

Curriculum Unit Introduction

Title of Unit: The Secret City

Vital theme of the unit: The living conditions of Oak Ridge Residents during W.W. II

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Grade level: Five

Number of lessons in the unit: 3 **Time needed to complete unit:** 3-4 days

Curriculum standards addressed: (see lessons below)

Technology used: United Streaming (on-line educational resource with video clips)

Unit introduction and Overview of Instructional Plan: After being introduced to the importance of Oak Ridge during World War II in Social Studies, students will examine the lives of residents who lived in the city through Language Arts activities. In particular, students will participate in activities that reinforce the tight security and immense over crowding of Oak Ridge during the war. By the end of the unit, students will take a quiz, which will cover concepts covered in Language Arts and a Social Studies test, which will cover content knowledge of the unit discussed in Social Studies and Language Arts. By this point, students should understand not only how residents lived in Oak Ridge during World War II, but also what an impact Oak Ridge had on the war. This unit should last approximately three days in Language Arts.

The Secret Life of Oak Ridge

(A Document Reader)

By: Jason Mysinger

North Middle School

August 14, 2005

Prepared for: The East Tennessee Historical Society

The Secret Life of Oak Ridge

In the fall of 1942, 59,000 acres west of Knoxville were acquired by the federal government to begin a secret city that would help create an early end to the war. This city, termed “The Manhattan Project,” was eventually named “Oak Ridge.” The thousands of employees shipped into this city would experience an environment like no other. Viewed as just another army camp by visiting military personnel, Lieutenant Colonel Thomas Crenshaw stated that “the government has built a village.”¹ People living in this village during World War II experienced high security, immense over-crowding, and a government-imposed sense of normality.

On August 6, 1945, The *New York Times* ran an article, “Atom Bombs Made in 3 Hidden ‘Cities’”. The article revealed the purpose of Oak Ridge as well as two other secret cities after the first atomic bomb was dropped on Hiroshima.² Until this time, only a small handful of high-ranking government officials knew about the purpose of Oak Ridge. In a letter to Dr. Robert Oppenheimer, head scientist over the Manhattan project, President Franklin Roosevelt stated, “I have therefore given directions that every precaution be taken to insure the security of your project.”³ Because of the tight security within the secret city, accessing valid information about the project was nearly impossible. According to Charles Johnson and Charles Jackson, authors of *City Behind a Fence*, the Army had three tasks to ensure secrecy: restriction of physical access to the reservation, elimination of all potential threats to ensure “smooth operation,” and compartmentalization of jobs to ensure that employees did not know the ultimate goal of the project.¹

¹ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 38, 137.

² Jay Walz, “Atom Bombs Made in 3 Hidden ‘Cities’” *New York Times*, 6 August 1945, 1.

³ Letter, Franklin D. Roosevelt to J. Robert Oppenheimer, 29 June 1943, in possession of J. Robert Oppenheimer Papers.

The first task was, comparatively, easy; fencing was placed at multiple points around the city and seven gates were built for access into Oak Ridge. A picture of Elza gate, which was a main thorough-fair for civilian traffic, depicts what a typical gate looked like. The second task, elimination of all potential threats, was successful thanks to a ratio of 14 police per 1,000 residents in Oak Ridge. This figure compares with the average 1.6 per 1,000 in other southern cities of similar size. By the beginning of 1945, 4,900 civilian guards, 740 military policemen, and over 400 civilian policemen patrolled the city.⁴ Most disruptions consisted of public drunkenness as bootleggers infiltrated the dry city.⁵ The final task of the military in ensuring secrecy (hiding information about the purpose and activities of Oak Ridge) was handled by compartmentalizing jobs. According to a *New York Times* article, “Work was so compartmentalized that each worker knew only his own job, and had no inkling of how his part fitted into the whole”.⁶ All employees had to wear I.D. tags, which dictated what areas they could enter. Moreover, only the President and a handful of generals and engineers knew the ultimate goal of the Manhattan Project. In these three ways, the inhabitants of Oak Ridge lived under high security.

Though a constant watch by the military may have seemed inconvenient enough, the sheer number of people packed into Oak Ridge was extraordinary. Though originally planned to accommodate 13,000 residents in 1943, that number peaked at 75,000 by 1945. The most serious problem that faced the Army in Oak Ridge was the housing shortage: the supply for housing never met the demand. The original plan for the town site was to build 3,000 cemesto single and multi-homes plus a small supply of family apartments. By the fall of 1944, however,

⁴ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 137, 228.

⁵ Russell B. Olwell, *At Work in the Atomic City*. (Knoxville: The University of Tennessee Press, 2004), 45.

⁶ “Text of Statements by Truman, Stimson on Development of Atomic Bomb,” *New York Times*, 7 August 1945, 4.

contractors had to increase this number to approximately 6,000 units. While the top-level engineers and high-ranking officers had the luxury of staying in cement houses, most working-class citizens stayed in trailers, pre-fabricated houses, or extremely small hutments.⁷ Pictures of these structures depict just how crowded the town was during this period.⁸ As the city grew, trailers, pre-fabricated houses, and hutments began to dot the landscape in a hap-hazard fashion. As one resident described the scene in a letter to her mother, "...to live here permanently might be depressing—trailers, prefabricated houses, dormitories, barracks".⁹

In addition to a short supply of housing, Oak Ridge residents became quite accustomed to waiting in long lines. Pictures of residents waiting in line to purchase cigarettes and groceries at an A & P store exhibit a typical scene during this time. As residents began streaming into the community in 1943, only nine commercial enterprises were available; by 1945, this number increased to 165.¹⁰ Numerous times, the storekeeper ran out of the merchandise a customer waiting in line might be waiting for. During the war, the understood rule was: if you see a line, get in it.¹¹

Although the town of Oak Ridge may have appeared like just another army camp during World War II, this was not the intent of the government. According to the authors of *City Behind a Fence*, "What Corps officials did have in mind was for Oak Ridge to approximate a typical American small town as much as possible, within the constraints of security".¹² One step

⁷ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 25, 28, 77.

