spent about three hours with Hickenlooper on July 29, 1948, discussing many of the topics which Carpenter states Hickenlooper mentioned on Aug. 4, 1948. Lilienthal, Memo for Commissioners, Aug. 2, 1948, *AEC*, summarizes the July 29 meeting with Hickenlooper, but does not indicate that technical cooperation was discussed.
 17. Carpenter to the Commission, Aug. 9, 1948, *AEC*.
 18. Pike to Hickenlooper, Aug. 9, 1948, Strauss to Hickenlooper, Aug. 11, 1948, Carpenter, Memorandum of Meeting at 11:00 A.M. . . . , Aug. 12, 1948, *AEC*; Bush to Forrestal, Aug. 12, 1948, *WNRC*; Forrestal Diary, Aug. 12, 1948, *JFP*.
 19. Cable, Pike to Smith, Aug. 12, 1948, Pike to Commissioners, Aug. 13, 1948, *AEC*; Carpenter, Memorandum of Conversation with Mr. Sumner Pike, Aug. 13, 1948, *WNRC*; Smith to Pike, Aug. 14, 1948, Smith to Lilienthal, Sept. 8, 1948, *AEC*. The Pike and Strauss versions are in *Congressional Record*, 81 Cong., 2 sess., pp. 9755-73.
 20. Carpenter, Memorandum of Conversation with Dr. F. N. Woodward . . . , Aug. 16, 1948, *AEC*.
 21. *Ibid.*, Sept. 16, 1948, *AEC*.
 22. Millis, ed., *The Forrestal Diaries*, pp. 483-91; Forrestal Diary, *JFP*. Eisenhower to Forrestal, Sept. 27, 1948, Forrestal Papers, *JFP*.
 23. Carpenter to Joint Chiefs of Staff, Sept. 14, 1948, William C. Lalor, Memorandum for the MLC, Sept. 29, 1948, *WNRC*.
 24. Memorandum of Conversation, Sept. 30, 1948, *WNRC*.
 25. *Ibid.*, Nov. 16, 1948, *AEC*.
 26. CM 207, Oct. 15, 1948, *AEC*. The subgroup meeting was scheduled for Oct. 21, 1948. The meeting was held; it was agreed to consider four new areas of cooperation. Minutes of Third Meeting of CPC Sub-Group of Scientific Advisers . . . , Oct. 21, 1948, *WNRC*.
 27. Summary Log of Atomic Energy Work in Office of the Under Secretary, Nov. 1948, *DS*; CM 223, Dec. 9, 1948, Volpe to Snapp, Dec. 31, 1948, *AEC*. According to a State Department draft of Dec. 16, 1948, possible candidates for a four- or six-man advisory panel were: Acheson, A. W. Barkley, C. I. Barnard, B. M. Baruch, W. Batt, O. Bradley, Bush, Byrnes, Karl Compton, Conant, Elmer Davis, D. D. Eisenhower, John Hancock, George Harrison, and Oppenheimer. The study was to provide a policy which would cover the gamut of foreign relations and atomic energy, not just the relations with Britain and Canada. See Atomic Energy Policy, Dec. 16, 1948, *AEC*.
 28. Wilson Diary, Jan. 4, 1949, *AEC*.
 29. Notes re Princeton Meeting, Jan. 28, 1949, *AEC*; Arneson, Memorandum for the Secretary, the Under Secretary, Feb. 3, 1949, *DS*.
 30. CM 240, Feb. 3, 1949, *AEC*; Lilienthal, *Atomic Energy Years*, p. 457; D. E. L[lilienthal], Resolved that as a Member of the CPC . . . , Feb. 5, 1949, CM 242, Feb. 5, 1949, Strauss, Memorandum Read to a Meeting of the Atomic Energy Commission . . . , Feb. 5, 1949, *AEC*.
 31. Dean G. Acheson, "The President and the Secretary of State," Don K. Price, ed., *The Secretary of State* (Englewood Cliffs, N. J., 1960), p. 34.
 32. The special subcommittee of the NSC was approved by Truman on Feb. 10, 1949, see Acheson, Memorandum for the President, Feb. 10, 1949, *AEC*. For Lilienthal's doubts on the proce-

- dures see Lilienthal, *Atomic Energy Years*, pp. 462, 467. Truman's preliminary ideas were that atomic weapons in Britain were liable to capture, see Lilienthal, *Atomic Energy Years*, p. 465. The Commission considered the special subcommittee report at CM 247, Feb. 28, 1949, *AEC*. For the meeting of the special subcommittee see Arneson, Minutes of Meeting, the Special Committee of the NSC on Atomic Energy Policy with Respect to United Kingdom and Canada, Mar. 2, 1949, *AEC*. The report was transmitted to the President on Mar. 2, 1949. A brief account is contained in Truman, *Memoirs*, Vol. II, *Years of Trial and Hope* (Garden City, N. Y., 1956), pp. 302-03.
33. CM 250, Mar. 2, 1949, *AEC*.
 34. Lilienthal, *Atomic Energy Years*, pp. 511, 520.
 35. Arneson, Memorandum of Conversation, Mar. 9, Apr. 28, 1949, Arneson, Memorandum for the Files, June 2, 1949, Arneson to Webb, June 2, 1949, *DS*.
 36. Acheson, Memorandum of Conversation with the President, June 24, 1949, Arneson, Memorandum of Conversation, June 30, 1949, *DS*; Memorandum of Conversation: Tripartite Atomic Energy Negotiations, July 6, 1949, *AEC*. At the July 6 meeting, Pike was present instead of Lilienthal.
 37. President's News Conference of July 14, 1949, *Public Papers of Harry S. Truman, 1949* (Washington, 1964), pp. 375-80.
 38. *New York Times*, *Baltimore Evening Sun*, *Washington Post*, *Washington Star*, July 15, 1949.
 39. Arneson, Suggested Statement To Be Made by the President, July 13, 1949, Arneson, Memorandum for the File, Subject: Blair House Meeting, July 14, 1949, CM 291, July 15, 1949, *AEC*. The most colorful account is in Lilienthal, *Atomic Energy Years*, pp. 543-45, 547-48. A photocopy of Truman's remarks on White House stationery and presumably in Truman's handwriting is in *DS*.
 40. Acheson, Memo of Telephone Conversation, July 18, 1949, Arneson, Memorandum for the Secretary, July 20, 1949, *DS*.
 41. Arneson, Memorandum for the Files, July 20, 1949, *WNRC*; Lilienthal, *Atomic Energy Years*, pp. 545-52.
 42. The President's News Conference, July 28, 1949, *Public Papers of Harry S. Truman, 1949*, pp. 402-05; Lilienthal, *Atomic Energy Years*, pp. 555, 557-59; Johnson, Memorandum for the President, July 25, 1949, *WNRC*; Acheson, Memorandum of Conversation with the President, July 25, 1949, *DS*; Proposed Statement for the Secretary of State to the JCAE, July 27, 1949, *AEC*; Press Release from the Office of Senator Brien McMahon, July 27, 1949, *WNRC*.
 43. Zinn to Hilberry, July 26, 1949, quoted in Flaherty to Stirewalt, Aug. 9, 1949, *AEC*. For Volpe and Dean interpretations see CM 268, May 11, 1949, CM 287, July 5, 1949, Dean to Lilienthal *et al.*, July 21, 1949, Volpe to Commission, Sept. 13, 1949, Dean, Memorandum to the Commission, Oct. 20, 1949, *AEC*.
 44. Lilienthal, *Atomic Energy Years*, p. 565.
 45. Minutes, American side, CPC, Sept. 13, 1949, *AEC*.
 46. Minutes, CPC, Sept. 20, 1949, *AEC*.
 47. Draft, Minutes, Sub-Committee III, Sept. 21, 1949, Meeting of Drafting Group, Sub-Committee III, Sept. 22, 1949, *AEC*.
 48. Meeting of Drafting Group, Sub-Committee III, Sept. 24, 1949, *AEC*.
 49. Lilienthal, *Atomic Energy Years*, pp. 574-77.
 50. Minutes, CPC, Sept. 30, 1949, *AEC*.
 51. Transcript of Joint Committee Hearings, Oct. 13, 1949, *AEC*.
 52. Acheson, Memorandum of Conversation with the President, July 21, 1949, Webb, Meeting with the President, Monday, September 26, dated Oct. 1, 1949, Webb, Meeting with the President, Saturday, October 1, 1949, dated Oct. 1, 1949, Webb, Meeting with the President, Monday, October 3, 1949, dated Oct. 3, 1949, Acheson, 12:30 Meeting with the President, Oct. 13, 1949, *DS*.
 53. Arneson, Memorandum for the American Members of the CPC, Nov. 21, 1949, *AEC*; Seaborg to Wilson, Nov. 16, 1949, *WNRC*.
 54. Draft Notes on Meeting of American

- Working Group, CPC . . . , Nov. 22, 1949, *AEC*.
55. Hall, Draft Notes on Meeting of Sub-Group I, CPC . . . , at 10:30 A.M., Nov. 28, 1949, *AEC*.
56. Hall, Draft Notes on Meeting of the American Side, CPC Sub-Group I, at 3:00 P.M., R. Gordon Arneson's Office . . . , Nov. 28, 1949, *AEC*. Wilson met with the British and Canadians later that afternoon, but no accounts of the meeting have been found.
57. Arrangements with United Kingdom and Canada on Atomic Energy, n.d., *AEC*. Although undated, the draft memorandum was composed between Nov. 29 and Dec. 2, 1949.
58. CM 339, Dec. 2, 1949, *AEC*.
- 636 59. Remarks by C. L. Wilson in the Steering Group Meeting on Dec. 2, at 10:00 A.M., Notes on Meeting of Sub-Group I (Steering Committee) of the CPC, 10:00 A.M., Dec. 2, 1949, Notes on Informal Exploratory Technical Discussion Held in the Department of State on Dec. 2, 1949 at 11 A.M., *AEC*.
60. Notes on an Informal Exploratory Meeting Held in Carroll L. Wilson's Office at 4:55 P.M., Dec. 2, 1949, *AEC*.
61. Franks to Acheson, Dec. 29, 1949 and encl., CM 351, Jan. 5, 1950, *AEC*.
62. Fisher and Arneson to Johnson, Jan. 18, 1950, *AEC*.
63. The British proposal on allocation was accepted in Acheson to Franks, Jan. 26, 1950, *AEC*.
64. Wilson Diary, Feb. 2, 3, 1950, CM 363, Feb. 2, 1950, CM 364, Feb. 3, 1950, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 634-35; Joint Committee, Minutes of an Executive Meeting, Feb. 3, 1950, *AEC*. Several accounts of uneven quality have been written about Fuchs. Probably the best are Alan Moorehead, *The Traitors* (New York, 1952), pp. 44-164, and Rebecca West, *The New Meaning of Treason* (New York, 1964), pp. 174-97.

