THE EMPLOYMENT OF SCIENTIFIC AND TECHNICAL ENEMY ALIENS (ESTEA) SCHEME IN AUSTRALIA: A REPARATION FOR WORLD WAR II?*

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The new fields of atomic and nuclear science represented a weapon of immense power which, following 1945, became the key to military and economic activity precipitating the post-war arms race. Antipodean Australia was not unaffected by these advances in scientific knowledge. The Australian government, impressed by the technological changes elsewhere in the world and confident in the belief that the nature of science was universal, participated in what was, in effect, a hunt for German scientists. During the Cold War period 1949/52, approximately 145 German scientists and engineers were brought to Australia under the 'Employment of Scientific and Technical Enemy Aliens' (ESTEA) scheme. Their arrival and subsequent activities were given minimum publicity and it took 46 years before application for access to the closed files, of what was quite an elaborate Commonwealth government project, was successful.

Keywords: scientists, German, ESTEA scheme, reparation, Australian science, industry, CSIRO.

The present article was written to recall events that have almost been forgotten and to provide an overview of what happened at that time.[1] It explores the Australian Commonwealth government's participation in a scheme that prevented highly skilled and competent manpower from being enticed or forced to migrate to the Soviet Union and contributed to the growth of Australian science and technology in the post-war era. The ESTEA scheme deserves to be remembered not only for its scientific and engineering achievements but also for its human aspects, especially the light it throws on human interactions in difficult circumstances.

The literature on the subject of German reparations is constantly growing due to the declassification of material. Two of the earlier accounts by Michel Bar-Zohar (translated from the French) and Franz Kurowski (in German) give a journalistic account of the Allies' hunt for the German experts but are without references. Tom Bower, on the other hand, uses recently declassified British and American government documents to question why the recruitment of scientists took precedence over the punishment of war criminals. John Gimbel, using German as well as American

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archives, notes the 'failure to distinguish between war booty, reparations, and loot.' Linda Hunt concerns herself with the same topic but from a moral point of view. Her only reference on the Australia government's participation in what she describes as a British Commonwealth nations "cover-up which allowed Nazi war criminals to escape justice" in *The Australian* is referenced incorrectly and has so far not been sighted. These and other texts focus mainly on the American activities, while Australia is barely mentioned.[2]

My initial interest was based on information gleaned from the personal accounts, diaries and correspondence of a few of the German scientists, their families and colleagues. The mainly biographical, but also repetitive details, led me to search in the Victorian, South Australian and Commonwealth government, and CSIRO archives. A great deal of the material was still restricted and an application for access took several months to succeed. The ASIO application made over twelve months ago is still pending, while a search in the *Herald & Sun* (Melbourne) archives produced an empty folder. An advertisement in a national Australian-German newspaper brought no response. However, despite these obstacles this paper shows the extent to which I am able to formulate a framework of the ESTEA scheme. I have at this point no substantiated figures regarding how many people came, who stayed and who left for where.[3] But I have already gained new information on two of the scientists.

On 19 December 1946 newspapers across the world including the *International Herald Tribune*, the *Züricher Zeitung*, the *North China Daily* (Shanghai) and *Tagesspiegel* (Berlin) printed a small news item. It conveyed a Reuter's report that "Joseph B. Chifley, Australian Prime Minister, announced today that the Cabinet had decided to invite German scientists to Australia. He said that conditions were that they should possess knowledge and skill not possessed by Australians and that they should be subject to security supervision and be "politically unobjectionable." The report went on to say that the services of the scientists would be loaned to State authorities and to private firms. Projects on which they would be engaged were to include extraction of oil from coal. The Prime Minister said that the scheme might be the most valuable form of reparations to be obtained from Germany.[4]

HISTORICAL BACKGROUND

Allied officers startled by Hitler's momentous conquests, gradually realised the technical inferiority of many of their weapons. They also realised that during the blockade of essential minerals and chemicals, the German scientists had developed a large range of substitutes, that were the beginning of a new scientific era. "Indeed the Korean War can be viewed, on the technical level, as a trial of strength between two different teams of Germans: those hired by the US and those hired by the Soviet Union."[5] This explains why in the immediate aftermath of the Allied victory in May 1945, the American physicist Samuel Goudsmit led a mission into occupied Germany in order to discover the extent of German nuclear research and to take into custody its scientists.[6] Simultaneously, another American group was ferreting out the V2 installations, their equipment, documentation and specialised staff.[7] The story of Wernher von Braun and his rocketeers has been documented else-

where and needs no elaboration. The Soviet Union had, since the end of hostilities in their own zone, been dismantling and shipping off to Russia equipment and German personnel.[8] The German scientists, fearing the wrath of the French population, only signed contracts with the French government after it had made arrangements for the German specialists to live on the German side the Rhine. They were daily and secretly conveyed by bus to their places of work on the French side of the Rhine.[9]