⁸ Sam Yates, ed., *Through the Lens of Ed Westcott: A Photographic History of World War II's Secret City*. (Knoxville: The University of Tennessee Graphic Arts Services), 9, 44, 64.

⁹ Letter, Frances Carroll to Lena Carroll, 16 July 1945, in possession of The Frances Carroll Collection.

¹⁰ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 35

¹¹ Jennie Ivey, W. Calvin Dickinson, and Lisa W. Rand, *Tennessee Tales the Textbooks Don't Tell*. (Johnson City: The Overmountain Press, 2002), 165.

¹² Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 35.

toward this goal was to make the layout of the city attractive. Numerous dwellings constructed before the government bought the land were demolished due to their unsightly appearance. In addition, the initial plan to designate buildings and streets by numbers and letters was scrapped. Towncenter no. 1 became “Jackson Square,” Route 61 became the “Oak Ridge Turnpike” and so forth. Originally named “Clinton Engineer Works,” the city, too, was named “Oak Ridge” in the summer of 1943.¹³ Ironically, many parts of the city ended up looking like slums due to the immense overcrowding as discussed previously.

Another effort at normality transferred governance of the community from the Army to civilians. Military officials viewed civilian control as more acceptable to residents than direction from the Army. By instating a civilian controlled community, the military could maintain a much lower profile in community life. Moreover, this civilian presence could act as a “lightning rod to absorb community discontent” thereby minimizing direct confrontation between residents and the Army. The Turner Construction Company of New York City, later named the Roane-Anderson Company, was given the duty of governing the town site. Responding to grievances from residents, the company repeatedly assured them “an effort will be made”.¹⁴

In conclusion, the tight security and overcrowding of Oak Ridge during World War II could easily cause others to view the community as a typical army camp. The lives of Oak Ridge residents were under constant surveillance inside this secret city. Through the visage of a civilian controlled government, the Army was able to keep tight control of the community from a distance. Certainly, the government was successful in creating such a community, not only from a military perspective in making an atomic bomb, but also from a community perspective in that

¹³ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 36.

¹⁴ Charles W. Johnson and Charles O. Jackson, *City Behind a Fence*. (Knoxville: The University of Tennessee Press, 1981), 66, 97.

Oak Ridge is still a thriving city even today. Indeed, the city of Oak Ridge was a unique community, one that will hopefully forever be remembered.

Annotated Bibliography

Carroll, Frances to Lean Carroll, 16 July 1945. Letter in possession of The Frances Carroll Collection (available on-line at www.childrenofthemanhattanproject.org).

Frances Carroll writes to her mother describing her living conditions after recently moving to Oak Ridge in the summer of 1945. The letter provides some details about life in Oak Ridge during World War II.

Ivey, Jennie, W. Calvin Dickinson, and Lisa W. Rand. *Tennessee Tales the Textbooks Don't Tell*. Johnson City: The Overmountain Press.

The authors of this book provide detailed information about the lives of residents during the war. Quotes from residents are included and cited at the end of the chapter.

Johnson, Charles, and Charles Jackson. *City Behind a Fence*. Knoxville: University of Tennessee Press, 1981.

Johnson and Jackson provide a history of Oak Ridge from its conception in 1943 until 1947. Using previously classified material and oral interviews from residents, the authors describe living and working conditions within the "secret city."

Kaempffert, Waldemar, "The Story Behind the Atomic Bomb," *New York Times*, 12 August 1945, E4.

In this historical newspaper article, Kaempffert reveals the history of the atomic bomb from its birth in Germany to the first test and predictions for the future of the bomb. The article exemplifies the tight government secrecy behind the making of the atomic bomb as well as the public's opinion of such energy.

Olwell, Russell B. *At Work in the Atomic City*. Knoxville: University of Tennessee Press, 2004.

Dr. Olwell gives an in-depth description of a worker's life in Oak Ridge during the war. Although the book describes the positive aspects of life in Oak Ridge, it also portrays a darker picture of the dangers and problems faced by residents in this community.

Roosevelt, Franklin D. to J. Robert Oppenheimer, 29 June 1943. Letter in possession of J. Robert Oppenheimer Papers.

In his letter to Dr. Robert Oppenheimer, President Franklin Roosevelt emphasizes the importance of ensuring secrecy regarding the Manhattan Project.

“Text of Statements by Truman, Stimson on Development of Atomic Bomb,” *New York Times*, 6 August 1945, 4.

Printed two days after the first atomic bomb was detonated over Hiroshima, this article discloses the secret cities involved in the Manhattan Project, including Oak Ridge. The article also provides a statement by Secretary of War, Henry L. Stimson.

“Twilight Over Oak Ridge,” *New York Times*, 16 December 1945, S8.

