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Pushed into Pragmatism:

**British Approaches to Science
in Post-War Occupied Germany**

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ABSTRACT

One of the most important dilemmas facing the British authorities when they occupied their zone of Germany at the end of the Second World War was what to do with German science. The contributions made by scientists and engineers to the Nazi war machine, in fields such as rocketry and submarines, meant that German science was both revered and feared, and was therefore closely linked to concerns about a post-war military resurgence in Germany. This article aims to chart the changing approaches which the British occupation officials adopted towards German science in this period. While the initial intention was to prevent Germany from ever waging war again, through demilitarisation, denazification and dismantling, the focus changed as British enmity shifted from a former adversary, Germany, to a former ally, the Soviet Union. Policy reflected this shift as technology transfer and the reconstruction of domestic German science won greater favour. This article aims to show that, in the face of growing hostility from the USSR and in the deeply suspicious climate of the early Cold War, Britain was forced to abandon its moral mission towards German science and adopt a far more pragmatic strategy instead.

KEYWORDS: British occupation, post-war Germany, science policies, Cold War, reconstruction

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Despite the totality of Germany's defeat in 1945, the British impression of German science at the end of the Second World War was that it was vastly superior to Britain's own. Though the perceptions of the Third Reich's technological superiority were greatly exaggerated, and had a minimal impact on the course of the war, there is no doubt that Germany's arsenal contained much which was better or more advanced than that in the Allied armouries.¹ This belief in turn gave rise to a characterisation of the German war machine as vast, unthinking, soulless and ruthlessly destructive but with a strong foundation in cutting-edge science.² In a report from the Economic and Industrial Planning Staff, one of the numerous British bodies tasked with preparing for the post-war period, the Nazi regime was described as having successfully dedicated 'every aspect of scientific activity ... to waging war'. The report went on to argue that Germany was 'perhaps the only nation who carried the prostitution of science to this extremity'.³ This gives a clear indication of the way in which British officials, many of whom had no scientific background or expertise, conceived of and defined science in this period, particularly under the Third Reich. In their minds, German science, meaning mainly 'research and development', was one of two things – either a blunt instrument wielded by the Nazis to aid their military efforts and industrial output, or an island of scholarly non-conformity within the regime. This dichotomous, even contradictory, understanding, stripped of all nuance, goes some way to explaining the approaches the British occupation authorities took to science – for example, as David Cassidy has argued, for many officials, the important distinction between pure and applied science ceased to matter during discussions on this topic.⁴ Throughout this article, therefore, the term science is represented in a form which, though oversimplified, would be familiar to the contemporary actors.

The British attitude towards science was very much in alignment with the main initial thrust of occupation policy – that is, to ensure Germany was never again in a position to wage war against Britain or its allies.⁵ This, coupled with the desire to extract reparations for the considerable financial cost of waging the war, led to the programme of exploitation – of German science, as well as of industry and of various other human resources – which maintained a prominent place in British occupation policy throughout the post-war period, and is critical to understanding approaches to German science. These motivations, however, were not totally fixed or

static and the enormous expenses of the occupation— unmet by exploitation or other reparations schemes - soon generated a desire to return Germany to a position of economic viability and self-sufficiency. Moreover, before long, the Soviet Union had replaced Germany as the most serious threat to Britain's security, and it became apparent that Germany might in fact be strategically valuable in the defence against this new menace.⁶

The aim of this article is to show that although the British never settled on a formal 'science policy' with respect to Germany – indeed such a policy would have been alien to British politicians and civil servants alike in 1945 – their approaches towards German science after the Second World War largely followed the broader trends of occupation policy, though often in sharper relief. As such, while they were initially guided by principles of retribution, censure and, to a lesser extent, morality, expediency came to be the dominant element in decision-making on this matter. In studying British approaches to science as a microcosm, or case study, of occupation policy, it is clear that the relevant authorities were pushed into pragmatism not only by the prohibitively high cost of an occupation which deliberately restricted any German efforts towards economic independence, but also by the increasing fear of the USSR and the fact that a strong, pro-Western Germany was seen as necessary to resist Soviet hostility.

Along with presenting the first account and explanation of this hitherto unexplored aspect of British post-war occupation policy, this article has three broader goals. The first is to contribute a new facet to the historical appraisal of the occupation of Germany, complementing the growth of recent scholarship which deals with other specific elements, such as public health, prosecution of war crimes and the refugee crisis.⁷ The unprecedented mass mobilisation of the Second World War meant that, at its conclusion, the victorious powers had to secure peace and impose their vision of the future not only at a government level but across German society, including in science.⁸ The second is to redress the scholarly neglect of Britain's role in the occupation, overshadowed as it so often is by the actions of its larger allies, the United States and the Soviet Union.⁹ This imbalance is evident in discussions of policy towards German science,¹⁰ and Michael Neufeld has urged a more global and transnational approach to, for example, the experiences of German scientists in the aftermath of the war, away from the traditional US-led 'brain drain' narrative.¹¹ The third goal is to re-evaluate the motives behind British occupation policy, and to move beyond the simple contrast of retribution versus reconstruction. The existing historiography on this topic is relatively sparse (some of it remaining sadly unpublished) but it is clear that a range of issues, including early Cold War hostilities, post-war British financial strife, and the desire to rebuild a 'better' Germany and Europe, all figured in occupation policy development. Ultimately, the British approach was generally

characterised by strong ideals and anti-German sentiment watered down by the practicalities of occupation.¹² As Christopher Knowles illustrates, while moral imperatives did have their place in the public discourse about how to handle Germany after the war,¹³ the vicissitudes of the post-war era meant that priorities and policies were usually governed, in the end, by pragmatism. This article will demonstrate this by showing the evolution of the British handling of German science, which underwent restriction, denazification, exploitation and reconstruction – approaches that were separate but overlapping, and which each enjoyed a period of favour and dominance, depending on changing conditions and a pragmatic reading of which would best serve Britain's current interests.