CHAPTER 11

1. For a good summary of the Commission organization in early 1948 see Richard O. Niehoff, "Organization and Administration of the United States Atomic Energy Commission," *Public Administration Review* 8 (Spring, 1948), 91-102.
2. The account of this meeting is based on Part II, Conference of Managers and Principal Washington Personnel, Dec. 4-6, 1947, *AEC*. The transcript of the discussion of program goals has not been found.
3. Wilson to Principal Washington Staff, Oct. 21, 1947, Snapp to Principal Washington Staff, Nov. 12, 1947, *AEC* Press Release 78, Dec. 30, 1947, *AEC*.
4. Part II, Conference of Managers and Principal Washington Personnel, Dec. 4-6, 1947, *AEC*; Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), p. 89.
5. Sec. 19, The Atomic Energy Act of 1946 (P.L. 585, 79 Cong., 60 *Stat.*, 755-75; 42 U.S.C., 1801-19).
6. Committee on Appropriations, *Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives . . . on the First*

- Deficiency Appropriations Bill for 1948* (Washington, 1948), pp. 861-972. There are references to a closed hearing in the subcommittee hearing, Lilienthal, *Atomic Energy Years*, pp. 299-302; Wilson Diary, Feb. 26, 1948, *AEC*.
12. Summary of Proceedings, Executive Meeting, JCAE, May 27, 28, 1948, *AEC*.
 13. Committee on Appropriations, *Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives . . . on the Supplemental Independent Offices Appropriation Bill for 1949* (Washington, 1948), pp. 747-873.
 14. Lilienthal, *Atomic Energy Years*, p. 352.
 15. "Supplemental Independent Offices Appropriation Bill, 1949," *House Report*, 80 Cong., 2 sess., no. 2455 (June 8, 1948); *Congressional Record*, 80 Cong., 2 sess., p. 7629.
 16. *Congressional Record*, 80 Cong., 2 sess., pp. 7612-14, 7714-15.
 17. A good study of the Joint Committee is in Harold P. Green and Alan Rosenthal, *Government of the Atom, The Integration of Powers* (New York, 1963), pp. 25-30.
 18. "Development and Control of Atomic Energy," *Senate Report*, 80 Cong., 2 sess., no. 850 (Jan. 30, 1948).
 19. Summary of Proceedings, Executive Meeting, JCAE, Nov. 28, 1947, *AEC*.
 20. CM 127, Dec. 4, 1947, AEC Press Release No. 82, Jan. 20, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, p. 267.
 21. "Directing the Secretary of Commerce to Transmit . . . a Certain Letter with Respect to Dr. Edward U. Condon," *House Report*, 80 Cong., 2 sess., no. 1753 (Apr. 19, 1948).
 22. Summary of Proceedings, Executive Meeting, JCAE, Mar. 2, 1948, *AEC*.
 23. *Ibid.*, Apr. 1, 1948, *AEC*; New York *Times*, Mar. 5, 1948; "Directive on the Need for Maintaining the Confidential Status of Employee Loyalty Records," Mar. 13, 1948, *Public Papers of Harry S. Truman, 1948* (Washington, 1964), pp. 181-82; Harry S. Truman, *Memoirs*, Vol. II, *Years of Trial and Hope* (Garden City, New York, 1956), pp. 269-93.
 24. Lilienthal, *Atomic Energy Years*, p. 312; Fisher to Files, Apr. 8, 1948, *AEC*.
 25. Lilienthal, *Atomic Energy Years*, pp. 296-97.
 26. *Ibid.*, pp. 286, 296, 304-07, 314.
 27. Walter Millis, ed., *The Forrestal Diaries* (New York, 1951), pp. 379-80.
 28. Lilienthal, *Atomic Energy Years*, pp. 319-25; Lilienthal, Memo of Conversation with Senator Hickenlooper . . . , Apr. 21, 1948, *AEC*; New York *Times*, Washington *Post*, Apr. 21, 1948.
 29. Excerpts from telephone conversation between . . . Forrestal . . . and . . . Hickenlooper . . . , Apr. 19, 1948, *JFP*.
 30. New York *Times*, Apr. 21, 1948; Lilienthal, *Atomic Energy Years*, pp. 319-25; Memorandum from the President to Secretary of Defense, Apr. 22, 1948, *JFP*.
 31. Lilienthal, *Atomic Energy Years*, pp. 320-25.
 32. New York *Times*, Apr. 24, 1948; Waymack to R. J. Blakely, Apr. 26, 1948, *AEC*.
 33. Washington *Post*, Apr. 28, 1948; Lilienthal, *Atomic Energy Years*, pp. 326-31.
 34. "Providing for Extension of the Terms of Office of the Present Members of the Atomic Energy Commission—Minority Views," *Senate Report*, 80 Cong., 2 sess., no. 1342, part 2 (May 24, 1948), contains the letters from Oppenheimer, DuBridge, and Rabi to Hickenlooper. Lilienthal, *Atomic Energy Years*, p. 328; Oppenheimer to Lilienthal, May 1, 1948, *DEL*.
 35. News Conference of Apr. 29, 1948, *Public Papers of Harry S. Truman, 1948*, pp. 236-39.
 36. Waymack to Commission, Apr. 30, 1948, *AEC*.
 37. "Providing for Extension of the Terms of Office . . .," *Senate Report*, 80 Cong., 2 sess., no. 1342 (May 17, 1948); "Providing for Extension of the Terms of Office . . . Minority Views," *Senate Report*, 80 Cong., 2 sess., no. 1342, part 2 (May 24, 1948); *Congressional Record*, 80 Cong., 2 sess., pp. 8614, 8953-54, 9060-67, 9070-73; Lilienthal, *Atomic*

- Energy Years*, pp. 341, 345, 362-63.
38. Report of the Office of Security and Intelligence to the General Manager for the Period January 1-April 1, 1948, *AEC*.
 39. Development of AEC Security Program, appendix to Memorandum to the Commission from the General Manager, July 20, 1949, Bulletin GM-80, Mar. 30, 1948, *AEC*.
 40. Interim Procedure, Apr. 15, 1948, Wilson to Managers of Directed Operations, May 29, 1948; James S. Stewart to Commission, May 20, 1948, Wilson to Stewart, June 16, 1948, *AEC*. Similar procedures governed clearance requests originating in headquarters. Comparison of AEC procedures with those of other agencies can be found in Walter Gellhorn, *Security, Loyalty, and Science* (Ithaca, New York, 1950); Eleanor Bontecou, *The Federal Loyalty-Security Program* (Ithaca, New York, 1953); New York City Bar Association, *The Federal Loyalty-Security Program* (New York, 1956).
 41. Chairman, Personnel Security Review Board to General Manager, June 7, 1948, Wilson to Cunningham, June 17, 1948, CM 185, July 15, 1948, Lilienthal to Files, July 15, 1948, Lilienthal, Memorandum for Information of Commissioners, July 15, 1948, *AEC*.
 42. Roberts to Commission, June 30, 1948, *AEC*.
 43. Director of Security and Intelligence, Decentralization to Managers of Directed Operations of Authority To Grant Emergency Clearance, July 20, 1948, CM 187, July 22, 1948, *AEC*.
 44. D. F. Carpenter, Memorandum of Conversation with Senator Hickenlooper . . . Aug. 4, 1948, *WNRC*; Millis, ed., *The Forrestal Diaries*, p. 380.
 45. Wilson to Hickenlooper, Mar. 13, 1947, *AEC*.
 46. CM 70, July 1, 1947, CM 85, July 24, 1947, Green to Wilson, July 9, 1947, *AEC*.
 47. Statement by Paul M. Green . . . Prepared in Answer to . . . Letter . . . from the Comptroller General . . . , Dec. 15, 1947, *AEC*.
 48. Green, AEC Finance and Accounting, Apr. 1948, *AEC*.
 49. Summary of Proceedings, Executive Meeting, JCAE, May 11, 1948, Warren to Lilienthal, June 15, 1948, *AEC*. An account of financial and contract procedures is in the *Ninth Semiannual Report of The Atomic Energy Commission* (Washington, January, 1951). Useful and brief is John P. Abbadessa, "Financial Management in the Atomic Energy Commission," *The Federal Accountant 14* (Spring, 1965).
 50. R. M. Underhill, Memorandum, Sept. 10, 1947, Lawrence Papers, *LRL*; Lilienthal, *Atomic Energy Years*, pp. 242, 245-46, 354; AEC Press Release 59, Oct. 6, 1947, Preliminary Draft of Report of the United States Atomic Energy Commission by the Industrial Advisory Group, May 29, 1948, Wilson Diary, June 3, 1948, *AEC*.
 51. GAC 10, June 4-6, 1948, *AEC*.
 52. Lilienthal, *Atomic Energy Years*, pp. 354, 367-68. Oppenheimer to Lilienthal, June 18, 1948, *DEL*; Terry, Memorandum for the Secretary, Aug. 27, 1948, *WNRC*.
 53. Wilson to Parker, July 28, 1948, Manley to Fisk, July 22, 1948, Lilienthal to Commissioners, Aug. 2, 1948, *AEC*; Carpenter, Memorandum of Conversation with Senator Hickenlooper . . . , Aug. 4, 1948, *WNRC*.
 54. Wilson, Memorandum for Managers of Directed Operations and Principal Washington Staff, Aug. 5, 1948, *AEC*.
 55. GAC 10, June 4-6, 1948, *AEC*.
 56. Lilienthal, *Atomic Energy Years*, pp. 360-62; CM 180, June 17, 1948, Strauss to Secretary, July 2, 1948, Hickenlooper to Lilienthal, July 30, 1948, *AEC*.
 57. CM 186, July 21, 1948, Director of Biology and Medicine, Security Clearance of Fellows Participating in the AEC Fellowship Programs, Sept. 10, 1948, *AEC*.
 58. The text of the two speeches is in *Bulletin of the Atomic Scientists 4* (Oct., 1948), 291-94.
 59. Lilienthal to Hickenlooper, Oct. 11, 1948, *AEC*.
 60. The chronology and complications of the Oak Ridge situation are set forth in Lilienthal to Hickenlooper, Jan. 6, 1948, and annexes, and Lilienthal to Hickenlooper, Jan. 16, 1948, encl., Report on Labor Problems Relating to

- Continuity of Production in the Atomic Energy Program, included in Joint Committee, *Hearings . . . on Labor Policy in Atomic Energy Plants, Part 1, March 9, 10, 12, 15, and 16, 1948* (Washington, 1948), pp. 7-15, 117-138. Two helpful unpublished studies are David B. Johnson, "Labor-Management Relations in the Atomic Energy Program," a doctoral dissertation completed at the University of Wisconsin, 1955, and Joan M. Silver, "Labor-Management Relations in the Atomic Energy Program 1946-1952: Variations on a Theme," 1967, *AEC*.
61. Director of Labor Relations, Conference with the Federal Mediation and Conciliation Service, Jan. 13, 1948, *AEC*.
 62. Lilienthal to Hickenlooper, Jan. 16, 1948, encl., Report on Labor Relations Relating to Continuity of Production in the Atomic Energy Program in Joint Committee, *Hearings on Labor Policy*, pp. 117-38.
 63. Director of Labor Relations, Reported Communist Domination of Unions at AEC Installations in Schenectady and Chicago, Sept. 9, 1948, *AEC*.
 64. Smith to Files, Jan. 30, 1948, Smith to Files, June 18, 1948, *AEC*. The Commission position on the UEW is in Report of Senate Subcommittee on Labor and Labor-Management Relations of the Committee on Labor and Public Welfare, *Communist Domination of Certain Unions—Part II—Atomic Energy Commission Reply to Subcommittee Questionnaire*, 82 Cong., 2 sess. (Washington, 1954).
 65. Summary of Proceedings, Executive Meeting, JCAE, Mar. 2, 1948, *AEC*; Joint Committee, *Hearings on Labor Policy*.
 66. Director of Labor Relations, A Program for Assuring Continuity of Production within the Atomic Energy Industry, Apr. 16, Apr. 19, 1948, CM 168, Apr. 22, 1948, Summary of Proceedings, Executive Meeting, JCAE, May 6, 1948, *AEC*.
 67. Lilienthal, *Atomic Energy Years*, p. 354. Useful accounts of the Oak Ridge dispute are in Donald B. Straus, *The Development of a Policy for Industrial Peace in Atomic Energy* (Washington, 1950), and David B. Johnson, "Labor-Management Relations in the Atomic Energy Program."
 68. Special Message to the Congress on the Labor Dispute at Oak Ridge, June 18, 1948, *Public Papers of Harry S. Truman, 1948*, pp. 379-381.
 69. Report of Senate Subcommittee on Labor and Labor-Management Relations, *Communist Domination of Certain Unions—Part II—Atomic Energy Commission Reply to Subcommittee Questionnaire*, p. 4; Director of Labor Relations, Reported Communist Domination of Unions at AEC Installations in Schenectady and Chicago, Sept. 9, 1948, *AEC*.
 70. Smith, Memorandum to the Files, June 18, 1948, *AEC*.
 71. CM 197, Sept. 21, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 411-12. Lilienthal's journal incorrectly gives the date as Sept. 22.
 72. CM 198, Sept. 23, 1948, Boulware to Lilienthal, Sept. 28, 1948, Smith to Files, Oct. 1, 1948, Smith to Snapp, Oct. 1, 1948, *AEC*; Lilienthal, *Atomic Energy Years*, p. 413.
 73. Fitzgerald to Lilienthal, Sept. 30, 1948, Memorandum of Conference of Mr. Oscar Smith with Mr. Philip Murray, Oct. 1, 1948, *AEC*.
 74. See Report of Senate Subcommittee on Labor and Labor Management Relations, *Communist Domination of Certain Unions*.
 75. The President's Commission on Labor Relations in Atomic Energy Installations, Memorandum . . . Regarding . . . the Relation of the Commission to Contractors and Labor Organizations, Apr. 9, 1949, Interim Statement of the AEC in Respect to Its Role in Labor Management Relations in Atomic Energy Installations, Apr. 29, 1949, CM Bulletin No. 44, Rev., *AEC*; Report of the President's Commission on Labor Relations in the Atomic Energy Installations (Washington, 1949).
 76. Dewey, "The Challenge of the Atomic Age," *Bulletin of the Atomic Scientists* 4 (Oct. 1948), 296-97; Lilienthal, *Atomic Energy Years*, p. 412.
 77. The McMahon draft was enclosed in Borden to Hopkins, Sept. 27, 1948, *HST*. As an article it appeared in *Bulletin of the Atomic Scientists* 4 (Oct. 1948), 298-99. The Milwaukee

