The Fuchs Factor:
Espionage, the Soviet Atomic Bomb and Anglo-American relations

Matthew Collyer: thesis for MA in Modern History (2023)

Abstract

Klaus Fuchs, born in 1911, was a communist and theoretical physicist. The Manhattan Project was infiltrated by a quiet, treacherous man who appeared loyal to his country. Fuchs also headed the British atomic bomb project at Harwell from 1946 until his arrest in 1949. The impact of Fuchs in theoretical physics, the atomic bombs of America, the Soviet Union and Britain is unprecedented. The impact of the Bomb did not just inject fear into Western allies and civilians of both the Soviet Union and America; it also resonated through popular culture, architecture, and the technological race which endeavoured space travel. This thesis examines Fuchs's role in the Soviet atomic bomb project that conceived of Joe-1.

Although Fuchs's treason is at the epicentre of its analysis, the thesis peripherally considers the successes of the FBI and MI5, and whether their security apparatuses were efficient in catching Fuchs. It also scrutinises Fuchs's impact on Anglo-American relations and post-war foreign policy. Other spy cases in the early Cold War are addressed, and their overall impact on Anglo-American atomic relations considered. The thesis concludes with a consideration of Fuchs's impact on intelligence relations between the American and British establishments.

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Abbreviations

AEC – Atomic Energy Commission

ASA - Atomic Scientists Association

CHARLES – Fuchs's second codename while in America

DPP – Director of Public Prosecutions

ENORMOZ – Soviet codename for Manhattan Project

FOI – Freedom of Information

GRU – Soviet Military Intelligence

JIC- Joint Intelligence Committee

KGB – Committee for State Security

MI5 – Military Intelligence, Section Five

MI6 - Military Intelligence, Section Six

MUAD – Committee formed of British Scientists during World War Two

NKVD - People's Commissariat of Internal Affairs

REST – Fuchs's Codename while in America

TNA – The National Archives

Introduction

Literature Review; Methodology

Klaus Fuchs is widely regarded as the most infamous, and damaging, "nuclear spy" of the Cold War era. In this thesis, the security services materials at the UK National Archives are examined to produce a chronological and contextual perspective on Fuchs at the beginning of the atomic age. The thesis provides a comprehensive narrative and analysis of Fuchs's involvement within the Manhattan Project, The British Atomic Bomb Project at Harwell, and how his espionage impacted the Soviet bomb project. Additionally, the thesis contextualises Fuchs's conduct within broader paradigms of the Anglo-American relationship, including nuclear negotiations and state intelligence. It also furnished an in-depth review of literature spanning early ground-breaking secondary literature and recent scholarship from the 2020s. It utilises newer archival data that sheds light on the atomic spies throughout the 1940s and 1950s.

The earlier scholarship on Fuchs is detailed, though limited, as the clandestine endeavours were declassified by Venona in 1995, and The National Archives (TNA) released Fuchs's collections in 2003 and subsequent years. The historiographical nuances that arise from espionage during World War Two and Cold War stress the discrepancies in intelligence history and the difficulties of researching this area.

The Introduction provides a concise background on Fuchs's early life and his first years in Britain, it also opens the question of how Fuchs may have trickled through the British security system. It also includes a comprehensive literature review on secondary and primary sourced material. Chapter One seeks to establish the base of Fuchs's treachery and his professional reservation within the British 'Tube Alloys'. It also examines Fuchs's espionage, how he gathered data and delivered material to the Soviet spies working in Britain and America up until 1949, before his arrest. It highlights Fuchs's successful concealment of his double life from peers at Los Alamos and Harwell under what appeared to be a strict vetting policy. The second half of the thesis focuses on Fuchs's confession and arrest by using primary sources and provides a detailed account of Fuchs's personality and what he may have been going through. Moreover, it gives the reader a thorough understanding of how MI5, GCHQ and the FBI tackled Fuchs's espionage.

Chapter Three investigates the Anglo-American relationship in relation to Fuchs, other spy cases, and legislation including the Quebec Agreement and McMahon Act. It seeks to answer whether Fuchs was the main culprit in dismantling Anglo-American relations in the early 1950s. The inquiry considers American spies and the Maclean-Burgess spy scandal that erupted in unification with the fallout from Fuchs's espionage. It also considers whether espionage was the most critical component in developing Joe-1 via The Smyth Report and the role of Soviet scientists during the 1940s. The thesis concludes with a summary of Churchill's fervent endeavour to build an atomic bomb, the atomic age and the legacy of Fuchs.

Klaus Fuchs: A Background

Klaus Fuchs, born on 29 December 1911, in Russelsheim, Germany. Fuchs's ideological landscape started construction as a young boy, surrounded by socialist ideas and actions being dictated from a religious, moral point of view – the two key aspects that influenced Fuchs's initial intention and, paradoxically, his confession in 1950. Fuchs was always interested in politics and joined the student SPD union and the *Reichsbanner Schwarz-Rot-Gold*, with its goal of bolstering parliamentary democracy against left and right extremism, especially the rise of the Nazi party within the 1930s.[1] Fuchs's political 'awakening', as Frank Close asserts is somewhat significant in Fuchs's intention.[2] By July 1933, Klaus fled to France and eventually arrived in Folkestone, UK on 24 September 1933.

Fuchs graduated in 1937 with a PhD in physics at Bristol University, his paper, *A Quantum Mechanical Calculation of the Elastic Constants of Monovalent Metals*. Fuchs worked with Max Born, and the Home Office provided Fuchs permission to stay in the UK and to move to Edinburgh University. Fuchs applied for British citizenship on 17 July 1939; however, with the war outbreak, Fuchs was swiftly listed as an 'alien'.[3] Ironically, his Alien tribunal highlighted his social and liberal ideas; Born testified that Fuchs was 'devoted to liberal and social ideas' and he was a member of the Social Democratic Party in Germany.[4] However, there was no direct mention of his involvement with his communist's involvements or his

[1] Norman Moss, *Klaus Fuchs The Man Who Stole the Atom Bomb* (New Edition, Sharpe books, 2018), p.4.
[2] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.33.
[3] The UK National Archives, Kew, London, KV 2/1245, s. 510b, item 184.
[4] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).

family's involvement with communist ideology/groups in Germany.[5] Ironically, Fuchs's justification for leaving Nazi Germany was held in view, that he was more a socialist than fascist, but this very reason led to atomic secrets being delivered to NKVD members in the UK.

In 1941 MI5 and other Western intelligence services dismissed Fuchs's leftist ideology or ignored this completely. The war enabled Fuchs to slip under the radar with UK's government services attention being drawn to the war. Furthermore, MI5 was highly criticized for overlooking Fuchs's affiliations, however, the Soviet Union did not pose a huge risk or threat to the Western hemisphere during World War Two. MI5 did examine Fuchs's communist affiliations in 1951, confirming that there was 'no documentary evidence' to support Fuchs's communist links.[6] The director of MI5 in 1951, General Sir Percy Sillitoe, contacted Prime Minister Clement Attlee. He stated: 'It seems believable that Fuchs would gratuitously have drawn attention to his communist past at a time when the position of Russia in the war was by no means clear.'[7] The only written evidence highlighting Fuchs's ideology during World War Two was scooped up by the Nazis a day before Fuchs fled to France, again an ironic and fairy-tale scenario leading to a series of events. Luckily for Fuchs, these circumstances meant his scientific talent allowed him to reside in England for at least the foreseeable future.

Literature Review and Methodology

This thesis evaluates primary sources, gathering the evidence of declassified government and intelligence documentation to construct an inquiry into Fuchs. Primary sources shed light on MI5's tactics to observe and interrogate Fuchs, and include Guy Liddell's diary, MI5's Deputy General who operated to catch Fuchs with Skardon in 1949. Moreover, TNA networks Jim Skardon and Rudolf Peierls. General Leslie Groves' post-facto reflection *Now It Can Be Told* was also essential in constructing a historical picture. The declassified Venona files released in 1995 were fundamental to depicting Fuchs's importance during the Manhattan Project. Coupled with the FBI declassification from the early 2000s, it allows the historian to cross-examine TNA, which comprehensively paints a portrait of MI5, GCHQ, NKVD (KGB) and the FBI's accounts of Fuchs's espionage.

[5] Norman Moss, *Klaus Fuchs The Man Who Stole the Atom Bomb* (New Edition, Sharpe books, 2018).
[6] TNA KV 2/1257, minutes of meeting at the Foreign Office, 3 May 1951.
[7] TNA KV 2/1257, minutes of meeting at the Foreign Office, 3 May 1951.

Secondary scholarship provided ample literature, as historians and physicists have critically analysed tomes of declassified files. The work of Frank Close, John Earl Haynes, John Gaddis, and Nigel West, to name a few, has been scrutinised to reinforce my interpretations. Though secondary sources have been read extensively, they come with hindrances. Espionage provides a unique challenge because the declassification of inaccessible files may not provide the whole narrative; that, moreover, files continue to be declassified results in inconsistency across numerous studies of Fuchs. For example, scholarship from the 1980s and 1990s has significant gaps and discrepancies due to a lack of declassified data. Because the Cold War prevented the UK, the US, and the Soviet Union from releasing sensitive information, the cross-examination of earlier secondary scholarship with that of later years was vital in determining whether interpretations of primary sources stood true within broader scholarship vis-à-vis atomic espionage during the Second World War and the early Cold War.

British and American sources arrange a similarity, though the KGB files and Soviet intelligence reports provide differing views on several spy cases. Notably, they all share similar views on Fuchs's importance and the influence he inevitably had on the Soviet atomic bomb. With a forensic approach to this highly intricate historical matter, this thesis seeks to construct a reliable narrative regarding Fuchs in multiple contexts.

The Venona Files and the National Archives of the United Kingdom

The Venona papers were deciphered and translated between 1946-1981 and released in 1995 by the National Security Agency. The Venona project, a counterintelligence programme initiated during World War II, was designed to intercept and translate numerous Soviet code names. Venona alone distinguished the codenames of REST and CHARLES, the codenames given to Klaus Fuchs by the NKVD and KGB. Researching Venona is vital, as they support the evidence within the TNA, FBI Files and KGB files, and build a foundation to springboard research. For instance, the decryptions have sealed many interludes in the historical record and ratified FBI files and congressional meetings during the 1940s. They verified Harry Gold's

details and espionage by identifying codenames such as Bolt, Brother, Oppen, Emulsion and Fisherman. However, whose identities these belonged to are still undetermined.[89]

However, Venona only decrypted several thousand cables of an estimated 100,000 as deciphered messages could have drastically ranged in magnitude and matching together various cables can take time and effort, resulting in sporadic jumps between archives. John Haynes notes the difficulty in *Spies: The Rise and Fall of the KGB in America*: '[e]ven when complete, they were messages boiled down for transmission by telegram, often short, terse, and lacking detail'.[10] Due to the unintelligible nature of various encryptions, various quotations from Venona in this thesis rely on its 'irrecoverable' bracketed system albeit that the encryptions applied are coherent and valuable.

Paul Frazier, a renowned Cold War historian, has examined Venona and its decrypted documents. He distinguishes interpretations and illustrates nuances in historical exegesis in Chapter One of Romerstein and Briendel's *The Venona Secrets* and Chapter Five of Schrecker's *Cold War Triumphalism*.[11] Both chapters highlight very differing views of Cold War espionage which profoundly influence scholarship and political ideology. Romerstein and Briendel, who served in Senate Select Committee on Intelligence, adopt the traditionalist review which argues that the Soviet Union was to blame for the Cold War.[12] From that perspective, the Venona documents proves Soviet intentions to undermine American democracy. Contrastingly, a political and education historian, Ellen Schreker, takes the revisionist approach: the Venona documents should be met with caution because 'there are too many gaps in the record to use these materials with confidence'.[13] However, my use of Venona in this thesis attempts to be impartial by considering Venona's discrepancies as assets for the historiography of Cold War espionage.

[8] John Earl Haynes & Harvey Kleh, *Venona, Decoding Soviet Espionage in America*, (New Haven and London: Yale University Press, 1999), p.289.
[9] Full list of code names: Bolt, Brother, Oppen, Emulsion, Fisherman, I., Serb, Jack, Johnny, Octane and Karl. See *Venona, Decoding Soviet Espionage in America* by John Earl Haynes & Harvey Klehr for more detail regarding atomic espionage and codenames. Find the exhaustive list of Venona codenames in, *Venona, The Greatest Secret of the Cold War* by Nigel West.
[10] John Haynes, *Spies: The Rise and Fall of the KGB in America,* (New Haven & London: Y*ale* University Press, 2009), p.xi.
[11] Paul Frazier, "The Venona Project and Cold War Espionage." *OAH Magazine of History* 24, no. 4 (2010). p.36.
[12] ibid.
[13] ibid, p.36.

The National Archives have provided the go-to primary source for this thesis. TNA presents the British perspective on the Fuchs' case and provides a detailed account of various MI5, MI6, and GCHQ agents - most importantly, Guy Liddell and the confession documentation available for download.[14] Some files are prohibited from downloading, however, but are accessible if you travel to the TNA. Those declassified documents shed additional light on Fuchs's interrogation and private messages between him and Skinner.

