

## Episode 6 The Atom

How have nuclear issues been covered in documentary since the end of the Cold War? This original new book explores how the sometimes elusive, sometimes dramatic effects of uranium products on the landscape, on architecture, and on social organisation continue to show up on screen, maintaining a record of moving images that goes back to the early twentieth century. It is the first book to analyse independent documentary films about nuclear energy - it suggests an approach to documentary films as agents of change. Each chapter of this book focuses on one of ten different documentary films made in Europe and North America since 1989. Each of these films works the material and the ideological heritage of the nuclear power industry into visions of the future. Dealing with the legacy of how ignorance and neglect led to accidents and failures the films offer different ways of understanding and moving on from the past. The documentary form itself can be understood as a collective means for the discovery of creative solutions and the communication of new narratives. In the case of these films the concepts of radioactivity and deep time in particular are used to bring together narrative and formal aesthetics in the process of reimagining the relationships between people and their environments. Focussing on the representation of radioactive spaces in documentary and experimental art films, the study shows how moving images do more than communicate the risks and opportunities, and the tumultuous history, associated with atomic energy. They embody the effects of Cold War technologies as they persist into the present, acting as a reminder that the story is not over yet. Primary readership will be academics and students working in environmental communication and in environmental humanities more broadly. For students of independent film or documentary it will also provide a clear picture of contemporary themes and creative practice.

This two-part volume contains a comprehensive collection of original studies by well-known scholars focusing on the Bible's wide-ranging reception in world cinema. It is organized into sections examining the rich cinematic afterlives of selected characters from the Hebrew Bible and New Testament; considering issues of biblical reception across a wide array of film genres, ranging from noir to anime; featuring directors, from Lee Chang-dong to the Coen brothers, whose body of work reveals an enduring fascination with biblical texts and motifs; and offering topical essays on cinema's treatment of selected biblical themes (e.g., lament, apocalyptic), particular interpretive lenses (e.g., feminist interpretation, queer theory), and windows into biblical reception in a variety of world cinemas (e.g., Indian, Israeli, and Third Cinema). This handbook is intended for scholars of the Bible, religion, and film as well as for a wider general audience.

To the casual observer, similarities between fan communities and religious believers are difficult to find. Religion is traditional, institutional, and serious; whereas fandom is contemporary, individualistic, and fun. Can the robes of nuns and priests be compared to cosplay outfits of Jedi Knights and anime characters? Can travelling to fan conventions be understood as pilgrimages to the shrines of saints? These new essays investigate fan activities connected to books, film, and online games, such as Harry Potter-themed weddings, using *The Hobbit* as a sacred text, and taking on heroic roles in *World of Warcraft*. Young Muslim women cosplayers are brought into conversation with Chaos magicians who use pop culture tropes and characters. A range of canonical texts, such as *Supernatural*, *Buffy the Vampire Slayer*, and *Sherlock*—are examined in terms of the pleasure and enchantment of repeated viewing. Popular culture is revealed to be a fertile source of religious and spiritual creativity in the contemporary world.

Freedom of the sort implicated in acting freely or with free will is important to the truth of different sorts of moral judgment, such as judgments of moral responsibility and those of moral obligation. Little thought, however, has been invested into whether appraisals of good or evil

presuppose free will. This important topic has not commanded the attention it deserves owing to what is perhaps a prevalent assumption that freedom leaves judgments concerning good and evil largely unaffected. The central aim of this book is to dispute this assumption by arguing for the relevance of free will to the truth of two sorts of such judgment: welfare-ranking judgments or judgments of personal well-being (when is one's life intrinsically good for the one who lives it?), and world-ranking judgments (when is a possible world intrinsically better than another?). The book also examines free will's impact on the truth of such judgments for central issues in moral obligation and in the free will debate. This book should be of interest to those working on intrinsic value, personal well-being, moral obligation, and free will.