Restriction and Demilitarisation

For the entire duration of the Third Reich, and especially during the Second World War, science in Germany was closely directed by the state, and this oversight even extended into semi-autonomous organisations such as the Kaiser-Wilhelm-Society. As indicated above, Nazi Germany excelled at mobilising its scientific resources, both material and human, and, whether the focus was on new weapons, such as rockets or atomic bombs, or on less obviously military topics, such as synthetic rubber production or agricultural techniques, much of this research was geared towards aiding Germany's war effort.¹⁴ As such, almost immediately after the end of the war, the control of German science became an important topic, not just within the civil service in Britain but at the uppermost levels of government too. In the House of Lords on 29 May 1945, Baron Robert Vansittart, in one of many diatribes advocating harsh treatment of post-war Germany, bemoaned how inadequate British responses to German advances in military technology had been during both the First and Second World Wars. He complained that the only remedy which had been found to the threat of the V-weapons had been to overrun the launch sites – 'the answer of infantry and not of science' – and warned that, as the range of long-distance weapons increased, such a solution would not always be available. From this, and coloured deeply by his personal anti-German prejudices, he surmised that 'in dealing with a nation that is periodically homicidal, I think no precaution is excessive'.¹⁵ Others shared these extreme sentiments – Lady Apsley, Conservative Member of Parliament for Bristol Central, suggested as early as September 1944 that the German people should be left only to 'the study of the higher humanities such as architecture and other peaceful pursuits', and that their scientists should be distributed across the countries of the United Nations to continue their research under supervision in laboratories there.¹⁶ These opinions were, however, in the minority, at least among the educated and those in a position to actually influence policy.

In April 1945, in an article in the *Daily Worker*, the eminent British geneticist, J.B.S. Haldane, wrote that he disagreed with such castigatory schemes on three grounds: firstly, because ‘a great deal of German research, even in the last 12 years, has been of benefit to the whole of humanity’; secondly, Haldane hoped that ‘the Germans will ultimately take their place among the civilised peoples’ and believed they could not do this ‘without intellectual culture, which includes science’ – as an example, he cited biological education as necessary to show the ‘utter falsity of Hitler’s racial theories’; and thirdly, because of the length of time which it takes to put a discovery in fundamental science into practice, meaning that pure research itself posed no particular threat. Ultimately, Haldane felt that the banning of certain types of applied science, the requirement of having a license for any research, and periodic inspections of facilities, without forewarning, would suffice to control German science.¹⁷ Joseph Kenworthy, Baron Strabolgi, shared Haldane’s view and dismissed more restrictive suggestions as impracticable and ‘as Utopian as the Morgenthau plan for confining Germany to agriculture and pastoral pursuits’, noting, however, that there was no reason ‘why we should not keep an eye on them and control them’.¹⁸ Indeed, even Baron Vansittart’s proposed precautions were remarkably moderate – he suggested establishing an inter-Allied committee of scientists, whose responsibility it would be to ‘examine and control, and if necessary to prohibit the use by Germany of, any scientific discovery or invention considered dangerous to the safety of mankind’.¹⁹ It was this outlook which formed the basis of policy, at least initially, mirroring similar strategies regarding other areas of German life, such as education.²⁰ As such, a plethora of committees and agencies were established by the British to develop and enforce these comparatively rational measures of scientific control.

The German Science and Industry Committee (GSIC) had been appointed in August 1944 to consider questions both of scientific control and industrial disarmament. They acknowledged the close link between industry and war potential, and recommended a policy of constant watchfulness to ensure no new research areas with military connotations were permitted to arise.²¹ The Scientific and Technical Intelligence Branch (STIB) operated much like a conventional intelligence agency, gathering information on all scientific and technical research taking place within the British Zone, particularly where it related to warlike developments.²² The Scientific Committee for Germany was a consultative body, comprising senior British experts from across the spectrum of scientific fields, and tasked with advising the government on ‘all questions relating to German scientific and technical development in the British Zone’, especially those of ‘potential military importance’.²³ Lastly, the Research Branch of the Control Commission for Germany (CCG) had arguably the most challenging task, as they were charged not only with monitoring any potentially dangerous German scientific

research, but also with preventing too many German scientists leaving the British Zone (especially for Soviet employment).²⁴

The largest and most far-reaching development in the control of science came in April 1946 when, as part of a raft of measures designed to codify the central tenets of the occupation and to co-ordinate policy throughout the four zones of Germany, the Allied Control Council (comprised of British, French, American and Soviet representatives) passed Law No.25, entitled 'Control of Scientific Research'. This law forbade any applied or fundamental research 'of a wholly or primarily military nature', as well as any non-warlike research which would require the use of facilities or installations which, 'on account of their size or their special or peculiar construction', could also be used for military research. Even scientific research which was not prohibited under the above measures could only be conducted in facilities which were given the explicit approval of the Zone Commander.²⁵ Completely banned subjects included aerodynamics, aircraft design and ship construction, while those which required prior permission included electromagnetic, infrared and acoustic radiation research. The effect of Law No. 25 was to seriously limit German scientific endeavour and as such it also severely threatened Germany's ability to recover economically.²⁶

As a result, thinking on this subject began to change. At the end of April, as Law No. 25 was promulgated, Research Branch began to advocate a 'conception of control' which was not 'merely the negative one of preventing the Germans from doing undesirable things' but also taking 'positive action to provide conditions in which German research can develop along the right line'. Indeed, this was not entirely a new idea. In September 1945, both the Deputy Chiefs of Staff and the GSIC advanced the view that a 'purely restrictive policy will not achieve the desired ends' and would likely create 'conditions of unrest and rancour' among the scientific community – a sector of the German population which the occupying officials were most keen to encourage. Their report continued that although there should be 'important measures of prohibition, limitation and control in certain fields which may have a military significance, there should be no restriction of German scientific activity for peaceful ends'.²⁷ This was in alignment with British policy on education – while the occupation authorities acknowledged the extent to which it had been poisoned by Nazi ideology, they also saw its revival as essential to the restoration of peace and democracy in Germany.²⁸

This more reasonable approach tended to prevail and, as a result, the harsher, stricter elements of policy were accompanied by more positive and conciliatory tactics, which sought to rehabilitate German science and incorporate it back into the global community. One proposed scheme along these lines was to place research contracts from British government departments and private industry with German firms. In November 1946, the secretary of the Scientific Committee for

