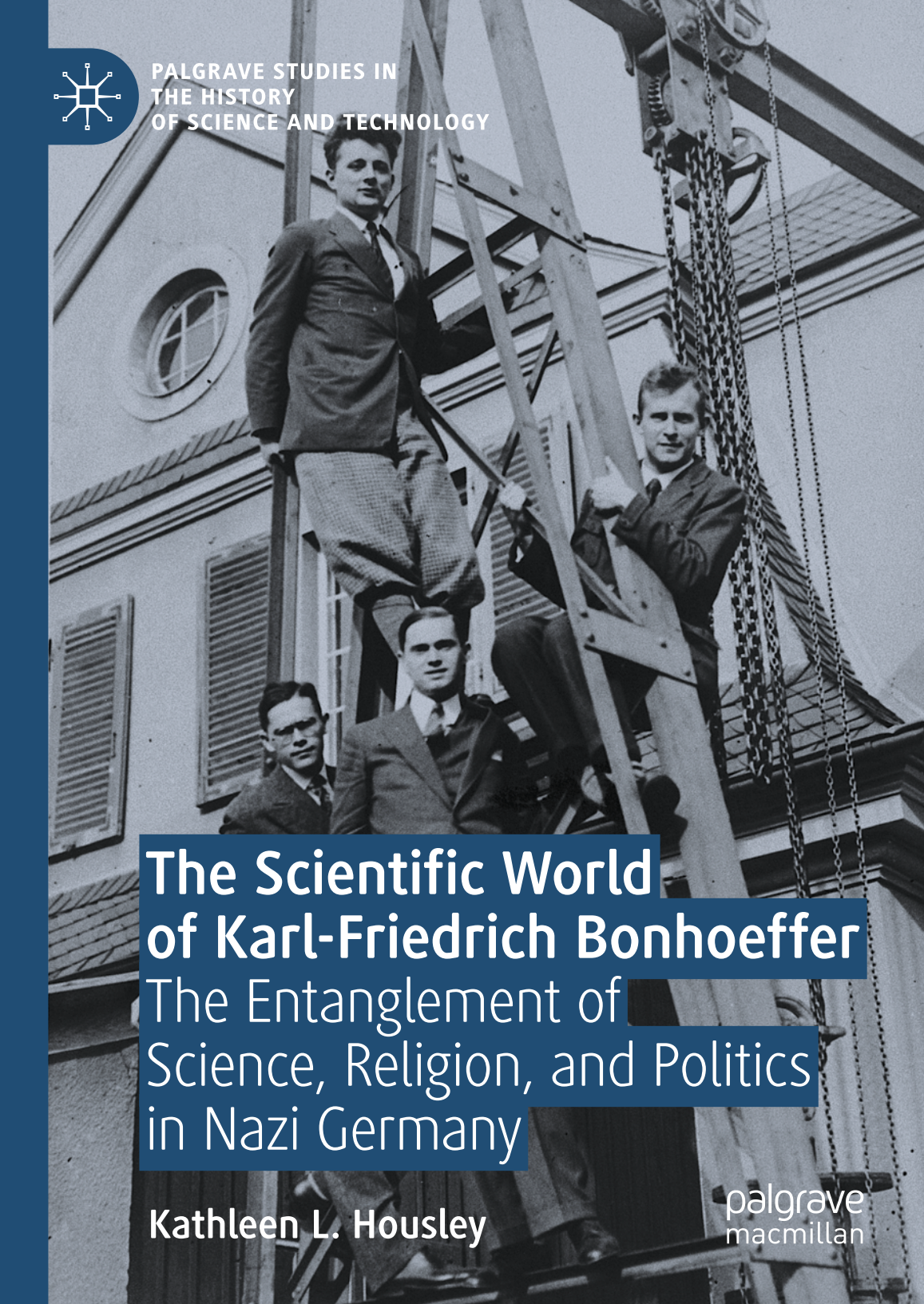

The Scientific World of Karl-Friedrich Bonhoeffer

The Entanglement of Science, Religion, and Politics in Nazi Germany

Kathleen L. Housley

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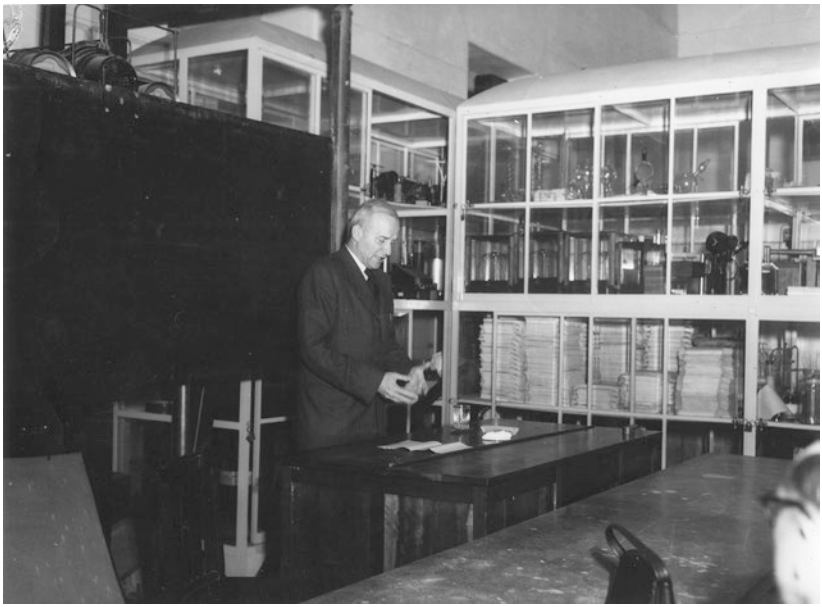
Palgrave Studies in the History of Science and Technology
ISBN 978-3-319-95800-2 ISBN 978-3-319-95801-9 (eBook)
https://doi.org/10.1007/978-3-319-95801-9

Library of Congress Control Number: 2018949354

Cover credit: United States Holocaust Memorial Museum, courtesy of Leorah Kroyanker

This Palgrave Macmillan imprint is published by the registered company
Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland



Karl-Friedrich Bonhoeffer in the physical chemistry laboratory at the University of Göttingen during the early 1950s. Photo Credit: Paul Harteck Papers, MC17, Institute Archives and Special Collections, Rensselaer Polytechnic Institute, NY

Preface

My research did not begin with Karl-Friedrich Bonhoeffer but with his brother Dietrich, specifically his extensive reading list while in a Nazi prison. On that list was *The World View of Physics* by the German physicist Carl Friedrich von Weizsäcker that Karl-Friedrich had sent to Dietrich in 1944. That book was of interest to me because it had an impact on Dietrich's ideas about science and religion. I decided to cast a broader research net because of a comment made by Roald Hoffmann, winner of the Nobel Prize in Chemistry and professor emeritus at Cornell University. Hoffmann spent a year and a half of his childhood hiding in an attic in German-occupied Poland with his mother, barely surviving World War II. In his reply to an email I had sent him about my research, Hoffmann asked if I knew about Weizsäcker's involvement in Nazi atomic bomb research. That question was like a warning flare. I realized that I had to expand my research exponentially into nuclear science during the Third Reich, a very difficult subject.

In doing so, I came across numerous references to Karl-Friedrich's research on heavy water. Some were troubling. It was not until I found several exceptional letters written after the war by Paul Rosbaud, the spy known by the code name *The Griffin*, as well as letters from prominent Jewish scientists to Karl-Friedrich, expressing their gratitude and offering their support, that I began to comprehend what had occurred. I am grateful to Hoffmann for his comment on Weizsäcker that changed the