Science fiction often operates as either an extended metaphor for human relationships or as a genuine attempt to encounter the alien Other. Both types of stories tend to rehearse the processes of colonialism, in which a sympathetic protagonist encounters and tames the unknown. Despite this logic, Native American writers have claimed the genre as a productive space in which they can critique historical colonialism and reassert the value of Indigenous worldviews. Encountering the Sovereign Other proposes a new theoretical framework for understanding Indigenous science fiction, placing Native theorists like Vine Deloria Jr. and Gregory Cajete in conversation with science fiction theorists like Darko Suvin, David Higgins, and Michael Pinsky. In response to older colonial discourses, many contemporary Indigenous authors insist that readers acknowledge their humanity while recognizing them as distinct peoples who maintain their own cultures, beliefs, and nationhood. Here author Miriam C. Brown Spiers analyzes four novels: William Sanders's *The Ballad of Billy Badass and the Rose of Turkestan*, Stephen Graham Jones's *It Came from Del Rio*, D. L. Birchfield's *Field of Honor*, and Blake M. Hausman's *Riding the Trail of Tears*. Demonstrating how Indigenous science fiction expands the boundaries of the genre while reinforcing the relevance of Indigenous knowledge, Brown Spiers illustrates the use of science fiction as a critical compass for navigating and surviving the distinct challenges of the twenty-first century.

Rescuing Han Solo from the clutches of the bounty hunter Jabba the Hutt, Luke and his companions race to join the massing rebel forces preparing to attack the Empire's new and deadly Death Star. Solo and Leia lead a strike team to the forest moon of Endor and win the aid of the tribal Ewoks in their attempts to shut off the force-field that protects the Empire's vast space station. But Han's band are falling into a trap - as are the Rebel space fleet lead by Lando Calrissian. For the Emperor himself is aboard the Death Star and his plans to capture Skywalker and destroy all who oppose him are approaching fruition.

In *The Routledge Atlas of the Second World War*, Martin Gilbert graphically charts the war's political, military, economic and social history through 247 maps. Each map has been specially drawn for this atlas, many of them covering topics that have not previously been mapped. The atlas covers all the major events from the German invasion of Poland in September 1939 to the defeat of Japan in August 1945, including the Blitz, the Fall of France, Pearl Harbor, the naval Battles of the Atlantic, the Indian Ocean and the Pacific, Dieppe, Stalingrad, Midway, the Normandy Landings, the bombing of Warsaw, London, Coventry, Hamburg, Dresden, Tokyo, Hiroshima and Nagasaki, the Burma Railway, concentration camps and slave labour camps, and prisoner-of-war camps in Europe, the Americas and the Far East. Focusing on the human - and inhuman - aspects of the war, *The Routledge Atlas of the Second World War* includes examination of: Military, naval and air campaigns on all the war fronts The war on land, at sea and in the air The economic and social aspects of the war The global nature of the war, in armed combat and in suffering The impact of the war on

civilians, both under occupation, and as deportees and refugees The aftermath of the war: the post-war political and national boundaries; war graves, and the human cost of the war on every continent.

Now open the hood to see how the nucleus works. Start simple with a hydrogen atom, which has a nucleus of one proton orbited by a single electron. Build from there, adding neutrons and more protons, forging elements and their isotopes and seeing how the nucleus behaves much like a liquid drop. Then use the Fermi gas model to refine your understanding of nuclear structure.

All the science in *Breaking Bad*—from explosive experiments to acid-based evidence destruction—explained and analyzed for authenticity. *Breaking Bad's* (anti)hero Walter White (played by Emmy-winner Bryan Cranston) is a scientist, a high school chemistry teacher who displays a plaque that recognizes his “contributions to research awarded the Nobel Prize.” During the course of five seasons, Walt practices a lot of ad hoc chemistry—from experiments that explode to acid-based evidence destruction to an amazing repertoire of methodologies for illicit meth making. But how much of Walt's science is actually scientific? In *The Science of “Breaking Bad,”* Dave Trumbore and Donna Nelson explain, analyze, and evaluate the show's portrayal of science, from the pilot's opening credits to the final moments of the series finale. The intent is not, of course, to provide a how-to manual for wannabe meth moguls but to decode the show's most head-turning, jaw-dropping moments. Trumbore, a science and entertainment writer, and Nelson, a professor of chemistry and *Breaking Bad's* science advisor, are the perfect scientific tour guides. Trumbore and Nelson cover the show's portrayal of chemistry, biology, physics, and subdivisions of each area including toxicology and electromagnetism. They explain, among other things, Walt's DIY battery making; the dangers of Mylar balloons; the feasibility of using hydrofluoric acid to dissolve bodies; and the chemistry of methamphetamine itself. Nelson adds interesting behind-the-scenes anecdotes and describes her work with the show's creator and writers. Marius Stan, who played Bogdan on the show (and who is a PhD scientist himself) contributes a foreword. This is a book for every science buff who appreciated the show's scientific moments and every diehard *Breaking Bad* fan who wondered just how smart Walt really was.

