

Taking Nazi Technology

**Allied Scientific Espionage and Exploitation of
German Technology after the Second World War**

Book Proposal – February 2017

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Description and Rationale

Following the Second World War, the Allied Powers attempted the largest-scale technology transfer effort in history, aiming to take "intellectual reparations" from occupied Germany. This book is a history of American, British, French, and Soviet cooperation and competition in controlling and exploiting German science and technology. Through this, it is a history of science, diplomacy, espionage, and changing attitudes towards technology in society.

One dimension of this story is fairly well-known: Project Paperclip, which brought over the Nazi rocket scientists who helped NASA with the moon landings, led by Wernher von Braun. The Nazi scientist working for the West became a cultural archetype in fiction from *Dr. Strangelove* to *Captain America*. Paperclip is only one relatively small episode in the American case, however. This book reveals the inner workings of an international set of programs with much broader ambitions than rocket science. In nearly every field of industrial science and technological research, the Western allies gathered teams of experts to scour defeated Germany, seeking industrial secrets and the technical personnel who could explain them.

This book addresses two major gaps in the sparse academic literature on these efforts. First, almost all of the current literature on this topic looks solely at the American case, limiting our knowledge to the perspective of the country with the least to gain from German technology. The United States emerged from the war with excess industrial capacity and a mobilized, world-class scientific community, unlike indebted Britain, recently-occupied France, or the shattered Soviet Union. Second, this literature tends to accept claims of technology being "taken" at face value, skipping over the enormous challenges of effectively communicating and implementing technology across national and cultural borders. The greatest espionage coup in the world is useless if no one uses the information it provides.

By taking a transnational perspective, this book emphasizes how these ambitions filtered through the different diplomatic, political, and economic circumstances of the three main Western Allies. It takes a careful approach to the question of technology transfer. What exactly did planners in each country expect to acquire from studying Germany, and why did they expect that? How did they intend to *take* science and technology? Were they successful, as judged by the businessmen and trade associations involved? These issues played out very differently in each nation, with early Cold War diplomatic tension driving and being driven by different approaches to learning from German science. The legacies of the efforts to take German technology lay not just in economic gains, but in the international politics and business culture of the early Cold War.

The overarching argument of the book is that the late 1940s and early 1950s witnessed a dramatic change in international understanding of what it means to transfer technology. While America and Britain initially planned on sharing German technology with their industries via written reports, they increasingly found themselves in agreement with a stance already held by many in France and the Soviet Union: technology cannot be separated from the technical 'know-how,' the hands-on skill and experience of technicians and engineers, that cannot be captured in writing. This meant rapid and fundamental changes in the exploitation programs, with significant diplomatic costs. It also left a lasting impression on the businessmen across the Western world, who had been brought in to staff these programs and select targets of economic value. Moving technology across national and cultural borders meant moving people – a lesson with long-lasting implications for business, law, and intelligence agencies in an increasingly global postwar economy.

Annotated Table of Contents

Introduction. Exploitation of German Science and the Challenges of Technology Transfer in the Postwar World (6,300 words, plus 2,200 in footnotes)

Chapter One. American Intellectual Reparations and the Myth of German Technological Superiority (12,500 words, plus 2,500 in footnotes)

A summary of the American side of the story, with a central argument that US business and government leaders anticipated great value from German exploitation because of outdated conceptions of German scientific and technical superiority. The chief value of these programs for the US should not be measured in dollars and cents, but in reorienting US industry to thinking of itself as a world leader, with long-spanning implications for trade diplomacy.

Chapter Two. British Postwar Scientific Exploitation and Tacit Knowledge (10,000 words, plus 2,200 in footnotes)

The British side of the story. This chapter emphasizes the unexpected fragility of the alliance with the US and the way that war debt (and resulting emphasis on increasing exports at all costs) warped British diplomacy. This is true even within the US/UK "Special Relationship." The British had much more to gain from German technology, yet became frustrated that investigations were not capturing "the 'know-how'" necessary to recreate technologies. They largely abandoned cooperative efforts, at significant diplomatic cost, in order to capture German science.

Chapter Three. French Scientific Exploitation and Technology Transfer from Germany in the Diplomatic Context of the Early Cold War (7,000 words, plus 2,000 in footnotes)

The first major English-language study of the French viewpoint (and nearly the first anywhere). The French military pushed for inclusion in the US/UK efforts, but were held at arm's length because of deep distrust of the French. Once they won limited inclusion and turned exploitation over to civilian agencies, however, fundamental differences in how the French understood technology led to completely different strategies for handling German science. These leaders of French science argued that technology is too socially embedded to be moved easily, and that even scientists are only valuable in their native *milieu*. As such, they focused instead on building Franco-German institutes to train cooperative teams, laying one foundation for early European Union cooperation.