This article unveils Oak Ridge as a new source of anxiety. Though the site indirectly helped end the war early, it also meant the dawn of a new atomic age. Fears of actions by Russia foretell the beginnings of the Cold War.

Walz, Jay, “Atom Bombs Made in 3 Hidden ‘Cities’,” *New York Times*, 7 August 1945, 1.

Printed one day after the first atomic bomb was detonated, Walz provides information about the Manhattan Project as it was revealed by The War Department. A detailed description of the construction of Oak Ridge is also given.

Yates, Sam, ed., *Through the Lens of Ed Westcott: a Photographic History of World War II's Secret City*. Knoxville: The University of Tennessee Graphic Arts Services, 2005.

Pictures by Ed Westcott, primary photographer of Oak Ridge during World War II, provide an excellent description of the people and places living in the secret city.

Lesson Plan Outline

Day 1

Unit: The Secret City

Lesson Title: Four types of sentences in World War II billboards

Grade Level: 5

Essential Question related to Vital Theme: What is the difference between a declarative, imperative, interrogative, and exclamatory sentence?

Lesson Time: one class period (forty-five to fifty minutes) *(note: Prior to this lesson, the teacher should expose students to the four types of sentences. This lesson provides a good review of the four types.)*

Curriculum Standards—list:

- ✓ 5.3.04- Demonstrate knowledge of correct sentence structure.
- ✓ 5.09 Understand America's role during World War II.

Technology used and how: Brain Pop (on-line site used as an introduction or review to material covered in academic classes)

Materials: 1) six to seven pictures of billboards in Oak Ridge during W.W. II (provided in the Primary Sources section of this reader); pictures should be placed in different areas of the room. 2) United Streaming 3) paper and pencils

Activity description(s) and overview of instructional strategies:

-Set: The teacher will briefly review the four types of sentences with students. Then, the teacher will review the high security of Oak Ridge during World War II as it was presented during Social Studies.

-Activity: Students will be placed in groups and asked to walk to a specific picture of a billboard photographed in Oak Ridge during World War II. At each picture, student groups will copy the sentences on the billboard onto a piece of paper. Then, students must decide what type of sentence(s) is included in the billboard. After two to three minutes, the teacher will tell student groups to move to a different picture. During this time, the teacher will walk around to supervise and ensure that students are correctly identifying the sentences.

-Review: After students are finished visiting every picture, the teacher will discuss each picture to check the accuracy of student responses. The teacher will also ask students about the importance of these billboards to the operation of the secret city.

Supporting Assignments/Homework:

Assessment:

-Practice/homework: Students will draw four billboards that depict those in Oak Ridge during the war. Each billboard must have one of the four types of sentences and convey the high security of Oak Ridge. In addition, students must write which type of sentence is used beside each billboard.

-Assessment: The homework will be graded based on the accuracy of student answers regarding the type of sentence. In addition, billboards must reflect the high security administered in Oak Ridge during the war.

Days 2-3

Unit: The Secret City

Lesson Title: Identifying complete and compound sentences in historical newspapers

Grade Level: 5

Essential Question related to Vital Theme: What are complete sentences? What are compound sentences?

Lesson Time: two to three fifty-minute class periods

Curriculum Standards—list:

- ✓ 5.3.04- Demonstrate knowledge of correct sentence structure.
- ✓ 5.3.02- Demonstrate knowledge of standard English mechanics.
- ✓ 5.09 Understand America's role during World War II.
- ✓ 5.2.11- Write in a variety of modes and genres.
- ✓ 5.2.06- Experience numerous publishing opportunities.
- ✓ 5.1.12- Experience various literary and media genres.

Technology used and how: students computers used to type articles

Materials: 1) newspapers discussing Oak Ridge after the first atomic bomb was detonated over Hiroshima, 2)computers, 3)paper and pencils

Activity description(s) and overview of instructional strategies:

- Set: The teacher will explain each type of sentence and give examples on the board.
- Activity: Students will get into groups of two or three. Each group will receive a copy of a New York Times newspaper (included in the “Primary Sources” section) printed directly after the first atomic bomb was dropped on Hiroshima. Each group will be given ten to fifteen minutes to find and copy four to five complete sentences and four to five compound sentences from the newspaper.
- Review: After the designated time, the teacher will ask for examples from each type of sentence.

Supporting Assignments/Homework:

Assessment:

- Practice/homework: Student groups will pretend they are newspaper writers in August of 1945. They will write a brief article about the detonation of the atomic bomb over Hiroshima. The article must reference Oak Ridge. The article must have complete sentences and at least two to three compound sentences, properly identified. If time allows, the teacher can take students to the computer lab to type their articles and add pictures. Students can also name their newspaper.

-Assessment: Articles will be graded based on the use of complete sentences and the predetermined number of compound sentences. Articles that do not reference Oak Ridge will not be given full credit.

Primary Source Documents

Page 1 of 1

THE WHITE HOUSE
WASHINGTON

June 27, 1943

Secret

My dear Dr. Oppenheimer:

I have recently reviewed with Dr. Bush the highly important and secret program of research, development and manufacture with which you are familiar. I was very glad to hear of the excellent work which is being done in a number of places in this country under the immediate supervision of General L. R. Groves and the general direction of the Committee of which Dr. Bush is Chairman. The successful solution of the problem is of the utmost importance to the national safety, and I am confident that the work will be completed in as short a time as possible as the result of the wholehearted cooperation of all concerned.