Cultural critics say that “science is politics by other means,” arguing that the results of scientific inquiry are profoundly shaped by the ideological agendas of powerful elites. They base their claims on historical case studies purporting to show the systematic intrusion of sexist, racist, capitalist, colonialist, and/or professional interests into the very content of science. In this hard-hitting collection of essays, contributors offer crisp and detailed critiques of case studies offered by the cultural critics as evidence that scientific results tell us more about social context than they do about the natural world. Pulling no punches, they identify numerous crude factual blunders (e.g. that Newton never performed any experiments) and egregious errors of omission, such as the attempt to explain the slow development of fluid dynamics solely in terms of gender bias. Where there are positive aspects of a flawed account, or something to be learned from it, they do not hesitate to say so. Their target is shoddy scholarship. Comprising new essays by distinguished scholars of history, philosophy, and science, this book raises a lively debate to a new level of seriousness.

Chemistry and Our Universe Episode 6: Electronic Structure of the Atom

? Women remain woefully underrepresented in science, technology, engineering and math (STEM). Negative stereotypes about women in these fields are pervasive, rooted in the debunked claim that women have less aptitude than men in science and math. While some TV series present portrayals that challenge this generalization, others reinforce troubling biases—sometimes even as writers and producers attempt to champion women in STEM. This collection of new essays examines numerous popular series, from children's programs to primetime shows, and discusses the ways in which these narratives inform cultural ideas about women in STEM.

This *Atom Bomb in Me* traces what it felt like to grow up suffused with American nuclear culture in and around the atomic city of Oak Ridge, Tennessee. As a secret city during the Manhattan Project, Oak Ridge enriched the uranium that powered Little Boy, the bomb that destroyed Hiroshima. The city was a major nuclear production site throughout the Cold War, adding something to each and every bomb in the United States arsenal. Even today, Oak Ridge contains the world's largest supply of fissionable uranium. The granddaughter of an atomic courier, Lindsey A. Freeman turns a critical yet nostalgic eye to the place where her family was sent as part of a covert government plan. There was a city devoted to nuclear science within a larger America obsessed with its nuclear prowess. Through memories, mysterious photographs, and uncanny childhood toys, she shows how Reagan-era politics and nuclear culture irradiated the late twentieth century. Alternately tender and alarming, her book takes a Geiger counter to recent history, reading the half-life of the atomic past as it resonates in our tense nuclear present.

The geeks will inherit the earth. With well over two hundred episodes and a dozen seasons, *The Big Bang Theory* is one of America's favorite television series, bringing a new class of character to mainstream television: the science nerd. In spite of its evident popularity and influence in shaping public attitudes to science and scientists, there are relatively few books that explore the show's culture and social dimension. *The Science of The Big Bang Theory* looks behind the comedy scenes and scripts of this long-running and successful TV show to explore topics such as: *The Bachelor Party Corrosion* and *Archimedes* *The Valentino Submergence: Fun with Flags* *The Dumpling Decoupling: Sheldon and Doctor Who* *The Mystery Date Observation: The Unlikely Dating Habits of Eggheads* *And More!* This book is a light-hearted science companion to TV's *The Big Bang Theory*, providing you with just the kind of dissection of the science and culture you'd need to understand "math, science, history, unraveling the mysteries, that all started with the big bang! Hey!"