Aspects of this chapter, combined with Chapter Two, became an article published in *The International History Review* in 2014.

Chapter Four. Soviet Science and the Use of German Scientists and Technology (7,200 words, plus 1,900 in footnotes).

This chapter, unlike the others, builds almost entirely from secondary sources, and is primarily a synthesis of these other works. It describes the Soviet exploitation of German science, including the dramatic Operation Ossoaviakhim, during which thousands of Germans were forcefully and suddenly moved deep into the Soviet Union and kept there for years. Meanwhile, science became an important part of the newly-developing East German regime. This chapter examines how these efforts compare and contrast to the Western allies, with all the major differences in political and economic systems between Stalin's USSR and the Western democracies.

Chapter Five. Science, Industry, and the Reconstruction of Occupied Germany (9,800 words, plus 1,900 in footnotes)

Moving away from nation-by-nation history to an integrated, thematic approach, this chapter looks at how each occupying nation saw the roles of science and technology in reforming Germany, and how these plans ties to their own domestic worries about ensuring scientific preeminence. Rhetoric of the civilizing, democratizing effects of science clashed with fears of "Hunnic" technology. The controls on research in occupied Germany are a prime example of how this period can only be understood by combining top-level diplomacy, the individual priorities and internal politics of each occupying nation, and the decisions of key individuals on the ground. This chapter also attempts to give voice to the Germans themselves, who were far from passive vessels for Allied planning.

Chapter Six. Documentation, Microfilm, and Information Technology: Dealing with Information Overload in the Exploitation of German Science (11,000 words, plus 1,200 in footnotes)

While radar and atomic weapons were vital technologies for winning the war, microfilm completely reshaped the world of espionage and intelligence. The Allies sought information about German science/technology throughout the war, found themselves buried under the enormous amount of data they were able to collect. The explosion in scientific and technical publications throughout the century forced governments to grapple with a problem all too familiar to scholars today, but new to the twentieth century: the availability of overwhelming amounts of information. Planners of the scientific exploitation efforts in Germany relied upon the breakthrough information technology of the day, microfilm. As with so many information technologies, microfilm fell short of its promise of free and unlimited knowledge. The problems it created entangled not just exploitation in Germany, but also intelligence agencies, library science, and scientific publication around the world.

Chapter Seven. Reversing the Flow: Allied Exploitation of American Science and Technology in the early Cold War (9,000 words, plus 1,900 in footnotes)

This chapter is a look at long-term consequences of exploiting German science by following the trend discussed in Chapter 1: American (and Soviet) postwar technical leadership. After years of American effort to *import* German science, in the late 1940s American policy shifted to *exporting* science and technology to Germany, Western Europe, and allied developing economies. The chapter examines American missions to influence British and French science and industry, promote American ideals of decartelization and antitrust in Germany, and use science as a key part of Cold War diplomacy. It also examines the development of the competing Soviet-influenced world of science, including Soviet technical aid to China. Finally, it looks towards the influence of "know-how" licensing on international business and law through the 1960s.

A relatively small part of this chapter has been revised substantially (along with other content) into an article recently accepted at *Technology & Culture*.

Conclusion. (2,800 words, plus 600 in footnotes)

Total: About 75,500 words, plus 15,500 in footnotes = 91,000 words total

Sources

The primary archives used in this project are the US National Archives facilities in Washington D.C. and College Park, MD; the *Archives nationales* facilities in Paris and Fontainebleau, France, as well as the Bibliothèque nationale and the French military archives; and the British National Archives in Kew. I also used the collections in the German Bundesarchiv in Berlin and Koblenz. Collectively, these facilities hold the archives of the various military and civilian agencies involved in investigating and acquiring German science and technology, providing a top-down perspective.

It also draws from contemporary trade journals for the chemical, aeronautical, pharmaceutical, machining tools, and metallurgy industries. This provides a mid-level perspective of the businesses involved.

Finally, memoirs of personnel on the ground in Germany, and in the exploitation agencies in the Western nations, provide a bottom-up perspective. American, British, and French newspapers and other periodicals from the time provide evidence of public perception and awareness of the efforts.