- speech is in *The Public Papers of Harry S. Truman, 1948*, pp. 787-92.
78. Lilienthal, *Atomic Energy Years*, pp. 431-33, 440.
 79. A discussion of the AEC contract policy is in the *Ninth Semiannual Report of the Atomic Energy Commission* (Washington, 1951), pp. 57-72, and Richard A. Tybout, *Government Contracting in Atomic Energy* (Ann Arbor, Michigan, 1956).
 80. CM 227, Dec. 21, 1948, Lilienthal to Pike *et al.*, Dec. 27, 1948, Lilienthal to Pike *et al.*, Dec. 31, 1948, *AEC*.
 81. Lilienthal to Commissioners, Jan. 1, 1949, *AEC*.
 82. Lilienthal, *Atomic Energy Years*, pp. 441-42; Shugg Diary, Jan. 4, 1949, AEC Press Release No. 151, "Criteria for Determining Eligibility for Personnel Security Clearance," Jan. 5, 1949, *AEC*.
 83. Comments of Fulton Lewis, Jr., Jan. 11, 12, 1949, *AEC*. The Commission unanimously approved the Graham clearance against the recommendations of Gingrich and the Roberts board. CM 217, Nov. 17, 1948, *AEC*. The Commission had informed Hickenlooper of the action in Lilienthal to Hickenlooper, Dec. 1, 1948, *AEC*.
 84. Hickenlooper to Lilienthal, Jan. 12, 1949, quoted in Joint Committee, *Atomic Energy Fellowship Program* (Washington, 1949), p. 6; Bacher to Hickenlooper, Jan. 31, 1949, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 360-61, 528-29.
 85. *Fifth Semiannual Report of the Atomic Energy Commission* (Washington, 1948); Press Conference . . . Jan. 28, 1949, CM 243, Feb. 10, 1949, *AEC*; Joint Committee, *Atomic Energy Report to Congress, Feb. 2, 1949* (Washington, 1949); News Conference, Feb. 10, 1949, *Public Papers of Harry S. Truman, 1949* (Washington, 1964), pp. 132-33; Lilienthal, *Atomic Energy Years*, pp. 453, 461-62, 468.
 86. Lilienthal, *Atomic Energy Years*, pp. 444, 459-67; Wilson Diary, Feb. 9, 1949, *AEC*.
 87. CM 250, Mar. 2, 1949, Williams Diary, Mar. 7, 8, 14, 1949, *AEC*. The reference to the Feb. 19, 1949, meeting is in CM 250. Lilienthal, *Atomic Energy Years*, pp. 484-85, 488, 489-90.
 88. Lilienthal to Commissioners, Mar. 14, 1949, *AEC*.
 89. Joint Committee, Executive Meeting, Mar. 16, 1949, *AEC*.
 90. Joint Committee, Executive Meeting, Mar. 17, 1949, *AEC*.
 91. Joint Committee, Executive Meeting, Apr. 6, 1949, *AEC*.
 92. Joint Committee, Executive Meeting, May 18, 1949, Lilienthal to Elston, May 30, 1949, *AEC*; Joint Committee, *Investigation into the United States Atomic Energy Project, Part 9, June 16, 1949* (Washington, 1949).
 93. The transcript of the May 16 hearings has not been found; references to it are in Lilienthal, *Atomic Energy Years*, pp. 528-30, and in Wilson Diary, May 4, 5, 6, 1949, *AEC*. Partial texts of the Lewis broadcasts are in Senate Subcommittee on Appropriations, *Independent Offices Appropriation Bill for 1950* (Washington, 1949), pp. 622-34. The Lilienthal letter and Hoey's remarks are in *Congressional Record*, 81 Cong., 1 sess., p. 6081.
 94. Joint Committee, *Confirmation of Gordon E. Dean and Henry DeWolf Smyth . . . May 12 and 18, 1949* (Washington, 1949).
 95. Lilienthal, *Atomic Energy Years*, pp. 528-29.
 96. Joint Committee, *Atomic Energy Commission Fellowship Program, May 16, 17, 18, 19, 1949* (Washington, 1949); Lilienthal, *Atomic Energy Years*, pp. 530-31.
 97. *New York Daily News*, May 18, 1949; Lilienthal, *Atomic Energy Years*, pp. 530-31; Williams Diary, May 18, 1949, Wilson Diary, May 18, 1949, Shugg Diary, May 18, 1949, Joint Committee Executive Session, May 18, 1949, *AEC*.
 98. Senate Subcommittee of the Committee on Appropriations, *Independent Offices Appropriation Bill for 1950* (Washington, 1949). Hearings were held on May 19, 20, 24, and June 7, 1949. P. L. 266, approved Aug. 24, 1949, provided that no part of any appropriation for the Commission could be used to confer a fellowship on an individual who is a member of an organization advocating overthrow of the Government.
 99. The text of the Hickenlooper charges

- are in *Bulletin of the Atomic Scientists* 5 (June-July, 1949), 182. Lilienthal, *Atomic Energy Years*, pp. 532-34; Arthur H. Vandenberg, Jr., ed., *The Private Papers of Senator Vandenberg* (Boston, 1952), pp. 357-58.
100. Lilienthal, *Atomic Energy Years*, pp. 535-36; Lilienthal to McMahon, May 25, 1949, reprinted in Joint Committee, *Investigation into the United States Atomic Energy Project* (Washington, 1949), pp. 7-8.
101. Joint Committee, *Investigation into the United States Atomic Energy Project*; Joint Committee, Executive Meetings, June 2, 10, 13, 17, July 26, Aug. 1, 11, 23, 1949, *AEC*.
102. Minutes, Laboratory Executive Committee, May 25, June 14, 1949, *ANL*; K. Kraus to J. Swartout, July 15, 1949, Swartout to Kraus, July 20, 1949, *ORNL*.
103. Joint Committee, Executive Meeting, Aug. 25, 1949, *AEC*.
104. The reports are in Joint Committee, Hearings on *Investigation into the United States Atomic Energy Project*.

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2. U. S. Air Force, Detection of the First Soviet Nuclear Test on August 29, 1949, dated Feb. 6, 1962, pp. 1-2, 7-11, *AEC* (hereafter cited as "Detection Report"). Strauss, *Men and Decisions* (Garden City, N. Y., 1962), pp. 204-05.
3. Wilson Diary, Sept. 8, 1949, *AEC*.
4. Wilson Diary, Sept. 9, 1949, Detection Report, pp. 11-12, *AEC*.
5. Pike to File, Sept. 14, 1949, Wilson Diary, Sept. 14, 1949, *AEC*; Webster to Johnson, Sept. 14, 1949, *WNRC*; Arneson wrote to Acheson on Sept. 12, 1949, that Truman had been informed. Arneson to Acheson, Sept. 12, 1949, *DS*.
6. Draft Report to the President on the Proposed Acceleration of the Atomic Energy Program, Sept. 13, 1949, CM 304, Sept. 14, 1949, *AEC*.
7. U. S. Atomic Energy Commission, *In the Matter of J. Robert Oppenheimer* (Washington, 1954), pp. 615, 801, 910-11 (hereafter cited as *Oppenheimer Hearings*); Detection Report, pp. 13-16, Wilson Diary, Sept. 19, 1949, *AEC*.
8. Wilson Diary, Sept. 19, 1949, Lilienthal Appointment Book, Sept. 19-20, 1949; Lilienthal, *Journals*, Vol. II, *The Atomic Energy Years, 1945-1950* (New York, 1964), pp. 569-72.
9. Lilienthal to Oppenheimer, Sept. 23, 1949, Box 46, *JRO*; Notes on Conversation Between Pike and Souers, Sept. 21, 1949, *AEC*. Persistent rumors of devaluation of the pound sterling were part of the growing financial crisis in September. News of the devaluation broke in American newspapers on Sept. 19. *New York Times*, Sept. 12-19, 1949.
10. Truman, *Memoirs*, Vol. II, *Years of Trial and Hope* (Garden City, N. Y., 1956), pp. 306-08.
11. *New York Times*, Sept. 24, 1949; *Public Papers of Harry S. Truman, 1949* (Washington, 1964), p. 485.
12. GAC 16, Sept. 22-23, 1949, *AEC*.
13. *Oppenheimer Hearings*, p. 714; Teller to Bradbury, Aug. 23, 1949, encl., Teller to von Neumann, Aug. 23, 1949, Bradbury to McCormack, Aug. 30, 1949, encl., Bradbury to von Neumann, Sept. 14, 1949, Dean Diary, Sept. 23, 1949, Dean to the Commissioners, Sept. 23, 1949, *AEC*.
14. The Historian's Office has an extensive file of newspaper clippings on reaction to the announcement.
15. Minutes, Program Council, Sept. 23, 26, 1949, Dean to the Commission, Sept. 23, 1949, *AEC*.
16. CM 308, Sept. 27, 1949, Suggested Revisions in Draft Report to the President, Sept. 27, 1949, *AEC*; J. H. Ohly to Johnson, Sept. 30, 1949, *WNRC*.
17. JCAE, Transcript of Hearing, Sept. 28, 1949, *AEC*. The rider appears in the Appropriation Act for Fiscal Year 1950, P.L. 266, 81 Cong., 63 Stat. 634.

18. MLC 37, Sept. 28, 1949, *AEC*.
19. JCAE, Transcript of Hearing, Sept. 29, 1949, *AEC*.
20. Lilienthal, *Atomic Energy Years*, pp. 574-77; Lilienthal Appointment Book, Sept. 29, 1949, *AEC*. For details, see Chap. 10.
21. CM 309, Sept. 29, 1949, Strauss to the Commission, Oct. 5, 1949, with covering note, Strauss to Lilienthal, Oct. 5, 1949, *AEC*. The text of the letter is in Strauss, *Men and Decisions*, pp. 216-17.
22. CM 310, Oct. 5, 1949, Strauss to Lilienthal, covering note on Oct. 5 memorandum, *AEC*.
23. CM 311, Oct. 6, 1949, CM 312, Oct. 7, 1949, Lilienthal Appointment Book, Oct. 7, 1949, *AEC*.
24. *Oppenheimer Hearings*, pp. 659, 773-75. An account of Lawrence's activities differing in some of the details is found in Herbert Childs, *An American Genius: The Life of Ernest Orlando Lawrence* (New York, 1968), pp. 413-16. Research on the thermonuclear reaction is described in the following Los Alamos reports: LAMS-724, 743, 753, 761, 781, 791, 804, 811, 830, 868, 893, 930, and 944, *AEC*. A study paper on this subject is in the files of the Historian's Office, *AEC*. For Bradbury's views on the status of thermonuclear research, see *Oppenheimer Hearings*, pp. 478-79, 485-86. See also Ulam, "Computers," *Scientific American* 211 (Sept. 1964), 203-07.
25. *Oppenheimer Hearings*, pp. 776-77; CM 313, Oct. 10, 1949, *AEC*.
26. CM 313, Oct. 10, 1949, *AEC*; Lilienthal to Pace, Oct. 10, 1949, Report to the President by the Special Committee of the National Security Council, Oct. 10, 1949, *AEC*.
27. *Oppenheimer Hearings*, pp. 243-44, 460-61, 777-78.
28. Teller to Bradbury, Oct. 10, 1949, McCormack to Bradbury, Oct. 13, 1949, *LASL*; Lilienthal Appointment Book, Oct. 11, 1949, Lilienthal to Oppenheimer, Oct. 11, 1949, M. J. Brown to the Commissioners, Oct. 13, 1949, Oppenheimer to Lilienthal, Oct. 14, 1949, CM 316, Oct. 12, 1949, Dean Diary, Oct. 13, 1949, *AEC*.
29. *Oppenheimer Appointment Books*, Oct. 17, 20-22, 1949, Box 2, *JRO*; Bradbury's and Manley's position is based on Manley to Los Alamos Technical Council, Oct. 13, 1949, *LASL*; *Oppenheimer Hearings*, p. 231.
30. Oppenheimer to Conant, Oct. 21, 1949, *AEC*; *Oppenheimer Hearings*, pp. 242-43.
31. LeBaron to Oppenheimer, Oct. 31, 1949, Box 45, *JRO*; *Oppenheimer Hearings*, pp. 328, 386, 715.
32. Seaborg to Oppenheimer, Oct. 14, 1949, *AEC*; *Oppenheimer Hearings*, p. 715.
33. *Oppenheimer Hearings*, pp. 778-83.
34. McMahon to Lilienthal, Oct. 17, 1949, CM 317, Oct. 17, 1949, Pace to Lilienthal, Oct. 17, 1949, Truman to Lilienthal, Oct. 19, 1949, Dean Diary, Oct. 19, 1949, Pike to Oppenheimer, Oct. 21, 1949, *AEC*.
35. *Oppenheimer Hearings*, pp. 782-84; T. O. Jones to the Commissioners, Oct. 25, 1949, *AEC*. Serber saw Oppenheimer on Oct. 27, 1949. See *Oppenheimer Appointment Book*, Oct. 27, 1949, Box 2, *JRO*.
36. CM 325, Oct. 27, 1949, GAC Secretariat to Members, Oct. 28, 1949, Williams to Oppenheimer, Oct. 28, 1949, *AEC*.
37. GAC 17, Oct. 28, 1949, *AEC*; *Oppenheimer Hearings*, p. 359.
38. GAC 17, Oct. 28-29, 1949, *AEC*; *Oppenheimer Hearings*, p. 328.
39. GAC 17, Oct. 29, 1949, Lilienthal, Opening Remarks for GAC Meeting, Oct. 29, 1949, *AEC*; *Oppenheimer Hearings*, pp. 407, 785; Lilienthal, *Atomic Energy Years*, p. 581.
40. *Oppenheimer Hearings*, pp. 247, 785.
41. GAC 17, Oct. 30, 1949, *AEC*.
42. Oppenheimer to Lilienthal, Oct. 30, 1949, transmitting report on 17th GAC Meeting, with two attachments, *AEC*.
43. Evidence on this point is contradictory. Oppenheimer did not recall the existence of the letter until it was read to him during his security hearing on April 16, 1954. See *Oppenheimer Hearings*, pp. 237-39. In 1957 Oppenheimer told an interviewer that he did present the letter to the committee and that the members decided not to include the letter in the report "because it contained nothing new." See Warner R. Schilling, Transcript of Interview with J. R. Oppenheimer,