Germany, D.A. Johnston expounded the benefits of this plan, arguing that it would 'help us to keep German scientific activity out of subversive channels and will promote good morale and a healthy internationalism among German scientists'. Continuing, he expressed his belief that although the programme was dictated by political considerations, 'this step towards co-ordinating German with British research and towards harnessing German scientific resources to British technical progress' seemed to be 'thoroughly good and worthwhile in itself'.²⁹

The control of science, whether approached with a punitive or conciliatory attitude, was also affected by the wider scheme to disarm and demilitarise Germany. In simple terms, this encompassed the reduction of Germany's war potential to a position where it would no longer be able to conduct an aggressive military campaign. The clearest manifestation of this policy was the removal of 'war material', defined as 'any material of whatever nature and wherever situated, intended for war on land, at sea, or in the air, or which is or may be or has been at any time in use by, or intended for use by, the armed forces, civil defence, or other formations or organisations.'³⁰ Of course, weapons and ammunition were confiscated swiftly and effectively by the invading Allied forces and then by the early occupation troops; while other, less dangerous military material, such as clothing, shoes, soap and tools, were provided to Displaced Persons via humanitarian agencies and were later sold to the German people as the domestic economy was revived.³¹ The larger and more complicated issue was industrial disarmament, wherein it was necessary to remove from Germany the means to develop or manufacture any implements of war, which therefore included military-oriented laboratories and research and development facilities.

An official policy statement on German industrial disarmament, approved by the Cabinet on 13 September 1945, noted that it offered great value by 'lengthening the time between the start and the fruition of Germany's rearmament, so that action can be taken at once to prevent it with little cost to ourselves'. There were three alternative methods available for dealing with military factories and laboratories: one, to remove general purpose plant and destroy the buildings; two, to declare the plant available for reparations; or three, to convert it to civil use.³² Generally speaking, it was the second option, that of dismantling the plant and apportioning its valuable parts among the nations owed reparations, which became the most commonplace. This was largely because it offered a compromise which allowed Germany to remain at least somewhat economically viable and thus in a position to provide reparations, while also removing material which could later pose a threat to the security of the Allies.³³ This is not to say that dismantling was a wholly popular scheme, or that it was simple. In fact it faced many difficulties, not least the problem of public opinion in Germany, which became increasingly vocal and critical of punitive measures imposed by the occupiers, and could

take the form of 'go-slow' tactics or even organised resistance and sabotage.³⁴ The British had to handle this on a larger scale than the other occupiers because the rich industrial heartland of the Ruhr, which contained so many of Germany's factories and plants, lay within the British Zone. Beyond this, the occupation authorities were also concerned, as they were throughout the initial post-war period, with striking the balance between weakening Germany as a potential aggressor while still building an economy which allowed for a decent standard of living.³⁵

This dilemma can be clearly seen in the handling of the colossal and technologically-advanced German conglomerate, IG Farben, which had strong links with the Nazi regime and had indeed profited from the use of concentration camp slave labour in its factories. It was considered of such great importance that all four occupying powers set up a quadripartite commission to investigate its activities, and while the IG was formally liquidated, many of its constituent parts were allowed to live on under new identities and many of its directors were rehabilitated, even after they were found guilty of war crimes and crimes against humanity by Allied courts.³⁶ Overall, industrial disarmament strategies had a very direct bearing on British approaches to German science, which was seen as both the source of perhaps the most significant threat which Germany could offer in its comprehensively defeated condition, and, through its close connections with industry and business, as having an important role to play in Germany's economic rehabilitation. If, however, German science was going to be in a position to contribute towards the rebuilding of a strong, prosperous and diplomatically stable nation, all traces of the Nazi regime had to be purged from within it.

Denazification

This ideological purge took the form of comprehensive policies of denazification, pursued by all four Allies during the period of occupation, and designed to remove what was seen as a toxic political influence from all spheres of German life. This encompassed many different activities, such as the demolition of monuments to the Third Reich and the changing of street names which glorified prominent Nazis, but its main focus was directed towards people. Generally speaking, this entailed removing individuals tainted by a Nazi past from any positions of authority – teachers, civil servants, lawyers and so on – as well as attempting a widespread programme of re-education, ostensibly to show the German people what was wrong with Nazi ideology and prepare them for a peaceful democratic future.³⁷ Unsurprisingly, every aspect of denazification, from the basic premise to the practicalities of implementation, was a source of some controversy and the debate over both its validity as a concept and its effectiveness has been engaged in as thoroughly in historical literature

as it was among contemporary observers.³⁸ Of particular note is the fact that the British soon developed a reputation for having a lenient attitude towards denazification, in part because they believed low-ranking ex-Nazis would be more amenable to taking orders from the occupiers than other political denominations, such as communists.³⁹ It has been convincingly argued that this approach was inspired, in no small part, by Britain's experience as an imperial power, wherein local elites, who had sometimes previously fought against them, were relied upon to maintain law and order, provide intelligence and handle lower-level administration in the colonies.⁴⁰

One problem, which plagued the entire process of denazification, was assessing, or defining, who exactly constituted a Nazi.⁴¹ The denazification of German science was no exception and the overriding question for the occupation authorities was to what extent German scientists were actually implicated in the crimes of the Third Reich. Despite the multiple contributions which the scientific community had made to the German war effort, there was a widespread belief that most German scientists had not supported Nazism, or had in some cases directly opposed it. In September 1946, the Deputy Chiefs of Staff voiced the opinion that denazification of science would hardly be necessary as 'from a political point of view the records of scientists as a class were reasonably good'⁴². The US National Academy of the Sciences took this even further, believing that the scientific community had withdrawn into their ivory tower during the Third Reich and thus composed an 'island of non-conformity' within the regime.⁴³ Others preferred to view the situation in more abstract terms – scientists, especially physicists, were to be seen as little more than tools, and tools could not be Nazified or denazified.⁴⁴ This was indicative of a wider re-evaluation of the moral leadership and institutional governance of modern science, taking place in Britain and elsewhere and sparked by the complex entanglement of science and state during the Second World War.⁴⁵ This uncertainty and introspection translated into practical action, or the distinct lack of it. The Kaiser Wilhelm Society (KWS; later rebranded as the Max Planck Society), for instance, was left to largely denazify itself, which led to it further promoting the view that all German scientists had either resisted the Nazi regime or were victims of it.⁴⁶