I am writing to you as the leader of one group which is to play a vital role in the months ahead. I know that you and your colleagues are working on a hazardous matter under unusual circumstances. The fact that the outcome of your labors is of such great significance to the nation requires that this program be even more drastically guarded than other highly secret war developments. I have therefore given directions that every precaution be taken to insure the security of your project and feel sure that those in charge will see that these orders are carried out. You are fully aware of the reasons why your own endeavors and those of your associates must be circumscribed by very special restrictions. Nevertheless, I wish you would express to the scientists assembled with you my deep appreciation of their willingness to undertake the tasks which lie before them in spite of the dangers and the personal sacrifices. I am sure we can rely on their continued wholehearted and unselfish labors. Whatever the enemy may be planning, American science will be equal to the challenge. With this thought in mind, I send this note of confidence and appreciation.

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ATOM BOMBS MADE IN 3 HIDDEN 'CITIES'

By JAY WALZ Special to THE NEW YORK TIMES. The New York Times (U.S. Army) The N...
New York Times (1857-Current file): Aug 7, 1945; ProQuest Historical Newspapers The New York Times (1851 - 2001)
pg. 1

ATOM BOMBS MADE IN 3 HIDDEN 'CITIES'

Secrecy on Weapon So Great
That Not Even Workers
Knew of Their Product

By **JAY WALZ**

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 6 — The War Department revealed today how three "hidden cities" with a total population of 100,000 inhabitants sprang into being as a result of the \$2,000,000,000 atomic bomb project, how they did their work without knowing what it was all about, and how they kept the biggest secret of the war.

One of these, Oak Ridge, situated where only oak and pine trees had dotted small farms before, is today the fifth largest city in Tennessee. Its population of 75,000 persons has thirteen supermarkets, nine drug stores and seven theatres.

A second town of 7,000 was built for reasons of isolation and security on a New Mexico mesa. The third, named Richland Village, houses 17,000 men, women and children on remote banks of the Columbia River in the State of Washington.

None of the people, who came to these developments from homes all the way from Maine to California, had the slightest idea of what they were making in the gigantic Gov-

Continued on Page 3, Column 2

district engineer of the Manhattan project in Tennessee.
The New York Times (U. S. Army)

ATOM BOMB BUILT IN 3 HIDDEN 'CITIES'

Continued From Page 1

ernment plants they saw all around them.
Oak Ridge, the most remarkable of the towns and heart of the entire project, was operated under the camouflaged name of Manhattan Engineer District, a title selected by Maj. Gen. Leslie L. Groves, director of the war project. Only engineers and Army officers knew what the "District" was doing and fewer still realized the full implications.

The manager of one plant, for example, was kept completely isolated from other plants where different processes and methods were used. Work was so compartmentalized that each worker knew only his own job, and had no inkling of how his part fitted into the whole. Some of the men, it was told, were actually producing anything. They were being used as a means of social going into the plants, but nothing came out. "This created an atmosphere of unreality," said a War Department statement, "in which giant plants operated feverishly day and night to produce nothing that could be seen or touched."

Oak Ridge is the residential center for the workers in one division of the Manhattan Engineer District, known as the Clinton Engineer Works, which covers a 59,000-acre Government Reservation near Government Ridge itself spreads modest 10,000 family units, has dormitories for 13,000 residents, 5,000 trailers and huts and barracks for more than 16,000 other inhabitants.

1,000 Houses Built a Month

The site, acquired in the autumn of 1942, was chosen for its nearness to power and water—it is in the heart of the TVA country and for its remoteness from the coast. The first houses were completed there on July 3, 1943, and the first house, Government-built and owned, was occupied three weeks later. At the height of its construction period, 1,000 houses were built a month.

Simultaneously with the roads

mands the Hanford Engineer Works near Pasco, Wash.
The New York Times (U. S. Army)



carloads of material, placed 760,000 carloads of concrete, and built 345 miles of road.
The entire working area is subdivided into three huge areas, and each of these in turn is again subdivided into sections covering miles of ground. One of the main areas contains three enormous structures where material is produced. The second contains three huge chemical plants where material is purified and concentrated and the third prepares raw materials.

In addition to the 17,000 persons housed and accommodated at the site, hundreds of workers live at Ziaford, eight miles away.

Entire New Town Built

The decision to locate the laboratory for the atomic bomb project on a mesa an hour's drive from Santa Fe because of the site's isolated location resulted in the construction by Army engineers of an entirely new town.

The Los Alamos boys' school, located there, was taken over, and the Army began immediately to build 37 buildings in the school area, and 200 others in scattered locations. Three hundred other buildings contain 620 family units, and military barracks, hospital buildings and structures for administrative offices were added.

The War Department today described life there as not unlike that of any other American community. A "town council" of eight elected members serves in an advisory capacity, meeting with representatives of the project and of the Army. Gerald B. Flett, head of the Army Post Office, oversees the operation of an accredited elementary school and a high school. There is even a nursery school for the benefit of housewives who work on the project.

