

DEVELOPMENT OF ATOMIC BOMB

DEVELOPMENT OF ATOMIC BOMB MARKED A PIVOTAL MOMENT IN HUMAN HISTORY, FUNDAMENTALLY ALTERING THE NATURE OF WARFARE AND INTERNATIONAL RELATIONS. THIS REVOLUTIONARY SCIENTIFIC AND MILITARY ACHIEVEMENT EMERGED DURING WORLD WAR II AS GLOBAL POWERS RACED TO HARNESS THE IMMENSE ENERGY RELEASED BY NUCLEAR FISSION. THE PROJECT COMBINED CUTTING-EDGE PHYSICS, ENGINEERING, AND UNPRECEDENTED GOVERNMENT COLLABORATION TO PRODUCE THE FIRST NUCLEAR WEAPONS. UNDERSTANDING THE HISTORICAL CONTEXT, SCIENTIFIC BREAKTHROUGHS, AND KEY FIGURES INVOLVED PROVIDES INSIGHT INTO HOW THE ATOMIC BOMB TRANSITIONED FROM THEORETICAL POSSIBILITY TO A DEVASTATING REALITY. THIS ARTICLE EXPLORES THE ORIGINS, TECHNOLOGICAL CHALLENGES, AND CONSEQUENCES OF THE DEVELOPMENT OF ATOMIC BOMB, DETAILING THE MULTIFACETED JOURNEY THAT SHAPED THE MODERN ATOMIC ERA.

- HISTORICAL BACKGROUND AND EARLY RESEARCH
- THE MANHATTAN PROJECT
- SCIENTIFIC PRINCIPLES BEHIND THE ATOMIC BOMB
- KEY FIGURES IN THE DEVELOPMENT
- TESTING AND DEPLOYMENT
- IMPACT AND LEGACY

HISTORICAL BACKGROUND AND EARLY RESEARCH

THE DEVELOPMENT OF ATOMIC BOMB HAS ROOTS THAT TRACE BACK TO THE DISCOVERY OF RADIOACTIVITY AND NUCLEAR FISSION IN THE EARLY 20TH CENTURY. INITIAL SCIENTIFIC CURIOSITY ABOUT ATOMIC STRUCTURE LAID THE GROUNDWORK FOR LATER PRACTICAL APPLICATIONS. THE DISCOVERY OF NUCLEAR FISSION IN 1938 BY OTTO HAHN AND FRITZ STRASSMANN, AND ITS EXPLANATION BY LISE MEITNER AND OTTO FRISCH, REVEALED THAT SPLITTING URANIUM ATOMS RELEASED ENORMOUS ENERGY. THIS BREAKTHROUGH SUGGESTED THE POSSIBILITY OF A POWERFUL NEW WEAPON, ESPECIALLY AS TENSIONS MOUNTED ACROSS EUROPE LEADING INTO WORLD WAR II.

SCIENTIFIC DISCOVERIES LEADING TO NUCLEAR FISSION

KEY SCIENTIFIC ADVANCEMENTS DURING THE 1930S PAVED THE WAY FOR THE ATOMIC BOMB'S DEVELOPMENT. RESEARCHERS UNCOVERED THE STRUCTURE OF THE ATOM, IDENTIFIED RADIOACTIVE DECAY, AND BEGAN EXPERIMENTING WITH CHAIN REACTIONS. THE DISCOVERY OF URANIUM'S ABILITY TO SUSTAIN A CHAIN REACTION WAS PARTICULARLY SIGNIFICANT, AS IT PROVIDED THE PHYSICAL BASIS FOR A SELF-SUSTAINING, EXPLOSIVE RELEASE OF ENERGY.

POLITICAL AND MILITARY CONTEXT

THE ONSET OF WORLD WAR II INTENSIFIED CONCERNS ABOUT NUCLEAR WEAPONS. REPORTS THAT NAZI GERMANY MIGHT BE PURSUING ATOMIC RESEARCH PROMPTED ALLIED POWERS, ESPECIALLY THE UNITED STATES, TO ACCELERATE THEIR OWN EFFORTS. EARLY WARNINGS FROM PHYSICISTS LIKE ALBERT EINSTEIN AND LEO SZILARD ALERTED THE U.S. GOVERNMENT TO THE POTENTIAL THREAT AND NECESSITY OF ATOMIC BOMB DEVELOPMENT.