- June 11, 1957, Box 65, *JRO*. Neither Rabi nor Fermi recalled in 1954 any discussion of the Seaborg letter. See *Oppenheimer Hearings*, pp. 395, 462. Cyril S. Smith in 1967 had "a definite recollection of the small group discussing Seaborg's opinion as expressed in a physically-present letter." See Smith to R. G. Hewlett, Apr. 27, May 5, 1967, *AEC*. Seaborg, who did not attend the meeting, assumed that the letter had not been discussed because none of the members ever referred to it in later meetings. Seaborg concluded that Oppenheimer had either forgotten about the letter by the time of the meeting or had decided it was not important.
44. Lilienthal Appointment Book, Oct. 30, 1949, *AEC*. J. H. Manley kindly provided a copy of his personal diary kept from Oct. 30 to Nov. 15, 1949. See entry for Oct. 30, 1949. For direct evidence of Oppenheimer's concern about Lilienthal, see Oppenheimer to Felix Frankfurter, Dec. 9, 1949, Box 34, *JRO*.
 45. Lilienthal Appointment Book, Oct. 31, 1949, Dean Diary, Oct. 31, 1949, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 582-85.
 46. Manley Diary, Oct. 31, 1949, *AEC*.
 47. Lilienthal, *Atomic Energy Years*, pp. 585-90.
 48. CM 328, Nov. 3, 1949, *AEC*. The minutes state that each Commissioner summarized his tentative conclusions. For the substance of the discussion we have used for Lilienthal the material cited in Note 44 and for Smyth his formal statement of Nov. 9, 1949, *AEC*.
 49. Dean, Outline of Views, Nov. 3, 1949, *AEC*.
 50. Strauss to R. B. Snapp, Nov. 3, 1949, *AEC*.
 51. Teller and Manley gave strikingly different versions of their telephone conversation in *Oppenheimer Hearings*, pp. 717-18, and in Manley Diary, Nov. 1, 1949, *AEC*. Teller's appointment with McMahon is discussed in Hafstad to Principal Staff, Oct. 21, 1949, *AEC*.
 52. Lilienthal, *Atomic Energy Years*, pp. 590-91; Lilienthal Appointment Book, Nov. 4, 1949, *AEC*. Acheson reported a meeting with Truman on this subject on Nov. 7, 1949. Acheson, Meeting with the President, Nov. 7, 1949, *DS*.
 53. CM 329, Nov. 4, 1949, *AEC*.
 54. Lilienthal, *Atomic Energy Years*, pp. 591-94.
 55. CM 330, Nov. 7, 1949, Manley to Snapp, Nov. 9, 1949, Dean, Sequence of Events Leading to the Decision on the "Super" Bomb, Jan. 27, 1950, *AEC*. Neither Manley's summary nor the minutes of the meeting refer to Dean. According to Dean, overcoming his disagreement with the GAC position was the purpose and subject of the meeting.
 56. CM 331, Nov. 9, 1949, Dean Diary, Nov. 8, 1949, *AEC*; Strauss, *Men and Decisions*, p. 222.
 57. Memorandum for the President, Development of a "Super" Bomb, encl., Lilienthal to Truman, Nov. 9, 1949, *AEC*.
 58. Lilienthal, *Atomic Energy Years*, pp. 594-96.
 59. Strauss, *Men and Decisions*, pp. 222-23; McMahon to Truman, Nov. 1, 1949, Manley Diary, Nov. 2, 1949, *AEC*. Dean saw Borden and talked with Strauss by telephone on Nov. 8. See Dean Diary, Nov. 8, 1949, *AEC*.
 60. Manley Diary, Nov. 10-13, 1949, H. A. Fidler to R. B. Snapp, Nov. 17, 1949, *AEC*; *Oppenheimer Hearings*, pp. 90-91, 716-17.
 61. Ulam to von Neumann, Nov. 15, 1949, *AEC*.
 62. Manley Diary, Nov. 14-15, 1949, *AEC*.
 63. Teller recorded his comments at the Nov. 15 meeting in a memorandum to Manley on Dec. 13, 1949, *LASL*.
 64. McMahon to Truman, Nov. 21, 1949, *AEC*.
 65. Transcript of Nov. 1, 1949, Dumont Television Network Program, Nov. 21, 1949, *AEC*; *Washington Post*, Nov. 18, 21, 26-28, 1949; *New York Times*, Nov. 24, 26, 1949; *New York Sun*, Nov. 30, 1949; E. C. Johnson to Truman, Dec. 13, 1949, Truman to Johnson, Dec. 17, 1949, *HST*; Lilienthal, *Atomic Energy Years*, pp. 601-02.
 66. Lilienthal, *Atomic Energy Years*, pp. 597-98; Truman to Souers, Nov. 19, 1949, *AEC*. Truman quotes the memorandum in part in *Years of Trial and Hope*, pp. 308-09, but the document is incorrectly dated Nov. 10.

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67. AEC Press Release 222, Nov. 25, 1949, AEC Press Release 225, Nov. 29, 1949, Transcript of Press Conference, Nov. 28, 1949, *AEC*.
 68. Pike to the Commission, Nov. 28, 1949, Strauss to Truman, Nov. 25, 1949, *AEC*. Strauss's letter is printed in full in Strauss, *Men and Decisions*, pp. 219-22.
 69. Bradley to Louis Johnson, Nov. 23, 1949, *AEC*.
 70. CM 337, Nov. 30, 1949, CM 338, Nov. 30, 1949, CM 339, Dec. 2, 1949, *AEC*.
 71. GAC 18, Dec. 2-3, 1949, Report on 18th GAC Meeting, encl., Oppenheimer to Lilienthal, Dec. 3, 1949, with the following attachments: Rowe to Oppenheimer, Dec. 3, 1949, Manley, Working Memorandum, Dec. 3, 1949, Fermi to Oppenheimer, Dec. 3, 1949, Buckley to Oppenheimer, Dec. 3, 1949, DuBridg to Lilienthal, Dec. 5, 1949, *AEC*; *Oppenheimer Hearings*, pp. 395, 604-05, 703, 707.
 72. E. Teller and F. de Hoffmann to Bradbury, Dec. 5, 1949, Fine, The Super, Dec. 8, 1949, CM 344, Dec. 9, 1949, *AEC*.
 73. Manley to Lilienthal, Dec. 12, 13, 1949, Lilienthal to Manley, Dec. 16, 1949, Dean Diary, Dec. 15, 1949, Manley, Military Worth, Dec. 15, 1949, encl., Manley to Lilienthal, Dec. 16, 1949, *AEC*.
 74. Lilienthal, *Atomic Energy Years*, pp. 610-12; Dean Diary, Dec. 19, 1949, Lilienthal to Truman, Dec. 21, 1949, Truman to Lilienthal, Dec. 22, 1949, *AEC*. Oppenheimer had discussed the issue with Kennan on Nov. 16, 1949. See Oppenheimer to Kennan, Nov. 17, 1949, and Kennan draft statement, Nov. 18, 1949, Box 43, *JRO*.
 75. Lilienthal, *Atomic Energy Years*, pp. 613-14.
 76. Military Implications of Thermonuclear Weapons, n.d., encl., Smyth to the Commissioners, Dec. 22, 1949, *AEC*; K. T. Compton to Truman, Nov. 9, 1949, *WNRRC*; Compton's letter is reproduced in Strauss, *Men and Decisions*, p. 440.
 77. Lilienthal Appointment Book, Jan. 4-7, 1950, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 615-17, 618-20.
 78. Dean Diary, Jan. 10, 1950, McMahon to Lilienthal, Jan. 9, 1950, *AEC*; McMahon to Johnson, Jan. 9, 1950, *WNRRC*.
 79. LeBaron to the Record, Jan. 11, 1950, *WNRRC*.
 80. Bradley to Johnson, Jan. 13, 1950, *AEC*.
 81. Transcript of Drew Pearson Broadcast, Jan. 15, 1950, *AEC*; New York *Times*, Jan. 17, 1950; DuBridg to Lilienthal, Dec. 5, 1949, Dean, Analysis of DuBridg's Letter, Jan. 16, 1950, F. Henderson to Lilienthal, Urgent Telegram, Jan. 17, 1950, Dean Diary, Jan. 17, 1950, *AEC*.
 82. Dean Diary, Jan. 16, 1950, JCAE, Transcript of Hearing, Jan. 18, 1950, CM 356, Jan. 19, 1950, *AEC*.
 83. JCAE, Transcript of Hearing, Jan. 20, 1950, *WNRRC*.
 84. Washington *Daily News*, Jan. 20, 1950; Washington *Evening Star*, Jan. 20, 1950; New York *Times*, Jan. 21, 1950.
 85. Lay to Lilienthal, Jan. 19, 1950, Lilienthal to the Commissioners, Jan. 27, 1950, *AEC*.
 86. Arneson, State Department Working Paper, Jan. 24, 1950, *AEC*. Kennan had prepared a paper urging that the Government "reexamine once more, in the most solemn and serious way, the whole principle of 'first use' of atomic weapons or any other weapons of mass destruction," and urged a public statement renouncing first use of such weapons. Kennan does not recall the fate of his paper, but apparently it did not receive serious consideration in the State Department. G. F. Kennan, *Memoirs, 1925-1950* (Boston, 1967), pp. 471-76.
 87. Lilienthal, *Atomic Energy Years*, pp. 620-21.
 88. JCAE, Transcript of Hearing, Jan. 27, 1950, *AEC*. Dean's interpretation of the hearing in his paper, Sequence of Events Leading to the Decision on the "Super" Bomb, Jan. 27, 1950, *AEC*, differs substantially from the transcript.
 89. Lilienthal, *Atomic Energy Years*, pp. 621-22. This entry does not make clear that the meeting with Truman was on Jan. 27. See Lilienthal Appointment Book, Jan. 27, 1950, *AEC*. Truman's remarks at the press conference are in *Public Papers of Harry S.*

- Truman, 1950 (Washington, 1965), p. 134.
90. *New York Times*, *Washington Post*, and *Washington Evening Star* all carried extensive reports on Jan. 28, 1950.
 91. Lilienthal, Meeting of Special NSC Committee on Super Bomb, Jan. 31, 1950, *AEC*. All but one paragraph of this document is reproduced in Lilienthal, *Atomic Energy Years*, pp. 623-32.
 92. A copy of Johnson's proposed statement is attached to Arneson to Lilienthal, Feb. 8, 1950, *AEC*.
 93. Lilienthal's account of the meeting with Truman is in Lilienthal, *Atomic Energy Years*, pp. 632-33. No copy of this memorandum has been found in *AEC*.
 94. Lilienthal Appointment Book, Jan. 31, 1950, *AEC*.
 95. The President's press statement is in *Public Papers of Harry S. Truman, 1950*, p. 138. Official notification came in Truman to Lilienthal, Jan. 31, 1950, *AEC*. Lilienthal's session with the GAC is recorded in GAC 19, Jan. 31, 1950, *AEC*, and in Lilienthal, *Atomic Energy Years*, pp. 633-34. On the Joint Committee meeting, see JCAE, Transcript of Hearing, Jan. 31, 1950, *AEC*. On instructions to Los Alamos, see McCormack to Manley, Jan. 31, 1950, *AEC*, McCormack to Tyler and Bradbury, Jan. 31, 1950, *LASL*.
 96. Strauss to Truman, Jan. 31, 1950, Lilienthal Appointment Book, Feb. 1, 1950, *AEC*; Lilienthal, *Atomic Energy Years*, pp. 634-36. Lilienthal recalled the day of his departure in the first of his Stafford Little Lectures at Princeton on Feb. 12, 1963, a copy of which is in *AEC*.