I encountered complications with TNA releasing varying files. In August 2022 and June 2023, I submitted various forms under The Freedom of Information Act (2000). For example, AB 1/695: 'Michael W Perrin interviews with Dr Klaus Fuchs following his arrest for espionage', and ES 1/493: 'Dr Klaus Fuchs: papers and correspondence by and about him' could not be processed by TNA. TNA cannot administer until The Nuclear Decommissioning Authority has completed the security review which collaborates with the Ministry of Defence (MOD) and the Atomic Weapons Establishment. Therefore, I veered towards secondary research that had already sourced those files which plugged numerous gaps within Fuchs's narrative.

The Bodleian Library at the University of Oxford has been utilised by British scholars such as Frank Close. Bodleian offers volumes of files on Fuchs's private life, Rudolf Peirels' private life and his relations with Fuchs. Bodleian also contains TNA documentation that has been relocated from Richmond, London, to Oxford. As the files from Bodleian are not accessible online, I have used Close's research as a springboard to examine a small number of files in conjunction with TNA. Close had special access to files that are now classified which has allowed me to benefit from his scholarship.

As well as using TNA from the UK, my research employed the FBI Files: The Vault. It is a new Freedom of Information Act (FOIA) Library that offers over 6,700 documents which have been scanned into digital copies. The files have provided unreleased information on Los Alamos and Klaus Fuchs. Similarly, to Venona, FBI files can cross-examine many archives. Fuchs has 111 files dedicated to him in The Vault offering a different perspective and range

[14] Numerous files are also within, FBI: The Vault for accessible download at FBI Records: The Vault — The Vault; File 65-58805-1324 consists of the full FBI files of Fuchs's confession – the same files as The UK National Archives, Kew, London.

from 1949 to 1976.[15] The files also incorporate the Rosenberg Case, thereby widening the understanding of Fuchs's direct impact in 1950 and supplying supplementary material for the conclusion.

Scholarship: Primitive Cold War, Espionage, atomic and intelligence Anglo-American relations

A modern historian, Mike Rossiter, began researching *The Spy Who Changed the World* in the late 1980s when the Cold War still rumbled in the background. Rossiter visited the Soviet Union to interview Georgi Flerov, a former Soviet physicist who worked on the Soviet atomic bomb. The interview was short, and a Soviet camera crew followed them, which restricted Flerov from commenting on spies within the NKGB who worked alongside the atomic bomb. Rossiter quoted this experience as follows: 'I left the Kurchatov Institute and Moscow, knowing nothing more about Klaus Fuchs.'[16] Ironically, the Berlin Wall collapsed a few months later, and a release of information tidal waved its way out of Moscow throughout the next decade. Rossiter's book was eventually published in 2014 like Close's *Trinity* (2019). The timing meant both authors could utilise TNA, KGB, Venona and FBI files.

The early scholarship from the 1980s may appear redundant, but the historiographer should consider it as it provides initial interpretations and corresponds with political motivations during the Cold War. Nigel West, a renowned author on espionage, wrote *Game Of Intelligence* in 1989. It scrutinises international espionage in an in-depth review, while similar works were not published before the 1980s. However, it significantly differs from West's *Mortal Crimes* published in 2004. *Game Of Intelligence* has a different premise to *Mortal Crimes* although the detailed account in *Mortal Crimes* relies on Venona and published files in the 1990s and early 2000s. It exemplifies the importance of contrasting and comparing sources between the 1980s and 2000s to build a solid foundation.

Nigel West accentuates the complications of deliberate efforts in the 1990s by ex-KGB officers to distort what truly happened. *Special Tasks: Memoirs of an Unwanted Witness by General Pavel Sudoplatov, published in* 1994 named Szlizard, Fermi, Gamow and Oppenheimer as

[15] ibid; see footnote 14 for more details.
[16] Mike Rossiter, *The Spy Who Changed the World, Klaus Fuchs and the secrets of the nuclear bomb*, (London: Headline Publishing Group, 2014), p.8.

spies. However, the publishing of *Comment Staline a Vole la Bombe Atomique aux Americains* in 1996, a translation of Stalin's *Atomic Spies, KGB File No.13676,* revealed that Fermi and Oppenheimer were not involved in espionage.[17] Furthermore, the Venona documents discovered the bulk of code names; for example, Fuchs as REST, then Charles.[18] West could therefore utilise Venona and build a new depiction of espionage. Thereby he exemplified the importance of contextualising time-period inferences within the Cold War framework.

John Lewis Gaddis, the renowned Cold War historian, published *Intelligence, Espionage, and Cold War Origins* in 1989. Again, Gaddis notes the historiographical dilemma facing research into espionage: 'Scholarship stops abruptly with the conclusion of the war: it is as if the possibilities for serious research on intelligence end with September 1945.'[19] Since 1947, the CIA has been reviewing the declassification of significant records. However, Gaddis was unsure whether it would 'substantially enhance our present understanding of how the agenc[ies] [CIA and FBI] operated during its early years.'[20] We now know that later scholarship utilises FBI declassifications and Venona providing an enhanced historical interpretation of the Fuchs' case between the American and British agencies. It also allows the historian to construct complex inferences from Fuchs, most notably the connection between espionage and Anglo-American relations. Gaddis, in 1989, like all historians, was not aware of Venona or the influence of Fuchs.

Interestingly, scholarly opinion remains in harmony concerning Fuchs. If we take the journalist and historian Norman Moss's *Klaus Fuchs: The Man Who Stole The Atom Bomb,* published in 1987 and compare it to Close's *Trinity* (2019), the argument for Fuchs's importance does not shift. Later scholarship reinforces the earlier position that the Soviets heavily relied on espionage. That said, Moss and Close romanticise Fuchs's espionage without considering other spies or factors. Research into Bruno Pontecorvo, Alan Nunn May, Harry Gold, Ethel and Julius Rosenberg, Donald Maclean, Guy Burgess and Kim Philby should not be disregarded when analysing Fuchs's early Cold War espionage.

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[17] Nigel West, *Mortal Crimes, The Greatest Theft in History: The Soviet Penetration of the Manhattan Project*, (New York: Enigma Books, 2004), Ref 4 P.xxi.
[18] The evaluation of all declassified files supports the premise that Oppenheimer is innocent. *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* (2005) by Kai Bird and Martin J. Sherwin supports the notion Oppenheimer was innocent.
[19] John Gaddis, "Intelligence, Espionage, and Cold War Origins." *Diplomatic History* 13, no. 2 (1989), p.192.
[20] ibid, p.192.

Various objections do arise regarding Fuchs's importance, however. The objections are indirect and come from the likes of Simone Turchetti, who suggests Pontecorvo had further impact on the Soviet Bomb than initially thought. As we will see, Russian scientists have claimed that espionage did not have a serious impact on the development of the Soviet atomic bomb although Lt. Colonel Anatoly Iatskov, a Soviet spy, reported that espionage had speeded up the detonation of Joe-1 by three or four years. According to Iatskov, it was innovations by Soviet physicists which produced Joe-1.

More recent scholarship has examined the importance of other spies regarding atomic espionage as additional documentation is being released. Simon Turchetti's "Atomic Secrets and Governmental Lies: Nuclear Science, Politics and Security in the Pontecorvo Case" and "For Slow Neutrons, Slow Pay: Enrico Fermi's Patent and the US Atomic Energy Program, 1938–1953" emphasises Pontecorvo's importance. Turchetti's work doubts that Fuchs played a central role when considering the peripheral spy network which unknowingly surrounded Fuchs during the Manhattan Project. Again, however, recently declassified information supports the notion that Fuchs was the most critical atomic spy, and other spies confirmed his detailed blueprints.

Finding scholarship on Fuchs's Anglo-American impact was challenging due to the nature of TNA and Foreign Office documents. Because intelligence and early Cold War Anglo-American relations are also understudied areas within the context of Fuchs's influence, I have leaned on secondary scholarship to find a foothold in which I could cross-examine. For example, Septimus Paul, an American historian, argues in *Nuclear Rivals, Anglo-American Atomic Relations 1941-1952* (2000) that Fuchs was not the most crucial element in dismantling the Anglo-American relationship; he suggests that it was a series of events that contributed to the undoing.

When we consider Septimus Paul, and Graham Farmelo, a modern British historian and author of *Churchill's Bomb* (2013), an ensuing difference in premise exists. Farmelo accords more significance to Fuchs affecting negotiations whereas Paul published his work in 2000, before the release of Fuchs's confession and subsequent files highlighting the intelligence relations between MI5 and the FBI. Paul bases his interpretation on various other sources. However, the overall state of Anglo-American relations between 1945-1955 was not just caused by Fuchs.

In *Intelligence and International Relations in the Early Cold War* (1998), Christopher Andrew highlights how 'recent' research on intelligence and relations has changed our perception and understanding of the early Cold War. Post-Cold War historians can now draw upon better sources.[21] In most cases, the study of intelligence alliance is of peripheral importance as there is not an extensive literature to draw upon. Geoffrey Warner's *The Anglo-American Special Relationship* (1989) has the same difficulty when we incorporate intelligence and Anglo-American relations because it lacks comprehensive analysis due to the primitive nature of this type of research. *British Intelligence and the Anglo-American' Special Relationship' during the Cold* War (1998), written by Richard Aldrich, a political scientist, offers a spectrum of espionage and its incorporation in politics. By 1998, Venona and various TNA files were declassified from the FO, providing a partial analysis of early Cold War relations. However, it still only considers declassified data from the 1990s. Since the 1990s, TNA has released huge tomes of declassified information, building a better picture of 1940s and 1950s intelligence relations.

Encountering the Russo-Ukraine War

For research purposes, I contemplated travelling to the Russian Archives to access files unavailable on 'Russian Archives Online', but for obvious reasons the ongoing war restricted travel. Consequently, I retrieved additional KGB files from a secondary source, *Mortal Crimes and VENONA: The Greatest Secret of the Cold War* by Nigel West, who utilises KGB files extensively.[22] This thesis has relied on TNA, Venona, and FBI declassifications in order to answer the following questions: 1) What was Fuchs's responsibility in the Soviet atomic bomb project? 2) Did other spies play more critical roles? Was Fuchs justified in providing the Soviets with atomic secrets? 3) How did Fuchs pass the atomic secrets to the Soviets without being caught during World War Two? 4) Were the FBI, GCHQ, and MI5 successful at catching other spies during the early Cold War? 5) How did Fuchs and espionage impact Anglo-American relations during atomic bomb negotiations and security service relations? 6) Were

[21] Christopher Andrew, Intelligence and International Relations in the Early Cold War, Review of International Studies, Vol. 24, No 3 (July 1998), pp.321-330.
[22] You can access to KGB documents at: Home » KGB Documents – https://www.kgbdocuments.eu.

there other factors influencing Anglo-American relations? Hereafter, the thesis contextualises Fuchs's importance in that broader context of questioning.

Chapter I

The Treachery of Klaus Fuchs (1941-1949) - the infiltration of the Manhattan Project and Harwell

> **"**We knew the world would not be the same. A few people laughed, a few people cried. Most people were silent."[23] – J. Robert Oppenheimer

Fuchs began work with Peierls in 1941 on the British atomic bomb project and described Fuchs as one of the 'finest brains available… and such brains as Dr Fuchs possess are very rare indeed.'[24] However, Fuchs was only allowed to work with Peierls if it was an absolute imperative.[25] Fuchs was not questioned and given security clearance without hindrance after Peierls pushed for the clearance; MI5 did not have hard, physical evidence to think otherwise, and without accurate testimonies from Max Born, the British services were unaware to the full extent of Fuchs's ideological standpoint – but enough to question Fuchs's background.

The immediate aim for the atomic development's trajectory set by the MAUD report was to enrich uranium and then isolate U235 – this would help split the atoms and cause a cause-and-effect implosion course. Peierls gave Fuchs his first 'assignment', May 1941: 'How can one ensure that when a gas passes through a diffusion plant, uranium isotopes are filtered out rather than those of other elements'.[26] By May 1941, Fuchs was already in contact with Soviet agencies on the atomic project. Fuchs's ambiguous spy beginnings also provided an essential element to the reduced sentence he later received as the Soviet Union were not an ally until Operation Barbarossa (1941). Fuchs's confession matches his ambiguous beginnings, he confessed that between 1942 to December 1943, he turned over 21 documents and early work

[23] Quote from J. Robert Oppenheimer interview, 1965: J. Robert Oppenheimer "Now I am become death..." | Media Gallery (atomicarchive.com).
[24] TNA KV 2/1263, s. 27b, p.2., Address to the Court on behalf of the Director of Public Prosecutions, 10 February 1950.
[25] Rudolf Peierls, *Bird of Passage* (Princeton University Press, 1985), p.163 cited in, Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Penguin Books, Milton Keynes, 2019), p.64.
[26] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.71.

on neutron diffusion theory and provided all the diffusion plant information known to him at the time he left the New York British Office.[27]

Between May-August 1941, Fuchs somehow communicated with Jurgen Kuczynski to communicate his new role in the 'Tube Alloy' project – atomic research.[28] This meant the Soviet Military Intelligence (GRU) officer Ivan Sklyarov (BRION) was notified. Sklyarov then notified the GRU office in Moscow, instructing him to enrol Fuchs.[29] Fuchs met Kremer in London on 8 August 1941; there is no evidence to suggest Fuchs met before this date with a Soviet spy; Fuchs testified that he began his espionage in 1942.[30] KGB files have recorded Fuchs's meeting with Kremer. The meeting was set out to check Fuchs's originality and see if he was bait from MI5's services. Fuchs was not bait and was given his first code name, 'OTTO', for the foreseeable future. From here, Fuchs began working for the Soviet Union, and his acts of espionage began, setting a precedent for the next eight years of Fuchs's life.