THE MANHATTAN PROJECT

THE MANHATTAN PROJECT WAS THE SECRET U.S. GOVERNMENT RESEARCH INITIATIVE TASKED WITH DEVELOPING THE ATOMIC BOMB. IT BROUGHT TOGETHER THOUSANDS OF SCIENTISTS, ENGINEERS, AND MILITARY PERSONNEL IN A VAST AND HIGHLY CLASSIFIED OPERATION. THE PROJECT REPRESENTED ONE OF THE LARGEST AND MOST COMPLEX SCIENTIFIC ENDEAVORS OF ITS TIME, COMBINING THEORETICAL PHYSICS WITH PRACTICAL ENGINEERING CHALLENGES.

ORGANIZATION AND LEADERSHIP

DIRECTED BY GENERAL LESLIE GROVES AND SCIENTIFIC LEAD J. ROBERT OPPENHEIMER, THE MANHATTAN PROJECT COORDINATED EFFORTS ACROSS MULTIPLE SITES INCLUDING LOS ALAMOS, OAK RIDGE, AND HANFORD. THESE LOCATIONS SPECIALIZED IN DIFFERENT ASPECTS SUCH AS URANIUM ENRICHMENT, PLUTONIUM PRODUCTION, AND BOMB ASSEMBLY.

TECHNOLOGICAL CHALLENGES AND SOLUTIONS

THE PROJECT FACED NUMEROUS TECHNICAL HURDLES, INCLUDING ISOTOPE SEPARATION, NUCLEAR REACTOR DESIGN, AND WEAPONIZATION OF FISSILE MATERIAL. TWO PRIMARY BOMB DESIGNS WERE PURSUED: A URANIUM-BASED GUN-TYPE BOMB AND A PLUTONIUM-BASED IMPLOSION BOMB. THESE INNOVATIONS REQUIRED BREAKTHROUGHS IN CHEMISTRY, METALLURGY, AND EXPLOSIVES ENGINEERING.

SCIENTIFIC PRINCIPLES BEHIND THE ATOMIC BOMB

THE DEVELOPMENT OF ATOMIC BOMB RELIED HEAVILY ON UNDERSTANDING THE PRINCIPLES OF NUCLEAR REACTIONS, PARTICULARLY NUCLEAR FISSION. THIS PROCESS INVOLVES SPLITTING THE NUCLEUS OF A HEAVY ATOM, SUCH AS URANIUM-235 OR PLUTONIUM-239, RELEASING A TREMENDOUS AMOUNT OF ENERGY AND ADDITIONAL NEUTRONS THAT SUSTAIN THE CHAIN REACTION.

NUCLEAR FISSION AND CHAIN REACTIONS

A CHAIN REACTION OCCURS WHEN NEUTRONS RELEASED BY FISSION STRIKE OTHER FISSILE NUCLEI, CAUSING THEM TO SPLIT AND RELEASE MORE NEUTRONS IN A SELF-SUSTAINING PROCESS. CONTROLLING THIS REACTION TO PRODUCE AN EXPLOSIVE YIELD REQUIRED PRECISE CALCULATIONS AND ENGINEERING TO ACHIEVE CRITICAL MASS AND RAPID ASSEMBLY.

BOMB DESIGN CONCEPTS

TWO FUNDAMENTAL DESIGNS EMERGED:

- **GUN-TYPE ASSEMBLY:** THIS METHOD INVOLVED FIRING ONE SUBCRITICAL PIECE OF URANIUM INTO ANOTHER TO REACH CRITICAL MASS.
- **IMPLOSION-TYPE ASSEMBLY:** USING CONVENTIONAL EXPLOSIVES TO COMPRESS PLUTONIUM INTO A SUPERCRITICAL STATE, ENABLING A MORE EFFICIENT AND POWERFUL EXPLOSION.

KEY FIGURES IN THE DEVELOPMENT

THE DEVELOPMENT OF ATOMIC BOMB WAS DRIVEN BY A CADRE OF INFLUENTIAL SCIENTISTS, ENGINEERS, AND MILITARY LEADERS WHOSE EXPERTISE SHAPED THE PROJECT'S SUCCESS. THEIR CONTRIBUTIONS SPANNED THEORY, EXPERIMENTATION, AND PRACTICAL APPLICATION.

J. ROBERT OPPENHEIMER

OFTEN CALLED THE "FATHER OF THE ATOMIC BOMB," OPPENHEIMER SERVED AS THE SCIENTIFIC DIRECTOR OF THE LOS ALAMOS LABORATORY. HIS LEADERSHIP UNIFIED DIVERSE SCIENTIFIC DISCIPLINES AND GUIDED THE BOMB'S DESIGN AND TESTING PHASES.

