

First in the Nation: The Iowa Plan for Atomic Education

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IN 1948 the State of Iowa's Department of Public Instruction established the Iowa Committee of Atomic Energy Education to develop a curriculum for the study of atomic science. Between 1950 and 1952, the department published the nation's first comprehensive plan for atomic energy education, *The Iowa Plan for Atomic Energy Education* (hereafter *The Iowa Plan*) and distributed it throughout the state.¹ The first of its five volumes introduced *The Iowa Plan*; each of the subsequent four volumes provided curricula for elementary, secondary, college, and adult education, respectively. In addition to explaining the science of atomic energy, these programs promoted discussion of its political, social, and ethical dimensions. Although several other classrooms and schools around the nation introduced independent programs for atomic energy education, the Iowa Committee of Atomic Energy Education intended *The Iowa Plan* to be implemented statewide. It rested on the premise that an educated public can create responsible policy to manage the momentous implications of atomic energy, a necessary prerequisite for maintaining a healthy democracy in an increasingly global community.

The State of Iowa published the five volumes of *The Iowa Plan* between 1950 and 1952. Almost immediately it drew the attention of those actively engaged in national atomic energy

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1. *The Iowa Plan for Atomic Energy Education*, 5 vols. (Des Moines, 1950-1952).

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policy. David E. Lilienthal, the first chairman of the federal Atomic Energy Commission (AEC) called it “one of the most heartening and imaginative programs in the entire country.” Brien McMahon, former chairman of the Joint Congressional Committee of Atomic Energy, praised the program’s dimensions and objectives. The AEC itself reported that “there is probably a more coordinated effort being carried forward in Iowa to integrate atomic energy into the classroom at all levels of education than in any other area.” *Newsweek* reported that it was “the best . . . being done and that it stood ‘far in front’ of any other statewide attempt to promote atomic education.”²

At the forefront of atomic energy education, *The Iowa Plan* reflected the complexity of emotions that the public experienced at the dawn of the atomic age and considered subjects that would only later become the focus of federal policy. Initially, immobilizing terror gripped the public’s imagination, evolving toward the more constructive emotions of fear, and then hope, as citizens sought some degree of control over this powerful new force. During the 1950s, the federal government promoted programs for civil defense, furthering the belief that the public could manage the unmanageable—a nuclear war.³ Each volume of *The Iowa Plan* discussed the dangers inherent in the atomic age in light of the age of the intended audience. Civil defense protocol, described in some detail for older students, provided at least the

2. David E. Lilienthal, frontispiece, in *The Iowa Plan*, vol. 5, *Iowa Citizens Investigate the Atom: What Adult Iowans Have Done and May Do to Prepare Themselves for the Atomic Age*; Brien McMahon, frontispiece, *ibid.*; *Waterloo Daily Courier*, 1/9/1950; *Mason City Globe Gazette*, 9/27/1950; *Newsweek*, 7/31/1950, 75. See also *Pella Chronicle*, 11/9/1950.

3. Spencer R. Weart, *Nuclear Fear: A History of Images* (Cambridge, MA, 1988), 129–37; Paul Boyer, *By the Bomb’s Early Light: American Thought and Culture at the Dawn of the Atomic Age* (1984; reprint, Chapel Hill, NC, 1994), 320–33; JoAnn Brown, “‘A is for Atom, B is for Bomb’: Civil Defense in American Public Education,” *Journal of American History* 75 (1988), 68–90; Guy Oakes and Andrew Grossman, “Managing Nuclear Terror: The Genesis of American Civil Defense Strategy,” *International Journal of Politics, Culture, and Society* 5 (1992), 361–403. For civil defense activities in Iowa specifically, see Jenny Barker Devine, “‘Mightier Than Missiles’: The Rhetoric of Civil Defense for Rural American Families, 1950–1970,” in *The Atomic Bomb and American Society: New Perspectives*, eds. Rosemary B. Mariner and G. Kurt Piehler (Knoxville, TN, 2009), 184–209; and *idem*, “The Farmer and the Atom: The Iowa State Cooperative Extension Service and Rural Civil Defense, 1955–1970,” *Annals of Iowa* 66 (2007), 161–94.

perception of recourse, and thus control, in the event of the unthinkable. The tone of the volumes of *The Iowa Plan* also evolved along with the age of the intended audience. The early volumes, aimed at younger students, portrayed a decidedly optimistic view of life in the atomic age, whereas later volumes, targeted toward adults, emphasized concerns and warnings about the conundrums and contradictions that atomic energy introduced.

While civil defense planning may have eased fears of the physical dangers posed by the atomic bomb, concerns about the threat of communism, both to the U.S. government and to the American way of life, grew during the 1950s. Indeed, personal survival became a metaphor for the very existence of the nation, and the condemnation of communism became inextricably bound to American loyalty and patriotism.⁴ The animosities between the Soviet Union and the United States permeated the content of *The Iowa Plan* to varying degrees, again relative to the age of the audience, with the college and adult volumes containing the most explicit anti-Soviet rhetoric. Nevertheless, each volume emphasized the importance of international cooperation to both further the science of atomic energy and to monitor international nuclear capabilities. Widespread support in the popular media during the late 1940s and early 1950s for international control of atomic energy suggested that much of the nation also looked to the global community to prevent an atomic arms race and to reduce the threat of war, despite waning support for international control among policy makers.⁵

As a counterpoint to the fear and uncertainty accompanying the new atomic age, the promise of a better life through the peacetime capabilities of atomic science became topics of national discussion both informally, in social groups and club

4. Ferenc M. Szasz, "Atomic Comics: The Comic Book Industry Confronts the Nuclear Age," in *Atomic Culture: How We Learned to Stop Worrying and Love the Bomb*, eds. Scott C. Zeman and Michael A. Amundson (Boulder, CO, 2004), 18-20; Robert A. Jacobs, *The Dragon's Tail: Americans Face the Atomic Age* (Amherst, MA, 2010), 82; John L. Rudolph, *Scientists in the Classroom: The Cold War Reconstruction of American Science Education* (New York, 2002), 89; Boyer, *By the Bomb's Early Light*, 70, 326-27; Weart, *Nuclear Fear*, 123, 127, 156.

5. Boyer, *By the Bomb's Early Light*, 36, 68, 76-80; Weart, *Nuclear Fear*, 115-17, 126, 142, 157.

programs, and through classroom education.⁶ Early on, Iowans incorporated these subjects into their conversations and, subsequently, their school curricula. Even before President Dwight D. Eisenhower extolled the peaceful uses of atomic energy in his 1953 “Atoms for Peace” speech, *The Iowa Plan* explored the potential for atomic science to revolutionize agriculture and medicine and eradicate energy shortages.⁷

Earlier, between 1945 and 1950, the Iowa Department of Public Instruction had recommended that teachers increase their focus on science and mathematics inasmuch as the recent war demonstrated a need for mathematically and scientifically literate students.⁸ The content of *The Iowa Plan* reflected this interest. It included a tutorial on basic atomic structure and chemical reactions for grade school students and a more complex treatment of the physics and chemistry of atomic science in the volumes for older students. This all took place well before the federal government codified an increased emphasis on mathematics and science education with the National Defense Education Act in 1958 in order to maintain U.S. preeminence with regard to scientific research and development.⁹

6. Michael Scheibach, *Atomic Narratives and American Youth: Coming of Age with the Atom, 1945–1955* (Jefferson, NC, 2003), 34–56; Weart, *Nuclear Fear*, 156–69; Boyer, *By the Bomb's Early Light*, 109–21.

7. Dwight D. Eisenhower, *Atoms for Peace*, 1953, http://www.iaea.org/About/atomsforpeace_speech.html, accessed 7/23/2010.

8. Iowa Department of Public Instruction, *Issues Concerning the Secondary School Curriculum: A Study Manual* (Des Moines, 1945), 82, 85; idem, *Iowa Secondary School Cooperative Curriculum Program*, vol. 2, *A Proposed Design for Secondary Education in Iowa* (Des Moines, 1947), 72, 83, 123; idem, *Iowa Secondary School Cooperative Curriculum Program*, Mathematics Series, vol. 19 (Des Moines, 1949),

8. Atomic energy was included in the physics section of *Chemistry and Physics for Secondary Schools* (Des Moines, 1950), 70, 74–77. All of these publications are in boxes 1–3, Malcolm Price Lab School Collection, University of Northern Iowa University Archives and Special Collections, Cedar Falls. In 1951 the Iowa Department of Public Instruction published the results of a survey of about 6,000 1946 and 1949 high school graduates who were asked what should be added to the high school curriculum; about 33 percent wanted additional science and math education. Iowa Department of Public Instruction, *Educational Needs: Iowa's Young Adults* (Des Moines, 1951), 17–18.