course of my research. So also, I am grateful to him for reading an early draft and challenging me to look carefully at changes in the field of physical chemistry in the early 1930s.

Glastonbury, USA Kathleen L. Housley

Acknowledgements

My thanks go to Victoria Barnett, Director of the Program of Ethics, Religion, and the Holocaust, the United States Holocaust Memorial Museum in Washington, D.C., and Clifford Green, past president of the International Dietrich Bonhoeffer Society, English Language Section, for their encouragement and guidance. As editors for *Dietrich Bonhoeffer Works*, their knowledge of the Bonhoeffers is of the highest order. Victoria read an early draft of *The Scientific World of Karl-Friedrich Bonhoeffer: The Entanglement of Science, Religion, and Politics in Nazi Germany* and made suggestions. Clifford helped me find an excellent researcher and translator, Saskia Triesscheijn, who obtained copies of many of Karl-Friedrich Bonhoeffer's letters in the Max-Planck-Gesellschaft Archives in Berlin. Synergistically, Saskia has a degree in biology and is studying theology at Humboldt University in Berlin.

In regard to translation, I would not have gotten very far without the help of Margaret Ludwig who grew up in Germany, coming to the USA as a young woman in the early 1950s. Sitting with Margaret at her dining room table, I would hand her letters in faded handwriting between Paul Harteck, Michael Polanyi, and Karl-Friedrich Bonhoeffer and she would set to work, puzzling over which words most accurately conveyed the meaning and explaining to me colloquialisms that resisted translation.

I am also indebted to the libraries and librarians of Wesleyan University in Middletown, Connecticut. Wesleyan's libraries are open-stack, enabling the important research skill of browsing. I could peruse older, seemingly tangential books on science, which turned out to be significant, for example, *The Born-Einstein Letters* by Max Born (1971). Browsing also led me to newer books that I would have overlooked such as *Stalin's Captive: Nikolaus Riehl and the Soviet Race for the Bomb* by Nikolaus Riehl and Frederick Seitz (1996). In the world of Internet research and ebooks, actual hard-copy books and helpful librarians remain invaluable. Special thanks to Melissa Behney, science librarian at Wesleyan.