This is not as disingenuous as it may at first appear. There were many examples of German scientists who genuinely did not 'succumb to the temptation and threat of tyranny' and pressure was exerted, frequently by their peers in Britain or the USA, to rescue these men from the destitution which often befell them following the end of the war and the subsequent ban on much scientific research. Among these was Otto Heubner, a professor of pharmacology from Berlin who had ended up living in a poor situation in Hamburg after the war. An old colleague of his, Otto Kraye, who had fled the Nazis and had become a professor of pharmacology at Harvard, wrote to Sir

Henry Dale, a fellow pharmacologist and outgoing President of the Royal Society, and asked for assistance to be rendered to Heubner, describing him as 'a representative of the spiritual and intellectual forces, who, if saved from a miserable fate, can be valuable in the restoration in the all-embracing community of science'⁴⁷. Dale shared Kraye's assessment and, in passing the request for aid on to the relevant administrative bodies, remarked how 'Heubner and his wife, in fact, both trailed their coats to the Nazis', such as by refusing to give the Hitler salute at the beginning of lectures, 'and somehow were left unmolested.'⁴⁸ These appeals obviously had the desired effect as, in March 1946, after almost six months of the case being passed through bureaucratic channels, Heubner was offered a Chair at the University of Bonn.

Not all scientists from the Allied countries were so quick to render support and assistance to their German peers, and not all held the view that science had largely been exempt from the horrors of the Nazi regime. In December 1947, in the *Bulletin of the Atomic Scientists*, Philip Morrison, professor of physics at Cornell University, provided a damning indictment of German science, in which he did not question their implication in Nazi crimes:

... no different from their Allied counterparts, the German scientists worked for the military as best their circumstances allowed. But the difference, which it will never be possible to forgive, is that they worked for the cause of Himmler and Auschwitz, for the burners of books and the takers of hostages. The community of science will be long delayed in welcoming the armorers of the Nazis, even if their work was not successful.⁴⁹

In April 1948, the *Bulletin of Atomic Scientists* published a reply to Morrison's article, from Max von Laue, the atomic physicist to whom Morrison had referred by name in his piece as one scientist who resisted the Nazis. Von Laue refuted the 'monstrous suggestion' that German science as a body worked for Himmler and Auschwitz and attempted to explain how, in the Third Reich, basic compliance with the Nazi authorities allowed for smaller acts of non-conformity, such as preventing young scientific workers from being called up for frontline military service. Overall, von Laue tried to illustrate 'how careful one must be in passing judgement on events which took place under a tyranny' and with this in mind, it is clear how difficult denazification of science was to apply, as the distinctions between co-operation with, and opposition to, the Nazi regime were so malleable and indistinct.⁵⁰

Nevertheless, the Allies did enact a programme of denazification within German science and the core principles of this were laid out under Control Council Law No.25, in a clause which stated:

Senior officials or scientists who were members of the National Socialist German Workers' Party (NSDAP) or members of other Nazi organisations with more than nominal participation in its activities

shall be removed and their replacement effected only by persons with suitable political records. Scientific work in general or on the development of weapons in the past shall not, in itself, be regarded as ground for dismissal or other punishment.⁵¹

In terms of execution, the denazification of science can be seen to go through four stages, beginning with the initial arrests of scientists and confiscation of their materials; followed by summary dismissals or enforced 'self-cleansing' operations; then by the handing over of the general administration of denazification to German officials, with only minimal Allied oversight; and finally, the end of the process, and the gradual reabsorption of 'small-fry' Nazis and collaborators back into academic and scientific life.⁵² This was far from an ideal procedure, especially in terms of 'self-cleansing' initiatives, such as that conducted by the Kaiser Wilhelm Society, which, as we have seen, was not especially thorough. Carola Sachse argues that the KWS used 'the political ignorance of the scientific actors as an excuse for the indisputable amoral demarcation of scientific practice' and pursued 'a policy of obscuration, extenuation, and reinterpretation'.⁵³

Generally speaking, the British had a reputation for clemency and many Germans with dubious pasts travelled to the British zone, especially from the American zone, to avoid harsher punishment.⁵⁴ Nonetheless, across the British zone, denazification measures were criticised for punishing individuals whose co-operation Britain sought in the rebuilding of a healthy, prosperous and democratic Germany as well as more generally damaging the relationship between occupiers and occupied.⁵⁵ Indeed, in January 1947, when the Scientific Committee for Germany registered its concern that 'serious anomalies had occurred in the denazification of German scientists', their fear was not that politically tainted scientists were escaping punishment, but rather that the judgements passed on them were too severe, therefore hampering British recruitment of these men, or making them inaccessible altogether.⁵⁶ The situation was further compounded by the growing competition with the Russians for Germany's scientific resources, as evidenced by remarks made by the director of Research Branch, Bertie Blount – 'how successful our denazification policy, as carried out by the clever young men of Intelligence Division, is being in driving ability and intelligence into the ranks of our enemies'. He even accused the men of Intelligence Division of being socialists who saw a German scientist's dislike of Russia and close acquaintance with 'landed proprietors and big business men' as evidence of his political criminality and thus suitable grounds for his punishment under denazification laws.⁵⁷

Others shared Blount's dismay that Britain might suffer, to the benefit of their former ally, as a result of their commitment to denazification. Herbert Cremer, a chemical engineer and member of the Scientific Committee for Germany, considered it the 'height of folly' that by Britain's 'literal

adherence to the [inter-Allied] denazification agreement, we should be helping to drive German scientists into the hands of the Russians, who themselves treated the same agreement with complete cynicism.⁵⁸ It is fair to say that this 'literal adherence' was not especially evident in the British zone but Cremer's comments reveal that the very idea of it was seen as inimical to British interests. Alongside this criticism from the British authorities, denazification also faced increasing opposition from the German public during this period, even to the extent of active protest from certain sectors of society, such as the Protestant churches.⁵⁹