9. Diane Ravitch, *The Troubled Crusade: American Education, 1945–1980* (New York, 1983), 229; Carl F. Kaestle and Alyssa E. Lodewick, eds., *To Educate the Nation: Federal and National Strategies of School Curriculum, 1893–1958* (Boston, 1986), 264; Margaret Rossiter, “Science and Public Policy since World War II,”

Historians have explored the social implications of living in the atomic age: its effect on national demographics, the nuclear family, and the role of government and schools in everyday life.¹⁰ In Iowa, as elsewhere, these matters carried significance. In 1950 the Iowa Department of Public Instruction proposed that the social studies curriculum be expanded to include the study of contemporary social, economic, and political issues.¹¹ It suggested that atomic science, the challenges of living in the atomic age, and peaceful uses of atomic energy be included in commencement exercises, oratory presentations, and theatrical performances.¹² Much of the content of the elementary education volume of *The Iowa Plan* focused on social and even political considerations of the atomic age; the other volumes divided their content fairly equally between science and social science content. The comprehensive curriculum that *The Iowa Plan* promoted put it on the vanguard of atomic science pedagogy during the early years of the Cold War.¹³

in *Osiris: Historical Writing on American Science: Perspectives and Prospects*, 2d ser., vol. 1 (Baltimore, 1985), 285; Wayne J. Urban, *More Than Science and Sputnik: The National Defense Education Act of 1958* (Tuscaloosa, AL, 2010).

10. Allan M. Winkler, *Life under a Cloud: American Anxiety about the Atom* (New York, 1993), 109–35; Paul S. Boyer, “Sixty Years and Counting: Nuclear Themes in American Culture, 1945 to the Present,” in *The Atomic Bomb and American Society*, 3–9; Devine, “Mightier than Missiles,” 185–209; Elaine Tyler May, *Homeward Bound: American Families in the Cold War Era* (New York, 2008), 1–173; David Monteyne, “Shelter from the Elements: Architecture and Civil Defense in the Early Cold War,” *Philosophical Forum* 35 (2004), 179–99; Matthew Farish, “Disaster and Decentralization: American Cities and the Cold War,” *Cultural Geographies* 10 (2003), 125–48; Joseph Masco, “‘Survival Is Your Business’: Engineering Ruins and Affect in Nuclear America,” *Cultural Anthropology* 23 (2008), 361–98; Kathleen A. Tobin, “The Reduction of Urban Vulnerability: Revisiting 1950s American Suburbanization as Civil Defense,” *Cold War History* 2 (2002), 1–32; Boyer, *By the Bomb’s Early Light*, 131–77; Weart, *Nuclear Fear*, 128–74.

11. Department of Public Instruction, *Iowa Secondary School Cooperative Curriculum Program*, vol. 2, *A Proposed Design for Secondary Education in Iowa*, 122.

12. Iowa Department of Public Instruction, *The Student Activity Handbook for Secondary Schools* (Des Moines, 1950), 98–101, in box 3, Malcolm Price Lab School Collection.

13. Andrew Hartman, *Education and the Cold War: The Battle for the American School* (New York, 2008), 138, insists that such science and social science content was replaced by “duck and cover” drills after the onset of the Cold War.

THE STATE OF IOWA experienced significant changes during the decade after World War II. During the middle decades of the century, Iowa's population increased slowly but steadily, by 3 percent between 1940 and 1950 to 2,621,073 persons, and by another 5 percent by 1960. During the same period, its rural character began to diminish as cities grew and the urban population rivalled that of the countryside. The increasingly industrial character of its economy furthered this trend. By 1955, the Iowa Development Commission reported that the number of manufacturing plants had increased by over 26 percent to 3,736 in the decade since the war's end.¹⁴

In response to the changing demographics, progressive reformers accelerated a statewide school consolidation program that had begun earlier in the century. In 1950 school-aged children made up 15 percent of the state's population, or just over 400,000 in total; just under 300,000 students went to elementary school (kindergarten through eighth grade), and just over 100,000 were enrolled in high school (grades nine through twelve). Almost 80 percent of the schools were one- or two-room schoolhouses, and the content and quality of education varied widely. The strong interest in school consolidation extended to the development of standardized school curricula. It is in this context that during the fall of 1950 the Department of Public Instruction marketed *The Iowa Plan* to the larger districts as well as the remaining rural schools; its comprehensive curricula furthered the objective of standardization.¹⁵

14. Dorothy Schwieder, *Iowa: The Middle Land* (Iowa City, 1996), 288–89.

15. Iowa Department of Public Instruction, *56th Biennial Report for the Two Years Ending June 30, 1952* (Des Moines, 1952), 102–3, 108–11, 222–25; Schwieder, *Iowa: The Middle Land*, 291. These changes created ambivalent feelings of nostalgia for the past while preparing for the future. To some degree, this dynamic reinforced the tenets of the Catholic Rural Life and Country Life movements that nostalgically celebrated Iowa's rural roots while pragmatically promoting economic cooperatives to support it. See David S. Bovée, *The Church and the Land: The National Catholic Rural Life Conference and American Society, 1923–2007* (Washington, DC, 2010), 14, 136. In a similar vein, *The Iowa Plan* capitalized on the rural foundations that defined Iowans and instilled in them the importance of education, a necessary prerequisite to develop informed policy that would preserve "our" way of life into the atomic age. *The Iowa Plan*, 5:69–72. See also Devine, "Mightier than Missiles," 186.

After World War II and before the publication of *The Iowa Plan*, students and adults alike shared the nation's growing concern about the challenges of life in the atomic age and creatively explored them. In 1947 the residents of Burlington, Iowa, participated in a community-wide Atomic Energy Week. Later that year the *Des Moines Register* published a series of editorials on atomic energy. Adult education programs commanded large audiences in the small towns of Marengo and Maynard and in the larger cities of Davenport and Iowa City.

Burlington, Iowa (pop. 35,000), held the first community-wide program in the state, Atomic Energy Week, from October 25 to November 1, 1947. The League of Women Voters organized the week's activities, which sought to educate the community about the structure of the atom, the potential peaceful uses of atomic science, and the destructive capabilities of atomic energy. In what would become an enduring theme of *The Iowa Plan* itself, the Burlington program "recognize[d] that international control and strong international political organizations [for monitoring atomic energy] are essentials."¹⁶ A host of volunteers distributed thousands of pamphlets and posters provided by the National Council of Atomic Information and the League of Women Voters. These included the pamphlet "Twelve Points about Atomic Energy" and the posters "Time Doesn't Stand Still for the Atom," "Have You Caught Up with the Atom," and "You Can Do Your Part." In addition, volunteers set up and staffed information booths, arranged public forums, distributed press releases, and encouraged school, club, and theater programs. A group of boys associated with the local Hi-Y club painted atomic symbols on sidewalks and corners. Church leaders included atomic energy topics in their Sunday sermons. Art teachers assisted with displays in retail store windows.¹⁷

Despite the festive mood of the week's events, many of the exhibits conveyed a somber message. Window designs drove home the theme—"Time Won't Wait, Neither Can You" or "Time Is Running Out"—by filling jewelry store windows with clocks and watches. A department store window displayed an

16. *The Iowa Plan*, 5:33.

17. *Ibid.*, 34-35.

exhibit based on Ding Darling's cartoon, "Eventually, Why Not Now?" It featured a skeleton "in an atomic-war scarred world" calling for world peace. Another store displayed a brown rabbit in the snow with the sign, "A Brown Rabbit in the Snow is an Easy Target. Animals Who Can Adapt Themselves to Their Environment Survive. Those Who Can't Become Extinct. Can You Adapt Your Ideas to the Atomic Age? Or Are You a Brown Rabbit in the Snow?"¹⁸

A mass rally attended by 1,200 people, despite heavy rain, concluded the week's activities. Shortly before it began, military planes flew in formation over the city, the Kiwanis Club set off "fire-cracker bombs," and the city blew sirens and organized a five-minute blackout. The speeches that followed continued to emphasize the critical nature of the present times. Atomic Energy Commission member Lewis Strauss presented "The Atom in Civil Life," and *Des Moines Register* editor Forrest Seymour spoke on "A Citizen's Responsibility in the Atomic Age."¹⁹

The widespread involvement of the community, the informal discussions that followed, and the requests from other communities for program information attested to the success of Burlington's Atomic Energy Week. Prominent scientists and government officials commented on the program, and the Associated Press picked up the story and spread it to papers as far away as Hawaii.²⁰

The editor-in-chief of the *Des Moines Register*, William W. Waymack, who felt strongly about the need for public education concerning matters of atomic energy, lobbied for it from his desk at the *Des Moines Register* and later from his pulpit as a member of the first U.S. Atomic Energy Commission.²¹ During the fall of