Thanks also to Jenifer Monger, archivist at the Institute Archives and Special Collections, Folsom Library, Rensselaer Polytechnic Institute, for helping me locate correspondence and photographs in the Paul Harteck Papers.

My husband, Timothy J. Housley, encouraged me to keep going, patiently reading numerous drafts. I also found encouragement in the Bonhoeffers themselves. Their letters to each other were warm and supportive even when they disagreed. More than once when I questioned whether I should continue, it would be their words about standing firm in the face of difficulties that would restore my belief that a book could—and should—be written.

Contents

About the Cover Image

In this photograph taken around 1930, Karl-Friedrich Bonhoeffer (middle) and his doctoral assistants, Paul Harteck (top), Ladislaus Farkas (bottom left), and Adalbert Farkas (bottom right), are perched on scaffolding outside the Kaiser Wilhelm Institute for Physical and Electrochemistry in Berlin. It is the pose of young men full of purpose and hope who are unaware their world is about to fall apart. The Farkas brothers will be forced out of Germany because they are Jewish. Harteck will become a leader of Hitler's atomic bomb project. Bonhoeffer will be caught in between, attempting desperately to hold everything together even as World War II overwhelms them all.

List of Figures

Notes on Sources

The seventeen-volume *Dietrich Bonhoeffer Works* (DBW), published by Fortress Press, is magisterial. I could not have written *The Scientific World of Karl-Friedrich Bonhoeffer: The Entanglement of Science, Religion, and Politics in Nazi Germany* without the series because it includes the correspondence between the brothers. It took great dedication on the part of many editors and translators to bring the series into existence—retranslated, unexpurgated, with extensive footnotes and commentary. Prior to the publication of the series, some of Dietrich's books were shortened with sections reordered, inadvertently misleading readers.

Eberhard Bethge's *Dietrich Bonhoeffer: A Biography* (2000) is ancillary to *Dietrich Bonhoeffer Works.* It is the primary source for information on Dietrich's life and is destined to remain so because Bethge was a close friend who married into the Bonhoeffer family and whose correspondence with Dietrich was critically important in helping him shape his theology. Bethge dedicated his life to keeping Dietrich's legacy alive. Other biographies have been written, but all are built on the foundation Bethge laid down.

Primary material is always of great importance. Karl-Friedrich Bonhoeffer's papers are in the Max-Planck-Gesellschaft Archives in Berlin. Paul Harteck's papers are in the Institute Archives and Special Collections, Folsom Library, Rensselaer Polytechnic Institute. The correspondence between Paul Rosbaud and Samuel Goudsmit is in the Alsos Mission Papers, Niels Bohr Library & Archives with the Center

for History and Physics, American Institute of Physics, and is available online.

Because of the large number of people who are mentioned in *The Scientific World of Karl-Friedrich Bonhoeffer*, I have included in the appendix *Biographical Profiles*, which include birth/death dates, academic affiliations, major events, and what occurred in the lives of these people following World War II.

Many excellent books and biographies have been written about science and scientists during the Nazi era and the German atomic bomb project. However, I found most helpful the books written by an elite group of physicists who elected, usually at points well along in their scientific careers, to bring their knowledge to bear on history. Among this group was Per F. Dahl whose book *Heavy Water and the Wartime Race for Nuclear Energy* (1999) is an excellent summation of research during this period. Dahl was a physicist who worked on superconductors at Brookhaven National Laboratory and Lawrence Berkeley National Laboratory. Because of his expertise, coupled with his being multilingual, he was able to delve into German and Norwegian archives in a way that few other researchers could. As a result, he brought scientific clarity to the history of heavy water and the connections between the Norsk Hydro plant in Vemork, Norway, and some members of the Uranium Club. I could not have written about Karl-Friedrich's work on heavy water without Dahl's exemplary scholarship, which underscored the interplay between pure science and atomic bomb research.

Stalin's Captive: Nikolaus Riehl and the Soviet Race for the Bomb (1996) by Nikolaus Riehl and Frederick Seitz is another valuable book written from the scientific perspective. It is mainly the memoir of Riehl whose job was to supply purified uranium and who went to the USSR following the war. However, the memoir needed to be set in historical context so as to be more understandable, including explanations of both science and espionage. A physicist, Seitz admirably provided these components. Working as a technical intelligence expert assigned to General Dwight Eisenhower's headquarters in Versailles, Seitz personally knew many German scientists. He also knew the members of the Alsos team, including the physicist Samuel Goudsmit whose mission was to learn everything about German nuclear research. After the war, Seitz led a distinguished career as director of the Oak Ridge National Laboratory, chair of physics at the University of Illinois, and president of The Rockefeller University.