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1. *Congressional Record*, 81 Cong., 2 sess., Feb. 2, 1950, pp. 1338-44.
2. Joint Committee, Transcript of Hearing, Argonne National Laboratory, Mar. 11, 1950, pp. 29-30, *AEC*.
3. MLC 41, Feb. 2, 1950, *AEC*.
4. Wilson Diary, Feb. 2, 1950, *AEC*.
5. *Ibid.*; Brig. Gen. R. C. Wilson, Memorandum for the Record, Feb. 6, 1950, *AEC*.
6. Joint Committee, Hearing on . . . Hydrogen Bomb Development, Feb. 10, 1950, *AEC*.
7. Teletypes, McCormack to Tyler, Feb. 8, 1950, Coiner to Tyler, Feb. 13, 1950, *ALOO*; Wilson to LeBaron, Feb. 13, 20, 1950, *AEC*.
8. Notes of a Briefing Held at the Los Alamos Scientific Laboratory on Feb. 23, 1950, *AEC*; P. J. Long, Memorandum for the Record, Mar. 6, 1950, *WNRRC*.
9. Wilson to LeBaron, Feb. 20, 1950, *AEC*.
10. LeBaron to the Secretary of Defense, Feb. 16, 20, 1950, *WNRRC*. The evidence for the analysis's having gone to the White House rests on a note from Matthew Connally to the Secretary of Defense, Feb. 24, 1950, *WNRRC*; Johnson to Truman, Feb. 24, 1950, CM 376, Mar. 1, 1950, *AEC*.
11. MLC 42, Mar. 1, 1950, *AEC*.
12. CM 376, Mar. 1, 1950, CM 377, Mar. 2, 1950, Smyth to Pike *et al.*, Mar. 6, 1950, *AEC*.
13. Wilson Diary, Mar. 3, 1950, Joint Committee, Hearing on H-Bomb Personnel, Mar. 3, 1950, *AEC*.
14. Report to the President on Development of Thermonuclear Weapons, Mar. 9, 1950; Lay to Secretaries of State, Defense, and the Chairman of the Atomic Energy Commission, Mar. 10, 1950, *AEC*.
15. Joint Committee, Hearing on Development of the Hydrogen Bomb, Mar. 10, 1950, *AEC*.
16. Joint Committee, Transcript of Hearing, Argonne National Laboratory, Mar. 11, 1950, pp. 4-8, *AEC*.
17. H. Etherington, Interim Report on Water-Cooled Water-Moderated Reactor for Naval Application, Mar. 1, 1950, ANL-4393, H. Etherington, Quarterly Report, Naval Reactor Division, Dec. 1, 1949-Feb. 28, 1950, ANL-4424, Naymark, Feasibility of

- Naval Reactor Fuel Elements Made of Zirconium-Uranium Alloy Clad with Zirconium, Mar. 31, 1950, ANL-4436, *AEC*.
18. W. A. Hamilton to W. L. Borden, June 1, 1950, *JCAE*; Scheduling Committee, Second Quarterly Report to the Naval Reactor Policy Board, Mar. 1-June 1, 1950, *ANL*.
 19. J. R. Huffman, MTR Project, Quarterly Report, Mar. 1, 1950, ANL-4439, *AEC*.
 20. M. M. Mann and J. A. Lane, MTR Project, Progress Report, Nov. 30, 1949, ORNL-529, *AEC*.
 21. F. W. Bruner, History and Present Status of NEPA, Feb. 23, 1950, C. B. Ellis and W. B. Thompson, ANP Project, Quarterly Progress Report, Aug. 31, 1950, ORNL-858, *AEC*. An excellent historical summary of developments from the fall of 1948 to the spring of 1950 is in Director of Reactor Development, Information on Activities in the Aircraft Nuclear Propulsion Program, May 31, 1950, *AEC*.
 22. Oak Ridge News Release, Jan. 12, 1950, *AEC*; Weinberg, Memo on State of Laboratory and Reactor Projects, May 1, 1950, *ORNL*.
 23. C. E. Winters, HRE Quarterly Report, Feb. 28, 1950, ORNL-630, C. E. Winters and A. M. Weinberg, HRE Feasibility Report, July 6, 1950, ORNL-730, *AEC*.
 24. For earlier history, see Chap. 7. C. Shugg to H. A. Winne, Aug. 9, 1949, Winne to Shugg, Aug. 22, 1949, Shugg to Winne, Nov. 9, 1949, Technical Feasibility Report for the KAPL WMA Reactor, Feb. 14, 1950, KAPL-238, Shugg Diary, Feb. 21, 1950, *AEC*.
 25. Schenectady *Gazette*, Mar. 11, 13, 1950; Joint Committee, Transcript of Hearing, Mar. 12, 1950, *AEC*.
 26. J. C. Stewart, Conference . . . with General Electric Co., Mar. 17, 1950, Wilson to Stewart, Mar. 20, 1950, *AEC*.
 27. Rickover and Hafstad, Notes of Meeting with Chairman, Joint Committee, Mar. 21, 1950, Shugg Diary, Mar. 21, 22, 1950, *AEC* Press Release 276, Mar. 30, 1950, GAC 20, Mar. 31-Apr. 1, 1950, Joint Committee, Transcript of Hearing, Apr. 3, 1950, D. B. Langmuir, Notes of Meeting with Philip Sporn, Apr. 5, 1950, Oppenheimer to Pike, Apr. 1, 27, 1950, CM 390, Apr. 5, 1950, Winne to Stewart, Apr. 6, 1950, CM 391, Apr. 12, 1950, Hafstad to Stewart, Apr. 12, 1950, *AEC*.
 28. Preliminary Study of P-10 Production, Mar. 20, 1950, *AEC*; Zinn's thoughts on production reactors are in Zinn to Hafstad, Oct. 19, 1949, Zinn to Hafstad, Feb. 10, 1950, *ANL*; Shugg Diary, Feb. 24, 1950, Wilson Diary, Mar. 6, 17, 21, 1950, *AEC*.
 29. Preliminary Study of P-10 Production, Mar. 20, 1950, Summary of Minutes of Staff Meetings on P-10 Production, Mar. 21-22, 1950, *AEC*.
 30. Wilson Diary, Mar. 30, 31, 1950, Shugg Diary, Mar. 31, 1950, *AEC*; Zinn to Hafstad, Oct. 19, 1949, Meeting of the Laboratory Executive Committee, Apr. 18, 1950, *ANL*.
 31. GAC 20, Mar. 31-Apr. 1, 1950, Oppenheimer to Pike, Apr. 1, 1950, *AEC*.
 32. Lawrence to Pitzer, Jan. 5, 1950. Background material and correspondence are in Director of Research, Proposal from the Radiation Laboratory To Construct a 25 Mev High Current Linear Accelerator, Feb. 6, 1950, approved at CM 367, Feb. 8, 1950, *AEC*.
 33. Wilson Diary, Mar. 13, 14, 1950, L. A. Johnson, Memorandum for the Secretary of State, Mar. 13, 1950, CM 380, Mar. 14, 1950, Johnson to Pike, Mar. 16, 1950, Minutes, American Members, CPC, Apr. 25, 1950, *AEC* Press Release 330, Dec. 13, 1950, *AEC*.
 34. CM 396, Apr. 28, 1950, Shugg Diary, Apr. 28, May 4, 1950, Wilson Diary, May 1, 1950, LeBaron to Wilson, May 1, 1950, Memorandum by the General Manager, May 5, 1950, CM 401, May 5, 1950, *AEC*.
 35. Wilson Diary, May 12, 1950, CM 405, May 11, 1950, CM 407, May 15, 1950, *AEC*.
 36. CM 405, May 11, 1950, CM 407, May 15, 1950, CM 410, May 18, 1950, Director of Production, Dual Temperature Process Heavy Water Facility, May 11, 1950, *AEC*.
 37. Two letters from Zinn to Weil, both dated Apr. 12, 1950, Zinn to Weil, May 23, 1950, *ANL*.
 38. Shugg Diary, Apr. 25, 1950, Weil to Zinn, May 11, 1950, Krisberg, Untermyer, Spinrad to Zinn, ANL-WPB-69, Apr. 6, 1950, ANL-WPB-71, Apr. 11, 1950, ANL-WHZ-245, May 23, 1950,

- H. C. Ott and U. M. Staebler, Meeting To Discuss Designs of Heavy Water Moderated Neutron Production Reactors, June 2, 1950. The North American design is in NAA-SR-61, a D₂O Natural Uranium Neutron Production Reactor, Interim Report, Apr. 10, 1950, *AEC*.
39. MLC 44, May 15, 1950, Pike and Johnson to the President, May 25, 1950, CM 418, June 5, 1950, J. S. Lay to Secretary of Defense and Acting Chairman, June 8, 1950, *AEC*.
 40. Pike to Greenewalt, June 12, 1950, Truman to Greenewalt, July 25, 1950, Wilson to Principal Washington Staff, June 22, 1950, Wilson to Washington Staff and Operations Managers, June 23, 1950, *AEC*. The contract with du Pont was not signed until Sept. 30, 1953.
 41. McMahon to Johnson, Mar. 10, 1950, Johnson to McMahon, May 5, 1950, McMahon to Johnson, May 6, 1950, McMahon to Pike, May 26, 1950. McMahon's and Borden's views are in Joint Committee, Conference with General Electric, June 22, 1950, *AEC*.
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 43. Smyth, "The Role of the National Laboratories in Atomic Energy Development," *Bulletin of the Atomic Scientists* 6 (Jan., 1950), 5-8.
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 45. H. C. Brown, A Report on AEC Management Practices in Dealing with National Laboratories, Mar. 10, 1950, Minutes, AEC Research Committee, Dec. 19, 1949, Mar. 13, 1950, Apr. 4, 1950, Directors of Research and Reactor Development, Policy Statements for Operation of Oak Ridge and Argonne National Laboratories, May 31, 1950, CM 416, June 1, 1950, Manager of New York Operations Office and Director of Biology and Medicine, Guide to Operations at Brookhaven National Laboratories, May 1, 1950, CM 400, May 4, 1950, *AEC*.
 46. Oppenheimer, "Encouragement of Science," *Science* 111 (Apr., 1950), 373-75.
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3. Glennan to Boyer, June 14, 1951, CM 572, June 20, 1951, Murray to Dean, June 21, 1951, Murray to Boyer, June 26, 1951, Murray to Glennan, June 28, 1951, Murray to Boyer, June 28, 1951, Glennan to Murray, July 5, 1951, Boyer to Murray, July 18, 1951, *AEC*.
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16. For earlier description, see Chap. 16, p. 532. On construction status, see Oak Ridge Monthly Status and Progress Reports, 1951-1952, *AEC*.
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- 1951, CM 586, Aug. 1, 1951, CM 608, Sept. 26, 1951, *AEC*.
25. Dean to LeBaron, Oct. 1, 1951, Dean Diary, Oct. 3, 1951, LeBaron to Dean, Oct. 4, 1951, MLC 60, Oct. 5, 1951, *AEC*.
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30. GAC 27, Oct. 11-13, 1951, Oppenheimer to Dean, Oct. 13, 1951, *AEC*. Bradbury's views are in his letter to Fields, Oct. 9, 1951, *AEC*, which was read by the GAC. Libby's views are in Libby to Dean, Oct. 13, 1951, *AEC*.
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32. Dean Diary, Oct. 18, 1951, Chronology of Expansion Program incorporated in CM 618, Oct. 19, 1951, Lovett to Dean, Oct. 19, 1951, *AEC*.
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34. Dean Diary, Oct. 19, 21, 1951, Tyler to Dean, Dec. 19, 1951, *AEC*.
35. Dean Diary, Oct. 24, 1951, LeBaron to Dean, Oct. 25, 1951, CM 620, Oct. 25, 1951, Murray, Memorandum, undated but discussed at CM 620, *AEC*.
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37. CM 621, Oct. 31, 1951, Murray to NSC, Nov. 2, 1951, *AEC*.
38. Smyth to Lovett, Nov. 2, 1951, Murray to NSC, Nov. 2, 1951, with copy for Lovett, Lovett to Smyth, Nov. 6, 1951, *AEC*. On Lilienthal's earlier position, see Chap. 6, pp. 180-84.
39. *AEC* Press Release 392, Aug. 2, 1951, *AEC*.
40. CM 627, Nov. 14, 1951, *AEC*.
41. Smyth to Files, Nov. 16, 1951, Williams Diary, Nov. 16, 1951, *AEC*.
42. MLC 62, Nov. 20, 1951, *AEC*.
43. Dean Diary, Nov. 26, 27, 1951, CM 629, Nov. 26, 1951, CM 630, Nov. 27, 1951, Draft Report on Expansion of Fissionable Materials Production, Nov. 21, 1951, *AEC*.
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45. Smyth, Memorandum on Expansion of Fissionable Materials Production, Nov. 27, 1951, *AEC*.
46. Murray, Memorandum on Expansion of Fissionable Materials Production, Nov. 26, 1951, CM 632, Nov. 30, 1951, Smyth, Factors Relevant to Proposed Expansion of the Atomic Energy Program, encl., Smyth to Lay, Nov. 30, 1951, *AEC*. Smyth actually delivered the paper on Dec. 3, 1951. CM 633, Dec. 4, 1951, *AEC*.
47. GAC 28, Dec. 12-14, 1951, *AEC*.
48. Bradbury to Fields, Oct. 16, 1951, *AEC*.
49. Oppenheimer to Dean, Nov. 14, 1951, Murray to Oppenheimer, Dec. 12, 1951, encl., Thermonuclear Weapons Development Laboratory, *AEC*.
50. Teller, Statement to the General Advisory Committee on the Need of Second Weapons Laboratory, Dec. 7, 1951, GAC 28, Dec. 12-14, 1951, *AEC*.
51. CM 639, Dec. 19, 1951, Director of Military Application, Preliminary Examination of the Workload at Santa Fe Operations, Dec. 7, 1951, *AEC*.
52. Bradbury to Tyler, Dec. 26, 1951, *AEC*.
53. Dean to Lovett, Dec. 10, 1951, Lovett, Memorandum for the Executive Secretary, NSC, Dec. 11, 1951, CM 640, Dec. 20, 1951; CM 641, Dec. 21, 1951, MLC 63, Dec. 20, 1951; Lovett to Dean, Dec. 20, 1951, Smyth to Commissioners, Dec. 20, 1951, Smyth to Dean, Dec. 21, 1951, Smyth, Memorandum on the Expansion Program, Dec.