18. Ibid.

19. Ibid., 35.

20. Ibid.

21. Waymack served on numerous local, state, and national committees before President Harry Truman appointed him to the AEC in 1946. He served on the President's Committee on Farm Tenancy (1936-1937), the Federal Reserve Board of Chicago (1941-1946), and the War Labor Board (1942). See *The Biographical Dictionary of Iowa*, s.v. Waymack, William Wesley, University of Iowa Press Digital Edition at <http://uipress.lib.uiowa.edu/bdi/>, accessed 12/8/2013. For testimony to his commitment to educating the public on atomic energy, see Brian Balogh, *Chain Reaction: Expert Debate and Public Participation in American*

1947 Robert J. Blakely, a *Des Moines Register* editorial writer, published a series of eight columns under the title "You Can Understand the Atom," which provided a basic tutorial in atomic science. Then, between December 1947 and January 1948, the *Register* published a series of six editorials titled "The Atom and You," which called for the public to take responsibility for understanding the essential elements of atomic science so that they could participate in the public discourse on the implications of nuclear policy. The editorials also lobbied for international control of atomic energy; stressed the importance of openness, rather than secrecy, to further scientific advancement; and celebrated the potential for peaceful uses of atomic energy for the military, industrial, and academic complex.²²

The interest in atomic energy continued to grow during the late 1940s. In response, several Iowa communities developed new adult education programs. In 1949 the town of Marengo, a typical, rural midwestern town with a population of 2,260, hosted an adult education program, dubbed the Marengo Experiment. Several of the organizers, who also constituted the core of the Iowa Committee of Atomic Energy Education, hoped to resolve two key issues: Could atomic energy be explained to the lay person? And would education calm the growing fears of living in the atomic age? The Marengo Experiment answered both questions affirmatively.

Marengo, like many Iowa towns, featured an evening adult education program that offered the usual classes in agriculture, sewing, cooking, woodworking, current thought, music, knitting,

Commercial Nuclear Power, 1945-1975 (Cambridge, 1991), 235; Richard G. Hewlett and Oscar E. Anderson Jr., *The New World: A History of the United States Atomic Energy Commission*, vol. 1, 1939-1946 (Berkeley, CA, 1990), 1, 622-40; and W. W. Waymack, "Remarks of Commissioner, U.S. Atomic Energy Commission Before General Session of the Thirty-Second Annual Convention of the National Association of Secondary-School Principals," Atlantic City, NJ, February 21, 1948, in folder: Iowa Education Courses in Atomic Energy Reports, Harley A. Wilhelm Papers, Ames Laboratory Archives, Ames.

22. "You Can Understand the Atom," *Des Moines Register*, 10/12/1947, 10/19/1947, 10/26/1947, 11/2/1947, 11/9/1947, 11/16/1947, 11/23/1947, 11/30/1947; "The Atom and You," *Des Moines Register*, 12/22/1947, 12/26/1947, 12/30/1947, 1/5/1948, 1/7/1948, 1/9/1948; Emil C. Miller, "A Study of Atomic Energy Education for Adults" (Ph.D. diss., State University of Iowa, 1951), 287.

bridge, handicrafts, and public speaking. For ten weeks during the fall of 1949, the 450 adult education students availed themselves of a course on atomic energy offered during the hour that followed their adult education elective. State University of Iowa (SUI) Professor Hew Roberts, former director of adult education and a member of the Iowa Committee of Atomic Energy Education, organized and moderated the presentations, which included lectures, films, demonstrations, and discussions of suggested readings. Much of the program, which included presentations by several of Roberts's SUI colleagues, emphasized science rather than social science aspects of atomic energy. In addition to atomic science and the bomb, there were discussions of a variety of nonmilitary uses of atomic science in industry, medicine, and agriculture. Robert J. Blakely closed the ten-week program with a lecture that raised some of the social implications of the atomic era. His keynote lecture, "Political and Social Adjustments for the Atomic Age," considered many of the controversial issues of the atomic age, underscoring the significance of international scientific collaboration and publication for the advancement of science, as opposed to the government's insistence on secrecy that, arguably, served the interests of national security. He also stressed the importance of international control and cooperation with regard to atomic science, rather than protecting the sovereign right of nations to develop nuclear capabilities to serve their own interests.²³

The publicity that followed the Marengo Experiment best characterized its success. An SUI science journalism intern who attended the lectures distributed extensive notes as press releases; 137 Iowa newspapers and radio stations incorporated those materials into their own programming schedules.²⁴ The Marengo Experiment also drew national attention. The Social Science Research Service of the University of Michigan noted that "the level of public information [about atomic energy] was higher in Iowa than in neighboring states." The University of Virginia asked for permission to reprint and distribute the lecture notes. The Atomic Energy Commission lauded the Marengo

23. *The Iowa Plan*, 5:39–45.

24. *Ibid.*, 42.

Experiment as the “foremost amongst university sponsored adult education programs.” The National Education Association journal, *NEA Journal*, and the *Journal of Educational Sociology*, as well as *Midland Schools*, the journal of the Iowa State Education Association, all reported on the Marengo Experiment.²⁵

In its wake, the demand for adult education programs grew. Roberts repeated the Marengo Experiment during the summer of 1949 with a college-educated audience at SUI, with a general audience of 267 at SUI during the summer of 1950, and with 537 participants in Davenport during the winter of 1950–51.²⁶ In 1950 the residents of Maynard, Iowa, appealed to the superintendent of their consolidated school, Donald D. Palmer, who did not have a background in science but rather in commercial law, to develop an adult education program on atomic energy. When he did, 80 of the 430 residents in this rural northeastern Iowa town attended his ten-week presentation.²⁷

Clearly, the public was hungry for atomic energy education. The success of these public programs impressed the Committee on Atomic Energy Education, and the content of the programs influenced the substance of *The Iowa Plan*.

IN 1947 Jessie M. Parker, the superintendent of Iowa’s Department of Public Instruction, appointed a provisional committee for education and information on atomic energy at the behest of atomic education advocate and *Des Moines Register* editor Robert J. Blakely, who served as its first chairman.²⁸ In 1948, after Blakely left Iowa for St. Louis, Glenn E. Holmes of the Department of Public Instruction replaced him. Together with Parker, Holmes expanded the committee’s membership and appointed subcommittees to develop curricula for particular student popu-

25. *Ibid.*, 42, 39 (citing *Atomic Energy Educational Programs, 1947–1949* [Washington, DC, 1950]); Vernon Langille, “Understanding Atomic Energy,” *NEA Journal* 38 (1949), 592; George L. Glasheen, “The Adult Meets and Tries to Understand the Atom,” *Journal of Educational Sociology* 22 (1949), 339–43; Jean Shoquist, “Atomic Secrets Unfold for the Man on the Street,” *Midland Schools* 63 no. 5 (January 1949), 6–22.

26. Langille, “Understanding Atomic Energy,” 592.

27. *The Iowa Plan*, 5:44.

28. G. E. Holmes, “Introduction,” *The Iowa Plan*, 1:10.

lations: elementary, secondary, college, and adult. The 35 members of the Iowa Committee of Atomic Energy Education were educators, scientists, and social scientists from the state's public colleges and university and Luther College and faculty from several elementary and high schools and the two state laboratory schools—the Malcolm Price Laboratory School (hereafter the Price Lab School), associated with Iowa State Teacher's College (ISTC), and the University High School, associated with the State University of Iowa (SUI). They were charged to develop the objectives and the content of *The Iowa Plan*.

The Department of Public Instruction selected the members of the subcommittees carefully to reflect the academic and professional expertise of the state. Faculty from the two state laboratory schools directed the elementary and secondary school subcommittees.²⁹ Guy Wagner, faculty member of the College of Education at ISTC and director of the Price Lab School, which focused on primary school education, chaired the elementary school subcommittee. John Haefner, director of the social studies program at SUI's University High School, chaired the secondary education subcommittee.

Harley Wilhelm headed the college subcommittee. His résumé made him particularly well qualified for the position. He had completed his Ph.D. in chemistry at ISC in 1931 and after graduation joined its faculty. During World War II, he played a key role in the wartime Manhattan Project.³⁰ Soon after the

29. The State University of Iowa operated an experimental elementary school and a high school from 1915 and 1916, respectively, until 1972. From its inception, the high school trained future teachers, and the elementary school initially prepared future administrators. See the finding aid to the Records of the University Schools, University of Iowa Archives, Department of Special Collections, University of Iowa Libraries, Iowa City at www.lib.uiowa.edu/scua/archives/guides/rg09/rg09.07.htm. The Price Laboratory School began in the late nineteenth century with the explicit goal of providing teachers at the state normal school with a live laboratory for their training. See "A Brief History of UNI" at www.library.uni.edu/collections/special-collections/-brief-history-uni, accessed July 4, 2013.