Trained in physics and history, David C. Cassidy has written two biographies of Werner Heisenberg who was Karl-Friedrich Bonhoeffer's colleague at the University of Leipzig. The second book *Beyond Uncertainty: Heisenberg, Quantum Physics, and the Bomb* (2009) builds on the first *Uncertainty: The Life and Science of Werner Heisenberg* (1992). However, the second book was written after the declassification in 1992 of the secret tapes made during the incarceration of ten German scientists at Farm Hall in England immediately following the war. The tapes shed light on the workings of the Uranium Club, the personalities of some of its members, and Heisenberg's efforts to justify himself.

Klaus Hentschel is also a physicist and a prolific historian of science. In his important book *Physics and National Socialism: An Anthology of Primary Sources*, Hentschel provides an in-depth introduction as well as copious scholarly footnotes, making vital connections between people and projects, both well known and obscure. This was not a book I read once and put aside; it became a reliable reference work always near at hand.

Arnold Kramish was a nuclear physicist who worked on the Manhattan Project. His book on Paul Rosbaud *The Griffin: The Greatest Untold Espionage Story of World War II* (1986) is inaccurate in some respects because certain documents were still classified at the time he wrote the book. Otherwise, it is well researched, buttressed by facts gleaned from extensive interviews. The information about the relationship between Karl-Friedrich and Rosbaud is corroborated by Rosbaud's letters to Samuel Goudsmit in the Niels Bohr Library & Archives with the Center for History and Physics, American Institute of Physics.

Although a historian, not a scientist, Fritz Stern is worthy of mention not only because of his exemplary scholarship on Germany but also because his family history overlapped with the Bonhoeffers at several critical points. The Sterns and their relatives lived in Breslau, Germany (now Wroclaw, Poland), from the early nineteenth century to the 1930s when they were forced into exile because of their Jewish heritage, even though many of them had converted to Christianity. Fritz's father and grandfather were renowned physicians. During the first decade of the twentieth century, they and their families moved in the same medical and cultural spheres as the Bonhoeffer family with whom they were friends. Although Fritz was not born until 1926, fourteen years after the Bonhoeffers moved from Breslau to Berlin, he knew of the close connection through letters and stories about which he wrote in his memoir *Five Germanys*

I Have Known (2006). Yet, another critical juncture is that Fritz was the godson of Fritz Haber, the physical chemist and Nobel laureate who figured prominently in Karl-Friedrich Bonhoeffer's life. Fritz Stern was also a relative of Otto Stern, the renowned physical chemist who was driven from his position at the University of Hamburg after Hitler came to power. In 1943, Otto was awarded the Nobel Prize in Physics. Fritz Stern's branch of the family came to the USA in 1938 when he was twelve years old. Following the war, the Sterns sent care packages to the Bonhoeffers to help alleviate their suffering. Unfortunately, Fritz Stern died in 2016. Had I gotten the chance to interview him, I would have thanked him for his scholarship. For me, Stern was cautionary: He considered oversimplification a danger, but so also was the piling up of historical details to the point that the reader became numb to the terror embedded therein. Stern tried not to lose sight of the individual human being struggling to live a worthy life in a world that labeled entire races, religions, and nations as worthless.

CHAPTER 1

Introduction

Karl-Friedrich Bonhoeffer seemed to stand apart from his family's intense resolve to bring the brutality of Nazism to an end. A distinguished scientist who was nominated five times for the Nobel Prize, he was chair of the department of physical chemistry at the University of Leipzig from 1934 until 1946. Besides being physically distant from the center of the resistance movement in Berlin, he was intellectually distant from his family due to the complexity of his research, combining the apparent insubstantiality of quantum mechanics with the substantiality of classical physics and chemistry. Few people had the requisite brilliance to understand his work other than his colleagues. What Karl-Friedrich shared with all the Bonhoeffers was the quality of being steadfast. After the war, using what strength he had left, he helped rebuild the shattered field of physical chemistry in Germany, brick by brick, element by element.

In quantum mechanics, the word *entanglement* means that while the states of particles are uncertain, nonetheless, there is a correlation even though the particles can be far apart. As Albert Einstein put it with incredulity, there is "spooky action at a distance." Entanglement appears literally in Karl-Friedrich's work on spin and anti-spin in hydrogen isotopes. Entanglement is also an apt metaphor for his life. No matter how remote he appeared from his family's involvement in the resistance, he was not remote. Throughout the evidentiary record, there are photon flashes of his compassionate awareness. However, these can be easily missed in the

K. L. Housley, *The Scientific World of Karl-Friedrich Bonhoeffer*,
Palgrave Studies in the History of Science and Technology,
https://doi.org/10.1007/978-3-319-95801-9_1

steady glow of the light cast by his brother, Dietrich, whose powerful theological writings and death by hanging in Flossenbürg concentration camp led to his being proclaimed a Christian martyr.