OTHER NOTABLE SCIENTISTS

SEVERAL KEY INDIVIDUALS PLAYED ESSENTIAL ROLES:

- ENRICO FERMI – DEVELOPED THE FIRST NUCLEAR REACTOR TO PRODUCE PLUTONIUM.

- RICHARD FEYNMAN – CONTRIBUTED TO THEORETICAL PHYSICS AND PRACTICAL PROBLEM-SOLVING.
- EDWARD TELLER – PROMOTED THE DEVELOPMENT OF THERMONUCLEAR WEAPONS FOLLOWING THE ATOMIC BOMB.
- LEO SZILARD – INITIATED EARLY ADVOCACY FOR NUCLEAR CHAIN REACTION RESEARCH.

TESTING AND DEPLOYMENT

AFTER YEARS OF RESEARCH AND DEVELOPMENT, THE ATOMIC BOMB REACHED ITS FIRST FULL-SCALE TEST IN JULY 1945. THE SUCCESSFUL DEMONSTRATION VALIDATED THE SCIENTIFIC PRINCIPLES AND ENGINEERING EFFORTS.

TRINITY TEST

THE TRINITY TEST, CONDUCTED IN NEW MEXICO, WAS THE FIRST DETONATION OF A NUCLEAR DEVICE. THE EXPLOSION CONFIRMED THE FEASIBILITY OF THE IMPLOSION-TYPE DESIGN AND MARKED A NEW ERA IN WARFARE TECHNOLOGY.

BOMBINGS OF HIROSHIMA AND NAGASAKI

IN AUGUST 1945, THE UNITED STATES DEPLOYED ATOMIC BOMBS OVER THE JAPANESE CITIES OF HIROSHIMA AND NAGASAKI. THESE BOMBINGS LED TO UNPRECEDENTED DESTRUCTION, HASTENING THE END OF WORLD WAR II AND DEMONSTRATING THE BOMB'S DEVASTATING POWER.

IMPACT AND LEGACY

THE DEVELOPMENT OF ATOMIC BOMB RESHAPED GLOBAL GEOPOLITICS AND USHERED IN THE NUCLEAR AGE. IT PROMPTED DEBATES ON ETHICS, DETERRENCE, AND INTERNATIONAL ARMS CONTROL THAT PERSIST TO THIS DAY.

GEOPOLITICAL CONSEQUENCES

THE EXISTENCE OF NUCLEAR WEAPONS INFLUENCED POST-WAR DIPLOMACY, CONTRIBUTING TO THE COLD WAR ARMS RACE AND THE ESTABLISHMENT OF NUCLEAR NON-PROLIFERATION TREATIES. THE BOMB'S POWER SHIFTED MILITARY STRATEGY TOWARD DETERRENCE AND MUTUAL ASSURED DESTRUCTION.

SCIENTIFIC AND TECHNOLOGICAL ADVANCEMENTS

THE PROJECT SPURRED INNOVATIONS IN NUCLEAR PHYSICS, MATERIALS SCIENCE, AND ENGINEERING. IT ALSO LAID THE FOUNDATION FOR PEACEFUL USES OF NUCLEAR ENERGY, INCLUDING POWER GENERATION AND MEDICAL APPLICATIONS.

FREQUENTLY ASKED QUESTIONS

WHAT WAS THE PRIMARY GOAL OF THE MANHATTAN PROJECT?

THE PRIMARY GOAL OF THE MANHATTAN PROJECT WAS TO DEVELOP THE FIRST ATOMIC BOMB DURING WORLD WAR II TO GAIN A STRATEGIC ADVANTAGE OVER AXIS POWERS.

WHO WERE THE KEY SCIENTISTS INVOLVED IN THE DEVELOPMENT OF THE ATOMIC BOMB?

KEY SCIENTISTS INCLUDED J. ROBERT OPPENHEIMER, ENRICO FERMI, RICHARD FEYNMAN, AND NIELS BOHR, AMONG OTHERS.

WHEN AND WHERE WAS THE FIRST SUCCESSFUL TEST OF AN ATOMIC BOMB CONDUCTED?

THE FIRST SUCCESSFUL TEST, KNOWN AS THE TRINITY TEST, WAS CONDUCTED ON JULY 16, 1945, IN THE NEW MEXICO DESERT.