Comparable and Competing Works

Competing works

Author/Title	Publisher	Price	Length	Date
John Gimbel, <i>Science, Technology and Reparations: Exploitation and Plunder in Postwar Germany</i>	Stanford University Press	~\$200 on used book market (bookfinder)	280 pages	1990-01-01

This is the only directly comparable academic monograph, though it focuses exclusively on the American case. It is excellent, and sparked enough interest to lead to a collection of response essays, Ciesla et al, [Technology Transfer out of Germany after 1945](#) (Routledge Studies in the History of Science, Technology and Medicine, 1996). By virtue of its age and scope, it does not engage with any research published or sources declassified within the past twenty-five years. Its greatest weakness, in retrospect, is that it takes the perspective of the exploitation agencies somewhat credulously. This leads Gimbel to exaggerate his central claim: that these exploitation efforts generated billions of dollars of value for the United States economy. This is a claim I confront directly in the first chapter of my work.

Author/Title	Publisher	Price	Length	Date
Annie Jacobsen, <i>Operation Paperclip: The Secret Intelligence Program that Brought Nazi Scientists to America</i>	Little, Brown and Company	Hardback: \$20.95 (Amazon) Paperback: \$14.80 (Amazon)	Hardback: 592 pages Paperback: 624 pages	Hardback: 2014-02-11 Paperback: 2015-01-20

Jacobsen is a journalist covering the same ground as earlier journalists on this general topic: the moral implications of bringing 'Nazi' scientists to the United States. While she goes into considerable depth on her topic, she does so by excluding discussion of other countries, and focuses fairly narrowly on medical scientists and unethical experimentation. In contrast, my book emphasizes the international scale, the breadth of industries affected (and how they were affected unevenly across countries and industries), and largely skips over the moral concerns that drive Jacobsen. *Operation Paperclip*'s length, structure, tone, and content aim it at a broad market of airport/beach readers, and is more likely to lead curious readers to my book than to substitute for it. My work will also be of far more value to academic readers.

There are a number of popular histories by non-academic authors focusing on the morality of America's dealing with Nazi scientists, indicating an ongoing broader audience. The following are very similar to Jacobsen's work, though hers is the best-documented and most recent:

- Linda Hunt, *Secret Agenda: The United States Government, Nazi Scientists, and Project Paperclip, 1945 to 1990* (New York: St. Martin's Press, 1991)
- Christopher Simpson, *Blowback: America's Recruitment of Nazis and Its Effects on the Cold War* (New York: Weidenfeld & Nicolson, 1988)
- Tom Bower, *The Paperclip Conspiracy: The Hunt for the Nazi Scientists* (Boston: Little, Brown, 1987)
- Clarence G. Lasby, *Project Paperclip: German Scientists and the Cold War* (New York: Atheneum, 1971)
- Michael Bar-Zohar, *The Hunt for German Scientists* (London: Barker, 1967)
- James McGovern, *Crossbow and Overcast* (New York, W. Morrow, 1964).

Comparable works

Monique Laney, *German Rocketeers in the Heart of Dixie* (New Haven, CT: Yale University Press, 2015). Hardback: \$31.74 ([Amazon](#))

Laney's work addresses the lives and careers of the German rocket scientists brought to the US by Project Paperclip. It is an excellent work, but an excellent complement to my book rather

than a competitor. Laney focuses solely on the rocket scientists, whereas my research spans many industries, and is focused on the scientists' life in America.

John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge, Mass.: The MIT Press, 2006). Hardback: \$63.41, Paperback: \$23.75 ([Amazon](#))

This book provides a model for my work. It smoothly integrates local cases into a transnational history; it's succinct (270 pages + notes); it incorporates the history of science and technology into diplomatic history, history of intelligence/espionage, and other fields; and its clear writing makes complex ideas accessible to a wide readership.

Ken Alder, *Engineering the Revolution: Arms and Enlightenment in France, 1763-1815* (Princeton: Princeton University Press, 1999).

Engineering the Revolution is another model. Like my work, it tackles a story of international technology transfer – in this case, the movement of interchangeable parts in gun manufacturing from France, to the US, and back to France. It also expands this basic story to address the ways that technology and society influence each other, incorporating both local politics and international diplomacy. *Engineering the Revolution's* breadth of focus has landed it on syllabi in a number of fields beyond its 18th century setting.