The Manhattan Project

From 1941 to 1943, Klaus Fuchs worked on the British Atomic Bomb project and then moved to New York with Peierls, to work at Columbia University until he was called on for the Manhattan Project at Los Alamos. Between 1941 and 1944, Fuchs continued to meet various Soviet spies - most notoriously, "Sonya".[31] Fuchs continued meeting agents in New York; this time, Harry Gold: his first meeting coming on 5 February 1944. By this time, Fuchs had already provided significant details to the Soviets on the atomic science behind an atomic bomb. The most important dates for Fuchs and the Soviets were still to come regarding the atomic bomb project. With Fuchs and Peierls being called into the Manhattan Project, now was a perfect

[27] TNA KV 6/134, Klaus Fuchs's confession to William Skardon, 27 January 1950; and FBI Files: The Vault *Evaluation of the Fuchs case By Committee of Senior Responsible Reviewers*, p.15.
[28] Alexander Vasiliev, 'Yellow Notebook #1', *Alexander Vasiliev Papers*, 1895-2011 (US Library of Congress), also in: Wilson Center, Digital Archive, Vassiliev Yellow Notebook #1, 2009, p.67. Fuchs was transferred from the GRU to KGB, cited in, Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.73.
[29] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.443-444.
[30]Yellow Notebook #1, Alexander Vasilievand, Venona decryptions, n.2., Retrieved from: Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.73. Also, in: Wilson Center, Digital Archive, Vassiliev Yellow Notebook #1, 2009**,** p.86; see: Home Page | Wilson Center Digital Archive.
[31] Ursula Maria Kuczynski was a spy for the Soviet Union in the 1930s and 1940s. She eventually wrote, *Sonjas Rapport*, her autobiography, published in 1977.

opportunity to gain access to vital work that had been trialled and tested under supervision by the most outstanding physicists of the time.

The Manhattan Project began in 1942, and General Leslie Groves was responsible for the security of the Project from February 1942. By the 1940s, the communist movement started to cause mass paranoia in the United States; thus, the security establishments began focusing on communists rather than criminals and mafia establishments. Even though Groves understood the potential by-product of communist sympathisers, he continued to avert British security issues. Groves later admitted that Anglo-American relations were at play regarding whether Fuchs should be allowed to work at Los Alamos: 'Our acceptance of Fuchs into the Project was a mistake. But I am at a loss when I try to determine just how we could have avoided that mistake without insulting our principal war ally, Great Britain, by insisting on controlling their security measures.'[32] Groves was directing a dig at the British security system, as he did not trust their system to oust any threat to the secrecy surrounding the Manhattan project. Groves also commented on how, though the British were informed of Fuchs's background, 'they ignored this and did not even record the information'.[33] However, since America's trust in British intelligence and the fear of offending British security vetting had fundamental importance in Fuchs's penetration of Los Alamos, the Americans were partially at fault.[34] Fuchs was provided travel time and liberties from Groves' instructions on Los Alamos security, which Groves highlighted: 'From February to May, 1944… [a] British delegation [including] Peierls, Kearton, Skyrne and Fuchs… were stationed in New York, but they were free to travel and did.'[35] Fuchs used those liberties to contact Harry Gold and his sister, Kristel.

At the beginning of 1944, living in New York, Fuchs first contacted Sonya and followed her instructions closely to contact his new Soviet accomplice.[36] Sonya was the codename for infamous Soviet spy Ursula Kuczynski. Fuchs then diligently navigated his way without hindrance, meeting 'Raymond', who turned out to be Harry Gold. Gold was a long timer at this

[32] Leslie R. Groves, *Now It Can Be Told*, (New York: Da Capo Press, Inc., 1962), p.143.
[33] ibid.
[34] General Groves never wanted the British to make any security investigations or take part in an American project. The assessment of Fuchs on the British side was deemed adequate through a lack of communication between the Americans and British. The resources available are unable to build a 100% sound picture of these events; however, it is more possible than not, that both the Americans and British failed to recognise all the vital signs and dig-deeper into Fuchs's personal life in Germany.
[35] Leslie R. Groves, *Now It Can Be Told*, (New York: Da Capo Press, Inc., 1962), p.119.
[36] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.115: See notes on page 449, reference 28.

stage, with his espionage career starting in 1934, after he became a communist during the Great Depression. Gold was assigned to military service in 1941 after the Pearl Harbour attacks, which is how Gold and Fuchs came into contact through mutual military service. By April 1944, Peierls and his British team had been very successful at developing the practice of building a practical way of diffusion. Fuchs met with Gold twice in this period, once while Fuchs was leading the British team - while Peierls was at Oak Ridge.

Uncoincidentally, Gold had the knowledge to understand Fuchs's information. After their first meeting, Fuchs would have likely presumed this, as Gold did not question atomic energy references or any reference to the atomic bomb. Nevertheless, Fuchs was not aware of Gold's dissertation on thermal diffusion and when Gold intervened with ideas of his own, Fuchs was quick to dismiss these; Fuchs did not have sufficient knowledge of thermal diffusion.[37] Fuchs ended up passing over 'two or more' papers on diffusion when they would meet, this was according to Fuchs while being questioned.[38] This was because of a significant security flaw that Fuchs had noted, Fuchs would handwrite the manuscript, wait for the approval and then it would be typed up. Thus, Fuchs would be able to have his copy, which was later noted; the papers Fuchs supplied were his blueprints.

With extensive security at Los Alamos, Fuchs struggled to meet Gold for the next two meetings, the reasons for which are not yet known. Eventually, Fuchs met with Gold at Kristel's house on 21 February 1945.[39] Fuchs informed Gold on the project at Los Alamos and gave him a complete detailed account and explanation on the plutonium bomb under construction. Fuchs's espionage was the first understanding of the plutonium bomb that the Soviets received. On 31 March 1945, Moscow noted the value of Fuchs's espionage: 'We are sending herewith an evaluation on ENORMOZ. Referenced are materials from CHARLES about the FUNICULAR: … b) 5/60 – [6 groups uncovered] – contains an interesting method

[37] KGB File 84490, vol I. and Alexander Vassiliev, 'Yellow Notebook #1', *Alexander Vassiliev Papers, 1895-2011* (US Library of Congress), pp. 67-76.
[38] Retrieved through the Freedom Of Information Act, the FOIA provides the right to make an official information request from various governmental departments, museums or healthcare providers. This file had already been declassified at this point of research: FOIA FBI file 65-58805-1412, Fuchs interview by FBI, 1950, p.14; also cited in, Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[39] KGB file 84490, vol. I p.79, Vassiliev, 'Yellow Notebook #1' *Alexander Vasiliev Papers, 1895-2011* (US Library of Congress), p.72, also in: Wilson Center, Digital Archive, Vassiliev Yellow Notebook #1, 2009.

of calculation, which will be used during the design.'[40] Fuchs outlined multiple reports on this work, the theories and tests of the membrane and information about the layout of Los Alamos (the plant).[41] The Venona cable from Moscow, dated 10 April 1945 highlighted Fuchs's importance:

> To Anton[i].
>
> CHARL'Z's[ii] information [under No.][a] 2/57 on the atomic bomb (henceforth "BAL…"[b]) is of great value. Apart from the data on the atomic mass of the nuclear explosive and on the details of the explosion method of actuating "BAL…", it contains information received for the first time from you about the electromagnetic method of separation of ENORMOZ[iii]. We wish in addition to establish the following: For what kind of fission – by means of fast or slow neutrons – [35 groups unrecovered] [281 groups unrecoverable].[42]

These cables highlight the extent of Fuchs's dissemination of secrets from Los Alamos, and his confession matches the indication from Venona: '…but in particular at Los Alamos I did what I consider to be the worst I have done, namely, to give information about the principle of the design of the plutonium bomb.'[43] Other spies working at Los Alamos were not able to contact the KGB or GRU to the extent that Fuchs appeared to manage, particularly on the information emphasised above, until a later period in 1945. In Moscow they concluded that "ChARL'Z's" material formed a most valuable piece of information, as concluded by VIKTOR (codename): Lt. General Pavel Mikhajilovich.[44] Ted Hall also provided detailed information from Los Alamos on critical development of the atomic bomb. Nonetheless Fuchs's significance is unrivalled, given the scope of declassified data; furthermore, he delved into the idea of a 'super-bomb' - the hydrogen bomb. In short, Fuchs's account of Los Alamos from August 1944 produced a substantial descriptive picture for the Soviet Union, the first of its

[40] Venona, evaluation of material on ENORMOZ: from Charl'z on Funicular and from MLAD, from Moscow to New York, 31 March 1945: All subsequent Venona material was accessed from: Venona: Selected messages intercepted messages with guide to specialized Soviet espionage terms.

[41] ibid.

[42] Venona, Charl'z's information on the atomic bomb and method of separation of ENORMOZ: Moscow requests further details, from Moscow to New York, 10 April 1945.

[43] TNA KV 6/134, Klaus Fuchs's confession to William Skardon, 27 January 1950.

[44] Venona, Evaluation of Material on Enormoz: From Charl'z on Funicular and from MLAD (1945), from Moscow to New York, 31 March 1945.

kind, meaning the nuclear bomb was not just a theoretical conception but a practical possibility in war.[45]

Fuchs met with Gold on 2 June 1945, one month before the planned detonation, and informed him of the potential success of Trinity. He provided designs for the plutonium bomb including his handwritten notes and sketches of 'Gadget'. Gold described this as substantial information.[46] Close credits Fuchs with Stalin's knowledge of the bomb, but perhaps that is an over-confident conclusion as other spies - Theodore Hall, and David Greenglass, who worked in conjunction with his sister, Ethel Rosenberg, and her husband, Julius, as well as Oscar Seborer - provided data to the Soviet Union in the 1940s.[47] Collectively, all enabled the Soviet's infiltration of the Manhattan Project. William Crowell, former Deputy Director of the National Security Agency, concludes that '[t]here can no longer be any doubt about the widespread and successful Soviet espionage operations against the United States and Great Britain during the 1940s…'.[48]

*

Oppenheimer named the first plutonium bomb, 'The Gadget' and planned to detonate it on the 16 July 1945. The Trinity test was a success, and various physicists would become haunted by what they had assembled over the previous four years. Trinity was a plutonium bomb, producing an estimated yield of 25 kilotons of TNT, compared to Little Boy, a uranium bomb triggering a yield of 15 kt, which was dropped on Hiroshima, and Fat Man, a plutonium bomb of 21 kt, on Nagasaki. Ultimately, assembling and dropping the atomic bombs ended World War Two, as Japan officially surrendered on 2 September 1945 due to the catastrophic damage and casualties caused by the bombings of Hiroshima on 6 August and Nagasaki on 9 August 1945.

[45] See: M.S. Goodman, 'The Grandfather of the Hydrogen Bomb? Anglo-American Intelligence and Klaus Fuchs', Historical Studies in *the Physical and Biological Sciences*, vol. 34, part I (2003), pp. 1-22, on the role Fuchs had on the Soviet hydrogen bomb.
[46] FOIA file 65-57449-551, Harry Gold's confession to FBI, p.19.
[47] In 2019, the declassification of FBI files allowed John Haynes to decipher another spy who worked at Los Alamos – Oscar Seborer. From: Klehr, Harvey, and John Earl Haynesa. "On the Trail of a Fourth Soviet Spy at Los Alamos." *Studies in Intelligence* 63, no. 3.
[48] Venona, Soviet Espionage and the American Response, 1939-1957, 21 August 1996. FOIA 42771, collected from Venona: Soviet Espionage and The American Response 1939-1957 (cia.gov) as a foreword to a series of memorandums; also see Venona: Soviet Espionage and The American Response, 1939-1957 - CIA for direct link to foreword by William P. Crowell, Deputy National Security Agency.

Fuchs met with Gold once more on 19 September 1945, two weeks after the official surrender of Japan. Fuchs left Los Alamos and wrote all the crucial details on the Trinity detonation since their last meeting, occurring in the June before the explosion. Fuchs stated: 'I stopped on the way in the desert, drove off the highway to a solitary place, and wrote a part of the paper … which I planned to deliver [to Gold]'.[49] Also, he delivered notes on Enrico Fermi's lectures on the 'Super' bomb, as well as the intricacies of a practical bomb test. As Frank Close concludes: 'For two years Klaus Fuchs… managed to carry out the most extensive and far-reaching feat of espionage in history.'[50] Thereby Close points to Fuchs as at the epicentre of atomic espionage and accentuates the reliability of declassified papers from Venona and UK intelligence agencies.