WHAT WERE THE MAIN TYPES OF ATOMIC BOMBS DEVELOPED DURING WORLD WAR II?

TWO MAIN TYPES WERE DEVELOPED: A URANIUM-BASED BOMB CALLED 'LITTLE BOY' AND A PLUTONIUM-BASED BOMB CALLED 'FAT MAN.'

HOW DID THE DEVELOPMENT OF THE ATOMIC BOMB IMPACT THE OUTCOME OF WORLD WAR II?

THE ATOMIC BOMBINGS OF HIROSHIMA AND NAGASAKI IN AUGUST 1945 LED TO JAPAN'S SURRENDER, EFFECTIVELY ENDING WORLD WAR II.

WHAT ETHICAL CONCERNS AROSE FROM THE DEVELOPMENT AND USE OF THE ATOMIC BOMB?

ETHICAL CONCERNS INCLUDED THE MASSIVE CIVILIAN CASUALTIES, LONG-TERM RADIATION EFFECTS, AND THE MORAL IMPLICATIONS OF USING SUCH A DESTRUCTIVE WEAPON.

HOW DID THE DEVELOPMENT OF THE ATOMIC BOMB INFLUENCE THE COLD WAR?

THE ATOMIC BOMB INITIATED AN ARMS RACE BETWEEN THE UNITED STATES AND THE SOVIET UNION, SIGNIFICANTLY SHAPING COLD WAR TENSIONS AND NUCLEAR DETERRENCE POLICIES.

WHAT SCIENTIFIC PRINCIPLES UNDERPIN THE OPERATION OF AN ATOMIC BOMB?

ATOMIC BOMBS OPERATE ON THE PRINCIPLE OF NUCLEAR FISSION, WHERE THE NUCLEUS OF A HEAVY ATOM LIKE URANIUM OR PLUTONIUM SPLITS, RELEASING VAST AMOUNTS OF ENERGY.

ADDITIONAL RESOURCES

1. *THE MAKING OF THE ATOMIC BOMB* BY RICHARD RHODES

THIS PULITZER PRIZE-WINNING BOOK OFFERS A COMPREHENSIVE AND DETAILED HISTORY OF THE DEVELOPMENT OF THE ATOMIC BOMB. RHODES EXPLORES THE SCIENTIFIC BREAKTHROUGHS, THE KEY FIGURES INVOLVED, AND THE POLITICAL AND ETHICAL DILEMMAS FACED DURING THE MANHATTAN PROJECT. THE NARRATIVE COMBINES TECHNICAL EXPLANATIONS WITH PERSONAL STORIES, PROVIDING A VIVID ACCOUNT OF ONE OF THE MOST SIGNIFICANT TECHNOLOGICAL ACHIEVEMENTS OF THE 20TH CENTURY.

2. *109 EAST PALACE: ROBERT OPPENHEIMER AND THE SECRET CITY OF LOS ALAMOS* BY JENNET CONANT

THIS BOOK FOCUSES ON THE COMMUNITY AND DAILY LIVES OF THE SCIENTISTS AND THEIR FAMILIES WHO WORKED AT LOS ALAMOS DURING THE MANHATTAN PROJECT. THROUGH PERSONAL LETTERS AND INTERVIEWS, CONANT REVEALS THE HUMAN SIDE OF THE PROJECT AND THE PRESSURES FACED BY THOSE INVOLVED IN CREATING THE ATOMIC BOMB. IT OFFERS A UNIQUE PERSPECTIVE ON THE SOCIAL DYNAMICS WITHIN THE SECRET CITY.

3. *DAY OF TRINITY* BY LANSING LAMONT

LANSING LAMONT PROVIDES A GRIPPING ACCOUNT OF THE FIRST ATOMIC BOMB TEST, KNOWN AS THE TRINITY TEST, CONDUCTED IN JULY 1945. THE BOOK DETAILS THE SCIENTIFIC PREPARATIONS, THE TEST ITSELF, AND THE IMPLICATIONS OF THIS MOMENTOUS EVENT. LAMONT CAPTURES THE TENSION, EXCITEMENT, AND UNCERTAINTY SURROUNDING THE DAWN OF THE NUCLEAR AGE.