While the community is isolated,

and streets, sewers and waterworks farmers, who were on the land went the building of schools, a warehouse, a bank, a post office, a library, a theatre, a hospital, a dental clinic, recreation centers of them took jobs on the site. The Hanford Engineer Works, which was constructed by the E. I. du Pont de Nemours & Co., to process raw materials for the atomic bombs, was located in the southeastern portion of the State, lying between the Columbia and the Snake rivers. Lying between the town Washington, the Columbia and the Snake rivers, the town of Richland, a low-rate insurance River, it occupies a rolling table land containing for the most part an uninhabited region of gray, sagebrush and dried water worship for seventeen years.

The nearest community of any size is Yakima, some forty miles west, which has a normal population of 30,000.

For the project the Government bought, or leased, 600 square miles of land, and in developing the facilities excavated 25,000,000 cubic yards of earth, hauled in 40,000

there is plenty of opportunity for recreation and entertainment. Among the facilities is a nine-hole golf course, built by volunteer labor.

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TWILIGHT OVER OAK RIDGE

New York Times (1857-Current file); Dec 16, 1945; ProQuest Historical Newspapers The New York Times (1851 - 200 pg. 58

sibly worth so much less that the two billion and more dollars spent on the atomic bomb are small change? Is it worth hundreds of billions of dollars less, millions of lives less? The answer must depend on how we adjust relationships between the centuries that are here in juxtaposition and in conflict. A log cabin is not in itself an evil thing—it is picturesque, it may even be comfortable, in this open country it is better than a dark hole in a city slum, it is sweeter to live in a log cabin in a world at peace than in a palace in a world menaced by the atom bomb. But how about log-cabin thinking, not just across the road from a plutonium plant but under the roof of the plutonium plant, and in the legislatures and executive departments of governments controlling plutonium plants?

Log-cabin thinking a century ago could do comparatively little harm. What if those who lived beyond the ridges were unfriendly? One never saw them. One kept one's place, raised corn and potatoes, caught fish, hunted deer, cut firewood. But the split atom and its allied instruments have abolished ridges, plains and oceans. Happy Valley, remote and placid, sheltered from the winds that sweep the earth, struck the blow that wiped out Hiroshima. The son of the pioneer bestrides the world, and from where he stands can kill deer—and people, and cities, and hope—on any continent, on any island.

Happy Valley can be a beautiful symbol or an evil and mocking one. It can represent civilization flowing in and redeeming hungry areas. And it can represent death. This alternative is basic in any honest thinking as to what is to come. Goodness and mercy, justice and freedom are still possible. But first the old prejudices, the old fears, the old jealousies, the old isolationism, yes, and the old unabated sovereignty of nations, must perish. It is twilight over Oak Ridge, over Happy Valley, while we make bombs there. The hurrying hours and days must soon decide whether it is the twilight of sunset or the twilight of dawn.

TWILIGHT OVER OAK RIDGE

In Moscow, Secretary Byrnes is meeting with Foreign Commissar Molotov and Foreign Secretary Bevin to discuss future relationships between Russia, Britain and the United States—and thereby, inescapably, the imme-

diate future of mankind. On the agenda is the question of Russia's attitude toward the proposed UNO commission for the control of the atomic bomb. It hardly needs to be written down. At every meeting, regardless of what else is talked about, the bomb will be almost visibly on the table. Like Banquo's ghost, it cannot be excluded.

While these talks are going on time does not stand still. The clocks tick and the hours strike at those vast and sinister factories which a little over two years ago began to take shape in Eastern Tennessee. The public knows the site of those factories as Oak Ridge, but the pioneers long ago named a section of its 59,000 acres Happy Valley. Happy Valley did not go out of business when Japan surrendered. As Prof. Harold Urey testified before the McMahon committee, "We are making bombs and storing them." With every day that passes the destructive powers of the United States increase. With every day that passes the need becomes more clear for placing the atomic bomb under some form of international control which can be counted upon to work.

Oak Ridge is out of bounds for most of the American people. The plants are closed to all but a trusted and chosen few. Men and women working there do not fully know what they do. Whether or not this policy of secrecy has been carried too far, whether there is, in fact, any secret, the layman cannot know. We are in the hands of the experts and let us hope also in the hands of the wise. But every American who is concerned about the future of his country, and the future of civilization, should visit Oak Ridge in spirit and should think about the implications of what is going on there.

What a visitor actually sees that is new and raw upon the eroded landscape is a sprawling city built to accommodate 75,000 people and now inhabited by a little more than half as many; removed from the center of this city by four to fifteen miles he sees mighty structures, one with walls three miles long and enclosing 600 acres, others closely grouped over 500 acres, still others smaller and scattered but none the less lethal, a single steam-power plant that is the equal of two Norris dams, TVA electric lines marching over the hills with strength enough to run a big city; and here and there, under the ragged autumnal tree horizons of the ridges, on ruined lands grown up to sedge, in little communities where not long ago TVA was

organizing demonstration farms to rebuild soil and human life, he sees the cabins and houses of the pre-atomic settlers and the graves of the pre-atomic dead. This is a new kind of farming and a new crop.

The people have not changed, except as they have learned new skills and come closer to motion-picture theatres, modern schools, modern stores, a modern hospital. Most of them come from stock that has lived long in these hills. A few years back, through no fault of their own, they were existing on their worn-out land under conditions not too different from those of a century gone by. Now, by a stupendous leap, they have been projected into the twenty-first century. On one side of a certain highway there are tall stacks to dissipate the radio-active fumes from one process of atom splitting. On the other side is a plain log cabin, chinked with clay and whitewashed—and lived in less than three years ago. The centuries jostle each other. A visitor may well wonder if the splitting of atoms in Happy Valley has done humanity as much good as the older-fashioned art of splitting logs.