For Karl-Friedrich, there was the world of pure science and then there was the rest of the world, but that does not mean the rest of the world was the lesser. In fact, he was very close to all his siblings with whom he corresponded frequently. An agnostic, he sometimes took issue with Dietrich's theological views but never to the point of snapping their brotherly bond. During Dietrich's incarceration in Tegel prison in Berlin, Karl-Friedrich wrote him warm letters, often accompanied by carefully selected books and food packages to supplement his sparse prison diet. In a letter dated May 30, 1943, less than two months after Dietrich's arrest, Karl-Friedrich wrote from Leipzig that he had not yet told his children what had occurred, adding on a light note, "I think they consider me somewhat peculiar since I always ask for homemade cookies and candies when I travel to Berlin."

In the catastrophic closing months of the war, when it was clear that his two brothers and two brothers-in-law would be executed along with many other friends and relatives, Karl-Friedrich tried desperately to visit them all in prison. At the same time, he was attempting to take care of his family, his brothers' families, and his elderly parents—some of them burned out and bombed out, some scattered, all traumatized, especially the children. It is no surprise that Karl-Friedrich suffered a severe heart attack not long after the war ended. On meeting him after many years of separation, his sister Sabine, who was Dietrich's twin, was astonished at the change in his appearance. "He had become very haggard, and as he looked at me, he had my mother's eyes."[1]

Karl-Friedrich did not speak publicly about what had happened. He had no choice but to remain silent because in postwar Germany the Bonhoeffers were not considered heroes but traitors for attempting to kill Hitler, who was still venerated by many people. Eventually, Germany would grapple with the truth, but Karl-Friedrich would not live to see it. He died of a second heart attack in 1957.

Karl-Friedrich was aware of his family's role in the resistance, although he did not know the degree. Besides Dietrich, his sister Christel and brother Klaus were involved as were his two brothers-in-law Hans Dohnanyi (married to Christel) and Rüdiger Schleicher (married to Ursula). In a letter to Sabine, who had gone into exile in England in

1938 because her husband was of Jewish descent, Karl-Friedrich wrote on August 3, 1945, that the family had received word of the executions of Dietrich, Klaus, and Rüdiger. The fate of Hans was still unknown, but Karl-Friedrich strongly suspected that he was dead as well. Then, Karl-Friedrich wrote movingly about the family's involvement:

> You can not imagine how much courage, prudence, caution and endurance was necessary, how often we all expected the imminent breakdown of this criminal tyranny. (I have since heard that no less than five attempts were made on Hitler's life), or how often we were disappointed. Our parents were aware of what they were doing, approved of it, and gave them assistance. I believe there can have been very few families in Germany during the past twelve years in which there was such complete agreement on political matters, and there is no doubt that this spirit gave them strength to continue their plans.[2]

Karl-Friedrich was also aware that some of his close scientific friends, including Werner Heisenberg, winner of the Nobel Prize for his seminal work on quantum mechanics, and Paul Harteck, who had worked with Karl-Friedrich on molecular hydrogen, were researching how to build an atomic bomb for Hitler. In fact, Karl-Friedrich's research on heavy water during the 1930s had been a crucial precursor step to the work being carried out by the Uranium Club—a euphemism evoking a group of colleagues sharing schnapps after a productive day spent in the laboratory.

Eberhard Bethge, Dietrich Bonhoeffer's friend and biographer, wrote that Karl-Friedrich "abandoned his earlier field of research into nuclear hydrogen, parahydrogen and heavy hydrogen in favour of electro-chemistry and the kinetics of electrode processes, in order to clarify the question of biological processes and basic electro-physical principles in nervous stimulation. He made this change so that he could avoid having to cooperate in the development of nuclear armaments."[3] That is only partially correct. Bethge did not know that during the war Karl-Friedrich was consulted several times by members of the Uranium Club about issues pertaining to heavy water on which their bomb research was reliant. Karl-Friedrich tried to distance himself by shifting the focus of his research and deflecting questions. However, his position at the University of Leipzig as well as his friendships with the Uranium Club members meant that he was privy to top secret information.