21, 1951, Glennan, Draft Memorandum for the Files, Dec. 21, 1951, *AEC*. There is no evidence that the

Commissioners saw Glennan's draft at this time; however, it is indicative of his thought.

CHAPTER 18

1. J. K. Penfield to Arneson, Nov. 16, 1951, Note by Secretary, U. S. Position in Discussions with Prime Minister Churchill, Jan. 2, 1952, CM 642, Jan. 2, 1952, Hall to Arneson, Jan. 2, 1952, *AEC*; Bradley, Memorandum for the Secretary of Defense, Jan. 2, 1952, *WNRC*; *Newsweek* 39 (1952), 19-20, 25-26. Remarks of Welcome to Prime Minister Churchill . . . , *Public Papers of Harry S. Truman, 1952-1953* (Washington, 1966), p. 9.
2. Acheson, Memorandum of Conversation at Dinner at British Embassy, Sunday, Jan. 6, 1952, *WNRC*.
3. Extract from Minutes of Truman-Churchill Talks Pertaining to . . . Atomic Energy . . . , January 7-9, 1952, *AEC*.
4. Dean Diary, Jan. 9, 10, 1952, Dean, Lord Cherwell's Visit, dated Jan. 9, 1952, filed in Dean Diary, Chief of Special Projects, Notes on Meeting with Lord Cherwell, Jan. 21, 1952, *AEC*.
5. Dean Diary, Jan. 2, 7, 1952, Acheson, Memorandum for Executive Secretary, NSC, Dec. 21, 1951, Wilson, Memorandum for Executive Secretary, NSC, Jan. 7, 1952, *AEC*.
6. LeBaron to Lovett, Jan. 7, 11, 1952, *WNRC*.
7. CM 648, Jan. 14, 1952, *AEC*.
8. Dean Diary, Jan. 16, 1952. The account of this meeting is based entirely on Dean's Memorandum for Files, Jan. 17, 1952, and his Statement to the NSC re Expansion Program, Jan. 16, 1952, *AEC*. In the memorandum he stated that he used the arguments in his statement except for data on manpower.
9. Dean Diary, Jan. 17, 1952, *AEC*.
10. Dean Diary, Jan. 17, 1952, CM 650, Jan. 17, 1952, Dean and Lovett to Chairman, Joint Committee, Jan. 17, 1952, encl., A Response to the Resolution of the Joint Committee . . . by the Department of Defense and the Atomic Energy Commission, Murray to McMahon, Jan. 22, 1952, *AEC*.
11. Joint Committee, Hearing on Expansion Program, Jan. 22, 1952, Hearing on Status of Atomic Energy Program, Feb. 6, 1952, *AEC*.
12. Dean Diary, Feb. 4, 8, 1952, S. Everett Gleason to the Secretary of State, Chairman of Atomic Energy Commission, Feb. 8, 1952, *AEC*. The only reference to the Commission meeting of Feb. 8 is in the Dean Diary.
13. Dean Diary, Feb. 8, 1952, Dean to Snapp, Feb. 12, 1952, Note by Secretary, Background Material on Custody and Use of Atomic Weapons, Feb. 18, 1952, Oppenheimer to Dean, Feb. 17, 18, 1952, *AEC*.
14. Snapp to Those Listed, May 29, 1952, *AEC*; U. S. Atomic Energy Commission, *In the Matter of J. Robert Oppenheimer* (Washington, 1954), pp. 446, 496-98, 503-05, 521, 524-25, 583-85, 616-17, 746, 748, 759, 762-73 (hereafter referred to as *Oppenheimer Hearings*).
15. CM 660, Feb. 12, 1952, Cook to Shaw, Feb. 20, 1952, Dean to Lovett, Feb. 20, 1952, *AEC*.
16. McMahon to Dean, Feb. 11, 1952, Joint Committee, Hearing on Status of Hydrogen Project, Feb. 21, 1952, *AEC*.
17. Borden to McMahon, Oct. 2, 1951, *JCAE*; Lovett to McMahon, Mar. 9, 1952, *AEC*. The chronology of these events is difficult to reconstruct and rests upon Teller and Allen Brown, *The Legacy of Hiroshima* (Garden City, N. Y., 1952) and *Oppenheimer Hearings*, pp. 744-58; Herbert Childs, *An American Genius: The Life of Ernest Orlando Lawrence* (New York,

- 1968), pp. 438-42, states that Dean asked Lawrence in November, 1951, about Livermore as the site for a second weapon laboratory. No records the Authors have seen mention Livermore for this purpose at this time, although other sites were under consideration.
18. *Oppenheimer Hearings*, pp. 757-58; Teller and Brown, *Legacy of Hiroshima*, pp. 61-62; A. S. Alexander, F. P. Whitehair, and T. K. Finletter to the Secretary of Defense, Mar. 27, 1952, Dean to Teller, Apr. 8, 1952, Dean to Snapp, May 29, 1952, *AEC*.
 19. Status Report on Mark I Tests, Apr. 15, 1952, Smyth to Lawrence, Apr. 3, 1952, Benedict *et al.*, Evaluation of the MTA Program by the Operations Analysis Staff, Apr. 10, 1952, Director of Production, Future Course of the MTA Program, June 12, 1952, CM 717, June 30, 1952, CM 729, Aug. 7, 1952, *AEC*.
 20. CM 744, Sept. 8, 1952, *AEC*.
 21. Dean Diary, July 28, 1952, *AEC*. Filed in the diary are Dean's statement and that of the Commission. Statement by the President on the Death of Brien McMahon, *Public Papers of Harry S. Truman, 1952-1953*, p. 509; *Newsweek* 39 (June, 1952), 27.
 22. Lovett to Executive Secretary, NSC, Feb. 6, 1952, encl., Glennan to Dean *et al.*, Mar. 3, 1952. Dean, Memorandum to the Commissioners, Mar. 10, 1952, Director of Military Application, Joint Chiefs of Staff Views on Department of Defense Interest in the Use of Atomic Weapons, Apr. 18, 1952 and revision of June 3, 1952, CM 690, May 7, 1952, Dean to NSC, May 27, 1952, Department of State Comments on JCS paper, Statement of the Views of the Joint Chiefs of Staff . . . , June 11, 1952, *AEC*. Dean in his memorandum of Mar. 10, 1952, refers to Murray's comments. These have not been found.
 23. Lay to Secretary of State, Secretary of Defense, Chairman, AEC, Sept. 10, 1952, encl., Agreed Concepts Regarding Atomic Weapons, *AEC*.
 24. Fleischmann to Lovett, Jan. 30, 1952, Foster to Fleischmann, Mar. 5, 1952, Dean to Lovett, June 17, 1952, Foster to Dean, July 7, 1952, Foster to Steelman, July 7, 1952, Steelman to Foster, July 8, 1952, *AEC*. The bewildering personnel changes in the production agencies can be found in U. S. Department of Commerce, National Production Authority, "Historical Reports on Defense Production, Report No. 1, Organization for Defense Production" (Washington, 1953).
 25. Monthly Status and Progress Report, Aug. 1952, Director of Production, Characteristics of the Jumbo Reactors, Aug. 19, 1952, AEC Press Release 441, Aug. 12, 1952, *AEC*. The operating contractor for Portsmouth was discussed at CM 739, Aug. 28, 1952, and at several later meetings before the announcement in AEC Press Release 449, Sept. 18, 1952, *AEC*.
 26. Douglas Larsen in an interview with Boyer, *Augusta Chronicle*, Jan. 31, 1951; Dean Diary, Nov. 6, Dec. 4, 5, 1950, June 1, 1951, *AEC*.
 27. Dean Diary, Nov. 19, Dec. 14, 1951, Jan. 8, 24, 1952, *AEC*; Joint Committee, *Hearing on the Nomination of Eugene M. Zuckert To Be a Member of the Atomic Energy Commission, January 29, 1952* (Washington, 1952).
 28. Glennan to the Commissioners, May 9, 1952, *AEC*.
 29. CM 680, Apr. 4, 1952, *AEC*.
 30. Policy Analysis Staff, Policy Studies, Aug. 25, 1952, CM 737, Aug. 26, 1952, *AEC*.
 31. Policy Analysis Staff, Preparation for Commission Review, Sept. 15, 1952, Memorandum for Mr. Dean, Sept. 19, 1952, Draft Memorandum to the President, Sept. 25, 1952, Snapp to the Commissioners, Sept. 23, 1952, *AEC*.
 32. *Topnotch* Conference, Oct. 22, 1952, Dean to Files, Oct. 7, 1952, *AEC*.
 33. Dean Diary, June 30, 1952, *AEC*.
 34. Bradbury to Oppenheimer, June 11, 1952, *AEC*, refers to Bethe, who expressed these doubts again in Bethe to Dean, Sept. 9, 1952, *AEC*.
 35. Dean Diary, Aug. 8, 11, 12, 1952, *AEC*.
 36. Dean, Memorandum for the Special Committee of the NSC, Aug. 15, 1952,

- Dean Diary, Aug. 19, 27, 28, Sept. 9, 1952, AEC Press Release 445, Sept. 9, 1952, Fields to Tyler, Sept. 26, 1952, *AEC*.
37. Dean Diary, Oct. 15, 1952, Dean, Memorandum to the Files, in Dean Diary, *AEC*; Truman's account of these events is in his *Memoirs*, Vol. II, *Years of Trial and Hope* (Garden City, N. Y., 1956), pp. 313-14. Zuck-ert carried a letter to Dean. The letter has not been found, but is referred to in Dean to Clarkson, Oct. 15, 1952, *AEC*.
38. Dean Diary, Oct. 27, 28, 29, 30, 1952, *AEC*. The itinerary is in the Dean Diary, *AEC*.
39. Dean Diary, Oct. 31, 1952, *AEC*.
40. Dean Diary, Nov. 6, 7, 1952, Dean to Eisenhower, Nov. 7, 1952, *AEC*.