The land was worth \$40 an acre when the Government took it over. What is it worth now—more or less? Is it pos-

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tremendous industrial and financial resources necessary for the project and they could be devoted to it without undue impairment of the national economy. The United States the laboratory work and the production plants, on which a substantial start had already been made, would be out of the hands of the enemy at the time Britain was exposed to constant air attack and was still threatened with the possibility of invasion.

Mr. Churchill and President Roosevelt agreed that it was wise to carry on the project here. We have two great plants and we have the greatest scientific and industrial production of atomic power. Employment during peak construction numbered 120,000, and over 100,000 are even now engaged in carrying it out. Many have worked there for two and a half years. Few know what they have been producing. They are going in and they see nothing coming out of these plants, for the physical size of the explosive charge is exceedingly small. We have the greatest scientific gamble in history—and won.

Scientific Triumph Landed

But the greatest gamble is not the size of the enterprise, the achievement of scientific brains in putting together infinitely complex machines into a workable plan. And hardly less marvelous has been the sign, and methods to do things never done before so that the atomic bomb could be produced in large quantities and performed as it was supposed to do.

Science and industry worked under the direction of the United States Army, which achieved a unique success in managing so diverse a problem in the laboratory. Despite the fact that it is amazingly short of time, it is doubtful if such another combination could be got together in the world. What has been done is the greatest scientific achievement in organized science in history. It was done under high pressure and without failure.

It was to be expected to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in the Pacific. It was to be their docks, their factories, and their communications. Let there be no mistake; we shall completely destroy Japan's power to make war. It was to spare the Japanese

the United States, thus insuring the safety of the continent and avoiding duplication. As a member of British scientists who had been working on this problem since 1933, and they have from that time participated in the development of the project in the United States.

All-Out Decision in 1941

In 1939 the possibility of using atomic energy for military purposes was brought to the attention of President Roosevelt. He appointed a committee to survey the problem. Research which had been conducted on a small scale on a full-scale basis as a result of the recommendations of various scientific committees. At the end of 1941 the decision was made to put the project on a full-scale basis. Under the direction of a group of eminent American scientists in the Office of Scientific Research and Development, the United States in operation being placed under contract with the OSRD.

Dr. Vannevar Bush, director of OSRD, is the chief scientific administrator. He has appointed a major development committee. Meanwhile, President Roosevelt appointed a general policy group, which consisted of Dr. Bush, Dr. Wallace, Secretary of War Henry L. Stimson, Gen. George C. Marshall, Dr. James B. Conant and Dr. J. Robert Oppenheimer.

In June, 1942, this group recommended a great expansion of the work and the transfer to the War Department of the program to the War Relocation Authority. Recommendations were approved by President Roosevelt and put into effect. The War Relocation Authority was appointed by the Secretary of War to take complete executive charge of the program and was made responsible to him.

In order to secure continuing consideration to the military aspects of the program, the President appointed a military policy committee consisting of Dr. Bush as chairman, with Dr. Conant as a member, and Dr. Vannevar Bush, Dr. D. Sizer, and Rear Admiral

items involved in putting the bomb in located in an isolated area in the vicinity of Santa Fe, N. M. This laboratory has been equipped with the latest scientific apparatus by Dr. Robert Oppenheimer.

The development of the bomb itself has been largely due to the genius and the inspiration and the leadership of Dr. Oppenheimer. Certain other manufacturing plants much smaller in scale are located in the United States in Chicago, and California.

tion of needed materials. Laboratories at the Universities of Columbia, Chicago, and California, as well as certain industrial laboratories, have contributed materially in carrying on research and in developing processes for the project. A laboratory has been established in Canada and a pilot plant for the production of plutonium is being built. This work is being carried on by the Canadian Government with assistance from, and appropriate liaison with, the United States and the United Kingdom.

Some Helpers Are Named

While space does not permit of a complete listing of the individuals who have contributed to the success of the project, mention should be made of a few. The duties of the various committees are assigned and conducted through the War Relocation Authority and operate them.

A special subsidiary of the War Relocation Authority, the United States Field Marshal Sir John Dill and Col. J. J. Lewell, M. C. in the United Kingdom, and M. C. in the United States. Colonel Llewellyn was replaced by

Congress have been most cooperative. The War Relocation Authority has the state security department that military security may be enriched when peace comes, but the overriding necessities of war have precluded the publication of this new knowledge. With the evidence presently at hand, however, it appears inevitable that military contributions to the well-being of mankind will ultimately flow from these discoveries when the time for action makes it possible for atomic energy can now be released on a large scale.

The fact that atomic energy can now be released on a large scale is a question of the prospect of using this energy for peaceful industrial purposes. Already in the course of developing one of the elements much more rapidly than in regulated amounts. This energy, however, is in the form of heat at a temperature too low to make prac-

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THE STORY BEHIND THE ATOMIC BOMB

By WALDEMAR KAEMPFERT
New York Times (1857-Current file); Aug 12, 1945; ProQuest Historical Newspapers The New York Times (1851 - 2001)
pg. E4

THE STORY BEHIND THE ATOMIC BOMB

BY WALDEMAR KAEMPFERT

Under the pressure of war the most powerful destructive weapon ever invented has been given to man for better or for worse. In three years organized science reached a goal for which even the romantic utopians allowed at least half a century. How was it done? The answer is partly given in scientific literature and in the disclosures of official reports so that it is possible to piece together a story without a parallel in the history of science.