It would appear that Karl-Friedrich found himself in a monstrous ethical dilemma, caught between men trying to kill Hitler and men trying to provide him with a weapon of mass destruction that would guarantee Nazi domination of the world, or what was left of it. Tottering between them, Karl-Friedrich chose a third way: What he knew about nuclear research, he passed on to Paul Rosbaud, a scientific advisor to the publisher Springer Verlag. Rosbaud was also a master spy for the British known by the code name *The Griffin*. Following the war, Rosbaud wrote in a letter to the American intelligence expert Samuel A. Goudsmit that Karl-Friedrich was not only his "ally" but also one of his "best friends."[4] Lending credence to Karl-Friedrich's passing on information to the British is a report written after the war by Franz (Francis) Simon to Michael Perrin, one of the leaders of the British atomic bomb program, in which he related a conversation with Karl-Friedrich on heavy water that undercut protestations of innocence by the members of the Uranium Club.[5] There are also letters written after the war to Karl-Friedrich from several exiled Jewish scientists. This was not a group disposed to compassion for their "Aryan" colleagues in Germany, no matter how dire their circumstances. Yet, they offered Karl-Friedrich help as the Soviet Union took over East Germany and the University of Leipzig disappeared behind the iron curtain. Despite the evidence that will be presented in this book, there is no certainty of Karl-Friedrich's link to British espionage, one reason being that Britain's Secret Intelligence Service (commonly known as MI6) has never released the World War II files of Paul Rosbaud. Another reason is that much was destroyed, pages were ripped out of diaries, codes were lost, material in archives disappeared.

To this must be added the significant problem of long-standing obfuscation. Many German scientists tried very hard for decades to obscure their roles in research that benefited the Nazis. They devised numerous stratagems to present themselves and their work in a positive light, for example, Werner Heizenberg's oft-repeated claim that he was building an atomic reactor for civilian purposes, not a bomb. Probably, most notorious was the disingenuous argument that German scientists were more ethical than American scientists because they knew how to build an atomic bomb but did not do it, intentionally sabotaging the research, whereas the Americans pushed ahead, built the bombs, and dropped them on Japan. This would be a devastating argument if true. However, the Germans knew full well what they were doing and were committed

to it. The reasons they failed have to do with the extreme difficulty of the science, lack of organizational unity, and insufficient financial resources—resources that were available in the USA but not in Germany.[6]

Yet, another difficulty in unearthing the truth is almost too obvious to mention: People who were passing on secrets or who were part of the resistance had to appear other than who they were, even taking on the guise of Nazis when it was essential. Dietrich Bonhoeffer had to do that repeatedly and in different ways, for example, when he told Bethge to give the Heil Hitler salute when they were sitting in the garden of a cafe and the surrender of France was announced over the loudspeaker. As people cheered wildly, jumping up on the chairs, Dietrich raised his arm in the salute while Bethge sat there dazed. "Raise your arm! Are you crazy?" he whispered to Bethge, later telling him, "We shall have to run risks for very different things now, but not for that salute."[7]

The title *The Scientific World of Karl-Friedrich Bonhoeffer: the Entanglement of Science, Religion, and Politics in Nazi Germany* points to the book's scope. This is not a straightforward biography of a single man. For example, Karl-Friedrich's belief in pure science was shared by almost all his colleagues. Einstein described pure science as a temple unsullied by connections to home, culture, and politics, dedicated solely to the pursuit of objective knowledge. Karl Bonhoeffer, the patriarch of the family and one of the leading physicians in Germany, also believed in pure science, which led him to remain detached from the political problems swirling around him. To understand that belief, it is essential to look at the extreme changes in German science from its glory days at the beginning of the century to its utter degradation after 1933. By holding fast to pure science, German scientists became dangerously vulnerable to manipulation. Yet, some men were beginning to scrutinize the nature of scientific autonomy and the effects of governmental and ideological control—among them was Michael Polanyi, Karl-Friedrich's colleague and close friend.

On one level, *The Scientific World of Karl-Friedrich Bonhoeffer* is the story of a compassionate man in love with chemistry, his family, and his nation, trying in the midst of chaos to do right by all of them. On another level, it raises ethical issues about the interaction of science, religion, and politics that are still relevant today. To tell that multi-level story requires me to step away from quantum mechanical entanglement and return to the cause and effect of linear history, beginning with Karl-Friedrich's childhood and the major influence of his father.

However, I do so holding in mind an illuminating observation made by Sir George Thomson, Nobel laureate in Physics, in a letter to Ronald W. Clark, the biographer of Albert Einstein: "Whenever a system is really complicated, as in the brain or in an organized community, indeterminacy comes in, not necessarily because of *h* [Planck's constant] but because to make a prediction so *many* things must be known that the stray consequences of studying them will disturb the *status quo*, which can never therefore be discovered. History is not and cannot be determinate. The supposed causes only *may* produce the consequences we expect."[8]