4. *BRIGHTER THAN A THOUSAND SUNS: A PERSONAL HISTORY OF THE ATOMIC SCIENTISTS* BY ROBERT JUNGK

WRITTEN BY A JOURNALIST AND HISTORIAN, THIS BOOK CHRONICLES THE LIVES AND ETHICAL STRUGGLES OF THE SCIENTISTS WHO DEVELOPED THE ATOMIC BOMB. JUNGK PRESENTS A CRITICAL VIEW OF THE MANHATTAN PROJECT, HIGHLIGHTING THE MORAL QUESTIONS AND THE IMPACT OF NUCLEAR WEAPONS ON HUMANITY. THE BOOK BLENDS BIOGRAPHY WITH HISTORICAL ANALYSIS.

5. *THE GIRLS OF ATOMIC CITY: THE UNTOLD STORY OF THE WOMEN WHO HELPED WIN WORLD WAR II* BY DENISE KIERNAN
THIS NARRATIVE REVEALS THE VITAL ROLE PLAYED BY WOMEN WHO WORKED IN OAK RIDGE, TENNESSEE, ONE OF THE PRIMARY SITES OF THE MANHATTAN PROJECT. KIERNAN UNCOVERS THEIR CONTRIBUTIONS TO URANIUM ENRICHMENT AND THE SECRECY UNDER WHICH THEY LIVED. THE BOOK SHEDS LIGHT ON A LESSER-KNOWN ASPECT OF THE BOMB'S DEVELOPMENT.

6. *OPPENHEIMER: A LIFE* BY ABRAHAM PAIS

THIS BIOGRAPHY DELVES DEEPLY INTO THE LIFE OF J. ROBERT OPPENHEIMER, THE SCIENTIFIC DIRECTOR OF THE MANHATTAN PROJECT. PAIS, A PHYSICIST HIMSELF, PROVIDES INSIGHT INTO OPPENHEIMER'S SCIENTIFIC GENIUS, HIS LEADERSHIP, AND THE MORAL CONFLICTS HE FACED. THE BOOK OFFERS A NUANCED PORTRAIT OF THE MAN BEHIND THE BOMB.

7. *ATOMIC QUEST: THE SECRET SCIENCE* BY WILLIAM L. LAURENCE

WILLIAM LAURENCE, A SCIENCE REPORTER WHO WAS EMBEDDED WITH THE MANHATTAN PROJECT, PROVIDES A FIRST-HAND JOURNALISTIC ACCOUNT OF THE BOMB'S DEVELOPMENT. THE BOOK DETAILS THE SCIENTIFIC CHALLENGES AND BREAKTHROUGHS, AS WELL AS THE WARTIME CONTEXT THAT DROVE THE PROJECT. LAURENCE'S NARRATIVE BRINGS A CONTEMPORARY PERSPECTIVE TO THE HISTORY.

8. *AMERICAN PROMETHEUS: THE TRIUMPH AND TRAGEDY OF J. ROBERT OPPENHEIMER* BY KAI BIRD AND MARTIN J. SHERWIN

THIS PULITZER PRIZE-WINNING BIOGRAPHY EXPLORES BOTH THE ACHIEVEMENTS AND THE CONTROVERSIES SURROUNDING OPPENHEIMER. BIRD AND SHERWIN EXAMINE HIS PIVOTAL ROLE IN THE ATOMIC BOMB'S CREATION AND HIS LATER POLITICAL PERSECUTION DURING THE RED SCARE. THE BOOK COMBINES EXTENSIVE RESEARCH WITH COMPELLING STORYTELLING.

9. *BOMB: THE RACE TO BUILD—AND STEAL—THE WORLD'S MOST DANGEROUS WEAPON* BY STEVE SHEINKIN

GEARED TOWARD YOUNGER READERS BUT ENGAGING FOR ALL, THIS BOOK NARRATES THE INTENSE SCIENTIFIC AND ESPIONAGE EFFORTS DURING THE RACE TO DEVELOP THE ATOMIC BOMB. SHEINKIN COVERS KEY FIGURES, SECRET OPERATIONS, AND THE GLOBAL STAKES INVOLVED. THE RESULT IS AN ACCESSIBLE AND THRILLING ACCOUNT OF THIS CRITICAL CHAPTER IN HISTORY.