30. Joanne Abel Goldman, "National Science in the Nation's Heartland: The Ames Laboratory and Iowa State University, 1942-1965," *Technology and Culture* 41 (2000), 435-59; idem, "Mobilizing Science in the Heartland: Iowa State College, the State University of Iowa, and National Science during World War II," *Annals of Iowa* 59 (2000), 435-59.

Manhattan Project established the Metallurgical Laboratory in Chicago, scientists faced a bottleneck in their effort to purify sufficient quantities of uranium necessary for sustained nuclear fission. Wilhelm, together with Frank Spedding and a group of ISC scientists, developed a process to purify large quantities of uranium metal cheaply. The Ames Process, as it became known, produced two million pounds of pure uranium on the ISC campus in Ames and delivered it to the Metallurgical Laboratory to be used in the first demonstration of a controlled chain reaction under Stagg Field at the University of Chicago, proving the real possibility of creating an atomic bomb. After the war, the Atomic Energy Commission established the Ames Laboratory at ISC, and Wilhelm became its first deputy director. The Ames Laboratory continued studies of nuclear materials and processes and became highly respected for its first-rate atomic science programs.³¹

Wilhelm divided his subcommittee into two groups: a science group and a social science group, reflecting the early commitment of all the subcommittees to include the science as well as the social and political implications of atomic energy in their curricula. Frank E. Brown, a physical chemist and colleague of Wilhelm at ISC and the Ames Laboratory, chaired the science subcommittee; ISTC historian Donald Howard chaired the social science subcommittee. Howard's interest in social science pedagogy served him well in this capacity.³² These key college subcommittee members held faculty positions at colleges but had prior experience in public schools as teachers and administrators. Wilhelm had worked as a math and science teacher at Mapleton High School in Guthrie Center, Iowa. Both Brown and Howard had been public school teachers and principals before joining the ISC and ISTC faculty, respectively. Presumably, their experiences in public education made them sensitive to and interested in the needs of students.

31. Goldman, "National Science," 450-52.

32. Howard's dissertation examined the graduate studies program at SUI. In addition, he actively participated in the development of a core curriculum at ISTC. See the Donald F. Howard Papers, University Archives, Rod Library, University of Northern Iowa, Cedar Falls.

In addition to working with institutions of formal education, the Iowa Committee of Atomic Energy Education believed it critical to generate and serve the interest in atomic energy among adults. Hew Roberts, who directed the adult education program at SUI, chaired the adult education subcommittee. Glenn E. Holmes, who specialized in adult education at the Department of Public Instruction and chaired the full Iowa Committee of Atomic Energy Education, also served on this subcommittee.

For the most part, each of the four subcommittees worked independently, with the chairs and subchairs assuming leadership roles in determining the format and content of their respective curricula.³³ To develop their programs they reviewed the variety of resources for atomic energy education, including the literature, audio-visual materials, and documents produced by agencies of the federal government, academic institutions, and private corporations.³⁴

The full committee held only two meetings—May 17, 1949, and December 15, 1949—when participants presented subcommittee progress reports and determined the contents of an introductory volume. The introduction set out both to extoll the virtues of atomic science and to raise the alarm with respect to its destructive capabilities. Most importantly, it sensitized educators to the concerns of students living in the atomic age. That introduction, volume one of *The Iowa Plan*, provided the connec-

33. The surviving evidence suggests that the internal dynamics of the subcommittees varied. James R. Wailes, who piloted the elementary program at the Price Lab School and authored *Barbara and Howard Discover Atomic Energy*, seems to have played a key role in the elementary report. Similarly, John Haeffner was primarily responsible for the secondary school volume. For the college volume, correspondence between Harley Wilhelm and other subcommittee members reveals that Howard edited much of the social science text and Wilhelm much of the science chapters. It appears that Howard had some difficulty getting support from the initial crop of social scientists, but ultimately Hew Roberts and ISC social studies professor Joseph Gittler contributed several chapters. Most of the subcommittee members, including Wilhelm, subcommittee science section chair F. E. Brown, Luther College scientist Emil Miller, and ISTC scientist R. A. Rogers, prepared additional chapters, as did Winfield Salisbury of Collins Radio. There is no record of the adult subcommittee dynamic, although it is clear that its chair, Hew Roberts, was very involved with that volume as well as contributing to the college volume.

34. See "Student and Teacher Materials" and various pieces of drafts of volumes of *The Iowa Plan* in the Wilhelm Papers.

tive tissue that bound the five volumes together. For marketing, the Department of Public Instruction would bundle the introduction with either one individual volume or together with the other four volumes to provide a complete set of the five volumes of *The Iowa Plan for Atomic Energy Education*.

THE IOWA PLAN opened with an image of a cornstalk and the accompanying caption, "Iowa: The Tall Corn State," to appeal to the residents of Iowa. Exploiting the importance of this resource, it explained how atomic science could be used for radioactive tracers so that scientists could increase their understanding of organic processes and improve the yield of produce. Completing the loop, *The Iowa Plan* closed with the statement, "This is an Iowa book, designed by Iowans for Iowans at the instigation of certain famous Iowans who have from time to time been called in national service."³⁵ Nevertheless, much of the content reflected the general concerns that people throughout the nation expressed about living in the atomic age: *fear* of the destructive capacity of the atomic bomb; *hope* for a new level of international cooperation; *optimism* for the potential of atomic science; and the importance of educating the public to *empower* them individually and enable them to responsibly guide the nation and the world into the atomic age.

Each of the volumes reiterated these basic themes and explored them with detail appropriate to the age and capabilities of the targeted audience. For example, to combat the *fear* of atomic weaponry, *The Iowa Plan* asserted that the key to survival in the atomic age lay with international cooperation and control of the atom. To this end, each of the volumes lobbied for the adoption of the principles embodied in the U.S.-supported Baruch Plan, and argued against the approach favored by the Russians. Presidential adviser Bernard Baruch had presented his plan to the United Nations Atomic Energy Commission at its first meeting in 1946. The Russians countered with a plan of their own. Although both programs provided for the destruction of nuclear

35. Hew Roberts, "The Committee Checks Out," *The Iowa Plan*, vol. 5, chap. 10, n.p. It is likely that the "famous Iowans" were William W. Waymack and Robert J. Blakely.

arsenals, the crux of the debate, as reported in *The Iowa Plan*, focused on the nature of an international regulatory authority. The Baruch Plan called for an international authority to inspect and operate atomic energy plants worldwide as well as to engage in atomic energy research itself. This authority would also maintain control of all uranium and thorium mines. Once fissionable material became unsuitable for weapons but valuable for peacetime uses, it would be "leased" by sovereign states and used for application in medicine, agriculture, industry, or power generation. The Russians also supported the establishment of an international oversight body but conceived of it quite differently. The international authority would own neither the fissionable material nor the atomic plants. Rather, its charge would be limited to periodic inspections of atomic facilities. The framers of *The Iowa Plan* argued that this alternative would do little to alleviate world tensions. "As the actual quantity of fissionable material required to make a bomb is physically small, nations whose plants were inspected only once a month could easily conceal quantities of fissionable products secretly used in preparations for war." Moreover, according to the Russian proposal, sovereign nations maintained veto power over the oversight body's authority; the Baruch Plan called for this authority to be omnipotent when it came to international atomic policy.³⁶

The internationalization of atomic energy provides just one example of *hope* for a new era of global cooperation anticipated by *The Iowa Plan*. Nationally, the notion of a "world government" had gained momentum in the immediate aftermath of the bombings of Hiroshima and Nagasaki but fell out of favor among policy makers by 1948.³⁷ Nevertheless, *The Iowa Plan* continued to promote internationalization well into the 1950s. *The Iowa Plan*, noting that international collaboration advanced atomic science, called for continued cooperation, even at the expense

36. *The Iowa Plan*, vol. 4, *Scientific and Social Aspects of Atomic Energy: A Source Book for General Use in Colleges*, 36–37.

37. Boyer, *By the Bomb's Early Light*, 33–45; Weart, *Nuclear Fear*, 115–16; Winkler, *Life under a Cloud*, 35–36, 46–53; Megan Barnhart, "Selling the International Control of Atomic Energy: The Scientists' Movement, the Advertising Council and the Problem of the Public," in *The Atomic Bomb and American Society: New Perspectives*, eds. Mariner and Piehler, 103–19.

of compromising national interests. The risk that the slippery slope of secrecy would undermine scientific advancement and the fundamental American value of an informed electorate, *The Iowa Plan* argued, far outweighed any protection such secrecy provided.³⁸

Increased scientific capabilities fueled *optimism* for peaceful applications for atomic energy. Each of the volumes informed readers of the enormous potential for improving the lives of many, worldwide. In biology, radioactive tracers would reveal organic processes, advancing agriculture and medical science; the quality and yield of farm produce would improve; and cancer could be eradicated. Energy would be produced cheaply, providing virtually unlimited power for homes, industry, and transportation, although many thought that atomic power plants would remain beyond reach for decades.³⁹ Most importantly, each of the volumes stressed that every woman, man, and child could be *empowered* through education. In fact, individuals had a responsibility to acquire atomic literacy in order to participate in the public discourse on atomic science.