However, domestic German protest was not the main reason for the disappearance of denazification of science from the British agenda. It was, rather, one of the first victims of the triumph of pragmatism and expediency over the moral missions with which the occupation authorities had initially been charged. Though it may have been nobly intended, it ran counter to the main objectives of the British occupation – to restore Germany's economic self-sufficiency and to build up defences against potential future aggression from the Soviet Union – and this spelled its demise. By 1948, there had been a significant shift in the perception of the 'relative danger of Nazism and communism', which was reflected in greater leniency in denazification proceedings and in their ultimate termination, long before the work which they had set out to do had been completed.⁶⁰ The British were not the only occupier to alter their policy in this way; a similar reconfiguration took place in the American zone too.⁶¹ While this change in attitudes contributed to denazification's deepening unpopularity, it simultaneously added much greater support to alternative policies being enacted by the British in post-war Germany, such as the exploitation of scientific resources and the quest for reparations, both of which came with the added benefit of providing Britain with direct material gain. These shifting priorities are perhaps best illustrated by a statement made in the House of Lords on 12 March 1946, by the Lord Chancellor, William Jowitt, in response to criticism of the employment of politically questionable German experts in Britain. He declared 'I am willing to risk their being Nazis – and I think they probably are – so long as they are highly skilled technicians who will teach our people something which they did not previously know.'⁶²

Exploitation and Reparations

As Jowitt's declaration suggests, along with the desire to denazify Germany and prevent another global conflict, there was also a wish to profit from Germany in order to offset some of the costs incurred by the Allies in their fight against the Third Reich, and during the post-war occupation.

Unsurprisingly, on the topic of reparations, the problematic experiences in the aftermath of the First World War loomed large in the consciousness of policy-makers. Not only had the reparations demands agreed upon at Versailles in 1919 proved deeply impractical and ultimately unobtainable, they had also contributed to the myth of betrayal and foreign suppression which Hitler and the Nazi Party had capitalised on in their rise to power during the 1920s and 1930s. As a result, the Allied authorities were keen to avoid a repeat of these mistakes following the Second World War; an issue which was further compounded by the difference between the situations in which Germany found itself after the two wars. Whereas in 1918, Germany was still a sovereign nation with only small parts of its territory occupied and with an economy that was weakened but still generally functional, in 1945, the whole country was under foreign occupation and a combination of intense Allied bombing, bitter ground combat, and Hitler's scorched earth policy had reduced industry to minimal levels of productivity. Any Allied reparations policy would have to reflect these dire conditions and the legacy of Versailles, as well as general hopes and expectations for the future.

The main lesson learned from the First World War was that it was ineffective to demand reparations in direct financial form – instead, payment in kind was to be encouraged.⁶³ Initially, it was intended that this would take the form of capital equipment, dismantled and shipped abroad, and this would then be followed by annual deliveries of goods from current German production.⁶⁴ At the Potsdam Conference, which took place between the leaders of Britain, the USA and the Soviet Union in the summer of 1945, the USA took a leading role in negotiating an Allied reparations agreement. During the war, the American economy had grown enormously and issues of surplus rather than scarcity were anticipated for the post-war period – as such, traditional reparations, in the form of plant, machinery, labour, or goods, were not only uninteresting to the US but genuinely undesirable. However, as it had been decided that reparations were a political goal in Germany, the US pushed for rewards which they could actually use, including patents, processes and 'technical know-how of every type'.⁶⁵ ~~Science and technology~~ therefore figured very highly in assessments of valuable reparations, for the British as well as the Americans. In fact, as early as March 1944, the Deputy Chief of the Imperial General Staff, Lieutenant-General Ronald Weeks, had predicted that German research and development information might be 'the only form of reparation which it will be possible to exact from Germany'.⁶⁶

Scientific and technological reparations, particularly those pertaining to military research, soon garnered much favour among the occupation authorities and one clear reason for this was that they represented something of a compromise between the potentially conflicting aims of weakening Germany's military power and maintaining its economic viability.⁶⁷ So naturally obvious were the

links between demilitarisation and reparations that it was felt necessary to include within the official British policy statement an assertion that disarmament measures 'should be carried out regardless of their effect on Germany's capacity to make reparation for the damage she has done'.⁶⁸ In short, reparations could contribute to demilitarisation but should always remain a secondary concern behind limiting Germany's capacity to wage aggressive war. Seizing intellectual property as reparations was even more problematic, not only because it was notoriously difficult to assign with financial value, but also because it was harder to justify on a moral or political basis. It could not be considered as direct restitution for losses incurred during the war nor were those most likely to profit from the post-war transfer of intellectual property generally the same people or groups who had suffered most severely during the war.⁶⁹

Further complicating matters was the fact that the reparations scheme was not the only way in which the British could remove what they wanted from Germany. In fact, under the occupation, there were three permissible ways in which material could be removed from Germany: it could be taken as reparations, as long as it passed through all the necessary official international channels; it could be paid for in approved currency as a straightforward export; or, if regarded as 'booty', it could be 'removed outside the reparations procedure and without payment'. Naturally, this last option was the most attractive. However, the material in question had to qualify as 'booty' for this route to be legitimate – the given definition of booty was: 'Arms, munitions and implements of war, and all research and development facilities (including documents, material and training devices) relative thereto.' What this loosely entailed in real terms was any equipment found within German research establishments concerned solely with warlike subjects, as well as certain industrial items required as prototypes or for further examination in Britain.⁷⁰

In fact, long before any formal international reparations agreement had come into practice, Britain and its allies had already been conducting operations to remove information and material of scientific and technological value from Germany. These actions, coming under the umbrella term of 'exploitation', had been conducted by numerous agencies working across both Germany and the formerly Nazi-occupied territories since the summer of 1944. Once the war ended, the scope increased dramatically as the Third Reich lay defenceless and utterly vulnerable to these unscrupulous removals, and the administrative framework necessary to handle this programme in the Allied countries grew quickly to meet the demand. All the victorious powers took part in exploitation, with the USA and the Soviet Union operating on the broadest scale, but with Britain and France both making up for their comparatively limited resources with enthusiasm, perseverance and considerable ingenuity.⁷¹ Unsurprisingly, exploitation operations, both on their own merit and in

concomitance with reparations removals, had a serious impact on British policy towards German science during the occupation.