TABLE OF ORGANIZATION

APPENDIX 1

U. S. ATOMIC ENERGY COMMISSION

David E. Lilienthal, Chairman	November 1, 1946–February 15, 1950
Robert F. Bacher	November 1, 1946–May 10, 1949
Sumner T. Pike	October 31, 1946–December 15, 1951
William W. Waymack	November 5, 1946–December 21, 1948
Lewis L. Strauss	November 12, 1946–April 15, 1950
Henry D. Smyth	May 30, 1949–September 30, 1954
Gordon E. Dean	May 24, 1949–June 30, 1953
Gordon E. Dean, Chairman	July 11, 1950–June 30, 1953
Thomas E. Murray	May 9, 1950–June 30, 1957
T. Keith Glennan	October 2, 1950–November 1, 1952
Eugene M. Zuckert	February 25, 1952–June 30, 1954

STATUTORY COMMITTEES

JOINT COMMITTEE ON ATOMIC ENERGY

79th Congress (1946)

Brien McMahon (Conn.), Chairman	
R. Ewing Thomason (Tex.), Vice-Chairman	
Richard B. Russell (Ga.)	Carl T. Durham (N. C.)
Edwin C. Johnson (Colo.)	Aime Forand (R. I.)
Tom Connally (Tex.)	Chet Holifield (Calif.)
Harry Flood Byrd (Va.)	Melvin Price (Ill.)
Arthur H. Vandenberg (Mich.)	Charles H. Elston (Ohio)
Eugene D. Millikin (Colo.)	J. Parnell Thomas (N. J.)
Bourke B. Hickenlooper (Iowa)	Carl Hinshaw (Calif.)
William F. Knowland (Calif.)	Clare Boothe Luce (Conn.)

80th Congress (1947–1948)

Bourke B. Hickenlooper, Chairman	
W. Sterling Cole (N. Y.), Vice-Chairman	
Arthur H. Vandenberg	Charles H. Elston
Eugene D. Millikin	Carl Hinshaw
William F. Knowland	James E. Van Zandt (Pa.)

John W. Bricker (Ohio)
 Brien McMahon
 Richard B. Russell
 Edwin C. Johnson
 Tom Connally

James T. Patterson (Conn.)
 Carl T. Durham
 Chet Holifield
 Melvin Price
 Lyndon B. Johnson (Tex.)

81st Congress (1949-1950)

Brien McMahon, Chairman
 Carl T. Durham, Vice-Chairman

Richard B. Russell
 Edwin C. Johnson
 Tom Connally
 Millard E. Tydings (Md.)
 Bourke B. Hickenlooper
 Eugene D. Millikin
 William F. Knowland
 John W. Bricker

Chet Holifield
 Melvin Price
 Paul J. Kilday (Tex.)
 Henry M. Jackson (Wash.)
 W. Sterling Cole
 Charles H. Elston
 Carl Hinshaw
 James E. Van Zandt

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82nd Congress (1951-1952)

Brien McMahon, Chairman *
 Carl T. Durham, Vice-Chairman

Richard B. Russell
 Edwin C. Johnson
 Lyndon B. Johnson
 Clinton P. Anderson (N. Mex.)
 Bourke B. Hickenlooper
 Eugene D. Millikin
 William F. Knowland
 John W. Bricker

Chet Holifield
 Melvin Price
 Paul J. Kilday
 Henry M. Jackson
 W. Sterling Cole
 Charles H. Elston
 Carl Hinshaw
 James E. Van Zandt

* Died July 28, 1952. John O. Pastore (R. I.) succeeded him on August 8, 1952.

GENERAL ADVISORY COMMITTEE

James B. Conant	December 12, 1946-August 1, 1952
Lee A. DuBridge	December 12, 1946-August 1, 1952
Enrico Fermi	December 12, 1946-August 1, 1950
J. Robert Oppenheimer (Chairman)	December 12, 1946-August 8, 1952
Isidor I. Rabi (Chairman, October 1952- July 1956)	December 12, 1946-August 1, 1956
Hartley Rowe	December 12, 1946-August 1, 1950
Glenn T. Seaborg	December 12, 1946-August 1, 1950
Cyril S. Smith	December 12, 1946-January 10, 1952
Hood Worthington	December 12, 1946-August 1, 1948
Oliver E. Buckley	August 2, 1948-August 1, 1954
Willard F. Libby	August 7, 1950-September 30, 1954
Eger V. Murphree	August 7, 1950-August 1, 1956
Walter G. Whitman	August 7, 1950-August 1, 1956
John von Neumann	February 27, 1952-August 1, 1954
James B. Fisk	September 22, 1952-August 1, 1958
John C. Warner	September 22, 1952-August 1, 1964
Eugene P. Wigner	September 22, 1952-November 19, 1956

MILITARY LIAISON COMMITTEE

Chairmen

Lt. Gen. Lewis H. Brereton, USAF	August 1, 1946-April 5, 1948
Donald F. Carpenter	April 6, 1948-September 21, 1948
William Webster	September 22, 1948-September 30, 1949
Robert LeBaron	October 1, 1949-August 1, 1954

Army Members

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Maj. Gen. Lunsford E. Oliver, USA	August 1946-February 2, 1947
Col. John H. Hinds, USA	August 1946-December 16, 1949
Lt. Gen. Leslie R. Groves, USA	February 2, 1947-February 29, 1948
Maj. Gen. Kenneth D. Nichols, USA	February 29, 1948-February 1, 1951
Brig. Gen. Herbert B. Loper, USA	November 1, 1949-August 21, 1952
Brig. Gen. Stanley R. Mickelsen, USA	February 1, 1951-July 24, 1952
Brig. Gen. Francis W. Farrell, USA	July 24, 1952-November 1, 1952
Brig. Gen. Harry McK. Roper, USA	August 21, 1952-August 26, 1955
Col. Kenner F. Hertford, USA	November 1, 1952-October 5, 1954

Navy Members

VADM Harold G. Bowen, USN	November, 1946-November 8, 1946
VADM Earle W. Mills, USN	November, 1946-November 15, 1946
RADM William S. Parsons, USN	November, 1946-May 23, 1949
RADM Tom B. Hill, USN	May 23, 1949-November 7, 1950
RADM Ralph A. Ofstie, USN	November 8, 1946-August 9, 1950
RADM Thorvald A. Solberg, USN	November 15, 1946-June 9, 1948
RADM Charles F. Coe, USN	August 10, 1950-March 4, 1952
RADM Frederic S. Withington, USN	November 7, 1950-November 3, 1952
RADM William V. Davis, USN	March 4, 1952-April 18, 1952
Capt. James S. Russell, USN	April 18, 1952-April 5, 1954
RADM George C. Wright, USN	November 18, 1952-September 26, 1955

Air Force Members

Lt. Gen. Lewis H. Brereton, USAF	August 1, 1946-July 1, 1948
Maj. Gen. Roscoe C. Wilson, USAF	April 15, 1948-October 3, 1951
Maj. Gen. David M. Schlatter, USAF	July 1, 1948-March 10, 1950
Maj. Gen. Frank F. Everest, USAF	March 10, 1950-June 7, 1951
Maj. Gen. Roger M. Ramey, USAF	June 7, 1951-March 5, 1952
Maj. Gen. Howard G. Bunker, USAF	October 3, 1951-October 29, 1954
Maj. Gen. James E. Briggs, USAF	March 5, 1952-May 2, 1954

THE COMMISSION STAFF

General Managers

Carroll L. Wilson	December 31, 1946-August 15, 1950
Marion W. Boyer	November 1, 1950-October 31, 1953

Deputy General Managers

Carleton Shugg	September 1, 1948-January 31, 1951
Walter J. Williams	February 1, 1951-January 29, 1954

Assistant General Managers

G. Lyle Belsley	April 7, 1947–November 1947
Fletcher C. Waller	October 6, 1947–October 5, 1948
Maj. Gen. Thomas F. Farrell, USA	July 27, 1951–February 29, 1952

Secretaries to the Commission

G. Lyle Belsley	April 7, 1947–October 7, 1947
Roy B. Snapp	October 7, 1947–February 28, 1955

General Counsels

Herbert S. Marks	February 1, 1947–December 30, 1947
Adrian S. Fisher	February 25, 1948–June 27, 1949
Joseph A. Volpe, Jr.	June 28, 1949–January 12, 1951
Everett L. Hollis	March 7, 1951–November 14, 1952

Controllers

Paul W. Ager (Director of Budget)	February 10, 1947–August 20, 1948
Paul M. Green	April 14, 1947–December 20, 1949
Lindsley H. Noble	March 1, 1950–May 9, 1952
Don S. Burrows	October 6, 1952–March 18, 1962

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Directors of Headquarters Divisions

MILITARY APPLICATION

Brig. Gen. James McCormack, Jr., USAF	February 1, 1947–August 19, 1951
Brig. Gen. Kenneth E. Fields, USA	August 20, 1951–April 30, 1955

PRODUCTION

Walter J. Williams	September 7, 1947–January 31, 1951
Richard W. Cook	February 18, 1951–January 30, 1954

RESEARCH

James B. Fisk	February 1, 1947–August 27, 1948
Kenneth S. Pitzer	December 30, 1948–June 18, 1951
Thomas H. Johnson	December 3, 1951–September 30, 1957

ENGINEERING

Roger S. Warner	August 9, 1947–August 19, 1949
George G. Brown	January 1, 1950–May 31, 1951
Lawrence R. Hafstad	June 1, 1951–August 30, 1954

BIOLOGY AND MEDICINE

Dr. Shields Warren	July 1, 1948–June 30, 1952
Dr. John C. Bugher	July 1, 1952–September 14, 1958

REACTOR DEVELOPMENT

Lawrence R. Hafstad	February 1, 1949–December 31, 1954
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RAW MATERIALS

John K. Gustafson	January 5, 1948–December 30, 1949
Jesse C. Johnson	January 1, 1950–July 15, 1963

CONSTRUCTION AND SUPPLY

Edward J. Bloch	June 1, 1951–March 14, 1954
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INTELLIGENCE

RADM John E. Gingrich, USN	August 7, 1947–September 14, 1948
Walter F. Colby	September 15, 1948–September 25, 1953

SECURITY

RADM John E. Gingrich, USN	August 7, 1947–May 3, 1949
Francis R. Hammack (Acting)	May 28, 1950–August 9, 1950
John A. Waters, Jr.	August 10, 1950–November 30, 1967

ORGANIZATION AND PERSONNEL

G. Lyle Belsley	January 29, 1947-April 7, 1947
Fletcher C. Waller	April 21, 1947-June 13, 1952
Oscar S. Smith	June 15, 1952-September 14, 1958

PUBLIC AND TECHNICAL INFORMATION

Morse Salisbury	September 24, 1947-May 27, 1960
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CLASSIFICATION

James G. Beckerley	November 27, 1949-August 27, 1954
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Managers of Operations Offices

OAK RIDGE

John C. Franklin	September 14, 1947-June 15, 1949
Richard W. Cook	September 18, 1949-February 17, 1951
Samuel R. Sapirie	February 18, 1951-Present

SANTA FE

Carroll L. Tyler	July 2, 1947-February 15, 1954
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HANFORD

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Carleton Shugg	September 2, 1947-August 31, 1948
Fred C. Schlemmer	September 16, 1948-May 31, 1950
David F. Shaw	June 1, 1950-June 5, 1955

CHICAGO

Alfonso Tammaro	August 31, 1947-March 31, 1954
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NEW YORK

Wilbur E. Kelley	May 5, 1947-February 27, 1953
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SCHENECTADY

James C. Stewart	May 19, 1949-November 4, 1950
Jon D. Anderson	November 5, 1950-June 12, 1959

SAVANNAH RIVER

Curtis A. Nelson	July 9, 1950-March 31, 1955
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IDAHO

Leonard E. Johnston	April 4, 1949-April 30, 1954
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SAN FRANCISCO