1946 -1949: "The Iron Curtain descends upon us", Britain's Cold War and Harwell

A new threat had developed since the defeat of Germany and Japan – the Soviet Union. Churchill famously insisted that an 'Iron Curtain' had descended across Europe. The Red Menace now swallowed Budapest, Prague, and Berlin, providing Stalin with a line of defence against the Soviet Union's previous Allies in the Western hemisphere. Berlin proved to be a strategic and political landmark in the Cold War: West Berlin had a democratic government, 100 miles within the Soviet zone. At this point in 1946, inharmonious talks between the Americans and British continued, as their relationship was further strained by the Geneva Convention and the Quebec Agreement.[51]

In 1946, Fuchs attended Enrico Fermi's lectures on the 'Classical Super', an early reference to the hydrogen bomb. Fuchs's significance in studying the hydrogen bomb is telling. While at Los Alamos, he worked with Von Neumann. Both scientists had worked on the plutonium and uranium projects previously. The magnitude of their discovery allowed Teller to build upon mathematics and theoretical probabilities proposed by Fuchs and Von Neumann. The theoretical probabilities led to the hydrogen bomb being built in America, the Soviet Union,

[49] FBI FOIA 65-58805-1324, Fuchs's statement to FBI, 26 May 1950, p.8.
[50] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.131.
[51] This will be detailed in the last section: The Fuchs Factor.

and eventually in Britain by 1958.[52] Although Teller indirectly finished Fuchs's work with lithium deuteride, the Soviet design was most likely produced with the aid of what Goodman has called its 'grandfather's (Fuchs's) blueprints sent in 1948.[53] This underpins the security implications caused by Los Alamos's weekly colloquium, assuming the H-bomb would have been discussed, *if* Teller attended. Groves' comments on the colloquiums set the tone: 'From the standpoint of security, it presented a major hazard, and it was one of the reasons why the treachery of Fuchs was so disastrous'.[54] Maybe not only a British security failure, after all.

Meanwhile, Peierls returned to Britain and created and chaired the ASA: Atomic Scientists Association. Peierls, aghast at atomic warfare, set out to create an association that spoke to civilians as well as politicians on the impact an atomic bomb could potentially have on a city or what might occur in the event of an atomic war. The reaction by scientists was a stimulus for the Campaign for Nuclear Disarmament in Britain. Unlike Peierls, Fuchs left Los Alamos in June 1946 and managed Theoretical Physics at Harwell. Harwell was the centre for the British atomic project from 1946, and the main aim was to construct a blueprint and create the first nuclear reactor in Western Europe; this would eventually enrich civilians with energy and generate sufficient plutonium to build a vast atomic arsenal.[55] Fuchs later shared files from Los Alamos on the hydrogen bomb with James Chadwick while travelling back to Britain, including vital information on deuterium and tritium interactions.[56] Notably, this last act by Fuchs was done in secret, since from this point the American McMahon Act prevented any passing of information. Thus Fuchs's last act of espionage in the US was ironically in favour of the British.

27 Saturday September 1947: Fuchs and the UK dimension of espionage

27 September 1947 marked the beginning of the third and final phase of Fuchs's espionage; at this point, it started the Jim Skardon - Klaus Fuchs rivalry. Fuchs was meant to meet Alexander Feklisov, a 33-year-old seasoned Soviet spy who had previously worked in America during the

[52] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[53] M.S. Goodman, 'The Grandfather of the Hydrogen Bomb? Anglo-American Intelligence and Klaus Fuchs', Historical Studies in *the Physical and Biological Sciences*, vol. 34, part I (2003), pp. 1-22.
[54] Leslie R. Groves, *Now It Can Be Told*, (New York: Da Capo Press, Inc., 1962), p.167.
[55] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[56] ibid, p.162.

war and was sent back to Moscow in 1946. The failed rendezvous happened to correlate with the discovery of the Canadian spy ring - the Gouzenko Affair.[57] Fuchs provided valuable information on the British Atomic bomb project which came to fruition as planned. Also, he informed Feklisov of the experimental reactor at Harwell and Windscale's large reactor that produced plutonium; the information was included in the 40 pages of notes that Fuchs had handwritten for the Soviets.[58] Fuchs also provided information orally that included the whereabouts of Teller and Fermi. Both were working on a theoretical framework in America for the hydrogen bomb. He further explained that the superbomb was, in fact, 'feasible', but he was not sure if the framework would translate to actual physical work on the bomb in America.[59] This first meeting led the Soviets to confirm the work on the hydrogen bomb, with Teller and Fermi at its core. They understood the reactions needed to create tritium, a key component for the superbomb.[60] Fuchs's information provided the first source and the lead for the Soviets to look further into such matters. This first connection provided the first step to the Soviets' first thermonuclear superbomb.

Such evidence indicates that Fuchs was the most active spy in Britain at the time. Feklisov asked him a question that enabled the latter to conclude that the Soviets had received more information from other sources too: What can you tell me about the tritium bomb?'[61] Fuchs understood that the Soviets had received information on the Fermi lectures, as he had previously given this information to Harry Gold in America; also, the Fermi lectures were well-known within their field. From this, Fuchs concluded that there were other vital spies in their network, but he did not know who they were.[62]

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[57] Igor Gouzenko, a member of GRU, defected to the Soviet Union in 1946. The spy ring also included Nicholai Zabotin, who directly corresponded with Alan Nunn May, another British physicist who worked in Canada while working on Britain's 'Tube Alloys' Project.
[58] Alexander Feklisov, Sergei Kostin, *The Man behind the Rosenbergs*, (Enigma Books, 2001).
[59] It is worth noting that Fuchs and Teller had a personal relationship; Teller discussed his work in depth with Fuchs, including information on the super bomb. Teller trusted Fuchs and 'learned many techniques from [Fuchs]', these techniques were most likely mathematical based, cited in: M.S. Goodman, 'The Grandfather of the Hydrogen Bomb? Anglo-American Intelligence and Klaus Fuchs', Historical Studies in *the Physical and Biological Sciences*, vol. 34, part I (2003), p.8.
[60] See: Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p. 192 on lithium deuteride.
[61] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.193.
[62] With the arrest of Alan Nunn May in 1946, Fuchs would have been hardly surprised, and this information most likely reaffirmed the belief, that since Los Alamos there were other potential spies.

Unknown to Fuchs, he was under MI5 surveillance in November / December 1947. The project at Harwell knew full well that Fuchs was the most suitable for leading the project, and only his mentor, Peierls, was more qualified in the United Kingdom. Fuchs's expertise called for him to take a full-time role at Harwell. Thus extra vetting was needed to clarify the level of danger he posed to the secrecy of the atomic bomb project. Once again, MI5, including White, Hollis and Furvial Jones who were officers in MI5, dismissed Fuchs's security risk as 'very slight' due to the lack of evidence other than the Gestapo findings from Nazi Germany.[63] One can also assume that working at Los Alamos and in America extensively throughout World War Two would prove Fuchs's allegiance to Britain and America, especially with 'strict' security measures in place on both sides of the Atlantic. It was not until August 1948 that Fuchs was given clearance to work at Harwell full-time.

Fuchs's meeting with Feklisov in March 1948 was pivotal in his espionage career. He outlined the hydrogen bomb and essentially informed the Russians that Fermi's original lectures were not valuable as the theoretical framework would allow the temperature of the bomb to cool down considerably. Fuchs, as previously noted, handed over several diagrams and keynotes, thereby enabling the Soviets to have considerable information on the plutonium bomb. Fuchs also abused the trust of Teller and handed over essential calculations that the latter and Bretscher had done in relation to the fusion of deuterium and tritium.[64] Fuchs was able to retell the information gained in America from November in extensive detail, as revealed within declassified KGB files: '[Fuchs] managed to obtain precious information on the structure of existing types of atomic bombs, including a hydrogen superbomb. Upon his arrival from the USA, he passed these materials to our operative, Major A. S. Feklisov.'[65] Fuchs's recollection proved invaluable once again; however, his ability to gain this information with the McMahon Act in place is puzzling. No documentation or significant scholarship has documented how such occurred in detail. Most likely, though, Fuchs obtained a considerable amount of information from Edward Teller, his close friend. Frank Close is the only scholar to note this

[63] TNA KV 2/1245, Roger Hollis report of the 8 December meeting, minute 106, 10 December 1947.
[64] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.195.
[65] KGB file 84490, vol. I, p.384, Vassiliev, 'Yellow Notebook #1', p.82. cited in, Frank Close, *Trinity*, p,196, also in: Wilson Center, Digital Archive, Vassiliev Yellow Notebook #1, 2009.

evidence which features in Guy Liddell's diary. Fuchs spent Thanksgiving in Liddell's home and possibly discussed the hydrogen bomb and other scientific matters while he was there.[66] [67]

The Soviet Union began to build momentum and confidence. The development of their atom bomb was advancing on all fronts; the theoretical frameworks were now beginning to come together. Remarkably, Lavrenti Beria ordered a hydrogen bomb for detonation in June 1949, which was unrealistic if not impossible. Even though they had built an extensive library of information, it was not until the early 1950s that scientists such as Teller developed further ideas on the H-bomb.[68] The Soviet scientists initially had to detonate a plutonium bomb, as the hydrogen bomb relies on Uranium-238 which uses a hollow plutonium or uranium core to create nuclear fusion.[69]

To further exemplify Fuchs's involvement in the success of the Soviet's atomic developments on a practical, theoretical, and political level, Jerry Gardner, one of Peierls' students, noticed something suspicious vis-à-vis his theory in a Soviet paper published a year before. Fuchs met with Peierls, and Gardner worked at Harwell for some time before releasing his data. Most likely, Gardner would have discussed his theory and the possibility of applying it to work at Harwell. The paper under discussion was the *Confinement of Slow Charged Particles to a Toroidal Tube*.[70] A frequent consideration from late 1945 was the anxiety provoked by publishing works that would enable the Soviets to gain information albeit that the Smyth Report, *Atomic Energy for Military Purposes*, written by Henry Dewolf Smyth, an American physicist, was released for public consumption on 12 August 1945. Nevertheless, Bunemann mentioned the security dilemma to Peierls and Fuchs. Unsurprisingly, Fuchs argued that the publication of the paper should go ahead. By this time, he had already provided the information acquired from the paper to Feklisov in one of their several meetings in 1948.

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[66] TNA KV 4/469, Guy Liddell's diary extract, cited in, Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[67] TNA KV 4/469, Guy Liddell's diary, 13 November 1947.
[68] It was not until 1 November 1952, that the Americans successfully tested 'Mike', the first hydrogen bomb. Unsurprisingly, it was only three-years and two weeks after that the Soviets successfully tested their first hydrogen bomb on 22 November 1955.
[69] Uranium-235 and plutonium-239 could also be used; this was a significant breakthrough, as uranium ore was hard to conjure which meant plutonium could be manufactured. Incidentally, this caused tension between America and Britain through later negotiations.
[70] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).

The Soviet Union received the information which was written in vernacular prose. This was noticed by Gardner, who found 'substantially the same ground as my thesis but which was published a year before my work.'[71] Now, it is possible the Soviet Union produced this work in a legitimate matter and was one year ahead of the British and Americans. However, this is highly unlikely given the historical evolution of the atomic arms race, which suggests a spy provided information to the Soviets. The information was given to Feklisov or an unknown Soviet spy, which was not mentioned in the confession.[72] It is highly plausible, therefore, that Fuchs was the man behind this, as he was closely associated with Gardner and Peierls in 1948.

Fuchs's last acts of espionage were such that meetings either were cancelled, or he failed to meet at agreed rendezvous. He met with Feklisov, in November 1948, again on 12 February 1949. By the summer of 1949, Fuchs had become seriously ill. Due to his espionage and personal family commitments, Fuchs cut communication with the KGB and the Soviet Union altogether. His last meeting was on the 12 February 1949. However, according to a KGB file, it was in April 1949.[73] Fuchs may have confessed to the February meeting but not the April meeting due to his fear of punishment; either that, or he forgot because of stress.[74] The KGB files are relatively reliable when we compare them to Venona and MI5 files. However, we must understand that errors can be made when filing information.

By September 1949, the Americans had uncoded the Soviet messages with Venona and narrowed their findings to two potential perpetrators, Rudolf Peierls and Klaus Fuchs. Furthermore, the first Soviet bomb was successfully tested on 29 August 1949 with a yield of 22kt, shocking America and Britain. They did not know until 3 September, when a meteorological reconnaissance aircraft detected plutonium in the atmosphere.[75] The west now feared war, as a nation as unsettled and fiery as the Soviet Union possessed the most lethal

[71] Gardner to Peierls, 11 January 1950, Bodleian Library, CIII, cited in, Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.202.
[72] Not all the codenames have been deciphered in the Venona files.
[73] TNA KV 2/1252, Fuchs's last meeting, 12 February 1949 Also see: KGB file 84490, vol I, p.424 highlights they had another meeting on 1 April 1949. Frank Close initially uncovered this vital fact in, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[74] I presume it was a logical move; as we have seen from Fuchs's history and habits, he was a competent individual with an incredible memory. Dr. John Corner, a physicist and mathematician recalled Fuchs having a very organised mind. Cited in, Brian Cathcart, *Test of Greatness Britain's Struggle For the Atom Bomb*, (London: John Murray, 1994) from corresponding letters between Dr. John Corner and the author. Herbert Pike, a Los Alamos physicist recalled seeing Fuchs taking mathematical calculations during the day, accumulating mass detail: Cited in, ibid, p.105, no source given.
[75] President Truman informed the World of the Soviet Bomb from the White House on the 23 September 1949.

weapon in human history. Somehow, the Soviets produced a successful atomic bomb within four years of the Americans and roughly two years before the American and British estimates. By the end of September 1949, their paranoia appeared justifiable and Fuchs's game was over. The collaboration between GCHQ, MI5, FBI, and MI6 now came to fruition.