All five volumes articulated these themes, though each had its own format and character. Volumes two and three had the most in common, suggesting specific lesson plans and activities for elementary and secondary school teachers respectively. In contrast, the text of volume four provided information and references that could be used as a resource by science and social science faculty members at colleges or universities. Volume five presented a variety of approaches for adult education. Whereas content dominated the college text, volumes two, three, and five explained “what to do” and “how to do it.”

THE ELEMENTARY SCHOOL subcommittee pondered two issues from the beginning: When can elementary students grasp the subject material of atomic science? And what materials exist to facilitate learning? To answer these questions, the subcom-

38. *The Iowa Plan*, vol. 1, *The Iowa Plan for Atomic Energy Education*, 12; *The Iowa Plan*, vol. 3, *The Atom and You: A Unit for Secondary Schools*, 24; *The Iowa Plan*, 4:36, 5:61–64.

39. *The Iowa Plan*, 4:19–20.

mittee surveyed elementary school specialists nationwide as well as the editors of nationally distributed magazines and periodicals for school children. Many of the respondents considered elementary school students too young to understand atomic science, but, if attempted, activities should be placed within the context of "energy" and limited to only the simplest of concepts. Others proposed that rather than scientific content, social issues raised by atomic science should be discussed. Not surprisingly, given the secrecy surrounding the Manhattan Project, the editors reported that virtually no literature existed on the subject for grade school students. Despite some discouraging responses, the elementary subcommittee pushed forward to develop curricula that emphasized the social and political aspects of atomic science.⁴⁰

To remedy the dearth of appropriate literature, James R. Wailes, supervisor of elementary education at Price Lab School and a member of the elementary subcommittee, authored *Barbara and Howard Discover Atomic Energy*, a text used in a 14-day pilot project in 1950 involving Margaret Day's class of fifth graders at the Price Lab School.⁴¹ In this fictional narrative, Barbara and Howard, children of about fifth-grade age, read an article in the newspaper about the possibility of flying to the moon in a rocket powered by atomic energy, piquing their curiosity about atomic science. To understand the exciting possibilities, they turned to their father's colleague, Mr. Anderson, who had worked at an atomic energy plant in Oak Ridge, Tennessee. Anderson's tutorial featured the general themes embraced by *The Iowa Plan*: the science of the atom, the destructive capabilities of the bomb, the variety of uses of atomic energy, and the importance of keeping world peace through international control of the atom. International cooperation and the United Nations figure prominently in the narrative.

40. *The Iowa Plan*, 1:13.

41. *The Iowa Plan*, vol. 2, *Preparing Elementary Pupils for the Era of Atomic Energy: A Source Book for Elementary School Teachers*, 47. This was actually the second of two pilot programs for Margaret Day's class of fifth graders. The first program went virtually unnoticed. It reportedly suffered from a lack of appropriate reading material, just as the respondents had indicated.

Several measures assessed the outcomes of this pilot program. Members of the subcommittee visited the class, and Margaret Day recorded her daily impressions; all reported that the students showed enthusiasm and grasped much of the content. Day evaluated the program as exceeding expectations.⁴² At the conclusion of the pilot program, Wailes evaluated the children's understanding of the atom, atomic energy, the uses for atomic energy, and the historic international collaborations that brought about atomic science, and declared the program a success.⁴³ Several newspapers around the state also praised the program. Perhaps the *Weekly Tribune* of Moulton, Iowa, said it most colorfully: "And experiments with Iowa fifth graders show that the youngsters can understand high-falutin' terms like fission, neutron, splitting the atom—but in terms of everyday fifth-grade English."⁴⁴

The subcommittee on elementary education that shaped volume two of *The Iowa Plan* drew on the experience and the content of the pilot program. It recommended the adoption of Wailes's text and added other materials to introduce students to atomic science and the social implications of living in the atomic age. The volume began with a statement directed at those who believed elementary school children to be too young to comprehend the issues surrounding the atomic age. In the view of the subcommittee, elementary school programs provided the foundation for the "concepts, attitudes, habits, and skills" that would guide students throughout their lives.⁴⁵ A mature citizenry, the plan insisted, must be well educated in the issues of the day, and, inasmuch as atomic energy defined new and dire challenges, it must be understood. Education empowered citizens, even the youngest of them.⁴⁶

42. *Ibid.*, 54.

43. *Ibid.*, 50–54.

44. "Teach Fifth Graders about Atomic Science," *Moulton Weekly Tribune*, 10/12/1950. See also "Teach Atom to Grade Students," *Council Bluffs Nonpareil*, 7/2/1950; "Fifth Graders Familiar with Atomic Term," *Cedar Rapids Gazette*, 7/2/1950; "Will Teach Iowa Fifth Graders Atomic Science," *Pella Chronicle*, 11/9/1950; and "Offer Atomic Energy Studies This Fall in State Schools," *Waterloo Courier*, 7/2/1950.

45. *The Iowa Plan*, 1:13.

46. *Ibid.*

Acknowledging that some background in atomic science should precede the study of its social and political implications and following the guidance provided by its survey, the subcommittee considered atomic energy within the broader topic of energy, a subject with which the students had some familiarity. In this context, atomic fission represented a new type of energy that could be employed for destructive purposes, as in the atomic bomb, or for constructive uses that held great promise for improvements in agricultural techniques and medical science and treatment.⁴⁷

The subcommittee advocated the scientific method of inquiry, that is, identifying issues, collecting and analyzing data, and forming conclusions based on that data analysis. Suggested science experiments compared the properties of elements, physical and chemical changes, and characteristics of the different states of matter. Chain reactions could be demonstrated by using mouse traps and corks or falling dominoes. In the oft-used mouse trap demonstration, the teacher loaded two corks, representing the multiplicity of neutrons released in one fission event, into each of 36 mousetraps. Triggering the first mousetrap released two corks, which set off subsequent events, releasing additional corks in a geometrically increasing fashion, just as in a nuclear chain reaction. Dominoes could be set up and knocked down in a similar manner.

The science provided a foundation for understanding the social implications and responsibilities of living in an atomic age. As stated in *The Iowa Plan*, "It is the task of the schools everywhere to develop those attitudes towards science and toward one's fellowmen which will make sure that atomic energy will be released only in such ways as will result in a better life for all mankind."⁴⁸ With the goal of molding citizens capable of coping in an atomic world, children needed to appreciate the differences and similarities between human beings, learn tolerance, and value national and international cooperation.

Understanding the global nature of the contemporary world encouraged students to think beyond national boundaries and to appreciate the importance of a balance of world power. *The*

47. *Ibid.*, 2:1.

48. *Ibid.*, 57.

Iowa Plan championed the critical role of international organizations, particularly the United Nations and, even for this age group, lobbied for the Baruch Plan over the Russian counter-proposal. Nevertheless, it assured elementary school students that international cooperation and the reality of the need for world peace would bring the Russians around.⁴⁹

Even as the curriculum sought to teach students to think globally, it also emphasized the need to encourage patriotism and to promote the development of the "right kind of loyalties," including the value of democracy, the responsibilities that go with it, and the importance of putting the good of the whole above self-interest. Group problem-solving techniques, committee work, group projects, and role-playing exercises explored historical and contemporary conflicts that democracies faced over such issues as race relations, ethnic strife, and economic disparities. Students could also learn useful character traits by studying the biographies of national heroes and people of extraordinary accomplishment to identify desirable qualities of citizens that students could seek to emulate.⁵⁰

It is also illuminating to consider what was not covered or emphasized in this volume. Most notably, it downplayed *fear* of the potential catastrophic consequences of the atomic bomb and the exploitation of atomic energy, stating only that "the handling of atomic energy and radioactive materials requires great care."⁵¹ The text deliberately avoided any discussion of civil defense measures or personal safety protocols. The subcommittee felt that popular media presented the destructive capacity of the atomic bomb extensively and that schools provided an opportunity to balance that with an "optimistic, constructive view of the atomic age."⁵²

THE SECONDARY SCHOOL subcommittee also sought to foster well-informed and responsible citizens by promoting the science and social studies of atomic energy. Volume three em-

49. *Ibid.*, 43–44.

50. *Ibid.*, 8–16

51. *Ibid.*, 6.

52. *Ibid.*, 1, 8.

phasized the science of atomic energy, the destructive capacity of the bomb, the need for international oversight and control of atomic capabilities, and the potential peacetime applications of atomic science. Like volume two, volume three provided a complete curriculum that could be implemented straightforwardly in the classroom.