Development Of Atomic Bomb

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development of atomic bomb: *The History and Science of the Manhattan Project* Bruce Cameron Reed, 2019-02-19 The development of atomic bombs under the auspices of the U.S. Army's Manhattan Project during World War II is considered to be the outstanding news story of the twentieth century. In this book, a physicist and expert on the history of the Project presents a comprehensive overview of this momentous achievement. The first three chapters cover the history of nuclear physics from the discovery of radioactivity to the discovery of fission, and would be ideal for instructors of a sophomore-level "Modern Physics" course. Student-level exercises at the ends of the chapters are accompanied by answers. Chapter 7 covers the physics of first-generation fission weapons at a similar level, again accompanied by exercises and answers. For the interested layman and for non-science students and instructors, the book includes extensive qualitative material on the history, organization, implementation, and results of the Manhattan Project and the Hiroshima and Nagasaki bombing missions. The reader also learns about the legacy of the Project as reflected in the current world stockpiles of nuclear weapons. This second edition contains important revisions and additions, including a new chapter on the German atomic bomb program and new sections on

British and Canadian contributions to the Manhattan project and on feed materials. Several other sections have been expanded; reader feedback has been helpful in introducing minor corrections and improved explanations; and, last but not least, the second edition includes a detailed index.

development of atomic bomb: *The Making of the Atomic Bomb* Richard Rhodes, 2012-06-12
Winner of the Pulitzer Prize, the National Book Award, and the National Book Critics Circle Award The definitive history of nuclear weapons—from the turn-of-the-century discovery of nuclear energy to J. Robert Oppenheimer and the Manhattan Project—this epic work details the science, the people, and the sociopolitical realities that led to the development of the atomic bomb. This sweeping account begins in the 19th century, with the discovery of nuclear fission, and continues to World War Two and the Americans' race to beat Hitler's Nazis. That competition launched the Manhattan Project and the nearly overnight construction of a vast military-industrial complex that culminated in the fateful dropping of the first bombs on Hiroshima and Nagasaki. Reading like a character-driven suspense novel, the book introduces the players in this saga of physics, politics, and human psychology—from FDR and Einstein to the visionary scientists who pioneered quantum theory and the application of thermonuclear fission, including Planck, Szilard, Bohr, Oppenheimer, Fermi, Teller, Meitner, von Neumann, and Lawrence. From nuclear power's earliest foreshadowing in the work of H.G. Wells to the bright glare of Trinity at Alamogordo and the arms race of the Cold War, this dread invention forever changed the course of human history, and *The Making of The Atomic Bomb* provides a panoramic backdrop for that story. Richard Rhodes's ability to craft compelling biographical portraits is matched only by his rigorous scholarship. Told in rich human, political, and scientific detail that any reader can follow, *The Making of the Atomic Bomb* is a thought-provoking and masterful work.

development of atomic bomb: The Manhattan Project Francis George Gosling, 1999 A history of the origins and development of the American atomic bomb program during WWII. Begins with the scientific developments of the pre-war years. Details the role of the U.S. government in conducting a secret, nationwide enterprise that took science from the laboratory and into combat with an entirely new type of weapon. Concludes with a discussion of the immediate postwar period, the debate over the Atomic Energy Act of 1946, and the founding of the Atomic Energy Commission. Chapters: the Einstein letter; physics background, 1919-1939; early government support; the atomic bomb and American strategy; and the Manhattan district in peacetime. Illustrated.

development of atomic bomb: *The Atomic Bomb: A History Just For Kids!* KidCaps, 2013-09-05 Now, from time to time you might hear the term "nuclear bomb" used, while other times you may hear the term "atomic bomb". What is the difference? Any bomb that uses tiny reactions inside the nucleus of a microscopic atom is, by definition, a "nuclear bomb". However, the first nuclear bombs were much simpler than today's bombs, which use multiple steps to produce their large explosions. The first nuclear bombs that were produced relied only on this special microscopic reaction in the atom and so are called "atomic bombs"; and it is this kind that we will be talking about. Find out about this exciting and complex period of time in this kid's book.

development of atomic bomb: The Atomic Bomb Margaret Gowing, Lorna Arnold, 1979

development of atomic bomb: *The Secret History of the Atomic Bomb* Anthony Cave Brown, Charles Brown MacDonald, Charles B. MacDonald, 1977

development of atomic bomb: The Manhattan Project: Making the Atomic Bomb F. G. Gosling, United States of Energy, 2012-08-09 The Department of Energy Organization Act of 1977 brought together for the first time in one department most of the Federal Government's energy programs. With these programs came a score of organizational entities each with its own history and traditions, from a dozen departments and independent agencies. The History Division has prepared a series of monographs on The Origins of the Department of Energy. Each explains the history, goals, and achievements of a predecessor agency or a major program of the Department of Energy. The Manhattan Project: Making the Atomic Bomb is a short history of the origins and development of the American atomic bomb program during World War II. Beginning with the scientific development of the pre-war years, the monograph details the role of United States government in conducting a

secret, nationwide enterprise that took science from the laboratory and into combat with an entirely new type of weapon. The monograph concludes with a discussion of the immediate postwar period, the debate over the Atomic Energy Act of 1946, and the founding of the Atomic Energy commission.