Chapter II

The Chase, Questioning, and Confession: A British Security Service Success?

In the summer of 1949, Meredith Gardner discovered the Soviet spy who worked at Los Alamos. Fuchs's downfall was the KGB itself, as it had used coded decryption twice when once is the standard usage. Gardner deciphered a critical message that unfolded a great deal of information on Los Alamos. Venona, the American counterintelligence programme, was in full swing regarding atomic espionage. They had narrowed it down to two suspects - Peierls or Fuchs - because they decoded secret messages that were based on diffusion. MI5 had a difficult

time at first when deciphering the codenames, especially CHARLES (Fuchs). When it came to the atomic bomb project, MI5 were unaware of Los Alamos due to the secrecy behind the American atomic project. Therefore, it was still a mystery to those cracking codes. Thus difficulties arose during the first instances of recognising CHARLES as a British spy in August 1949.

Michael Perrin worked closely with MI5, as he regulated the Tube Alloys Project, and by 1949 he had been given the title 'Deputy Controller of Production, Atomic Energy (Technical Policy)'.[76] Perrin was an ideal candidate when it came to the papers, letters and information acquired on Fuchs. Retrospectively, it has been argued that Perrin analysed the findings and quickly concluded that 'It looks like Fuchs has been working with the Russians.'[77] They swiftly established what was at stake when analysing whether Fuchs and Peierls had been spying. If it were the case that Fuchs was CHARLES, the acts of espionage would extend from World War Two to September 1949.

Furthermore, the fact that a British physicist unravelled the secrets of the Soviets and now the atomic bomb was a concern for the Americans and British regarding their allegiance and atomic technology. The strain after the abolition of Churchill and Roosevelt's Quebec agreement after Attlee gained office in July 1945 had settled by the late 1940s. However, with the revelation of a British physicist providing vital information to the Soviet Union, the Anglo-American bridges vanished into the Cold War abyss. The impact of Fuchs on Cold War tensions has not been under-estimated; his influence resulted in the premature formation of the Soviet atomic bomb. The British became increasingly isolated from the American Bomb project, which allowed the Soviet Union to pose a more significant threat to Europe, as the British lacked an atom bomb until 1952. This was a crucial issue to address, as Britain was in the direct range of Soviet nuclear bombers, without the means to retaliate.

The evidence MI5 received from GCHQ meant Harwell was locked down. Henry Arnold was now aware that there was a high chance that Fuchs was spying for the Soviets. Arnold and MI5

[76] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019). p.220.
[77] Cited in, ibid as: 'This appears to originate in' Montgomery Hyde, *Atom Bomb Spies* (Ballantine Books, 1980), p.143, which gives no source: '[T]here is no contemporaneous record that Perrin said this, or when, although this is certainly possible, given Patterson's telegram', p.463.

observed Fuchs's every move inside Harwell and London. MI5 also instructed Arnold to examine Fuchs's property and find a means to place a hidden microphone and ascertain whether he was able to photocopy documents (not an easy task in 1949).[78] After additional analysis, they confirmed Fuchs was CHARLES on 10 September 1949. They found no evidence on Peierls' sister in America and concluded that CHARLES was Fuchs and 'Identification [was] agreed' across the Atlantic in Washington because Fuchs had received a letter from Kristel in 1947.[79] [80]

Though MI5 and the FBI had evidence of CHARLES and REST being Klaus Fuchs, there was a discrepancy in their evidence. The decryption and translation led to the belief that Fuchs was CHARLES, but not the empirically based evidence needed for prosecution in the UK. Fuchs now had to 'slip up' for the British to arrest him, or he had to confess to his espionage. Henry Arnold began to provoke Fuchs into a 'slip up' that would result in the evidence needed for prosecution, but multiple attempts were made without success. Fuchs's contacts were now under scrutiny, and MI5 and Robertson planned to catch the contact if Fuchs met with them. The contact would become a number one priority. If Fuchs produced no contact with a Soviet agent within 24 hours, he would become the priority. Robertson's plan was somewhat quixotic, however, as they had to catch both in the act of delivering information to the Soviets. As it turned out, Fuchs's last meeting was in early 1949.

MI5 and the FBI continued to gather evidence in Britain and America. Fuchs's sister was now a branch of this alliance; likewise, Robert Heinemann had a communist past. The Americans captured the Gestapo files on Fuchs, which suggested he was a communist and most likely had fled to Russia, thereby reinforcing the suspicion that he was a communist.[81] This information was gathered in October 1949. Kim Philby soon replaced Patterson, and this proved essential to the Fuchs' case as the Soviets were now aware of his position. Philby enabled the Soviet Union to strip away any excess evidence (something Fuchs began in February 1949) and noted what the British and Americans may or may not have known of the information he provided.

[78] TNA KV 2/1266 – 2/1269, Telegram, A. Martin to SLO Washington, 9 September 1949.
[79] TNA KV 2/1246, Telegram, A. Martin to SLO Washington, 10 September 1949.
[80] TNA KV 2/1246, Telegram, A. Martin to SLO Washington, 9 September 1949.
[81] Britain did not have access to Gestapo files in 1941; at the same time, they were vetting Fuchs on his departure to America.

Only two days later, Fuchs began to find a way out of Harwell. The interpretation of these events is a matter of debate between historians. Fuchs told Henry Arnold that his father had moved to the Russian-occupied area of Germany, as the Soviet Union had offered his father a chair at the University of Leipzig. This move was to soften up Fuchs, as arguably it was arranged to convince him to continue his espionage activities. However, this interpretation is debatable as Frank Close believes it was a possible 'hostage' manoeuvre on the part of the Soviets into forcing Fuchs to provide information. Close adopts Arnold's initial reaction in mid-October 1949: 'a hostage in the hands of the Russians of which, having regard to Fuchs's position, they might be tempted to make use'.[82] Arnold asked more questions about Fuchs's father, continually referring to him and the position that he now held in Leipzig. Fuchs ended the conversation with Arnold by asking, 'If my father accepts this position, should I resign?'[83] Arnold argued "it is for the administration … to decide" - albeit if Fuchs wanted to evade prosecution, it seems on the face of it contradictory.[84] Arnold passed all the information onto MI5.[85] From here, it would be easy to assume Philby would have 'tipped' Fuchs off at some stage and planned for him to leave the country and / or stall MI5's investigation.[86]

As mentioned, Fuchs knew his father would accept the academic position. Hence Fuchs would resign immediately and most likely would have defected to Leipzig in the Soviet Union. Fuchs's instinct may have given him a sense of urgency to escape Britain, as MI5 was aware of his activities. Additionally, Kim Philby may have contacted Fuchs between 11 October 1949 and 13 October 1949; though highly unlikely, this was possible although Philby at this time was first secretary to the British embassy in Washington, which made it difficult to communicate with London or Moscow. Nevertheless, Philby may have warned Fuchs of MI5's movements, as there is no evidence to suggest that Philby did not contact Fuchs or his contacts prior to October 1949.[87]

MI5 deployed various 'ground troops' over two days in late September to catch Fuchs; they also tapped his telephone and read through his letters to his father in Leipzig. All that MI5

[82] TNA KV 2/1247, Robertson's report: 'Visit of W/C Arnold', 17 October 1949.
[83] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.236.
[84] ibid, p.236.
[85] TNA KV 2/1247, Henry Arnold to J. Robertson, 24 October 1949.
[86] Kim Philby's 'tip offs' will be analysed and contextualised in more depth in Chapter III.
[87] No evidence to suggest either argument; however, Philby's previous expeditiousness suggests he could have 'tipped off' Fuchs through direct or indirect means, even though he was in Washington at the time.

found was his affair with Mrs Skinner, and his professional friendship with Dr Wallace Harper in London. Fuchs was on 24-hour surveillance and continually followed by car on his journeys; it is reported that he stopped 'several' times in the countryside. Most likely, Fuchs caught on to the covert surveillance.[88] Other reports suggest identifying an agent was on Fuchs's agenda as counter-surveillance for a seasoned spy was not a rare occurrence. For example, he was followed into various shops in London and backtracked on the same journey. MI5 failed to acknowledge the counter-surveillance taking place before them. By the end of November MI5 had failed to catch him in the act by constant surveillance. Dick White insisted that Fuchs must be interviewed.[89] [90]

White's suggestion was not as straightforward as it appeared. As the evidence had originated from the FBI, the British would have had to request permission to interview Fuchs, thereby undermining their prestige. The case would destroy ties with America. Guy Liddell understood the implications: he used Arnold's report of Fuchs' comments on his father to say that 'On the basis of his statement about his father to Arnold, it would be embarrassing both for us [MI5] and for him if he remained in Atomic Energy…[w]e would do our utmost to find him other suitable employment.'[91] However, had Liddell been believed, Fuchs's treason would not have come to light.

Permission was provided to interview Fuchs by Venona's Admiral Earl E. Stone, Director of US Forces Security.[92] MI5 were unable to agree on a solution should the interrogation have gone the wrong way.[93] Straightforward questions may have turned into exhaustive legal disputes, as solicitors, journalists and the public, eventually drawn in, would cause the British government grave embarrassment. Moreover, the potential of Fuchs absconding was anticipated. In December 1949, MI5 gathered key senior officers to discuss placing Fuchs at the University of Liverpool with the Skinners or removing him from Harwell. As the latter suggestion was deemed satisfactory, Fuchs was interviewed by Jim Skardon on 21 December 1949.

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[88] TNA KV 2/1246, travel records of Klaus Fuchs from 1946 to 1949.
[89] TNA KV 2/1247, Henry Arnold to J. Robertson, minute 280, 26 October 1949.
[90] Dick White was cautious, he knew the Fuchs case would cease Anglo-American relations, and if Fuchs reacted spontaneously to being interviewed, he might defect to the Soviet Union.
[91] TNA KV 4/471, Guy Liddell's diary, 31 October 1949.
[92] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.252.
[93] It is important to note that the counterintelligence Venona Project was still top-secret in 1950 and the Americans did not want certain details of Fuchs's espionage being drawn into interviews and court.

Interview One: 21 December 1949

Interview one took place at Harwell within Fuchs's office. Fuchs was not aware of the planning behind the interview by MI5, and Jim Skardon was designated to interrogate Fuchs initially. Considering Philby's position in MI6, he may have potentially influenced the designation of Skardon on the Fuchs' case. This decision could have been established upon the premise that Skardon would fail to suitably question Fuchs and delay a confession. This assumption is grounded upon Philby adhering to Soviet tactics which may have involved stalling the Fuchs case; therefore, Fuchs could defect to the Soviet Union. However, Philby's *de facto* recollection differs to this postulation. Philby imposed the idea that Skardon found a tactic which impacted Fuchs's poise until he finally cracked: 'Skardon succeeded in winning his [Fuchs] confidence to such an extent that Fuchs not only confessed his own part in the business, but also identified … his contact in the US'.[94] [95] However, Philby's *de facto* memoir has numerous discrepancies: he was still a 'mole', which limited his discussion in various subjects, such as his private life; however, he still inadvertently inspirated the novels of Graham Greene and John le Carre. Philby's *A Silent War* still encourages the reader to ask: Would Philby lie about the Fuchs? Was it not of importance to remember the Fuchs' debacle?

Dick White differed with Philby's conclusion. White became so unimpressed with Skardon that he remarked: 'Skardon's interrogation taxed [his] wit.'[96] Further evidence suggests Skardon's ability to intimidate Fuchs was unsuccessful as his competence and confidence in interrogation were less than his colleagues. As mentioned, Philby may have influenced Skardon's deployment to delay Fuchs's exposure: this tactic may have been to provide Fuchs time to defect to the Soviet Union. The first interview did not provide Skardon nor his MI5 colleagues with sufficient evidence to indicate whether Fuchs was guilty or not. By December 1949, Fuchs was a seasoned spy with nearly a decade of experience and perhaps prepared for this eventuality. Skardon showed his hand several times throughout their conversation, resulting in a game of chess or a 'poker game'.[97]

[94] ibid, p.164.
[95] Kim Philby, *My Silent War: The Autobiography of a Spy* (London: Arrow Books, 2018), p.169.
[96] Dick White's interview with Tom Bower, quoted in Tom Bower, *The Perfect English Spy, Sir Dick White and The Secret War 1935-90*, (London: Mandarin Paperbacks, 1996), p.96.
[97] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.258.