John A. Derry	November 26, 1950-September 28, 1952
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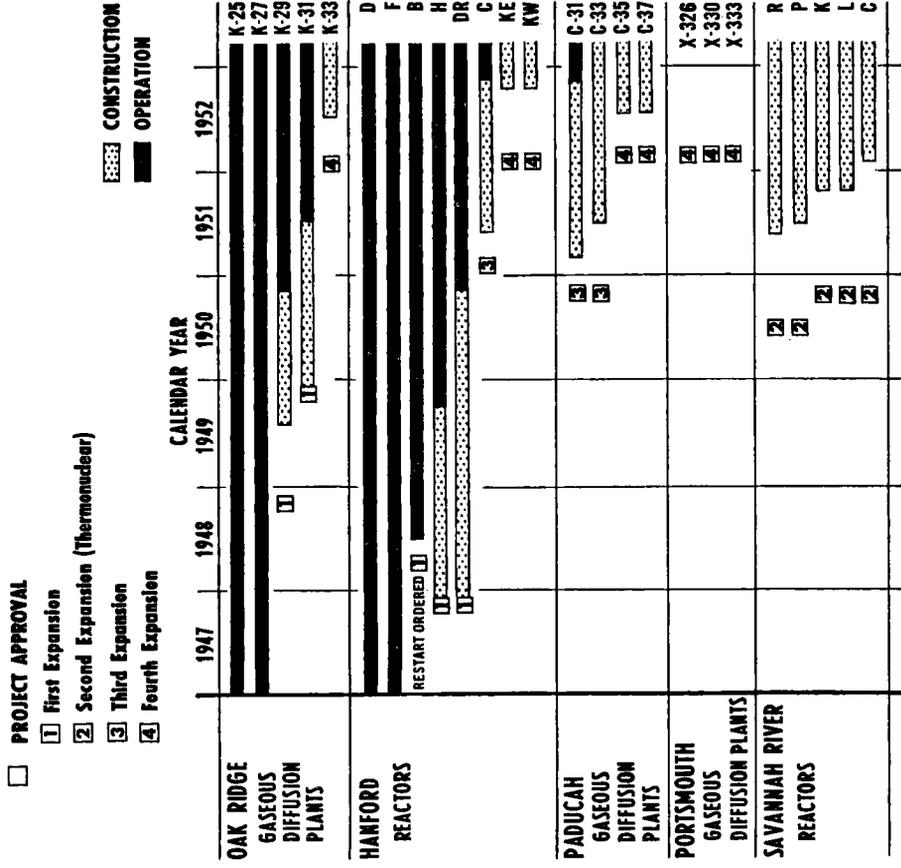
GRAND JUNCTION

Frank H. MacPherson	September 14, 1949-December 23, 1952
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CONSTRUCTION AND OPERATION OF PRODUCTION FACILITIES

AEC PRODUCTION FACILITIES 1947-1952

APPENDIX 2



DEVELOPMENT AND CONSTRUCTION OF

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REACTOR AND LOCATION	TYPE	PURPOSE
GENERAL RESEARCH REACTORS		
Manhattan Engineer District Projects Chicago Pile No. 1 (rebuilt as CP-2) Oak Ridge graphite reactor (X-10) Los Alamos water boiler Argonne CP-3 (rebuilt as CP-3') Los Alamos fast breeder Atomic Energy Commission Projects Brookhaven research reactor Oak Ridge bulk shielding reactor Oak Ridge low intensity test reactor North American water boiler neutron source, Downey, Calif.		
TEST REACTORS		
Manhattan Engineer District Projects Hanford 305 test reactor Atomic Energy Commission Projects Schenectady thermal test reactor Materials testing reactor, NRTS, Idaho		Process development Component testing Component and irradiation experiments
EXPERIMENTAL REACTORS		
Experimental breeder reactor, NRTS, Idaho Oak Ridge homogeneous reactor - Experiment NRTS, Idaho Submarine thermal reactor, Mark I, NRTS, Idaho Submarine intermediate reactor, Mark A, West Milton, N. Y. Intermediate power breeder reactor, West Milton, N. Y.	Unmoderated Homogeneous Pressurized water Sodium-cooled Sodium-cooled	Demonstration of power generation and breeding Fluid fuel demonstration Propulsion prototype Propulsion prototype Power and breeding

* Approval date for site only; the reactor was authorized in August, 1949.

† Project was canceled in March, 1950. Its technology contributed to the development of the submarine intermediate reactor.

NONPRODUCTION REACTORS

APPENDIX 3

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POWER	FORMAL PROJECT APPROVAL	START OF CONSTRUCTION	START-UP OF REACTOR
	June 1942	Nov. 1942	Dec. 1942
	Sept. 1942	Feb. 1943	Nov. 1943
	None	Oct. 1943	May 1944
	None	Sept. 1943	May 1944
	None	May 1946	Nov. 1946
	Apr. 1947	Aug. 1947	Aug. 1950
	Feb. 1950	June 1950	Dec. 1950
	Jan. 1948	Jan. 1949	Feb. 1950
	June 1951	June 1951	Apr. 1952
30 w	June 1943	Aug. 1943	Mar. 1944
10 w	Nov. 1950	Dec. 1950	Jan. 1951
30,000 kw	Nov. 1949	Mar. 1950	Mar. 1952
1,400 kw	Nov. 1947	Nov. 1949	Aug. 1951
1,000 kw	Nov. 1949	Aug. 1950	Apr. 1952
Classified	Apr. 1948	Aug. 1950	Mar. 1953
Classified	Feb. 1952	Apr. 1952	Mar. 1955
10,000 kw	Sept. 1948 *	July 1949	None †

ANNOUNCED NUCLEAR TESTS

SERIES	DATE (GCT)	LOCATION	TYPE OF BURST	YIELD (KILOTONS)	REMARKS
UNITED STATES TESTS					
Trinity	July 16, 1945	Alamogordo, N. M.	Tower	19	First nuclear detonation
World War II					
Little Boy	Aug. 5, 1945	Hiroshima, Japan	Air	12.5	First combat use
Fat Man	Aug. 9, 1945	Nagasaki, Japan	Air	22	Second combat use
Crossroads					
Able	June 30, 1946	Bikini Atoll	Air	Classified	Test of nuclear weapon effects on naval vessels
Baker	July 24, 1946	Bikini Atoll	Underwater	Classified	
Sandstone					
X-ray	Apr. 14, 1948	Eniwetok Atoll	Tower	37	First Commission test series
Yoke	Apr. 30, 1948	Eniwetok Atoll	Tower	49	
Zebra	May 14, 1948	Eniwetok Atoll	Tower	18	
Ranger					
Able	Jan. 27, 1951	Nevada test site	Air	1	First tests held at Nevada test site
Baker	Jan. 28, 1951	Nevada test site	Air	8	
Easy	Feb. 1, 1951	Nevada test site	Air	1	
Baker-2	Feb. 2, 1951	Nevada test site	Air	8	
Fox	Feb. 6, 1951	Nevada test site	Air	22	
Greenhouse					
Dog	Apr. 7, 1951	Eniwetok Atoll	Tower	Classified	Demonstrated thermonuclear principles
Easy	Apr. 20, 1951	Eniwetok Atoll	Tower	47	
George	May 8, 1951	Eniwetok Atoll	Tower	Classified	
Item	May 24, 1951	Eniwetok Atoll	Tower	Classified	

					Tests of improved device designs
Buster-Jangle					
Able	Oct. 22, 1951	Nevada test site	Tower	<0.1	
Baker	Oct. 28, 1951	Nevada test site	Air	3.5	
Charlie	Oct. 30, 1951	Nevada test site	Air	14	
Dog	Nov. 1, 1951	Nevada test site	Air	21	
Easy	Nov. 5, 1951	Nevada test site	Air	31	
Sugar	Nov. 19, 1951	Nevada test site	Surface	1.2	
Uncle	Nov. 29, 1951	Nevada test site	Underground	1.2	
Tumbler-Snapper					Tests of improved device designs
Able	Apr. 1, 1952	Nevada test site	Air	1	
Baker	Apr. 15, 1952	Nevada test site	Air	1	
Charlie	Apr. 22, 1952	Nevada test site	Air	31	
Dog	May 1, 1952	Nevada test site	Air	19	
Easy	May 7, 1952	Nevada test site	Tower	12	
Fox	May 25, 1952	Nevada test site	Tower	11	
George	June 1, 1952	Nevada test site	Tower	15	
How	June 5, 1952	Nevada test site	Tower	14	
Ivy					
Mike	Oct. 31, 1952	Eniwetok Atoll	Surface	10,400	First thermonuclear detonation
King	Nov. 15, 1952	Eniwetok Atoll	Air	Classified	

FOREIGN TESTS

United Kingdom					
Hurricane	Oct. 3, 1952	Monte Bello Islands, Australia	Ship		Kiloton range
Soviet Union					
Test No. 1	Aug. 29, 1949	U. S. S. R.	Air		
Test No. 2	Oct. 3, 1951 *	U. S. S. R.	Air		
Test No. 3	Oct. 22, 1951 *	U. S. S. R.	Air		

* Date of announcement; not necessarily date of detonation.

*PROCUREMENT OF
URANIUM CONCENTRATES*

APPENDIX 5

(TONS OF U_3O_8)

FISCAL YEAR	DOMESTIC	CANADA	OVERSEAS	TOTAL
1947 ($\frac{1}{2}$ year)	0	137	1,440	1,577
1948	116	206	1,689	2,011
1949	115	217	1,909	2,241
1950	323	235	2,505	3,063
1951	639	255	2,792	3,686
1952	824	210	2,623	3,657

COMMISSION AND CONTRACTOR EMPLOYMENT, NONMILITARY

APPENDIX 6

OFFICE	GOVERNMENT EMPLOYEES					
	1947 *	1948	1949	1950	1951	1952
Washington	587	980	1,079	1,197	1,362	1,436
Chicago	237	225	254	287	291	281
Hanford	309	343	338	341	358	455
Idaho	—	—	119	312	353	458
New York	454	498	571	515	534	585
Oak Ridge	2,033	1,366	942	858	990	1,186
San Francisco	—	—	—	—	55	96
Santa Fe	1,046	1,314	1,411	1,378	1,500	1,590
Savannah River	—	—	—	87	256	325
Schenectady	52	65	63	50	51	63
Grand Junction	—	—	—	—	—	228
TOTALS	4,718	4,791	4,777	5,025	5,750	6,703

	CONTRACTOR EMPLOYEES (INCLUDING OPERATING AND CONSTRUCTION)					
	1947	1948	1949	1950	1951	1952
Washington	—	—	304	338	442	403
Chicago	2,744	6,736	6,313	8,150	8,179	6,835
Hanford	15,313	22,729	9,191	13,920	16,667	13,166
Idaho	—	—	186	1,859	2,124	1,466
New York	2,761	4,516	3,903	2,783	5,559	6,586
Oak Ridge	21,361	19,253	17,826	21,270	35,844	43,057
San Francisco	—	—	—	—	1,141	3,452
Santa Fe	7,056	8,542	11,846	16,057	17,617	18,662
Savannah River	—	—	—	2,089	28,842	39,481
Schenectady	996	2,084	2,264	1,742	1,974	2,453
Grand Junction	—	—	—	—	—	406
TOTALS	50,231	63,860	51,833	68,208	118,389	135,967

* Figures are for December of the year indicated.

FINANCIAL DATA

APPENDIX 7

As the Commission's budget and cost accounting system evolved during the years 1947-1952, the format for reporting financial data changed. For this reason the data for each fiscal year are not strictly comparable, but the changing categories in the following tables do illustrate the improvement in financial controls.

EXPENDITURES IN THE ATOMIC ENERGY PROGRAM FISCAL YEARS 1947-1952 (in millions)

	1947	1948
Procurement and production	\$167.4	\$141.0
Research	24.5	53.4
Plant and research construction	59.1	134.4
Communities	35.0	83.8
Operations	(18.9)	(23.7)
Construction	(16.1)	(60.1)
Administration	16.0	24.8
Insurance funds	23.3	—
Advances to contractors	-7.0	25.2
TOTALS	\$318.3	\$462.6
	1949	
Source and fissionable material	\$110.6	
Weapons	92.4	
Reactor development	19.3	
Physical research	26.1	
Biology and medicine	15.2	
Communities	95.8	
Operations	(25.6)	
Construction	(70.2)	
Plant construction	255.5	
Administration	25.2	
Advances to contractors	-8.2	
TOTALS	\$631.9	

	1950	1951	1952
Procurement and production of nuclear materials	\$168.5	\$188.3	\$ 278.3
Weapons development and fabrication	112.0	163.6	229.2
Development of nuclear reactors	31.5	44.5	64.4
Research in chemistry, metallurgy, and physics	28.9	29.8	34.7
Research in cancer, biology, and medicine	17.8	21.3	24.5
Community operations—net	19.9	17.3	16.4
Administrative expenses	22.9	24.5	31.4
Other expenses and income—net	13.3	5.3	5.3
Plant construction	256.1	459.2	1,082.2
TOTALS	\$670.9	\$953.8	\$1,766.4

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