First of all, a material had to be selected which would take the place of the highest of high explosives. Secretary Stimson casually mentions "uranium ore."

Germans Were First

The hint takes us back to 1939. In that year Dr. Otto Hahn, E. Strassmann and Lise Meitner, all German subjects, electrified the world with the announcement that they had succeeded in breaking up the uranium atom and in the process released a staggering amount of energy—the first time that more atom than was put into it for the purpose of disruption.

Every military power took notice of what had been done by the German group. What Secretary Stimson calls "the battle of laboratories" began in 1940 and, hence, before the assault on Pearl Harbor. Germans, British and Americans were contestants. The winner of the scientific battle would win the war.

By 1941 actual research began in this country under the direction of the Office of Scientific Research and Development and in Great Britain under a corresponding body. In June, 1942, American work was transferred to the War Department with Maj. Gen. Leslie R. Groves as the directing officer. Henry A. Wallace, Secretary of War, Gen. George C. Marshall and Dr. James B. Conant and Vannevar Bush as counselors. In Great Britain there was a similar coordination of effort and supervision.

On Oct. 11, 1941, President

Vast Enterprise of Governments Found The Great Secret

ounds are intimately mixed with other isotopes. Naturally, the official account is silent on separation so that the best we can do is to indicate where the work was done or suggested before the war. A method was devised in 1938 by two Germans, Chusina and Dickel.

Role of the Neutron

But the uncharged neutron is different. It can slip through the electric defenses of a uranium atom, with one chance in 140 of hitting the nucleus. When that occurs the uranium splinters obtained are no longer splinters but barium and krypton, a rare gas in the atmosphere.

In other words, we have transmutation. Emission of energy and transmutation always occur together. The mass of the krypton and barium is less than that of the original uranium atom. The rest appears as energy—enormous energy. A neutron with an energy of only 200,000,000 volts.

It is plain that the bomb must contain bombarding mechanism. And this mechanism must slow down the neutrons. Fast neutrons are not effective. To produce such a slow neutron, the practice before the war was to bombard beryllium in a cyclotron. Thus activated the beryllium shot off neutrons some of which hit the uranium atoms. To slow the beryllium neutrons down hydrogen was used in the form of water, paraffin, cellophane or some other substance.

New Technical Additions

It is clearly a major technical performance to build into a bomb some way of making an appropriate element give up its neutrons. A cumbersome cyclotron that weighs tons cannot be packed into a bomb. We must assume that the

we have not been told. Consider- old haphazard method of research.

"HE MUST NEVER RISE AGAIN"



June 11 in The Minneapolis Star-Journal

research scientists devised a much simpler mechanism. Now that we have our bomb the obliterating of 90 per cent of the next step is to test it. Brig. Gen. Hiroshima at a single blow, a few Thomas F. Farrell has given us a thousand bombs are all that might vivid account of what happened at have been needed in reducing the southeast of Albuquerque, N. M., ruin.

The Future

What of the future? There is an official expression of awe, a realization that a weapon has been invented which cannot be placed in the hands of reckless Governments, a promise by Secretary Stimson that an international commission is to decide how and by whom the bomb may be used. But there is also the hope that some day the energy will be more generally available.

At M. M. has either a trick or a Niagara. "Already in the course of production two races in the re- ducing one of the elements much more control lower. A tremendous energy is being released not explosion of dust and debris rose in the steady but in regulated amounts." Secretary Stimson. This in shape of a ball and mushroomed says Secretary Stimson. This in effect later observed in Japan, adds that the energy, which mani- fests itself as heat, is "at a tem- perature too low to make prac- tical use of."

Secretary Stimson says that "in cable the operation of a conven- tional power plant." We may have their present form these bombs are now in production and even more to wait twenty, thirty, even fifty years before atomic energy com- mercially available. What the output may be with coal, if we rely on the we have not been told. Consider- old haphazard method of research.

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Roosevelt suggested to Clement Attlee (then a member of the Churchill Cabinet) that the two countries pool their knowledge and their efforts. Great Britain consented. Because we were safe from Hitler's bombers the foremost English physicists and some high staff officers came to this country. So it happened that the best scientific brains in two democracies concentrated on the atomic bomb.

Uranium 235 Chosen

First of all the group had to decide with what material the bomb should be loaded. Several forms of uranium were known. They are called "isotopes," meaning that they occupy the same place in the table of elements. Three are designated 234, 235 and 238, their atomic weights. At the top of the table of elements stands hydrogen, lightest of all, for which reason its weight is 1. Uranium 234, 235 and 238 are respectively 234, 235 and 238 times heavier than hydrogen.

Of these variants or isotopes of uranium it was known that only 235 could be used. In a ton of uranium ore there are only four-

teen pounds of 235, and these few miles. Here again a Government-owned town, Richland, had to be created for 17,000 workers and their families.