Interview Two: 30 December 1949

Skardon began the interview with the intent to strike Fuchs with unexpected and harsh statements. Firstly he asked Fuchs if he would assist in this investigation, and Fuchs answered with a blunt 'no'.[98] Skardon moved to the crux of the questioning and announced Kristel, Fuchs's sister. His sister's announcement would have shocked Fuchs, as his interaction with Kristel was limited while he was in America. Furthermore, only Fuchs knew of Kristel's involvement. Unknown to Fuchs, Israel Halperin, a mathematician turned spy in Canada, wrote of Kristel's role in his diary.[99] Skardon's attempt to unravel a possible masquerade succeeded, as Fuchs explained his two visits while he was in America, but left out his third with Harry Gold in January 1945. Skardon also circled other factors, such as Fuchs's social apparatus in New York. Fuchs identified Gold as his only contact in New York, thereby sending the intelligence officers in the wrong direction of who GOOSE could be. Skardon failed again at reeling Fuchs into a confession or providing more information. According to Dick White, Skardon exclaimed, 'You're barking up the wrong tree. Fuchs is innocent.'[100]

Interview Three: 13 January 1950

Between the second and third interviews, Guy Liddell discussed Fuchs's possibilities with Cockcroft and Portal and how they should not unwittingly provoke Fuchs into defection. This led to a conversation between Cockcroft and Fuchs on moving to a university within access of MI5 and his science to be obtainable for use; Fuchs would be helpful but limited by security services.

Once again, Skardon was sent to interview Fuchs though Skardon believed him to be innocent. It is essential to point out that Skardon was manipulated by Ursula Burton in 1947. However, Skardon was not aware of this as of January 1950. This also suggests that Skardon was strategically placed in this position by the influential Philby, as Burton contacted the Soviet

[98] TNA KV 2/1249, Skardon's report on the second interview with Fuchs, 30 December 1949. The report is dated as 'written on 2 January 1950'.
[99] Halperin was eventually released from several weeks of interrogation and confinement after a trial in 1947. However, his diary confirmed Kristel had contact with Harry Gold, providing America a lead to CHARLES / REST.
[100] Dick White's interview with Tom Bower, quoted in Tom Bower, *The Perfect English Spy, Sir Dick White and The Secret War 1935-90,* (London: Mandarin Paperbacks, 1996), p.95.

Union during World War Two. Skardon began the interview asking for Fuchs's New York address; again, Fuchs did not resist and acted innocently by pointing his apartment out on a map and then 'proposed' he would pass it onto Arnold.[101] Skardon confronted Fuchs and stated that a Soviet contact had found his apartment and gone to look for him there, to which Fuchs replied: 'it [is] extremely unlikely that such a visit had occurred'.[102] Fuchs did not mean to be ambiguous: Gold did not attend his apartment in New York but organised a rendezvous. Fuchs may have thought they were wrong in their information or trying to bluff, but this unintentionally gave Fuchs the upper hand. Skardon's 'beating around the bush' approach also gave the impression that MI5 were oblivious of his activities in Britain, further adding to Fuchs's confidence at this point.

Fuchs met with Erna Skinner between the 16th and 19th of January 1950 and confessed many a 'sin' to her within this period. Fuchs retrospectively declared: 'I couldn't lie. At this moment, I confessed.'[103] Fuchs met with Arnold on 23 January 1950 and implied that he found communism acceptable. However, the form Soviet communism had taken was unacceptable to him without him entirely knowing. Furthermore, Fuchs said that he wanted to speak to 'Mr Seddon' (Skardon's pseudonym) immediately, which led to the fourth interview occurring a day later, on 24 January.

Interview Four: 24 January 1950

Fuchs had requested the previous day that 'Mr Seddon' would meet him at his house at Harwell. Skardon opened the interview by saying: 'You asked to see me and here I am'.[104] Fuchs spoke of his social-political background in Germany and his ordeal in Canada. They went for lunch, during which Fuchs suggested that they should continue the interview. On arrival back at his house, Skardon asked Fuchs directly: 'Have you passed information to the Russians?'[105] Fuchs

[101] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.274.
[102] TNA KV 2/1250, Skardon's 18 January 1950, report on the third interview with Fuchs: Held on 13 January 1950.
[103] '*Klaus Fuchs – atomspion'*, Klaus Fuchs interview with East Herman television in 1983, transcribed in Zelluloid, 31 March 1990, ISSN 07 24-76 56, cited in, Frank Close in *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.280.
[104] TNA KV 2/1250, W.J. Skardon, Report on 'Emil Julius Klaus FUCHS: Fourth, Fifth, Sixth, and Seventh Interviews', 31 January 1950.
[105] TNA KV 2/1250 W.J. Skardon, 'Report of the fourth interview', 24 January 1950, p.1.

responded, 'From mid-1942 until about a year ago'.[106] Fuchs conceded that the development of the Soviet atomic bomb had been a shock to him, and he 'did not believe they would be up to it from a commercial and industrial standpoint'[107] - a factor which influenced his decision to confess. He also mentioned Kristel, denounced her involvement in espionage, stated that she would not have known what he was doing, and had played no part in his activities in America. Skardon called Colonel Robertson and explained that Fuchs had confessed not just to his escapades in 1944 but 'from 1942 until February 1949'.[108]

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Liddell concluded that 'it is now possible for Fuchs to be charged.'[109] However, because Fuchs had not formally confessed and the authorities had no legal hold over him, Skardon again met with Fuchs for a fifth interview. Arnold directly asked if Fuchs had given intelligence to the Russians.[110] Fuchs admitted that he had. However, he kept his activities in 1941 secret; not surprisingly, as the Soviet Union signed the allied allegiance pact after this point, meaning that Fuchs had passed information to a non-allied country. Presumably, Fuchs assumed that his sentence would be far greater if he had been caught supplying intelligence to the USSR in 1941 as they were a non-allied country. Fuchs informally confessed to espionage on 27 January and went ahead with Skardon's appeal at writing a declaration. Fuchs understood Skardon's commands and wanted Skardon to 'carry on'.[111] Fuchs's integrity protrudes throughout: he asked for the fourth interview, and by the sixth, he had agreed to Skardon's written statement.

Lord Portal realised that the authorities would have to be careful about the charges brought against Fuchs as one was connected to his treachery in the US, and the other in Britain. As the Americans, especially the FBI, felt charging Fuchs might strain already-strained Anglo-American security relations, the Foreign Office and DPP compromised by citing the British

[106] ibid, p.1.
[107] TNA KV 2/1250, Skardon's report on Fuchs's confession, 31 January 1950. as cited in *Trinity*, reference 58 on p.286 and in notes by Frank Close, p.469.
[108] ibid.
[109] TNA KV 4/472, Guy Liddell's diary, 25 January 1950.
[110] TNA KV 2/1263, Arnold's testimony at the Magistrates' Court, 10 February 1950; Cited in: Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.292.
[111] TNA KV 2/1250, W.J. Skardon, Report on 'Emil Julius Klaus FUCHS: Fourth, Fifth, Sixth and Seventh Interviews', 31 January 1950.

charge first, with the American charge 'appended'.[112] The events following Fuchs's initial confession led to the execution of the Rosenbergs, and the Soviet spy network being compromised, thereby demonstrating Fuchs's importance. Additionally, the director of the FBI, John Edgar Hoover, wanted to capture the political significance of the Fuchs' case in the same net as the FBI. According to Philby, 'he announced his intention of sending Lishman to London to question Fuchs in his cell.'[113] Lishman never interrogated Fuchs, however, although Hoover's intentions provide definitive proof of Anglo-American intelligence hostilities at the time.

Fuchs was arrested for his espionage throughout 1942-1949 and charged under the Official Secrets Act in 1950. He was sentenced to 14 years in Wakefield prison. Fuchs served nine years and was released on 23 June 1959. He moved to East Germany and became Deputy Director of the Central Institute for Nuclear Research at Helmholtz-Zentrum Dresden-Rossendorf laboratory. Retiring in 1979, he lived a quiet life until his death at 76 on 28 January 1988.

Chapter III

The Fuchs' Factor: An Anglo-American Cooperation

Chapter three scrutinises the role of the Fuchs' case in a wider context that considers the withering Anglo-American relationship and enquires whether it hampered intelligence relations, including the struggles in building the British atomic bomb in the 1950s and how British intelligence agencies responded to spy cases. Additionally, the chapter briefly examines a post-Cold War reaction to Russian scientists from their spy network and how the Smyth Report had a fundamental role in progressing the Russian atomic bomb project.

The Anglo-American atomic struggle

1950 proved to be an *annus horribilis* for Anglo-American atomic relations. After a turbulent period between 1941 and 1949, the horizon became optimistic for the British and Americans in reunifying to produce a joint atomic bomb programme. Roosevelt and Churchill struck up a

[112] Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019).
[113] Kim Philby, *My Silent War: The Autobiography of a Spy* (London: Arrow Books, 2018), p.164.

congenial wartime partnership like no other; Churchill impacted the early *MAUD* project in which the British atomic bomb project stood; however, once the British government noted the American advancement of the atomic bomb project, Britain hastily negotiated a deal with Roosevelt through the Quebec Agreement (1943) and the Hyde Park Aide-Memoire (1944). Both agreements were somewhat ambiguous, which eventually led to waning atomic relations post-war. The sudden death of Roosevelt, and Clement Atlee winning the UK election in 1945 meant that the relationship was not as friendly as it had been during the wartime years.

Harry Truman, Roosevelt's successor, and Attlee were keen on building the atomic partnership due to the looming Cold War and the communist movement across Europe and Asia. President Truman attempted to navigate the McMahon Act that placed legislation on the anti-sharing of atomic secrets to Britain, leading to an executive vs congressional stand-off in American politics. As the bureaucratic implications intensified, Anglo-American atomic relations were significantly impacted. Attlee set up a distinguished British atomic bomb project, and no other than Klaus Fuchs headed the British effort in post-war Britain at Harwell. The years passed, and the ignition to set stable bridges within a futile environment came to fruition until the Fuchs case penetrated the sentiments of American and British negotiators.

The Fuchs' case had inexorable consequences due to the ill-timing though a breakthrough was possible with the Americans needing uranium sources to complete their hydrogen bomb. However, Septimus Paul, a modern American historian, has analysed the Fuchs' case in conjunction with post-war atomic collaboration. Interestingly, he argues: 'After the first two [Fuchs and Bruno Pontecorvo cases] the United States was still prepared to engage … in cooperation … it was the third that had the most damaging effect'.[114] Paul is referring to the Maclean and Burgess spy case as, up until this point, the Americans were still interested in some collaboration as the British held plutonium produced from uranium ore throughout the Commonwealth. When the Fuchs' case came to light, the Americans were close to holding discussions with the Atomic Energy Commission (AEC). With the likes of General McCarthy and President Truman both making claims about communist involvement in the American establishment, communist spies became notorious in the press.

[114] Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000), p.166.

Additionally, the Fuchs' case had significant repercussions in the spying 'community'. Fuchs confessed and identified Harry Gold, his lead American informant during the Manhattan Project. Gold identified David Greenglass, who then identified Julius and Ethel Rosenberg. The Rosenbergs' case verified Americans' deepest fears of a communist global takeover. Fuchs not only delivered vital information to the Soviets to build the 1949 atomic bomb but also acted as the catalyst for a media frenzy embedding the Red Scare. The ignition for the psychological battlefield that consumed America had been kindled.[115] Dean Acheson, the former secretary of state between 1949 and 1953, stated: "The talks with the British and Canadians returned to square one, where there was a deep freezer from which they did not emerge in my time."[116]

Ironically, Fuchs' story led the British attempting to reignite the talks – an embarrassment for the former World-leading power. Fortunately, the Americans needed to collaborate with the British as the Soviet Union were intent on building a hydrogen bomb. The Americans were concerned to succeed at detonating the first thermo-nuclear device for deterrence sake.[117] Fuchs provided vital details for the plutonium bomb in the early stages of the production of the theoretical framework of the hydrogen bomb after he had attended Fermi's lectures. Several disagreements compromised the talks, however, most notably the uranium sources available and British and American security procedures. Carrol Wilson, the AEC's manager, was poised to undermine British security. As anticipated, Wilson used the Fuchs' case to argue for his non-tripartite agreements, as the British needed to have a competent security system in place before any collaboration could be carried out.

Dean Acheson, and Ernest Bevan, the British foreign secretary, believed they could downplay the Fuchs' case.[118] The Modus Vivendi came to light, with the British exploiting the agreement and stating its clauses that were still in effect. The AEC sent several reports, in the expectation of receiving information on the British Butex Process,[119] 'in accordance with our mutual

[115] The ramifications of the atomic explosion and espionage cases united and influenced all paradigms in American 1950s culture. The dystopian visions of Aldous Huxley and George Orwell were used as ammunition for the wider cultural Cold War.
[116] Kenneth Harris, *Attlee* (London: W.W. Norton, 1982), p.200.
[117] The US eventually succeeded in 1952 and the Soviets succeeded in 1953.
[118] Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000): Ref 18, p.171 "Memorandum by Lucius D. Battle, Special Assistant to Secretary of State," 13 February 1950, FRUS, 1950, vol. 1, pp.527-28.
[119] Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000), p.171.

understanding of the Technical Cooperation Program under the Modus Vivendi.[120] The Butex Process was a utilisation of two solvents, contributing to the separations for fission; unused uranium. This was a vital process for the Americans; the Americans had not mastered atomic energy by the 1950s and were lacking sufficient uranium for the hydrogen bomb project. In effect, this put the Fuchs' case on the backburner despite the media's moral panic on the Fuchs' and Rosenberg cases.[121] According to Septimus Paul, Acheson discovered Bevin's determination to undermine the Fuchs' case and focus on a joint atomic programme; their meeting included Attlee himself and Sir Roger Makins.[122]

The Americans continued to be awkward; negotiations were hampered, and the McMahon Act was again a vital pinching point for the American and British governments. The Americans still held onto the British for using plutonium, as they did not have the resources to do so. Moreover, the Fuchs' case did not impact the American-Anglo negotiations as previously thought; the American atomic programme needed plutonium desperately to continue its production of bombs. However, the Maclean-Burgess case came to light at a similar time to the negotiations - again hampering the British hopes for negotiations.