development of atomic bomb: *Fire in the Sky* Jeffrey K. Smith, 2010-03 In the summer of 1945, the world was introduced to the horrific consequences of nuclear warfare. On the sixth day of August, an American B-29 bomber dropped a revolutionary new weapon, the atomic bomb, over the Japanese city of Hiroshima. The catastrophic detonation instantly killed over 100,000 residents of the city, with thousands more dying from explosion-related injuries in the months and years to follow. Three days later, a second nuclear weapon was released over the skies of Nagasaki, killing over 40,000 Japanese citizens, most of whom were civilians. Six days after the second nuclear attack, the Empire of Japan surrendered, and World War II was ended. Jubilation among the Allied countries was tempered by a profound sense of relief; nearly four years of bloody war had finally come to an end. Some 406,000 Americans died during World War II, while another 671,000 were wounded. By the end of the war, an astonishing one out of every one hundred thirty six Americans had been killed or wounded in the fighting. American military personnel, along with their spouses, children, parents, and friends, were eager to see the bloody conflict come to an end, by any means possible. Consequently, President Harry Truman's decision to utilize the atomic bomb to bring Japan to its knees was wildly popular in the weeks and months that followed the Japanese surrender. In the six plus decades since Hiroshima and Nagasaki, however, many have questioned both the necessity and morality of America's deployment of the bomb. Significantly influenced by revisionist history, passionate debate has focused on the justification for nuclear warfare to subdue an enemy already nearing defeat. Like so many other momentous events, the reader must balance the reality of the world in 1945 against the seemingly clearer prism of revisionist history. *Fire in the Sky: The Story of the Atomic Bomb* chronicles the development and use of the first atomic bombs. This is a remarkable story about the lives and times of the brilliant scientists, seasoned military officers, and determined government leaders, who reshaped history, and irrevocably changed the dynamics of warfare.

development of atomic bomb: *Bulletin of the Atomic Scientists*, 1958-10 The Bulletin of the Atomic Scientists is the premier public resource on scientific and technological developments that impact global security. Founded by Manhattan Project Scientists, the Bulletin's iconic Doomsday Clock stimulates solutions for a safer world.

development of atomic bomb: *20th Century Atomic Bomb and Nuclear Weapon History - Manhattan Project and the Nevada Test Site Official History Documents* Department of Energy, 2017-08-17 Learn about the history of America's development and testing of nuclear weapons from this reproduction of two important Energy Department publications: *The Manhattan Project - Making the Atomic Bomb*, and *Origins of the Nevada Test Site*. Each publication provides exclusive details of the extraordinary development program known as the Manhattan Project and the subsequent early days of the Cold War. This makes a superb reference work for military enthusiasts, researchers, libraries, schools, students, and home reference! *The Manhattan Project: Making the Atomic Bomb* is a history of the origins and development of the American atomic bomb program during World War II. Beginning with the scientific developments of the pre-war years, the monograph details the role of United States government in conducting a secret, nationwide enterprise that took science from the laboratory and into combat with an entirely new type of weapon. The monograph concludes with a discussion of the immediate postwar period, the debate over the Atomic Energy Act of 1946, and the founding of the Atomic Energy Commission. *Origins of the Nevada Test Site* was written in conjunction with the 50th anniversary commemoration of the Nevada Test Site. The history was released at the official celebration held in Las Vegas, Nevada, on December 18, 2000, fifty years after President Harry S. Truman formally designated the site as the location for conducting nuclear weapons tests within the continental United States. The history represents a unique partnership between a field office and two headquarters offices of the U.S. Department of Energy. The Department's Nevada Operations Office provided the initial impetus for the project and offered support and resources throughout the researching and writing of the history.