To reach the greatest number of students, the committee decided to target high school juniors since all public school students in Iowa took American history in the eleventh grade, "and this material is of such vital importance that all pupils must be included."⁵³ Furthermore, many eleventh-grade students studied physics concurrently so they would have a greater capacity to understand the science. John Haefner, who chaired the secondary school subcommittee, produced a 15-day curriculum that Glenn E. Holmes, who chaired the full Committee of Atomic Energy Education, praised as "the best material that has been produced for the HS level."⁵⁴ The secondary school subcommittee endorsed this atomic energy unit and recommended that it be offered at the end of the spring semester in physics and social studies classes taught by the regular classroom teachers in tandem. Despite the rigid nature of its format, the committee suggested that "schools adapt this recommendation to their local situation."⁵⁵

For each of the 15 days, the curriculum identified daily objectives, suggested classroom activities (including discussion questions and classroom exercises), and recommended student assignments. The committee advised teachers to adopt R. Will Burnett's *Atomic Energy: The Double-Edged Sword of Science* as the textbook and included a copy of it with the volume. This 33-page textbook paralleled the format of the proposed curriculum: it consisted of six chapters—the first three on the science of atomic energy and the last three on the social studies of the atomic age. In contrast to the elementary school curriculum, chapter four, "One Edge of the Sword—Atomic Energy for Man's Destruction," addressed *fear*—the vulnerability of the world in an atomic age

53. *Ibid.*, 3:1.

54. G. E. Holmes to H. Wilhelm, 2/11/1949, Wilhelm Papers.

55. *The Iowa Plan*, 3:2.

and the relative ineffectiveness of civil defense protocols to mitigate damage. Burnett's hope was "to outlaw war by international control of atomic bombs and the sources of atomic weapons."⁵⁶ Chapter five, "The Other Edge of the Sword—Atomic Energy for Better Living," *optimistically* foresaw a world of plenty as atomic science could provide an inexhaustible source of power and revolutionary tools for medical, industrial, and agricultural science. The final chapter, "Which Edge of the Sword Shall We Use?" elaborated on the need for international control of atomic energy, promoted the Baruch proposal, considered the Russian counterproposal, and noted that negotiations would result in compromise. It concluded with *empowerment*, claiming that an educated public would rise above provincial attitudes and adopt an enlightened world view that embraced international cooperation. As individuals became more sophisticated and shared their personal insights with one another, they would realize change. "Slowly, by such spreading out of circles of information and of opinion, the American people will develop the informed intelligence to work out the solution of this problem."⁵⁷ In addition to the 15-day lesson plans, the secondary school curriculum included a bibliography of resources, supplementary materials, additional activities and demonstrations, and a 45-question multiple-choice examination. The test reflected the curriculum, examining the students' scientific literacy and command of the social science concepts.

Both the elementary and secondary education volumes contained all the materials needed to teach atomic energy in the public schools. After publication of *The Iowa Plan*, the Department of Public Instruction aggressively marketed it. Between May and November 1950, multiple-county one-day institutes throughout Iowa presented *The Iowa Plan* to elementary and secondary schoolteachers. Members of the various subcommittees of the Iowa Committee of Atomic Energy Education made presentations at these institutes.⁵⁸ School districts generally re-

56. R. Will Burnett, *Atomic Energy: Double-Edged Sword of Science* (Columbus, OH, 1949), 19.

57. Burnett, *Atomic Energy*, 29–30.

58. See announcements in Iowa newspapers, for example, *Cedar Rapids Gazette*, 5/15/1950, 5/17/1950, 6/22/1950, 10/8/1950, 11/21/1950; *Kossuth County*

quired their teachers to attend and, although the Department of Public Instruction never demanded that schools adopt *The Iowa Plan*, many did. Arthur C. Anderson of the Department of Public Instruction reported in 1952 that when the course was inaugurated in September 1950, 206 schools used it. By 1952, 491 of 836 schools in the state were planning to use it.⁵⁹

UNLIKE the elementary and secondary subcommittees, the college subcommittee did not develop a curriculum guide, nor did it include any pedagogical materials in its volume. Instead, it prepared a text to be used by faculty as a reference tool for the physical and social science of atomic energy, deciding on this format after it observed the strengths and weaknesses of several pilot programs. In 1950 and 1951 Cornell College, Luther College, and the State University of Iowa experimented with a variety of presentations as they hosted atomic energy programs for their students and interested community members.

On March 22, 1950, Cornell College cancelled classes for its "Atomic Energy Day." The college subcommittee, recognizing the program's value for cementing relations between state institutions and private colleges and stimulating the interest of staff, students, and the general public in atomic energy education, became involved, at the college's request, in organizing and implementing the program.⁶⁰ Cornell's Atomic Energy Day began with an opening address by the college's president, Russell D. Cole. The morning activities included five lectures on the science of atomic energy interspaced with informal discussion sessions and opportunities to visit 17 exhibits provided by ISC, SUI, Cor-

Advance, 6/1/1950; *Jefferson Herald*, 5/25/1950; *Le Mars Semi Weekly Sentinel*, 5/26/1950, 8/4/1950, 9/19/1950; *Mt. Pleasant News*, 5/15/1950; *Pella Chronicle*, 7/13/1950, 11/9/1950; *Waterloo Courier*, 7/2/1950; *Burlington Hawk-Eye Gazette*, 9/13/1950; *Mason City Gazette*, 11/24/1950, 9/27/1950, 10/20/1951; *Estherville Daily News*, 9/12/1950, 9/19/1950; *Humboldt Republican*, 9/15/1950; and *Oelwein Daily Register* 9/15/1950.

59. Arthur C. Anderson, a departmental regional supervisor for the Department of Public Instruction, reported this in the *Cedar Rapids Gazette*, 8/31/1952.

60. "Atomic Energy Day at Cornell College," supplement to Hew Roberts, "The Iowa Plan for the Study of Atomic Energy," Record of Committee Meeting, 5/17/1949, Wilhelm Papers.

nell College, and Collins Radio (later Rockwell Collins). The afternoon focused on the social implications of atomic energy, beginning with an introductory lecture, "Atomic Energy and Social Trends," by Joseph B. Gittler, ISC sociologist and a member of the college subcommittee. Panel discussions followed: "The Moral Aspects of the Atomic Problem," "The Impact of Secrecy on the Atomic Problem," and "Controls: Domestic and International." A member of the Iowa Committee of Atomic Energy Education or a Cornell faculty member led each discussion. Presentations by SUI adult education specialist Hew Roberts and George L. Glasheen, assistant director for educational services at the Atomic Energy Commission, concluded the program.⁶¹

To measure the effectiveness of the program, Cornell students took an objective examination one week before Atomic Energy Day and retook the exam five weeks later. In addition, Cornell faculty subjectively evaluated the students during class discussions. The success and positive feedback for the program prompted Luther College to host its own atomic energy program, with a few modifications.⁶²

Luther College's two-day event began on February 20, 1951. Hew Roberts provided continuity to the program, opening with an evening lecture, moderating the following day's presentations, and providing closing remarks. Rather than the dozen discussion leaders and expert lecturers from the state's colleges and university that had delivered Cornell's program, Luther's faculty made all of the other presentations. That created an intimacy among participants and reinforced their sense of community. The organizers scheduled longer, but fewer, lectures and discussion sections and expanded the use of audio-visual equipment. Observers reported that these changes made "Luther Day" even more of a success than Cornell's Atomic Energy Day.⁶³

The State University of Iowa experimented with more traditional classroom formats. First, for civil engineering students it offered four two-hour seminars on the social and political implications of the atomic age. The students enjoyed the discus-

61. *The Iowa Plan*, 4:44-45.

62. *Ibid.*

63. *Ibid.*, 4:45-46.

sions so much that they requested additional sessions. Faculty from physics, chemistry, biochemistry, medicine, engineering, sociology, economics, political science, education, and journalism adopted a different format: a series of 22 evening lectures and discussions on matters related to atomic energy. The feedback identified two problems with this design: too many faculty participants undermined any sense of continuity, and, because the course carried no credit, students felt overburdened by the time commitment.⁶⁴

The college subcommittee internalized these criticisms and recommended that atomic energy education be incorporated into existing courses or presented as a one- or two-day workshop modeled after Atomic Energy Day or Luther Day. To facilitate these options, the subcommittee prepared a reference manual on the atomic age for instructors to employ.⁶⁵ The four themes of fear, hope, optimism, and empowerment again permeated the text.