In August 1951, General Electric began working on its new Redox plant in Hanford which could recycle irradiated uranium. Kellex was also working on similar systems.[123] A uranium source was found at Radium Hill in South Australia and negotiations began to strike a deal. The British had to test their atom bombs in Australia at a similar time, as the Americans did not grant the British permission to use their test sites. The AEC also found South Africa at the forefront of plutonium production and speculated that South Africans could produce 'as much ore as the Belgian Congo, probably more than Canada and undoubtedly more than the US'.[124] Therefore, the British became dispensable to the Americans regarding uranium

[120] PRO, AB 16/858, cited in, "Frederick T. Hobbs to WA Macfarlane," 23 May 1950. Retrieved from: Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000), p.171.

[121] The spy cases justified Senator McCarthy's fear that up to 200 communists were working in State Department. This was compounded by 175,000 North Korean Soldiers crossing the 38th Parallel on 25 June 1950 and the Chinese Revolution in which one million communist soldiers tidal waved through a nationalist government in October 1950. Asia was becoming communist; the fear began to imbed itself into American culture.

[122] Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000).

[123] Richard G. Hewlett and Francis Ducan, *Atomic Shield, 1947-1952 US Atomic Energy Commission*, Vol. 2 1972. pp.549-50.

[124] Septimus H. Paul, *Nuclear Rivals, Anglo-American Relations 1941*-1952, (Columbus: Ohio State University Press, 2000), p.183, cited as: "*Memorandum by the Special Assistant to the Secretary of State* (*Arneson*)". 8 August 1951, FRUS, vol. 1, pp.750-52.

production and the Kiefer Plan was taken away from negotiations. The British suspected the spy scandals were responsible for this outcome although they considered the new sources of uranium a significant contribution to the American decision.

The result was compounded by the Americans refusing to give the British use of their atomic test site in Nevada, in April 1951. The US defence establishment initially had no qualms about the British using the test. However, the AEC quickly pointed out that using the test site would result in the disclosure of secret information. Therefore, it was quickly refused despite The McMahon Act not allowing for such an occurrence. Thus the conditions for the British had to be altered. However, it is difficult to refute the claim that the information had already been leaked to the British as Fuchs had been operating for them in secret during the latter stages of the Manhattan Project. In addition, Egon Bretscher, a Los Alamos physicist, required Fuchs to smuggle classified files out of Los Alamos on the hydrogen bomb theory. Overall, therefore, this circumstance prevented the British testing in America.

The Kaifer Plan offered optimism for the British during early 1951 to sway America's intransigence. By 1951, Fuchs had already been sentenced, and the plan was to exchange British plutonium for US bombs, even though the American prospects of producing plutonium had improved. However, as we know, the Maclean-Burgess case surfaced and again raised severe doubts about British security. It was not until 3 July 1958 that America and Britain signed the *US-UK Mutual Defence* Agreement.[125] In 1959, the amendment was ratified, and a nuclear exchange was denounced. The UK would provide the US over five tonnes of plutonium in exchange for 6.7kg of tritium and 7.5 tonnes of enriched uranium.[126] The UK would also provide 470kg of plutonium to the US. [127] Nonetheless, this agreement came after the British success in detonating their first H-bomb in May 1957; after the atomic 'secrets' were in the possession of Britain.

Intelligence and Anglo-American Relations

[125] Full title: *Agreement Between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America for Cooperation on the Uses of Atomic Energy for Mutual Defense Purposes*.
[126] TNA ES 19, cited in, William, J. Nuttall, *Britain and the Bomb - Technology, Culture and the Cold War,* (Dunbeath, Caithness: Whittles Publishing, 2019).
[127] ibid.

Early Cold War Anglo-American intelligence relations have not undergone a sustained analysis since the declassification of files vis-à-vis the peripheral Anglo-American cooperation. However, we can still assess whether the spy cases' impact substantially impacted relations between 1940 and 1955. Richard Aldrich, a political scientist, has also noted that Anglo-American relations have rarely been subject to vigorous analysis in the context of intelligence relations.[128] And the renowned Michael S. Goodman commented in 2012: '[t]he analytical intelligence relationship… has received far less attention'.[129]

American and British intelligence estimates were similar, and interestingly, these estimates were used over NATO estimates because the latter may have neglected to gather complete intelligence reports from military and political organisations. Alliance was strong, and the recent formation of NATO in 1949 proved to be significant. Spy cases and the Korean War facilitated an ambiguous relationship between America and Britain. Estimates became independent in the late 1950s; the 'missile gap' and the injudicious American estimates impacted the 1960 election in the USA. Britain's strategic positioning became the focal point of intelligence, and slowly, the relations between the two countries disimproved. Historians widely know this, but because the Fuchs' and other spy cases in the early 1950s have not been contextualised within the sphere of, The Korean War, Suez Crisis, Sputnik, and the Cuban Missile Crisis comprehensively; an aperture in scholarship arises. Consequently, it is difficult to conclude definitively whether the spy cases inadvertently impacted intelligence relations, therefore, affecting decision making in Korea, Suez, and the American rocket programme.

The Fuchs' case proposed new questions concerning MI5. The issues that enveloped the case led to the belief that MI5 was incapable and unable to catch a lethal spy. The British had unimpressed the FBI and American secret services, especially as Fuchs's work predominantly took place in America, as exposed by the Venona evidence produced by American counterintelligence units. This meant the British and Americans heavily exposed the trial of Fuchs and moulded their electoral campaigns to sway public opinion. For example, when the United Kingdom began the electoral campaign with polling on 23 February, Fuchs's arrest became publicly known. Perrin argued that *if* the Fuchs affair came to open court, they must

[128] Richard J. Aldrich, "British Intelligence and the Anglo-American' Special Relationship' during the Cold War." *Review of International Studies* 24, no. 3 (1998): 331–51. For Direct quote see, p.333.
[129] Michael S. Goodman, "The Foundations of Anglo-American Intelligence Sharing." *Studies in Intelligence* 59, no. 2 (2012), p.1.

consider altering the narrative so as not to frighten the American and British publics of the threat posed by the Soviets. The DPP and Mr Humphreys corresponded with Perrin; a version was transmitted to the FBI who were cooperating with the British regarding the case.[130] However, the feared political aftermath never took a full grip of electors in 1950 and 1951 in the United Kingdom, as Fuchs's espionage had spanned the Churchill and Attlee's governments. Because of that circumstance, neither party could launch a plausible case against each other.

The inexorable condemnations of MI5 gripped after the first trial. For *The New York Times*, 'Fuchs has a long background of Communist sympathy which the FBI uncovered with no special difficulty.'[131] Telford Taylor, a politically active American lawyer at the time, castigated 'those misguided people who think that secrecy and security are invariably synonymous, and who oppose any kind of international collaboration, even without most trusted allies in the field of secret weapons'.[132] If Britain had any more intelligence to transfer on Fuchs, it was now the time to prevent a colossal failure of relations though, by 1950, Anglo-American intelligence relations were far from cordial. The Truman Doctrine (1947) and Marshall Plan (1948) provided a glimmer of relief, and the Burns-Templer Agreement (1950) meant the UK and US exchanged military material. By 1950, 90% of the British JIC reports were sent to the US; however, the US did not collaborate and failed to provide the British JIC with any American papers.[133]

The Foreign Office understood the repercussions of the Fuchs' case on the 'special relationship', especially considering other cases that sprung out of the woodwork in the early 1950s: the Pontecorvo case in 1950 and the Maclean-Burgess case in May 1951. As mentioned, the politics for the British election were not impacted. However, it was more complicated in the US. By 1950, the Republicans were desperate to reach the White House again, as they had an opportunity to expose the failures of the Democrats regarding security. General Leslie Groves was also heavily impacted by the Fuchs' case, for as the head of the Manhattan Project and fighting against potential security risks, he was angered by the situation. Believing he had

[130] BA. Hill to H. Morgan (for the DPP), 10 February 1950, TNA KV 2/1263, s. 27a, cited in: Frank Close, *Trinity, The Treachery and Pursuit of the Most Dangerous Spy in History*, (Milton Keynes: Penguin Books, 2019), p.334.
[131] ibid, p.339.
[132] ibid, p.339.
[133] TNA CAB 163/14, cited in, William, J. Nuttall, *Britain and the Bomb - Technology, Culture and the Cold War*, (Dunbeath, Caithness: Whittles Publishing, 2019).

produced a system that could not be penetrated, Groves conveniently blamed the British Security Services and pointed out that '[he] believed that the British never made any investigations [of Fuchs] at all… and each member had been investigated… thoroughly.'[134] Indeed Groves argued that an American background check would have highlighted Fuchs's communist sympathies.

A get-out-of-jail clause for the British. Bruno Pontecorvo: American or British security woes?

Ironically, the Americans also had trouble with security clearances and spies infiltrating their vetting systems. Bruno Pontecorvo slipped under the radar and dispensed information to the Soviets during the 1940s until he defected in 1950. This meant the British were able to negotiate with the Americans with regards to political fallout from Fuchs due to the errors made within American security. The US and British concluded that they could undermine the Fuchs' and Pontecorvo cases to deter a serious backlash by media outlets. For example, the 1952 US election played a pivotal role on the Democrats' demeanour toward espionage in the early 1950s, as the McCarthy era took its hold on American civilians. However, the Fuchs' case does not accentuate the Pontecorvo case throughout declassified documents; the impact of Pontecorvo on atomic secrets was somewhat limited in comparison. Similarly, British and American scholars have undermined the case and argued that Pontecorvo's impact was diminutive, nevertheless, this section will cross-examine Pontecorvo in more depth.

Pontecorvo was a former pupil of Enrico Fermi who had previously worked at the Chalk River nuclear research facility in Canada as a part of the Manhattan Project.[135] Before he defected to the Soviet Union, he held an essential role in Harwell, which allowed him access to atomic secrets, and had previous experience of working for the Canadian nuclear programme. Pontecorvo's defection alerted the British and led to their downplaying the case so as to protect the relationship with the US. Michael Perrin, Deputy Director of UKAEA, was advised to downplay the impact due to the ongoing negotiations with the Americans. Accordingly, he stated that Pontecorvo had limited access to secret research.[136] The Modus Vivendi, signed in

[134] ibid, p.373.
[135] Simone Turchetti, *Atomic Secrets and Governmental Lies, Politics and Security in the Pontecorvo Case* (Dec. 2003).
[136] ibid, p.391.

January 1948, allowed an exchange of atomic information that was not in relation to weapons, but this did not fully satisfy both parties and negotiations were still open regarding uranium and American atomic secrets.

Oliver Franks, the British Ambassador, Roger Makins, the FO undersecretary, and Michael Perrin agreed that the British Embassy in Washington would downplay the Pontecorvo case.[137] The secret communications between them established that Pontecorvo had access to non-secret data only although the FBI discovered he had communist sympathies which were communicated to British intelligence years in advance of the defection.[138] Furthermore, the FBI argued that Pontecorvo should not have travelled to Italy in the first place; this enabled a flight to Finland and then to the Soviet Union.[139] However, Chapman Pincher, an English journalist and historian discovered that the FBI files on Pontecorvo were intercepted by none other than Kim Philby. Furthermore, Pincher argues that Philby tipped off Pontecorvo to defect, as his acts had been discovered.[140] Declassified primary sources cannot ratify this claim, however, and because Philby's tip-offs are common knowledge in the world of espionage, it is easy to assume he tipped off both Fuchs and Pontecorvo.

The British were right in thinking that their lack of security vetting was inadequate compared to the American system. Spies continued to be unearthed, and eventually ties fell away due to other uranium sources coming to fruition for the American atomic programme. Also, if Philby did tip off Pontecorvo and intercepted the FBI files on his communist background, it was a British infiltration of top-secret data, not the FBI's or CIA's. Considering Pontecorvo's importance, a former KGB official, Oleg Gordievsky, stated that Pontecorvo was of the same importance as Fuchs.[141] However, evidence still suggests that Fuchs was the heavyweight compared to Pontecorvo. Besides, Fuchs was at the Trinity site and headed the British Atomic Bomb project after that, two highly significant roles within the atomic research world.

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[137] TNA FO 371/84837, 'Emergency Top Secret Cypher Telegram' from Cabinet Office to British Joint Services Mission (BJSM), in 'Defection to USSR of Dr. Pontecorvo', Washington, 20 October 1950. Retrieved from TNA, also used in Simone Turchetti, *Atomic Secrets and Governmental Lies, Politics and Security in the Pontecorvo Case*; this is the case for subsequent TNA FO 371/84837 files.

[138] TNA FO 371/84837, 'Top Secret Cypher Telegram' from Cabinet Office to BJSM, in 'Defection to USSR of Dr Pontecorvo', Washington, 23 October 1950.