The Office of Defense Programs of the Department's National Nuclear Security Administration provided funding for printing the history. The History Division of the Department's Executive Secretariat researched and wrote the history. Contents include: The Manhattan Project - Making the Atomic Bomb - Introduction: The Einstein Letter; Part I: Physics Background, 1919-1939; Part II: Early Government Support; Part III: The Manhattan Engineer District; Part III: The Manhattan Engineer District in Operation; Part V The Atomic Bomb and American Strategy; Part VI: The Manhattan District in Peacetime; Manhattan Project Chart; Manhattan Project Chronology. Origins of the Nevada Test Site - Dropping the Bomb: The Able Shot * Part I: The Nevada Test Site: Description and Early History * Part II: The Birth of the Nuclear Age, 1919-1947 * The Trinity Test * Part III: The Search for a Continental Test Site, 1947-1950 * Sandstone * Fallout and the Continental Test Site * Part IV: Preparing to Test, December 1950-January 1951 * Going Public * Public and Press Reaction * Part V: The Ranger Series, January-February 1951 * Logistics * Official Visitors * Radiological Safety * Able's Aftermath * Baker Is Bigger * Part VI: Legacy of the Nevada Test Site * Permanentization of the Test Site * Atoms for War and Peace * Battleground of the Cold War This is a privately authored news service and educational publication of Progressive Management.

development of atomic bomb: *The Early Development of Guided Weapons in the United Kingdom, 1940-1960* Stephen Robert Twigge, 1993 First Published in 1993. Routledge is an imprint of Taylor & Francis, an informa company.

development of atomic bomb: Belief-based Energy Technology Development in the United States Chi-Jen Yang, 2009 This book is a comparative study of two energy policies that illustrates how and why technical fixes in energy policy failed in the United States. In the post-WWII era, the U.S. government forcefully and consistently endorsed the development of civilian nuclear power. It adopted policies to establish the competitiveness of civilian nuclear power far beyond what would have occurred under free-market conditions. Even though synthetic fuel was characterized by a similar level of economic potential and technical feasibility, the policy approach toward synthetic fuel was sporadic and indeterminate. The contrast between the unfaltering faith in nuclear power and the indeterminate attitude toward synthetic fuel raises many important questions. The answers to these questions reveal provocative yet compelling insights into the policy-making process. The author argues that these diverging paths of development can be explained by exploring the dominant government ideology of the time or ideology of the state as the sociology literature describes it. The forceful support for nuclear power was a result of a government preoccupied with fighting the Cold War. The U.S. national security planners intentionally idealized and deified nuclear power to serve its Cold War psychological strategy. These psychological maneuverings attached important symbolic meaning to nuclear power. This symbolism, in turn, explains the society-wide enthusiasm. The fabricated myth of the Atomic Age became a self-fulfilling prophecy and ushered in a bandwagon market. On the other hand, a confused, indeterminate, and relatively powerless welfare state stood behind synthetic fuel. The different ideologies of the state explain the government's different attitudes toward nuclear and synfuel endeavors. The overarching discovery is a mode of belief-based decision-making in long-term energy planning. This discovery goes against the prevalent assumption of rational choice in social sciences. The author argues that rational-choice assumption is inapplicable because of the extreme long-term nature of energy planning. It is not usually possible to predict the sociopolitical and economic conditions in the distant future. Rational decisions require supporting information, which often includes impossible long-term foresights. One cannot rationally choose between one unknown and another unknown. Pivotal decisions in long-term energy planning must inevitably be belief based, and beliefs are subject to political manipulation and distortions by social mechanisms. Understanding these peculiar but pervasive characteristics of energy business bears important lessons for today's decision making about energy technologies, and the stakes, if anything, are even higher than before. Energy policy communities; historians of the Cold War, American history, and technology; and sociologists would find this book an invaluable resource.

development of atomic bomb: Remembering the Manhattan Project Cynthia C. Kelly, 2004

During World War II, nations raced to construct the world's first nuclear weapon that would determine the future of the world. The Manhattan Project, one of the most significant achievements of the 20th century, was the culmination of America's war effort. Today, although the issue of nuclear weapons frequently dominates world politics, few are aware of the history behind its development. Part I of this book, comprised of papers from the Atomic Heritage Foundation's Symposium on the Manhattan Project, recounts the history of this remarkable effort and reflects upon its legacy. Most of the original structures of the Manhattan Project have been inaccessible to the public and in recent years, have been stripped of their equipment and slated for demolition. Part II proposes a strategy for preserving these historical artifacts for the public and future generations. This book has been selected for coverage in: ? Index to Scientific & Technical Proceedings (ISTP CDROM version / ISI Proceedings)? Index to Social Sciences & Humanities Proceedings? (ISSHP? / ISI Proceedings)? Index to Social Sciences & Humanities Proceedings (ISSHP CDROM version / ISI Proceedings)? CC Proceedings ? Engineering & Physical Sciences

development of atomic bomb: New Product Development Marc Annacchino, 2003-10-16
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