Exploitation took many forms during the post-war period and one of the most common involved teams of Allied experts in a certain field travelling to Germany, visiting numerous plants, laboratories and factories relevant to that field, examining equipment, documents and material, interviewing the staff, and then compiling final reports which served as a summary of progress made in that field in Germany since the start of the war. Initially, this approach was confined to military topics but was soon expanded to include those of civil industrial interest too. The work of these exploitation teams was often instrumental in deciding what should be taken as reparations – equipment and documentation was seen to comprise an ‘essential counterpart’ to the industrial intelligence gathered by these teams, and it was argued that the value of this intelligence would be ‘seriously reduced’ without having ‘the physical material for purposes of experiment’ in Britain.⁷²

While the exploitation of facilities and the removals (as reparations or booty) of plant, machinery, or other specialised equipment comprised an important part of British policy towards German science, it was dwarfed by another element of exploitation – the detention, interrogation and ultimate recruitment of German scientists and technicians.⁷³ Again, this extended into both the civilian and military spheres and was seen as a way to bring the greatest spoils of German expertise to Britain. It was mirrored by similar schemes to exploit the best and brightest of Germany’s military, law enforcement, and intelligence communities, though these were often smaller and more covert.⁷⁴ Initially, it was considered that ‘the service of these highly skilled Germans brought over by Government Departments is national property, like the specialised plant being seized as reparations or booty’.⁷⁵ Later, however, private firms in Britain were permitted to hire German specialists directly, thus contributing to the notion that the exploitation programme simply served as a vehicle for industrial espionage, wherein British companies could profit at the expense of their erstwhile German rivals.⁷⁶

Moreover, Germany as a whole suffered as a result of the loss of its brightest scientific minds. These experts, who were perhaps in the best position to help rebuild German science after the war, and restore its reputation as a thriving hub of innovation and progress, left to seek their fortune elsewhere. There were exceptions to this rule – for example, the esteemed nuclear physicists, Werner Heisenberg and Otto Hahn, both of whom had been interned in Britain throughout much of 1945, returned to Germany after the war.⁷⁷ Hahn later became President of the Max Planck Society while Heisenberg became director of the Max Planck Institute for Physics, but not all those who stayed behind were so fortunate in their post-war career paths. Many German

scientists, not offered employment in one of the Allied nations and unable to work in their particular field in Germany due to restrictions imposed by the occupation authorities, were deeply resentful about their poor treatment compared with the comfortable circumstances those who had been exploited found themselves in. It did not help that the scientists who stayed behind felt that their colleagues who had gone to Britain or America were lesser minds who had simply risen to the top of the pile in the Third Reich thanks to opportunism and a lack of political scruples.⁷⁸

The post-war 'brain drain' from Germany was exacerbated by the fierce competition which erupted between the Allies for the best German scientists and technicians. Even the close bonds which united the western occupiers (Britain, France and the United States) were put under strain by rival recruitment efforts, and there were examples of underhand tactics, economic muscle-flexing and diplomatic crises on all sides.⁷⁹ It was of particular importance to the British (and Americans) that as few of these experts as possible ended up in Soviet hands and this gave rise to an unscrupulous pragmatism which triumphed blindly over alternative policies. A Joint Intelligence Committee report from May 1946 reveals that the British security services worried that 'the alliance of German brainpower and Russian resources may well prove to be the most important outcome of the occupation of Germany' and feared that, by the end of the year, 'a large proportion of German brainpower will have gone to the Russians and there will be no looking back'.⁸⁰ Indeed, the Soviets were pursuing an active exploitation scheme of their own.⁸¹ In another British intelligence report from August 1946, submitted by an exploitation agency on the ground in Germany, the unnamed author expressed his feeling that 'we may just as well acknowledge the situation for what it is between Russia and the Western powers: a completely open race for the best talent and skill Germany has to offer.'⁸² As a result of these concerns, the British instigated what became known as 'denial policy', which entailed selecting German scientists for recruitment in the West, not necessarily because they had anything to offer Britain, but simply because they were to be prevented from going over to the Soviets.⁸³

On the whole, it can be argued that many aspects of British policy on post-war German science can *only* be understood in terms of the worsening relationship with the Soviet Union.⁸⁴ This was not only true in terms of exploitation, recruitment and 'denial policy', but also in that German scientists who had been recruited by the Russians but allowed to return to Germany, were often seized by the British intelligence services as valuable sources of information on Soviet weapons programmes – as Paul Maddrell has it, 'the first post-war penetration of Soviet military capability by British intelligence was a by-product of its effort to complete the victory over Germany'.⁸⁵ As has been shown above, denazification was an early victim to the overwhelming urge to secure the

services of large numbers of German specialists and thus deny them to the Soviet Union and so was, at least at first, any plan for the domestic reconstruction of German science. It was considered foolhardy and dangerous to leave any German specialist of note on German soil, almost irrespective of which zone of occupation he resided in, lest he be taken off to the Soviet Union and put to work there. However, in time, perspectives changed and, as new strategies were developed to resist any Soviet encroachment into Europe, the reconstruction of German science – and the rebuilding of a strong and prosperous German nation more widely – began to be seen as an asset rather than a liability.