[139] TNA FO 371/84837, 'Top Secret Cypher Telegram' from Cabinet Office to BJSM, in 'Defection to USSR of Dr Pontecorvo', Washington, 21 October 1950.

[140] Simone Turchetti, *Atomic Secrets and Governmental Lies, Politics and Security in the Pontecorvo Case* (Dec. 2003), p.411.

[141] C. Andrew and O. Gordievsky, *KGB: The Inside Story of Its Foreign Operations from Lenin to Gorbachev*, (London, 1990), pp.312-13.

The final factor: Russian scientists and The Smyth Report

Curiously, debates existed in the 1990s between ex-Soviet spies and scientists which questioned each other's role in the Russian atomic bomb project. Resentful spies such as KGB Lt. Colonel Anatoly Yatskov who stole American secrets on the atomic bomb were awarded the Combat Red Banner Order, six echelons below the Hero of Socialist Labour which six atomic Soviet physicists, including Igor Kurchatov and Andrei Sakharov received.[142] Bear in mind too that relevant KGB files were due to be published until 'security reasons' prevailed. Hence the suspicion that the Soviet award system, perhaps like all today, highlights the care the authorities exercise in hiding spies' work.[143] Yuli Khariton was a leading Soviet physicist on the Bomb programme and commented he and his colleagues worked with the American design, as it was a proving method. Nevertheless Khariton argues the Soviets did the majority of the scientific work and produced a 'superior' design.[144] In sum, the German-American theoretical physicist, Hans Bethe, provides a single sentence to highlight Fuchs's significance: 'Klaus Fuchs is the only physicist that I know who really changed history'.[145] We should note too that Fuchs received the Karl Marx Medal of Honour in 1979, the highest award of the German Democratic Republic.

Another significant factor contributing to the development of the Soviet bomb was The Smyth Report, *Atomic Energy for Military Purposes,* written by the physicist, Henry DeWolf Smyth. The Report was released on 12 August 1945, three days after the Nagasaki bombing. Translated into forty languages by the end of January 1946, 30,000 copies had been sold.[146] Lavrentiy Beria, the notorious ex-NKVD leader, seized the opportunity to consolidate the material in The Smyth Report with details from Fuchs's and other Los Alamos' spies. What he did not realise

[142] ibid, p.126.
[143] I have extensively analysed Fuchs's espionage, the Manhattan Project and Harwell throughout this thesis. It is also important to note the profound scientific talents the Soviet scientists held. Peter Kapista worked with Ernest Rutherford, Lev Landau with Edward Teller, and Kurchatov led the way with the cyclotron, a particle accelerator. As early as 1942, the Soviet atomic bomb project discussed the possibility of uranium's feasibility.
[144] Thomas Powers, *Intelligence War, American Secret History from Hitler to Al-Qaeda,* (New York: The New York Review of Books, 2004).
[145] *Race for the Superbomb TV Documentary* (1998): Retrieved from Gerard DeGroot, *The Bomb A Life*, (London: Jonathon Cape, 2000) p.128.
[146] Graham Farmelo, *Churchill's Bomb, A Hidden History of Britain's First Nuclear Weapons Programme*, (Faber & Faber, 2013) p.312.

was that, so as to mislead the Soviets, the Report was deliberately misleading in some respects. The Report focused on the physics, not the chemistry, because they did not wish the general population to associate the atomic bomb with chemical weapons. However, because the Soviet scientists were well-informed of the chemistry details of uranium and plutonium, we may doubt that this would have impacted them much.

During Alan Nunn May's trial, Gerald Gardiner attempted to downplay May's espionage. The Smyth Report, not May, had advised The Soviet Union how to build an atom bomb. From recollection, Pavel Sudoplatov, a General of the NKVD, had become convinced that Smyth had written the Soviet seven-page report, excluded for security reasons, handed to Beria on 18 October 1945.[147] [148] However, Sudoplatov's reports are inaccurate; his memoir makes various claims which have been disproven; consequently, the trustworthiness of his comments is in doubt. Besides, access to The Smyth Report made the difference, when it came to Soviet production of *tons* of uranium by the summer of 1946, resulting in important developments and speeding up the Soviet Bomb programme. Although The Smyth report did provide a degree of information for Soviet advancements from 1945, the underlining fact is that espionage from 1941 provided the spine of atomic information. Fuchs was at the epicentre of atomic espionage, and the evidence analysed in this thesis is supports the conclusion that Fuchs was the definitive factor for Joe-1's successful and premature detonation.

[147] Jim Baggot, Atomic, *The First War of Physics and The Secret History of the Atom Bomb, 1939-49,* (Faber & Faber, 2015).
[148] Pavel Sudoplatov also suggested Bohr, Fermi, Oppenheimer, and Szilard passed secrets to the Soviet Union, which is false. See: Thomas Powers, *Intelligence War, American Secret History from Hitler to Al-Qaeda,* (New York: The New York Review of Books, 2004): Chapter Four, 'Phantom Spies at Los Alamos' for a comprehensive analysis of Sudoplatov's claims.

Conclusion

Klaus Fuchs's legacy

"The nuclear scientist will prepare the bed on which [humankind] must lie"[149] – Aldous Huxley

This thesis has examined Fuchs's role in 1940s' atomic espionage by focussing on the Manhattan Project, Harwell, and MI5's interrogation of Fuchs. The importance of Fuchs is unprecedented as he delivered atomic secrets to the Soviet Union through various NKVD and

[149] Aldous Huxley, foreword from, *Brave New World* (1946) retrieved from: Oppenheimer, Oliphant and the human chain reaction behind the first atomic bombs - ABC News.

KGB contacts, eventually leading to the Soviets having an atomic bomb several years before Western predictions. Moreover, Fuchs's espionage was far more helpful to the Soviets than that of Theodore Hall, David Greenglass, Alun Nunn May, Oscar Seborer and the Rosenbergs. I have scoured tomes of secondary sources, starting with Michael Schwartz's very short, *The Russian-A(merican) Bomb: The Role of Espionage in the Soviet Atomic Bomb Project.* Arguing the Russian Bomb was indeed 'American'. *Frank Close and Norman Moss's* respective works, *The Treachery and Pursuit of the Most Dangerous Spy in History* and *Klaus Fuchs: the Man who Stole the Atom Bomb* both put Fuchs at the epicentre of the atomic ring, though they tend to romanticise his involvement.

Scholars such as Simone Turchetti, who wrote *Atomic Secrets and Governmental Lies, Politics and Security in the Pontecorvo Case* have not necessarily dismissed Fuchs but focussed on other spies. In the case of Pontecorvo, we have seen that his role was a fraction of Fuchs's. Similarly, Oscar Seborer, an atomic spy whose identity was revealed in 2019, has been considered an essential spy at Los Alamos working on the seismological effects of an atomic bomb. However, once we compare the nature of Fuchs's line of work with Pontecorvo's and Seborer's résumés, it is clear that Fuchs's work on the fissionable core at Los Alamos was critical inasmuch as he had direct contact with Oppenheimer, Peierls, Szilard, Bohr, and Teller.[150]

That Frank Close has made it clear that GCHQ and MI5 were at the centre of the Fuchs' case highlights the former's ability to decipher the Soviet codes leading to Fuchs's arrest – a circumstance which undermines the FBI's and Venona's credibility in some regard. Close has also claimed that the discrepancies in the FBI and MI5 cases, together with the embarrassment of not catching Fuchs earlier, led to both organisations covering up their failures from public and government. Although GCHQ was working alongside Venona and the FBI before M15 intervened, The Venona Project, the post-war counterintelligence establishment were primarily responsible for catching Fuchs. Nonetheless MI5 claimed that it had 'cracked' Fuchs. That said, interpretation of the Fuchs' case will continue to be debated by historians, principally because, as intelligence history demonstrates, contradictory sources and competing interests vie for attention. Recently released files from TNA, and historians gaining access to previously

[150] As we have seen, this also included theoretical work on the H-bomb; 'super'.

classified intelligence material has proven to be a vital steppingstone to constructing a plausible account of early Cold War intelligence.

I have also considered Fuchs's broader impact on Anglo-American relations. Because the McMahon Act prevented the Americans and British from trading atomic secrets, Fuchs not only provided the Soviets with atomic secrets, but his treachery assisted Britain from 1946. When the Fuchs' case appeared, the Americans and British were ready to continue negotiations in 1950 under Attlee. However, a series of spy cases and negotiation of the delivery of uranium ore between the Americans and Australians hampered Anglo-American cooperation. Unlike Fuchs's role in the Soviet atomic bomb project, his role in dismantling Anglo-American relations is not as definitive, but important, nevertheless. As discussed in Chapter IV, there were various compounding factors, but the untimely demise of Fuchs was an element in the atomic and intelligence Anglo-American relationship. Direct intelligence relations between American and British establishments in the 1950s is an area which needs further research to separate the causes and roots of various conflicts definitively.

Archived files in TNA, FBI: The Vault, and Venona demonstrate Fuchs's influence within intelligence history, enigmatically selective papers are still declassified; Fermi's notes on the 'super' and papers on H-bombs. The Americans with Venona set the foundation for the British security system to complete the American's findings of CHARLES. After MI5's interrogation, Fuchs confessed, and the shockwaves reverberated through British and American society. Churchill was reinstated in power in October 1951 after a snap election, during the election two further Soviet A-bomb tests took place, stressing the importance that the UK needed a nuclear deterrence. Churchill immediately acknowledged that the wartime partnership that stood with Roosevelt was no longer viable. With the British lagging behind dramatically at this stage in atomic bomb development, he decided to take it upon himself to reignite the British project again without Fuchs. With the success of Operation Hurricane, the first British A-bomb test on 3 October 1952, the British believed to have altered American perception, however, on 1 November 1952, the 10.4 megaton, Ivy-Mike was tested. Churchill was displeased; the British had not been informed of the test or provided details of the test after detonation.[151] Again, Britain and Churchill faced an arduous struggle to assimilate itself with US nuclear development and policy. It was not until 1958, after the British successfully detonated their

[151] Kevin Ruane, *Churchill and the Bomb In War and Cold War*, (London: Bloomsbury, 2018).

first hydrogen bombs throughout 1957 and 1958 during Operation Grapple, that Anglo-American atomic policy was re-established.

Klaus Fuchs has also shaped a fictional, cultural, and biographical model in academia and film. In 1990 *Väter der tausend Sonnen* (Father's of a Thousand Suns), an East German documentary, was released. Fuchs talks openly about himself, but, *in stricto sensu, the* documentary was a propaganda narrative. More importantly, though, Kai Bird's and Martin J. Sherwin's *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* showed the unjust indictment that shadowed Oppenheimer in 1954. The penetration of, and treachery at Los Alamos left a lasting impact throughout the McCarthy era. The recent release of Christopher Nolan's screen adaption of *Bird* and Sherwin's biography *Oppenheimer present* Fuchs as the quiet, kind individual whom no one suspected would become the most lethal spy during World War Two and early Cold War. Interestingly, Nolan's masterpiece does not consider other Los Alamos spies who have been discussed in this thesis, thereby cementing Fuchs's legacy.

By 1958 the Soviet Union looked robust, having launched Sputnik in October 1957, and tested 36 nuclear bombs in 1958. The Soviets continued to develop their hydrogen bomb, eventually detonating the Tsar Bomba in October 1961, the largest man-made explosion ever. Collaboration continued between America and Britain, and by 1962, with Macmillan and Kennedy steering the ship, and with the help of RFK and Ormsby-Gore, nuclear disaster during the Cuban Missile Crisis was avoided. As the Cold War continued, Kennedy and Khrushchev paved the way for a new era of nuclear 'security'. The Partial Nuclear Test Ban Treaty (1963) led to a series of treaties relinquishing tensions throughout the late 1960s and 1970s. A period of détente took hold, with the success of Apollo-Soyuz in 1975 emphasising both superpowers' technological and political accomplishments. It was not until the Soviet Union intervened in Afghanistan in 1979 that rising tensions boiled over. This was compounded by President Carter withdrawing from SALT II (Strategic Arms Limitation Talks) in January 1980, resulting in higher tensions. With Ronald Reagan elected after a landslide victory in 1980 and winning the 1984 election, and Mikhail Gorbachev navigating Soviet policy after presuming office in 1985, the Cold War ended in December 1991. The Soviet Union dissolved into various states, and 'freedom' ensued.

In retrospect, those who developed the atomic bomb initiated a new technological age which descended upon the World in the 1950s and 1960s. Arthur C. Clarke, the science fiction author, fittingly commented on technological innovation in 1958: 'at the present rate of progress, it is impossible to imagine any technical feat that cannot be achieved, *if* it can be achieved at all, within the next five hundred years.'[152] The technological age exploded into action, quite literally - with no boundaries. American, British, and Soviet nuclear testing intensified, and by 1963, Kennedy and Khrushchev signed the Partial Nuclear Test Ban Treaty. Deterrence succeeded, and fortunately, in 2023, only two atomic bombs have ever been dropped in war. Paradoxically, Fuchs's espionage may have been helpful, after all.

[152] Arthur C. Clarke, *Profiles of the Future: An Inquiry into the Limits of the Possible* (New York: Harper and Row, 1958), p. xiv.

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