The committee recommended that social science topics should be examined only after students had completed a course on the science of atomic energy. Scientists on the college subcommittee or closely associated with its members wrote the first five chapters of the college volume, which focused on the structure of matter, energy—its nature and sources, atomic fuels, and atomic energy for power—and radioactive isotopes in medical, industrial, and agricultural service. Harley Wilhelm wrote the third chapter of the volume, which dealt with the destructive capability of the atomic bomb. He described it rather dispassionately, triggering neither anguish nor alarm: "Figure 10 shows a photograph [a mushroom cloud] made just one fortieth of a second after the explosion was set off. At this time the fission process was completed. Intense gamma rays, heat rays, neutrons, and an intense light flash had been sent out. The radioactive fission products which may be considered as the ashes from the burnt atom fuel were in the vapor state and were still within the explosion envelope."⁶⁶

64. *Ibid.*, 44.

65. *Ibid.*

66. *Ibid.*, 16.

The college subcommittee adopted a particularly ambitious social science agenda. It identified four goals: to *orient* students to the interrelationship of science, technology, and social change; to *moderate* fear, defeatism, a false sense of security, or distrust of foreigners or foreign ideas; to stimulate college communities to *examine* contemporary contradictions with regard to atomic energy policy (security versus freedom of information, military versus peaceful uses of atomic energy, military versus civilian control, and national versus international oversight of atomic energy); and to *cultivate* an understanding of the social science implications of atomic energy, including geographic, political, ethnic, and religious considerations.⁶⁷ Social scientists on the college subcommittee discussed the implications of atomic energy in the last two chapters of volume four. They adopted a decidedly more somber tone and darker message than what was found in volumes two or three.

Drafted by Joseph B. Gittler of ISC, volume four offers a litany of concerns characteristic of the Cold War era: the atomic age changed the trajectory of technological and scientific growth, challenged contemporary demographic patterns, altered the economy, and posed a threat to the fundamental social values of the United States. Echoing apprehensions over academic freedom already raised by U.S. academicians, Gittler feared that national security issues would supersede the need for the free exchange of ideas, essential for cultural advancement and technological development.⁶⁸ Scientific progress could lag because applied science would take precedence over basic science during wartime, a development many viewed as imminent. Finally, Gittler pointed out that the public, fearing foreign attack, would increasingly turn to the federal government for protection, expanding its powers and the potential for abuse. Gittler's concerns echoed those of many public officials, journalists, and scientists during this period regarding the potential for compromising the

67. General College Level Production Committee, "Teaching Atomic Energy to General College Students, Report of the Social Science Sub-Committee of the Committee on Education in Atomic Energy at the College Level," 10/1/1948, Wilhelm Papers.

68. Boyer, *By the Bomb's Early Light*, 144, 303-6; Weart, *Nuclear Fear*, 119-27.

public's civil liberties, fundamental to a healthy democracy.⁶⁹ He did project some positive outcomes from peaceful uses of atomic energy: medical procedures could increase the lifespan of the population; technological advancements could spread urban culture to rural areas, creating a more homogenous society; and new transportation and communication technologies could reduce rural isolation, a matter of particular significance to many Iowans.

The tone of the final chapter of the volume, "Government in the Atomic Age," written primarily by Hew Roberts, raised more concerns. In addition to addressing Cold War tensions, this chapter considered the domestic political quagmires created by the atomic age and urged college communities to discuss them. In 1946 the Atomic Energy Act had provided for the creation of the Atomic Energy Commission (AEC) and authorized it to exercise executive, legislative, and military oversight.⁷⁰ Although Roberts thought that the creation of the AEC raised some thorny issues, he ultimately defended it. Nationalized atomic management served the interests of national security on one hand, but limited the scope of research and free enterprise on the other. Furthermore, the challenges of the nuclear age demanded that the AEC be the arbiter of all things atomic, but where did that leave America's democratic institutions, the principal mechanisms for policy decisions? Roberts conceded that abuses could occur, scientific advancement could be slowed, and the democratic process could be compromised. The chapter offered no definitive solutions; the subcommittee proposed instead that students "examine and discuss the problems, the achievements, the failures and the issues involved in free government in the Atomic Age." The chapter concluded with a quote from AEC commissioner (and former Iowan) W. W. Waymack: "It seems to me that this kind of inquiry has to be made. It seems to me that it is the imperative of practical education." The subcommittee further argued that college students have a particular responsibility to be educated in these issues because of their status as

69. *The Iowa Plan*, 4:28-29; Boyer, *By the Bomb's Early Light*, 143-48; Weart, *Nuclear Fear*, 119-27.

70. Atomic Energy Act of 1946, Pub. L. No. 585 - 79th Congress (1946).

members of the “educationally gifted.” In addition to embracing the personal empowerment that education provided, college students must be prepared to assume leadership roles in their communities, forming “a nucleus of informed voters” to shape policy and influence those who are less informed.⁷¹

THE ADULT EDUCATION VOLUME featured the most unique content and the most inspired presentation. Rather than addressing teachers and instructors, as the other volumes had, this volume spoke to the Iowa adult student directly. Furthermore, inasmuch as it connected national issues with local concerns, Iowa culture figured prominently. Finally, the Cold War assumed a more central role in this volume than in the others. To determine what should be included in the volume, the adult education subcommittee conducted personal interviews at lectures and films on atomic energy, sought input from those who sponsored local community programs, and sent agents to engage in “‘spontaneous’ interviews in cafes, clubs, and private homes.”⁷² Their findings shaped the content of this volume.

The volume began by attempting to convince readers that they must learn about atomic energy for their own safety, their children’s well-being, their community’s survival, and the future of humankind. The frontispiece drove the point home with a political cartoon reprinted from the *Des Moines Register*. Flanking the cartoon, titled “. . . we control the atom or it controls us,” were quotations by “a famous U.S. Senator” (likely Bourke B. Hickenlooper, U.S. senator from Iowa, 1945–1969) and “a famous Iowa member of the U.S. Atomic Energy Commission” (likely William W. Waymack) that stressed the importance of adult education.⁷³

The volume posited that adults have a civic responsibility to be well educated in matters of atomic energy inasmuch as knowledge protects the democratic system. Atomic science literacy allowed the public to understand and contribute to the national dialogue and defend the values that Iowans, in particu-

71. *The Iowa Plan*, 4:31–32, 38–39.

72. “Introduction,” *The Iowa Plan*, vol. 5, n.p.

73. *The Iowa Plan*, vol. 5, frontispiece.



This cartoon, which introduced the adult education volume, was titled "WHAT IS YOUR ATTITUDE?" and included the caption, "MAKE UP YOUR MIND, MADAM!" Courtesy of the J. N. "Ding" Darling Wildlife Society.

lar, treasured, including religious freedom and open access to education. Furthermore, it claimed that parents must be able to supplement the schools' effort to educate their children about atomic energy. Finally, men and women must be prepared to use their knowledge of radioactive contamination and safety to assist their families and communities in the event of an attack.

The first two chapters included a straightforward discussion of these issues, insisting that the public must understand the history and politics of atomic energy—the role of scientific experts, the federal government, the military, and the international community. In addition, adults must comprehend the subtle

dichotomies of the atomic age that had become part of the national dialogue: open scientific exchange versus national security and the current federal monopoly on atomic energy versus the private development of resources. The volume's authors proposed that the contemporary western concepts of "national sovereignty in international relations, parliamentary democracy in politics, and private capitalism in economics" did not adequately serve the atomic age; therefore those values and institutions needed to be reconsidered. Communism, however, must never be an option; its objectives ran contrary to those of a religiously grounded people. The contrast between the piety of those in the United States, especially Iowans, and the "atheism" of the Soviets permeated the public consciousness during the Cold War and defined the essence of the "ideological struggle between the western and communist worlds." Because the committee did not see any middle ground between communism and freedom, it feared that nuclear war might be inevitable.⁷⁴

The final chapter of the volume strived to moderate this fear. Notably, it pointed out that Iowa carried a higher risk of a bio-terror attack on crops and animals than decimation by an atomic bomb, although it prepared residents to survive the latter. The public had to take responsibility. People had to provide shelter, such as access to basements, to everyone: neighbors, friends, and strangers, including those of different religions, races, and values.⁷⁵ They must equip themselves with first aid skills, personal information, such as the blood types of family members, and awareness of emergency community resources. Most importantly, people must have literacy in atomic energy. "There is only one type of hiding that we can state definitively to be never safe—hiding your mind from exposure to knowledge."⁷⁶

74. *The Iowa Plan*, 5:61–66; Stephen J. Whitfield, *The Culture of the Cold War*, 2nd ed. (Baltimore, 1996), 77–100.

75. *The Iowa Plan*, 5:70. This tapped the popular notion that rural people in particular had a character that would be indispensable in the event of an atomic attack and "could prevent any type of socialism or communism from taking hold in local, state, and national governments." See Devine, "Mightier Than Missiles," 186.

76. *The Iowa Plan*, 5:71.