Reconstruction

The defining factor of this shift in priorities was the changing appraisal of the relative threat of Germany and the Soviet Union to British interests. Within a year of the war's end, most senior British politicians and civil servants acknowledged, in private if not yet in public, that the Soviet Union was a much more dangerous potential opponent than Germany. In truth, this was not a wholly new point of view and, even during the war when Britain and the USSR were actively collaborating as allies, many British intelligence and military officials, including the wartime Chief of the Imperial General Staff, Field Marshal Sir Alan Brooke, foresaw the Soviets becoming the most likely future enemy.⁸⁶ As Julian Lewis has convincingly put it, 'British military planners adjusted to the looming breakdown in Anglo-Soviet relations with foresight, prudence and exceptional rapidity'.⁸⁷ One of the main outcomes of this change in perspective was that Germany all but ceased to be seen as a potential enemy and instead adopted a role of probable target for Soviet imperialism; this in turn meant that the transformation of Germany into a productive capitalist nation, which could act as a bulwark against communist expansion (while simultaneously defraying the considerable costs of the occupation), became a highly desirable outcome.⁸⁸ Arguably, the British reached this conclusion before their American partners and expended considerable effort trying to convince the US that the Soviets could not be trusted and that the swift revival of the western zones of Germany was essential, despite the risks.⁸⁹

Nevertheless, the occupation authorities still recognised that German reconstruction needed to be carefully managed. In March 1946, the Allied Control Council published a plan for the level of the post-war German economy which listed the following as its guiding principles:

- a) Elimination of the German war potential and the industrial disarmament of Germany.
- b) Payment of reparations to the countries which had suffered from German aggression.

- c) Development of agricultural and peaceful industries.
- d) Maintenance in Germany of average living standards not exceeding the average standard of living of European countries (excluding the United Kingdom and USSR).
- e) Retention in Germany, after payment of reparations, of sufficient resources to enable her to maintain herself without external assistance.

The overall intention of the plan was to effect a reduction in the level of German industry as a whole to a figure of about 50% of the 1938 level.⁹⁰ This approach was quickly viewed as overly restrictive and many occupation officials on the ground simply ignored it and instead pursued a more practical and humane approach, following their instinct to get the country up and running again.⁹¹ This was reflected when the plan was revised in August 1947, as the new version acknowledged that 'under present conditions Germany cannot contribute her indispensable part to the economic rehabilitation of Europe as a whole'.⁹²

A major motive for this change in attitudes was the growing awareness that the financial benefit of dismantling, as advocated by proponents of both exploitation and industrial disarmament, was completely dwarfed by the advantages of reconstructing German industry to allow for national self-sufficiency.⁹³ This reconstructive approach to industry was echoed in other fields too – by mid-December 1945, despite the widespread structural damage and shortage of materials, all six universities in the British zone had reopened.⁹⁴ Additionally, most British officials believed that a strong, profitable and educated Germany was more resistant to communism, which in their opinion thrived on hunger, chaos and poverty.⁹⁵ Here again pragmatism had won out, as the more severe and punitive strategy proved unprofitable and ultimately unworkable in reality. Even so, Britain insisted on maintaining certain restrictions on German industry, ostensibly in the interests of preserving world peace but perhaps more accurately in the interests of Britain's own economic security and of retaining further breathing-space for British exports.⁹⁶

Although there were still lingering concerns about its possible contribution to German remilitarisation, generally speaking this new attitude in favour of revival extended to and included German science. In fact, many argued that a rehabilitated science would provide a democratising influence, foster educational reform and serve as a foundation for long-range economic viability, making it a very useful channel through which to facilitate German reconstruction.⁹⁷ From a political angle, some even felt that the inherent rationality of science rendered it diametrically opposed to tyranny, which was itself inherently irrational.⁹⁸ Bertie Blount of Research Branch, a firm advocate of reconstruction, put it thus:

I think it is a defensible historical thesis that revolutions are successful in so far as they are able to use the talent of the previous regime. We seem unable to appreciate this and, if we are not careful, the only long term result will be to substitute one hostile authoritarian regime in Germany for another.⁹⁹

This perspective offered a useful justification for a rehabilitation of science which was not even predicated on a particularly thorough expurgation of existing personnel, thus pushing denazification to the wayside. Moreover, the long-held scientific tradition of sharing knowledge promoted both openness and international co-operation; elements which were to be actively encouraged in the new revitalised Germany. Writing in *Nature* in February 1948, the Austrian-born British chemist Friedrich Paneth commented that 'there is little sign of any moral discrimination between men of science inside and outside Germany' and that post-war conversations between Allied scientists and their German counterparts, usually on the pretext of exploitation, 'could not fail to result in the awakening of the old spirit of international solidarity so sadly interrupted during the War'. Paneth, who was of Jewish descent and had fled Germany when the Nazis came to power, also remarked that it was 'very pleasant to see the efforts made by the occupying Powers to reactivate scientific life and research in Germany'.¹⁰⁰

Paneth was not alone in his favourable assessment of the revival of German science. In May 1947, the scientific correspondent for the *Daily Express*, Chapman Pincher, visited the former aerodynamics research institute at Göttingen, the home of much of the German scientific talent to be found in the British zone and, despite approaching the subject with considerable cynicism, reported back positively. He found that 'both the German scientists and the British officials are convinced that the rehabilitation of science is an essential step in the rebuilding of Germany as a peaceful, self-supporting State, able to pay us reparations instead of needing loans'. He ended his report, which was suggestively headlined 'Herr Doktor (with his teeth drawn) is busy again', with the verdict that 'in such an atmosphere of friendliness, enthusiasm and concentrated talent anything would be possible'.¹⁰¹ On the whole, though there were of course opponents of any reconstruction of German science, as seen in the first part of this article, opinion both within government circles and the mass media in Britain was generally in favour. Furthermore, Britain was more far-sighted in this approach than their American allies, who were slower to endorse German scientific reconstruction – indeed all reconstruction – despite entreaties for greater leniency from British officials at all levels.¹⁰²

One of the main reasons why British occupation authorities perceived German scientific revival as a positive outcome was the contribution it could make to 'denial policy'. In July 1946, the Scientific and Technical Research Board (STRB – who had some responsibility for exploitation and

recruitment in Germany) registered their concern that that many German scientists would have difficulty in obtaining suitable employment in the British zone and lamented that Law No. 25, on the Control of Research, while useful in many respects, 'does not cover scientists and engineers who are out of work or who are not in a research establishment'. It went on: 'These will, however, find a ready market for their services with the Russians, and to a lesser degree with the French.'¹⁰³ Elsewhere, the Admiralty worried that, although food shortages in the British zone might accelerate the departure of German scientists, 'it is doubtful whether the prospects of physical starvation weigh as heavily with these men as the virtual certainty of mental starvation if they remain in Western Germany'.¹⁰⁴ Recruitment through British exploitation channels offered only a limited solution to the problem of unemployed German scientists drifting into Russian hands, not least because government research establishments and private firms in Britain could only absorb a very small number of these German specialists.¹⁰⁵