Notes

1. Sabine Leibholz-Bonhoeffer, *The Bonhoeffers: Portrait of a Family* (London: Sidgwick & Jackson, 1971), 197.
2. Ibid., 195.
3. Eberhard Bethge, *Dietrich Bonhoeffer: A Biography* (Minneapolis: Fortress Press, 2000), 562.
4. Letter from Rosbaud to Goudsmit, February 17, 1947. Samuel A. Goudsmit Papers, 1921–1979. Series IV, Alsos Missions. Subseries B. Paul Rosbaud correspondence and manuscripts 1946–1949 (Box 28, Folder 43). Niels Bohr Library & Archives, American Institute of Physics. www.aip.org/history/nbl/collections/goudsmit/colls/print/Box_28/Goudsmit28_43/Goudmit28_430006.html.
5. Kenneth D. McRae, *Nuclear Dawn: F. E. Simon and the Race for Atomic Weapons in World War II* (Oxford: Oxford University Press, 2014), appendix.
6. There are several books on the German atomic bomb project. See David C. Cassidy, *Beyond Uncertainty: Heisenberg, Quantum Physics, and the Bomb* (New York: Bellevue Literary Press, 2009); John Cornwell, *Hitler's Scientists: Science, War and the Devil's Pact* (New York: Viking, 2003); Paul Lawrence Rose, *Heisenberg and the Nazi Atomic Bomb Project* (Berkeley: University of California Press, 1998); and Mark Walker, *Nazi Science: Myth, Truth, and the German Atomic Bomb* (New York and London: Plenum Press, 1995).
7. Bethge, *Bonhoeffer*, 681.
8. Ronald W. Clark, *Einstein: The Life and Times* (New York: World Publishing, 1971), x.

CHAPTER 2

The Father's Scientific World

Karl Ludwig Bonhoeffer is presented in several biographies of his son, Dietrich, as kindly but slightly remote. He seemed to play only a marginal role in shaping the direction of Dietrich's life as evidenced by his bemused tolerance of his youngest son's budding interest in religion, an interest he did not share. However, in the life of his oldest son, Karl-Friedrich, Karl played a central role, bequeathing to him his scientific worldview and his agnosticism.

In 1904 when Karl was thirty-six-years old, he was appointed chair of psychiatry at the University of Breslau and director of the prestigious Breslau Psychiatric Clinic. Of primary importance to him in his profession was the establishment of a solid neurobiological foundation to psychiatry. This had been true for Carl Wernicke, his predecessor in Breslau, who studied aphasia caused by brain damage. It would also be true for Karl's successor, Alois Alzheimer, well known for his research into dementia. In Germany, where academic lineage was nearly as important as family lineage, this was an exemplary succession of scientists. In 1912, Karl became head of the famed Charité Clinic and chair of psychiatry at the University of Berlin where he kept the succession going by training many other doctors who would become famous, among them Hans Creutzfeldt and Karen Horney.

Until his death in December 1948, Karl Bonhoeffer was one of the leading neurologists and psychiatrists in Germany, whose research papers were widely read in Europe and America. At the age of eighty,

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Palgrave Studies in the History of Science and Technology,
https://doi.org/10.1007/978-3-319-95801-9_2

he was visiting patients on a routine hospital round in Berlin when he suddenly developed a severe headache and dizziness. His obituary read, "He calmly announced his diagnosis and gave precise emergency instructions before he lapsed into deep unconsciousness from which he never awoke." Such was the nature of the man—the way he approached his death was in keeping with the way he approached his life.[1]

The preceding three paragraphs have compressed Karl Bonhoeffer's entire career, providing an uplifting but pallid image of the man: that of a respected physician so committed to his work that he died doing what he loved. The truth about his death is larger, encompassing the painful extremity of life in postwar Germany. Only by looking more broadly is it possible to comprehend why an elderly physician, retired for many years, was making rounds on a wintery day in the bombed-out ruins of a city under a Soviet blockade.

Karl had returned to clinical work at the age of seventy-seven immediately after the war because his world had collapsed, leaving him grief-stricken and appalled. In the 1930s, he had been cautiously silent about his anti-Nazi views, attempting to placate Nazi authorities while protecting the rights of his mentally ill patients. In a plan to overthrow Hitler in 1938, Karl's intended role was to perform a psychiatric examination following Hitler's arrest to determine his sanity. When the overthrow attempt failed, Karl continued to support the resistance, sometimes in strange ways that ran counter to everything he as a conscientious physician embodied, such as obtaining diphtheria bacillus for his daughter to smuggle to her husband in prison so that he would become too ill to be interrogated by the Gestapo.[2] For all Karl's study of the human condition, nothing had prepared him for this. Furthermore, as a German civil servant (as were all academics), he no longer had a pension after the war.[3] The USSR was the occupier of the section of Berlin where the clinic was located, so in late 1945, Karl contacted the Soviet authorities for permission to return to work, donned his white coat, and walked back into the clinic, seeing patients for three more years before he suffered a stroke in the hospital corridor (Fig. 2.1).