Comparable in focus on how the Nazi era shaped German science/technology:

- Mark Walker, *Nazi Science: Myth, Truth, and the German Atomic Bomb* (Cambridge, MA: Perseus Publishing, 1995)
- Raymond Stokes, *Divide and Prosper: The Heirs of I.G. Farben under Allied Authority, 1945-1951* (Berkeley: University of California Press, 1988)
- Reinhard Siegmund-Schultze, *Mathematicians Fleeing from Nazi Germany* (Princeton, NJ: Princeton University Press, 2009)
- Kristie Macrakis, *Surviving the Swastika: Scientific Research in Nazi Germany* (Oxford: Oxford University Press, 1993)

Comparable in studying the diplomacy of occupied Germany:

- Ian D. Turner, ed., *Reconstruction in Post-War Germany: British Occupation Policy and the Western Zones, 1945-55* (New York: St. Martin's Press, 1989)
- Norman M. Naimark, *The Russians in Germany: A History of the Soviet Zone of Occupation, 1945-1949* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1995)
- William Hitchcock, *France Restored: Cold War Diplomacy and the Quest for Leadership in Europe, 1944-1954* (Chapel Hill: University of North Carolina Press, 1998)

Comparable in interest in scientific espionage and technology transfer:

- Paul Maddrell, *Spying on Science: Western Intelligence in Divided Germany 1945-1961* (Oxford: Oxford University Press, 2006)
- Richard Aldrich, *The Hidden Hand: Britain, America, and Cold War Secret Intelligence* (Woodstock NY: Overlook Press, 2002).
- J. R. Harris, *Industrial Espionage and Technology Transfer: Britain and France in the Eighteenth Century* (Brookfield, VT: Ashgate Pub., 1998)

Readership

Academic audiences: This work will fit into a wide variety of courses in and beyond History departments. Examples of courses in which this could realistically be assigned include:

- History of science/technology:
 - UCSD's "[Science and the State: History, Philosophy and Sociology of Scientific Knowledge](#)," which uses Alder's *Engineering the Revolution*, discussed above
 - Texas A&M's "[History of Technology](#)," which uses both Bradley's *Guns for the Tsar* and Alder's *Engineering the Revolution*, both comparable works.
 - MIT's "[Introduction to the History of Technology](#)," which includes a unit on War Machines
 - MIT's "[Cold War Science](#)" uses Krige's *American Hegemony*, discussed above as a comparable work
- Science, Technology, and Society (STS) classes:
 - NYU Engineering's "[Seminar in Science and Technology Studies](#)," which spends fully half of its time on issues of technology transfer
- "America and the World," "US Foreign Relations in the 20th Century," "US Since 1945" and related courses
- International History courses such as:
 - UT Austin's (www.utexas.edu/cola/files/mKqnm6WYqQ)
- Business and Economic History courses, such as:
 - "[American Business History](#)"
 - "[The Global Economy](#)"

In general, the book should appeal to scholars interested in technology transfer, knowledge management, and political economy, and should at least receive publicity via reviews in these fields' journals.

Popular audiences: I revised the book with a wider, popular readership in mind. The popularity of books, TV shows, and movies referencing Project Paperclip and Wernher von Braun, such as *Operation Paperclip* and *The Paperclip Conspiracy*, demonstrate broader interest in this specific topic. There is also perennial interest in Nazis, technological espionage, and nuclear secrecy (which is not a main focus of the book, but is occasionally relevant). I include sufficient historical background and exposition into each chapter for an educated non-academic reader.

Specifications

Length

The current manuscript draft is about 91,000 words, including footnotes.

Images

Chapter 1 includes two images of organizational charts to lay out the American exploitation programs in all their complexity.

Chapter 7 includes two charts demonstrating some of the long-term consequences of these exploitation efforts.

If desired to bring in wider audiences, I could find additional pictures related to most topics.

Author Biography

Douglas O'Reagan is a postdoctoral fellow in the Department of History at the Massachusetts Institute of Technology. He received a PhD in History from the University of California, Berkeley in 2014, having earned undergraduate degrees in history and physics from the University of Virginia. He has received a number of prestigious awards and fellowships, including the Ambrose T. Monell Foundation Fellowship in Technology and Democracy from the Miller Center for Public Affairs, the Edward Teller Fellowship in Science and National Security Studies from the US Department of Energy, the Raquel and Author Siedel Fellowship in the History of Intellectual Property and Patents from the Chemical Heritage Foundation, and a postdoctoral fellowship at the Coleman Fung Institute for Engineering Leadership in UC Berkeley's College of Engineering.