*Mr. Wizard's World*. *Bill Nye the Science Guy*. *NPR's Science Friday*. These popular television and radio programs broadcast science into the homes of millions of viewers and listeners. But these modern series owe much of their success to the pioneering efforts of early-twentieth-century science shows like *Adventures in Science* and "Our Friend the Atom." *Science on the Air* is the fascinating history of the evolution of popular science in the first decades of the broadcasting era. Marcel Chotkowski LaFollette transports readers to the early days of radio, when the new medium allowed innovative and optimistic scientists the opportunity to broadcast serious and dignified presentations over the airwaves. But the exponential growth of listenership in the 1920s, from thousands to millions, and the networks' recognition that each listener represented a potential consumer, turned science on the radio into an opportunity to entertain, not just educate. *Science on the Air* chronicles the efforts of science popularizers, from 1923 until the mid-1950s, as they negotiated topic, content, and tone in order to gain precious time on the air. Offering a new perspective on the collision between science's idealistic and elitist view of public communication and the unbending economics of broadcasting, LaFollette rewrites the history of the public reception of science in the twentieth century and the role that scientists and their institutions have played in both encouraging and inhibiting popularization. By looking at the broadcasting of the past, *Science*

on the Air raises issues of concern to all those who seek to cultivate a scientifically literate society today.

Why our obsession with truth--the idea that some undeniable truth will make politics unnecessary--is driving our political polarization. In *The Divide*, Taylor Dotson argues provocatively that what drives political polarization is not our disregard for facts in a post-truth era, but rather our obsession with truth. The idea that some undeniable truth will make politics unnecessary, Dotson says, is damaging democracy. We think that appealing to facts, or common sense, or nature, or the market will resolve political disputes. We view our opponents as ignorant, corrupt, or brainwashed. Dotson argues that we don't need to agree with everyone, or force everyone to agree with us; we just need to be civil enough to practice effective politics. Dotson shows that we are misguided to pine for a lost age of respect for expertise. For one thing, such an age never happened. For another, people cannot be made into ultra-rational Vulcans. Dotson offers a road map to guide both citizens and policy makers in rethinking and refashioning political interactions to be more productive. To avoid the trap of divisive and fanatical certitude, we must stop idealizing expert knowledge and romanticizing common sense. He outlines strategies for making political disputes more productive: admitting uncertainty, sharing experiences, and tolerating and negotiating disagreement. He suggests reforms to political practices and processes, adjustments to media systems, and dramatic changes to schooling, childhood, the workplace, and other institutions. Productive and intelligent politics is not a product of embracing truth, Dotson argues, but of adopting a pluralistic democratic process.

In the early 1990s, Russian President Boris Yeltsin revealed that for the previous thirty years the Soviet Union had dumped vast amounts of dangerous radioactive waste into rivers and seas in blatant violation of international agreements. The disclosure caused outrage throughout the Western world, particularly since officials from the Soviet Union had denounced environmental pollution by the United States and Britain throughout the cold war. *Poison in the Well* provides a balanced look at the policy decisions, scientific conflicts, public relations strategies, and the myriad mishaps and subsequent cover-ups that were born out of the dilemma of where to house deadly nuclear materials. Why did scientists and politicians choose the sea for waste disposal? How did negotiations about the uses of the sea change the way scientists, government officials, and ultimately the lay public envisioned the oceans? Jacob Darwin Hamblin traces the development of the issue in Western countries from the end of World War II to the blossoming of the environmental movement in the early 1970s. This is an important book for students and scholars in the history of science who want to explore a striking case study of the conflicts that so often occur at the intersection of science, politics, and international diplomacy.

Almost immediately after his first appearance in comic books in June 1938, Superman began to be adapted to other media. The subsequent decades have

brought even more adaptations of the Man of Steel, his friends, family, and enemies in film, television, comic strip, radio, novels, video games, and even a musical. The rapid adaptation of the Man of Steel occurred before the character and storyworld were fully developed on the comic book page, allowing the adaptations an unprecedented level of freedom and adaptability. The essays in this collection provide specific insight into the practice of adapting Superman from comic books to other media and cultural contexts through a variety of methods, including social, economic, and political contexts. Authors touch on subjects such as the different international receptions to the characters, the evolution of both Clark Kent's character and Superman's powers, the importance of the radio, how the adaptations interact with issues such as racism and Cold War paranoia, and the role of fan fiction in the franchise. By applying a wide range of critical approaches to adaptation and Superman, this collection offers new insights into our popular entertainment and our cultural history.