This entanglement of personal conscience, medical prowess, and historical events began early in Karl's career—well before the rise of Hitler—when he decided to turn his research attention to the

Fig. 2.1 Karl Ludwig Bonhoeffer. Paul Feam/Alamy Stock Photo

connection between trauma and mental disorders. This decision would involve him in some of the major medical issues of the century, including shell shock suffered by soldiers in the trenches of the First World War.

Karl's education had begun in the 1880s at a time of an enormous leap forward in medicine linked to a revolutionary new way of comprehending disease causation. The Frenchman Louis Pasteur had provided strong evidence for the germ theory of disease through his work on deadly puerperal fever, known as childbed fever because it struck women after they had delivered. He showed that it was caused by bacterial contamination, not by the spontaneous generation of germs that moved via miasma from patient to patient, as commonly thought. The fever was spread by the dirty hands of doctors and nurses and by the use of unsterilized surgical equipment. The way to stop the spread was strict sanitary procedures. While he was not the first to make the connection between dirty hands and disease, Pasteur backed up his ideas with hard evidence that helped convince the skeptical medical profession. He then turned to preventing, but not curing, the scourge of rabies. In 1885, he successfully vaccinated a nine-year-old boy who had been mauled by a rabid dog. The boy's survival brought Pasteur worldwide acclaim. Pasteur himself was utterly fearless and often reckless in how he carried out his research, one of the most famous examples being his extraction of saliva from the jaws of a mad dog via a suction tube in Pasteur's own mouth while his assistants held the animal down.

In Germany, the less flamboyant, more meticulous, but equally brilliant Robert Koch was hard at work on tuberculosis. Commonly known as consumption, it had reached epidemic proportions, accounting for approximately twenty-five percent of all deaths in Europe. Koch also did groundbreaking research on anthrax and cholera, receiving the Nobel Prize in 1905 for his work. Meanwhile, Paul Ehrlich was opening up the field of immunology, putting forth the idea of a therapeutic "magic bullet" that would selectively target a pathogen in the body. In line with that idea, he successfully used Salvarsan (derived from arsenic) against syphilis, a sexually transmitted disease that caused physical deformations and madness before it finally killed. Ehrlich also won the Nobel Prize.

To describe these advances as enormous does not begin to convey the upheaval in worldview, accompanied by a surge in hopefulness, they caused. Suddenly it appeared possible to cure and prevent all diseases. Pasteur, Koch, and Ehrlich were lionized even when they made serious mistakes or overestimated the impact of their discoveries. A new era in

human history had begun, and it had been brought into being by the ingenious hands of men, not the hand of God, at least according to many scientists and physicians.

Karl's two fields of neurology and psychiatry were also undergoing vast change. Both had roots in the ancient world, but not until Karl's era were they set on a medical foundation. By the middle of the nineteenth century, the Frenchman Jean-Martin Charcot had developed clearer clinical pictures of many diseases, including multiple sclerosis, amyotrophic lateral sclerosis (called Charcot disease), and shaking palsy, which he renamed Parkinson's disease after the English doctor who had first identified it. Many physicians studied with Charcot, among them Sigmund Freud who was particularly interested in the etiology of hysteria.

Charcot's insistence on the use of the systematic neurological examination of patients was also significant. Doctors should not jump to a diagnostic conclusion on the basis of a superficial look. By the time that Karl entered practice, this was becoming standard procedure for neurologists. Karl himself insisted on it. Yet, unlike rabies and tuberculosis, the causes of neurological and psychological disorders were far less clear. Nowhere on the horizon was there the prospect of a magic bullet to cure Parkinson's, multiple sclerosis, epilepsy, or the strange psychosis the German psychiatrist Emil Kraepelin called *dementia praecox*, eventually renamed schizophrenia meaning a split mind. In his book *Clinical Psychiatry in Imperial Germany: A History of Psychiatric Practice*, Eric J. Engstrom makes the point that the simple model of expanding medical knowledge "is one that rather poorly describes the development of psychiatry." He quotes Karl Bonhoeffer as follows: "the development of psychiatry as a clinical field took a path different from other specialized disciplines. Unlike ophthalmology, otiatics, and orthopedics, it did not gradually specialize and split off from surgery or, like pediatrics, from internal medicine. Its path was just the opposite, it had to be brought laboriously from outside into the framework of the medical disciplines."[4]

In his book *Dreams and Delusions: The Drama of German History*, the historian Fritz Stern pondered what it was that Germany, as a new empire, sought at the end of the nineteenth century that drove it forward with such fervor, particularly in the sciences and medicine. Unified under Otto von Bismarck, its politically astute chancellor, in a way that preserved the privileges of the ruling class while denying those privileges to the middle and working classes, Germany exuded nationalist and militarist strength. Fearful on the one hand, aggressive on the other,