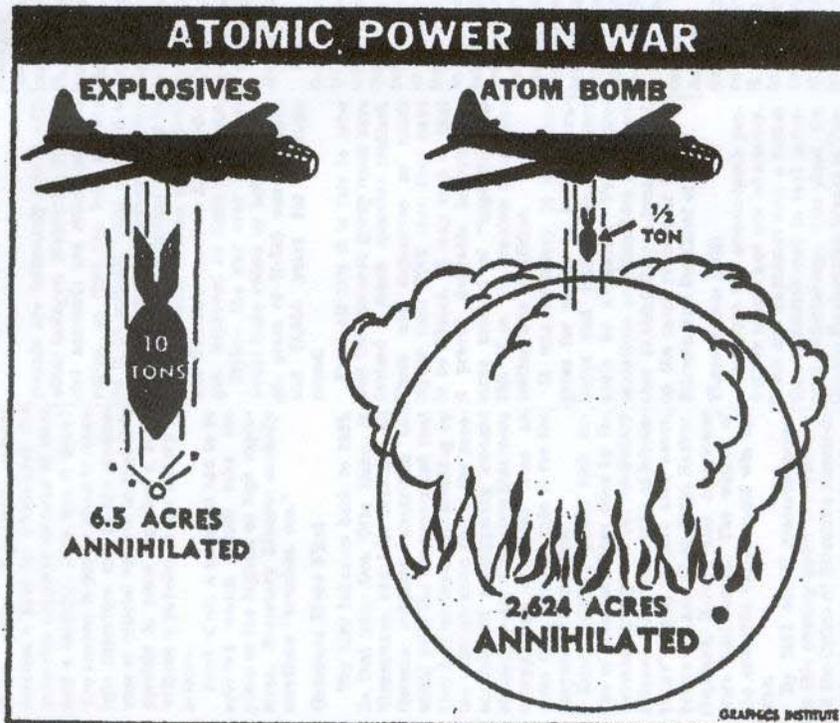
Lastly, there is a laboratory near Santa Fé, N. M., where Dr. J. Robert Oppenheimer is in charge, a man to whose "genius and leadership" Secretary Stimson pays tribute. What goes on there only a few in the Government know.

According to President Truman, over 125,000 were employed in the earlier and more feverish stages of the bomb's development—a great army mobilized to solve a scientific problem.

Nature of the Bomb

What of the bomb itself? This much is certain: it must contain not only uranium 235 in sufficient concentration but some means to split it and make it give up its energy in an explosion. The usual detonators will not do. There is nothing for it but to follow the

methods laid down before the war. When Drs. Hahn, Strassmann and Meitner bombarded uranium with neutrons they used the only suitable projectiles. Alpha par-

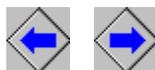


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The Frances Carroll Collection

Personal Letters - 8 of 24

http://www.childrenofthemanhattanproject.org/COLLECTIONS/LA-MDAV/Pages/MDAV_Gallery_1.htm [Back to Directory](#)



Fran to her Mother, Lena Carroll, July 16, 1945 Oak Ridge, TN

(On a working trip to Oakridge from NYC)

(from Dunmore Hall 118, Oakridge, Tennessee)

Dear Mother,

Are either of these “13” the ones to which you refer? I meant to write to Phyl immediately to see what she has but haven’t written to anyone since arriving here. We’re going through a dazing experience. Bobbie & I & three fellows were all the Co. could get to volunteer to come down here at first. They eventually rounded up several more To Meet A Great Emergency which we haven’t located yet. But Bobbie and I from the beginning have yearned to see this place. We are impressed.

It’s not been hotter than New York & the nights are extra cool. But all in all I do not think I would care to stay here longer than the scheduled month. There’s a haze of dust over the valley. The drinking water is heavily chlorinated. No butter, no dark bread, no chocolate ice cream. But you can get an excellent steak any night in the evening. All kinds of meat. On night shift, there’s practically nothing to eat. Bobbie and I held out for day shift, but the rest of the kids went patriotic & so we are all on rotating shifts—7 days on days, a day off, seven days graveyard, day off, & 7 swing shift & then 80 hours off. At that point we intend to take off for the Smokey Mountains.

Wish I could find the one man who declared a state of emergency & ask him if he feels a relaxation of the tension now that we’re here. You have to keep reminding yourself that they have accomplished all that’s been accomplished here so far—And that’s plenty. The GI’s want to know how we can complain since we’re going back to NY—we got round trip tickets, by the way. They stay. But its hard work—this hanging around. Every once in a while whilst contemplating a valve I am amazed that I am in the middle of

this Area in this building in the middle of Tennessee.

The trees and bushes that grow from the red dirt are green! There are people from every state in the union. The masses are southern. We are hardly able to understand some of them, their speech is so southern accented. A week ago Sat. we went on a moonlight ride on the Tennessee River; we've been swimming at Big Ridge, the Jones Beach of Oakridge. Haven't been to Norris Dam proper yet.

The main reason I didn't use the other half of my ticket immediately on discovering shift work is that Bill Allman's down here. He was shipped to this spot in the beginning of January. This is known as the sure cure—I'm considering applying for a job in the Philippines in the fall—You get your way paid to & from if you promise to stay a year. Only thing is it's civil service. And after the Navy Yard, I stated I would never again be a part of civil service.

On the one hand, Oakridge is like a never-ending carnival—dances on tennis courts, juke boxes in all the cafeterias, bus terminals broadcasting to the countryside, recreation halls in every section.

On the other hand to live here permanently might be depressing—trailers, prefabricated houses, dormitories, barracks.

I don't have the stamps with me but will send them tomorrow—absolutely.

Love, Fran