**Fundamentals of Environmental and Toxicological Chemistry: Sustainable Science, Fourth Edition** covers university-level environmental chemistry, with toxicological chemistry integrated throughout the book. This new edition of a bestseller provides an updated text with an increased emphasis on sustainability and green chemistry. It is organized based on the five spheres of Earth's environment: (1) the hydrosphere (water), (2) the atmosphere (air), (3) the geosphere (solid Earth), (4) the biosphere (life), and (5) the anthrosphere (the part of the environment made and used by humans). The first chapter defines environmental chemistry and each of the five environmental spheres. The second chapter presents the basics of toxicological chemistry and its relationship to environmental chemistry. Subsequent chapters are grouped by sphere, beginning with the hydrosphere and its environmental chemistry, water pollution, sustainability, and water as nature's most renewable resource. Chapters then describe the atmosphere, its structure and importance for protecting life on Earth, air pollutants, and the sustainability of atmospheric quality. The author explains the nature of the geosphere and discusses soil for growing food as well as geosphere sustainability. He also describes the biosphere and its sustainability. The final sphere described is the anthrosphere. The text explains human influence on the environment, including climate, pollution in and by the anthrosphere, and means of sustaining this sphere. It also discusses renewable, nonpolluting energy and introduces workplace monitoring. For readers needing additional basic chemistry background, the book includes two chapters on general chemistry and organic chemistry. This updated edition includes three new chapters, new examples and figures, and many new homework problems. A NEW YORK TIMES NOTABLE BOOK OF 2020 New York Times bestselling author Lesley M.M. Blume reveals how one courageous American reporter uncovered one of the deadliest cover-ups of the 20th century—the true effects of the atom bomb—potentially saving millions of lives. Just days after the United States decimated Hiroshima and Nagasaki with nuclear bombs, the Japanese

surrendered unconditionally. But even before the surrender, the US government and military had begun a secret propaganda and information suppression campaign to hide the devastating nature of these experimental weapons. The cover-up intensified as Occupation forces closed the atomic cities to Allied reporters, preventing leaks about the horrific long-term effects of radiation which would kill thousands during the months after the blast. For nearly a year the cover-up worked—until New Yorker journalist John Hersey got into Hiroshima and managed to report the truth to the world. As Hersey and his editors prepared his article for publication, they kept the story secret—even from most of their New Yorker colleagues. When the magazine published “Hiroshima” in August 1946, it became an instant global sensation, and inspired pervasive horror about the hellish new threat that America had unleashed. Since 1945, no nuclear weapons have ever been deployed in war partly because Hersey alerted the world to their true, devastating impact. This knowledge has remained among the greatest deterrents to using them since the end of World War II. Released on the 75th anniversary of the Hiroshima bombing, *Fallout* is an engrossing detective story, as well as an important piece of hidden history that shows how one heroic scoop saved—and can still save—the world.

The dramatic and chilling story of an American-born Soviet spy in the atom bomb project in World War II, perfect for fans of *The Americans*. George Koval was born in Iowa. In 1932, his parents, Russian Jews who had emigrated because of anti-Semitism, decided to return home to live out their socialist ideals. George, who was as committed to socialism as they were, went with them. It was there that he was recruited by the Soviet Army as a spy and returned to the US in 1940. A gifted science student, he enrolled at Columbia University, where he knew scientists soon to join the Manhattan Project, America’s atom bomb program. After being drafted into the US Army, George used his scientific background and connections to secure an assignment at a site where plutonium and uranium were produced to fuel the atom bomb. There, and later in a second top-secret location, he had full access to all facilities and he passed highly sensitive information to Moscow. There were hundreds of spies in the US during World War II but Koval was the only Soviet military spy with security clearances in the atomic-bomb project. The ultimate sleeper agent, he was an all-American boy who had played baseball, loved Walt Whitman’s poetry, and mingled freely with fellow Americans. After the war got away without a scratch. It is indisputable that his information landed in the right hands in Moscow. In 1949 Soviet scientists produced a bomb identical to America’s years earlier than US experts expected. A gripping, fast-paced, extensively researched story about one undetected spy who influenced history, *Sleeper Agent* is perfect for Ben Macintyre fans. Starting with hydrogen, see how electrons organize themselves within the atom, depending on their energy state. Graduate from Niels Bohr’s revolutionary model of the atom to Erwin Schrödinger’s even more precise theory. Then, chart different electron configurations in heavier and heavier atoms.

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