Much of the rest of the volume presented different formats that could be used to engage adults in these subjects. Those chapters emphasized the content of atomic science and its social implications. The adult subcommittee had initially intended to promote a ten-week program modeled after the Marengo Experiment, but after studying other formats that had been implemented in Iowa and elsewhere, it recognized that individual study, one- or two-day programs, as well as community-wide events also held value.⁷⁷ To facilitate individual study, chapter three—"Atoms from an Easy Chair"—provided the means for individuals to expand their own understanding of atomic science. It contained a comprehensive listing of the current literature along with detailed reviews. However, the Adult Education Committee favored informal group activities that provided social forums for education, believing that reading circles, library exhibits and programs, and informal social quizzes and games would generate excitement and interest in learning about atomic energy.

The committee also recognized value in informal programs led by lay speakers. Community members such as the neighborhood doctor, veterinarian, waterworks engineer, social studies and science teachers, and clergy could all make presentations about different aspects of atomic energy.⁷⁸ More formal professional lecture series also had an important place in adult education. The committee included a description and analysis of its role in Burlington's Atomic Energy Week and the Marengo Experiment. Furthermore, it hoped that as individuals, groups, and communities raised new questions, they would seek answers by participating in even more events. To facilitate all of these suggestions, the volume included an extensive list of films and recordings that would complement a multimedia series.

The volume concluded as it began, with a political cartoon, as bleak as the one that opened the volume, that had appeared in the *Des Moines Register*.⁷⁹ These two political cartoons, reprinted

77. Hew Roberts, "The Iowa Plan for the Study of Atomic Energy," Record of Committee Meeting, Des Moines, Iowa, May 17, 1949, 5-7, Wilhelm Papers; "Introduction," *The Iowa Plan*, vol. 5.

78. *The Iowa Plan*, 5:28.

79. *The Iowa Plan*, 5:23-31.



from the *Des Moines Register*, captured the importance of adult education on atomic energy and the dire consequences of ignorance.

THE VOLUMES of *The Iowa Plan* treated the destructive capabilities of the bomb, the social challenges of living in the atomic age, and the international tensions of the Cold War with a progression of detail; as the age of the targeted audience advanced, these concerns deepened. Volume two, for elementary school students, carried the most optimistic message. It avoided discussing the potential devastation of an atomic attack entirely; instead, it emphasized the rewards that atomic science would reap and a future of international cooperation.

Volume three, the secondary school curriculum, paid the dangers of the Cold War a bit more attention. One of its 15 lessons focused on the devastating impact of an atomic bomb and the need for students to learn the skills of civil preparedness. It suggested showing graphic films about the dropping of the atomic bomb—*Tale of Two Cities* or *One World or None*—and the recommended textbook argued that one could not completely protect oneself from an atomic bomb attack.⁸⁰ The subcommittee also suggested that students read and formulate presentations on *The Challenge of Atomic Energy*, by Ryland W. Crary et al., a book that presented a “bleak picture of a culture in the grip of atomic fear,” and *Hiroshima*, by John Hersey, which offered an explicit account of the effects on six Japanese individuals of the dropping of the atomic bomb.⁸¹ Five questions in the accompanying multiple-choice test examined the students’ understanding of civil defense preparedness and the effects of the bomb.

In the college text, the culture of the Cold War received even more explicit treatment. The section titled “international frictions” highlighted the stalemate between the United States and the Soviet Union.⁸² The college subcommittee contrasted the differences between the two nations with regard to access to the strategic material, uranium, and the disagreement over the future control of atomic energy. It noted that the United States obtained its supply of uranium by purchasing it from sovereign nations, if those nations chose to export the materials. The Soviet Union, on the other hand, controlled Czechoslovakia, which had the largest supply of uranium in Europe, and forced an exclusive arrangement with its “satellite,” prompting a rebuke phrased in classic Cold War rhetoric: “The uranium mines of Czechoslovakia were in large part the reason behind the allegedly altruistic desire of the Russians to ‘liberate’ Czechoslovakia. This type of liberation is of course merely another name for imperialist conquest and monopoly of sources of raw materials.”⁸³

80. *The Iowa Plan*, 3:18. See also Burnett, *Atomic Energy*, 18–19; and Scheibach, *Atomic Narratives*, 57.

81. *The Iowa Plan*, 3:20. For descriptions of these books, see Boyer, *By the Bomb's Early Light*, 203–10, 280.

82. *The Iowa Plan*, 4:35.

83. *Ibid.*

In the last of the five volumes, *Iowa Citizens Investigate the Atom*, the Cold War took center stage. Indeed, suspicion and gloom permeated the entire text of the adult education volume, making it the bleakest of the five. The text included a good deal of graphic and frightening detail of threats presented by the atomic age and the tensions of the Cold War, underscoring the urgency of the situation and driving home the message that the future of one's family, community, nation, and world depended on one's literacy in atomic science. Clearly, in the view of the Committee of Atomic Energy Education, the parents of elementary-age students, rather than the schools, were obligated to convey and mitigate the dark side of the Cold War to their young children as they saw fit.

Immediately after the Department of Public Instruction published *The Iowa Plan*, many Iowa educators considered it compelling and adopted it. *The Iowa Plan* became the first comprehensive atomic energy education plan in the United States, and that made it noteworthy. Throughout the nation, other teachers and schools taught the subject of atomic energy, but adopted curricula on an individual or district-wide basis. During the 1945–46 academic year, Oak Ridge High School in Oak Ridge, Tennessee, introduced a curriculum that considered the scientific, social, and political implications of atomic science and called for the creation of a “world government” to control it.⁸⁴ *The Iowa Plan* itself included an appendix in volume two—“Elementary Schools Where Atomic Energy Has Been Taught”—which reported on eight programs in six states: Illinois, Massachusetts, New Hampshire, New York, Rhode Island, and Virginia.⁸⁵ George L. Glasheen, the closing speaker at Cornell College's Atomic Energy Day, and later the AEC's chief of educational services, compiled a much more extensive list of atomic energy education initiatives throughout the country for a 1953 special edition of *School Life*, a publication of the U.S. Department of Health, Education, and Welfare's Office of Education. He reported on a wealth of reference materials, traveling exhibits, and classroom audio-visual resources that the recently

84. Hartman, *Education and the Cold War*, 137.

85. *The Iowa Plan*, 2:70–73.

formed Atomic Energy Commission made available. Nonetheless, reflecting on the traditional value of local control over education, he asserted that "it is the job of the schools to mold these [AEC] source materials into teaching materials. This the schools are doing with satisfying results." Among his list of programs, he found *The Iowa Plan* particularly noteworthy for its important *comprehensive* contribution.⁸⁶

Nationally, atomic science education became widespread in the 1950s. In the late 1940s and early 1950s national laboratories partnered with universities, school districts, and even museums to educate teachers on atomic science. To serve this growing community of educators, private companies, including GE, McGraw-Hill, Encyclopedia Britannica, MGM, and Disney, individually and in partnership with the AEC and the U.S. Department of Education, developed curricular materials.⁸⁷

As teachers were trained and more classroom materials became available, atomic science education became more commonplace and mainstreamed into traditional classroom curricula. That probably diminished the impact of *The Iowa Plan* during the latter half of the 1950s. Nevertheless, during the early Cold War period, several features made it a program worthy of recognition. The membership of the Iowa Committee of Atomic Energy Education reflected all sectors of the state's educational community and together constituted a particularly diverse group that contributed breadth to the program. Furthermore, there is no indication that any individual or institution dictated content or format to any of the subcommittees; the evidence suggests that each developed its content independently, reflecting the priorities that the committee-at-large agreed on. Moreover, *The Iowa Plan's* presentation as a statewide program targeting elementary, secondary, college, and adult education venues defined it as uniquely comprehensive. Their differences reflect mid-century assumptions about the objectives of education for different age groups.

86. George L. Glasheen, "What Schools Are Doing in Atomic Energy Education," *School Life* 35 (Sept. 1953), 159, 154.

87. Weart, *Nuclear Fear*, 169; Scheibach, *Atomic Narratives*, 50-71. Although Scheibach's compilation of local initiatives and school materials is extremely extensive, he does not reference *The Iowa Plan*.

The Iowa Plan's messages provide important opportunities to view the complexity of Cold War culture. The plan mitigated the profound fear of the bomb by teaching the power of knowledge and the importance of civil defense preparedness. Many scholars have stressed that the importance of "duck and cover" programs overshadowed other aspects of atomic science education as the Cold War intensified in the 1950s, but that is not evident in *The Iowa Plan*. Rather, it argued that international control over the world's atomic arsenal would provide effective protection against the United States' Cold War nemesis, the Soviet Union. Although the most influential U.S. policymakers rejected the Baruch Plan, it remained central to each of the volumes of *The Iowa Plan*. Most importantly, *The Iowa Plan* rested on the foundation that all people had a responsibility to be educated in the potential benefits of atomic science and its political, social, and ethical implications. In that regard, it presented the most comprehensive curricula on atomic energy education in the nation.