As a result, the STRB seriously considered the idea of permanently imprisoning the high-priority experts in Germany, but eventually dismissed this as impracticable.¹⁰⁶ Nonetheless, temporary detainment quickly became a critical part of British policy towards German scientists and technicians. Under the auspices of Operation Matchbox, for instance, a large number of German specialists and their families were held at a 'transit hotel' in the British zone and afforded various amenities, an increased ration allowance and a small stipend.¹⁰⁷ Although conditions were comfortable, especially in contrast to the living arrangements of much of the German public in the post-war period, the scientists, who were termed 'consultants', were expected to produce reports on their research but chances of real financial recompense for this work, or of long-term employment, were extremely slim.¹⁰⁸ Naturally, this left many of these men 'intensely dissatisfied with their lot' and in some cases actually increased their willingness to work for the Soviets.¹⁰⁹ Neither employment in Britain, nor detention in Germany, really constituted a long-term strategy to ensure that German experts would not end up in Soviet hands.

Understandably, the reconstruction of German science offered a viable and attractive approach to tackling this issue. In December 1946, the Research Branch of the Control Commission stated its belief that the most effective strategy was to give 'as much encouragement as possible to peaceful research, and to all measures which increase the prestige of Western democratic ideals – in particular, interchange of scientific views, and increased facilities for scientific publications'.¹¹⁰ While still keeping to the basic premise of Law No. 25 and the restrictions on certain fields of research, scientific institutions in the British zone were among the first in Germany to begin functioning again, as evidenced perhaps most clearly by the reincarnation of the Kaiser Wilhelm Society as the Max

Planck Society in Göttingen in 1948.¹¹¹ In addition, with the advent of the European Recovery Program (also known as the Marshall Plan), funds became readily available for investment in German science, including on certain military topics, and the German specialists now had access to books, periodicals and equipment, as well as scarce essentials such as accommodation, food and heating. This strategy paid dividends remarkably quickly – when a cross-section of the scientists assembled at Göttingen were surveyed in 1948, their earlier discontent had largely evaporated and they viewed the British and the Americans in a much more favourable light. This was largely because of fear of the Soviet Union, which was now seen as a dangerous threat, not a desirable alternative, thus rendering ‘denial policy’ essentially defunct.¹¹²

However, while the risk of German specialists actively seeking better employment options in the USSR had effectively been neutralised, the British authorities, in concert with the Americans, were still concerned about the Soviets forcibly removing these experts, especially in the event of an invasion of the western zones of Germany. In March 1949, it was considered important to ‘guard against the possibility of German scientists having to be left in Germany and therefore assisting an invading power’ and so a ‘mobilisation plan’ was drawn up, which essentially consisted of a continually updated list of ‘German scientists who would have a real value to a hostile power’, with the idea that as many as possible of these scientists would be evacuated to Western countries ‘in the event of an emergency threatening’.¹¹³ This was seen by Britain and the USA as an essential caveat to the revival of scientific activity in Germany.

In short, the reconstruction of German science was simply the final phase in a varied strategic approach to this issue in the British zone. It offered many benefits, not least that it was inexpensive and could offer a route towards a more stable and democratic post-war society, essential as the cost to Britain of supporting its zone for the first two years of occupation was approximately £140 million, an amount it could ill-afford in its own dire economic state after the war.¹¹⁴ The only reservation which prevented this approach from being adopted as policy from the offset was that German science revived might contribute considerably to a German military resurgence. This concern was quickly swept away as the Soviet Union replaced Germany as the major threat to peace, and British interests, in Europe. Even as early as the summer of 1946, when the STRB were considering their policy towards German scientists, they expressed this view clearly: ‘we feel it is most unlikely in view of Law No. 25 that those [scientists] left in Germany will become a future German war potential and our proposals are advocated solely with the object of denying them to others.’¹¹⁵ Whatever the additional benefits, financial or otherwise, it was the need to

prevent these men from contributing in any way to the Soviet Union which truly drove the British support for the reconstruction of German science after the war.

To conclude, it is clear to see that British approaches to German science followed a similar trajectory to other aspects of occupation policy, though there were often more drastic shifts between the different strategies adopted, marking science out as an area of greater contrast and complexity than the handling of other elements, such as politics or education. While Britain may have entered the occupation period with the intention to strip German science of any military capacity and to remove any trace of Nazi influence from its ranks, this crusade soon fell afoul of the exigencies of the period, most notably the rising threat of the Soviet Union. Stringent restrictions on the types of research which were permitted and the thorough denazification of scientific personnel were both seen to be incompatible with the new Cold War agenda, in which resisting Soviet imperialism and communist encroachment was top priority. Instead, the British sought to utilise the most important resources of German science for their own ends, facilitated through the exploitation process, while simultaneously preventing the Soviet Union from doing the same, as evidenced by the preponderance of 'denial policy'. Even after six years of war, the desire to chastise, punish and extract reparations from Germany evaporated remarkably quickly, in the face of a new conflict looming on the horizon.

This was not just true with regards to German science, but more widely too; there is little doubt that the occupation was entered into with a commitment to several moral missions – denazification, prosecuting war crimes, democratisation, re-education and many more – but the reality of the situation, not just the shift in international relations but also the considerable financial constraints of the period, meant that these noble aims had to be set aside in favour of simpler goals, such as making Germany self-sufficient and ensuring that its people did not starve or descend into anarchy.¹¹⁶ As a result, although when the war ended the British sought to comprehensively exploit, thoroughly demilitarise and tightly restrict German science, rapidly changing circumstances, not least the deepening enmity between East and West, pushed the occupation authorities towards pragmatism, which meant that British approaches to German science in the latter part of the post-war period were far more practical, lenient and ultimately rehabilitative. While the Soviet Union remained a constant, growing threat throughout, the policies deemed most appropriate to face this new enemy changed often – in other words, perceived Cold War necessity both fuelled punitive and exploitative tactics in the early occupation period and then forced their decline in favour of reconstruction only a few years later.

Word count: 12,086

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