Based on information gathered during the last three years of the war, the British section of Field Information Agency Technical (FIAT) at Frankfurt had accumulated a card index containing the names of 1800 German scientists, together with details of background and location. "T" Forces, created by a directive of General Dwight D. Eisenhower's headquarters and formed to secure and safeguard certain special intelligence targets from destruction and looting until they could be examined by experts, closely followed the advancing armies. In general, British policy was to secure scientists for interrogation and to return them to Germany rather than attempt to incorporate them into British military installations. This policy avoided difficult and often controversial decisions involving security. But a limited number of key scientists and technicians, who had been certified as politically unobjectionable following official investigation, were recruited in Germany for service in Great Britain, where they worked under strict supervision. When British industry was informed by the Board of Trade of the availability of specialists in non-military areas and industries new to the United Kingdom, about 200 specialists were brought to Britain under British government contracts.[10]

The allies had agreed at the Potsdam conference in August 1945 that a number of German industrial complexes with war-making potential were to be dismantled.[11] Whole industries were to be prohibited, research institutes closed, and the staff working in war sensitive installations dismissed.[12] This left many unemployed scientists and technicians with no alternative but to accept the USSR government's offer of work in the Soviet Union in order to save their families from possible starvation.[13] The Soviet Union was then the only nation offering positions in research, while ignoring the regulations regarding exit permits for German nationals. Most at risk of voluntary or involuntary disappearance were those scientists whose exceptional abilities could be readily directed to military work.[14] In October 1946 the Russians forcibly removed a large number of scientists from all over Germany in one well planned operation.[15] They needed large numbers of trained people to reassemble the dismantled machinery shipped from Germany and sufficient experts to further their military ambitions.

By 1947 the British government acknowledged the advantage obtained from employing German scientists in classified defence and civil industry. They were, however, concerned about increasing attempts by the Soviet authorities to recruit German scientists from western zones.[16] Yet it took British and United States officials several months to process exit permits for German nationals. Consequently, as Soviet expansionism progressed, the Allies decided on a 'denial' policy in order to stop the movement of German scientists and engineers eastwards. The American and British governments agreed that "vigorous steps should be taken to increase

the employment of scientists in Germany and elsewhere",[17] and to ostensibly engage German scientists as consultants, and hide them in holding camps until suitable employment could be found for them. These measures gave the specialists an income and at the same time removed them from recruitment by the Soviets. But Britain, like France and the US, could only absorb a limited number of foreign specialists, leaving many scientists searching for opportunities.

To facilitate and encourage the successful recruitment of German specialists, the British Secretary of State for Dominion Affairs proposed that lists of eligible men and their qualifications be prepared for the Dominions.[18] In order to simplify the procedure of allocation, Australia, Canada and India became parties to the British 'Darwin Panel' scheme. This was the controlling authority for Germans employed in British civil industry.[19] The requirements of the Commonwealth countries were added to the list presented by the United Kingdom in Washington to the Joint Intelligence Objectives Agency (JIOA) which held a list of security reports on individual Germans. Once the Americans had agreed to release a scientist, his allocation could be taken up directly with the Darwin Panel.

AUSTRALIAN PARTICIPATION

In December 1946 the Cabinet of Prime Minister Chifley approved a plan, under certain safeguards, for the introduction of German personnel who possessed special scientific qualification for utilisation in pure and applied research work in Australia. This decision, eighteen months after the end of World War II, was the result of secret correspondence between the Secretary of State for Dominion Affairs in Britain and the Australian government. Negotiations had begun in September 1945.

By February 1947 a study of the British system of selecting and employing German personnel had been made by members of the Ministry for Post-war Reconstruction and a plan suitable for Australia, developed from it.[20] Moreover, based on discussions and advice by British and Australian scientists, both in England and Germany, the Australian government took the view that brainpower was equal to reparation. To obtain the services of eminent scientists, was, from a long term point of view, "the most valuable form of reparations obtainable from Germany".[21] In other words, the Australian government, like its British counterpart, viewed the importation of German scientists, as a significant investment in human capital, with a higher potential for capital return during a period when other forms of reparation were virtually unobtainable.

The Australian project, based on the British scheme, was similar to that adopted by the US and France, which had been acquiring experts and knowledge of the latest scientific developments in Germany since the end of the war. Technical and scientific specialists were admissible, provided they could contribute knowledge and skill not possessed by an Australian or British citizen, were voluntarily recruited, were politically unobjectionable (that is, possessed a denazification certificate) and had fulfilled health criteria.[22] They were to come to Australia under contract to the Commonwealth Government and after a nine month probationary period, by mutual agreement, their contracts were to be extended for a further six

months and they were to be permitted to send for their families whose fares were paid by the Commonwealth government.

1. Conditions of Employment.

The scientists were to be federal government employees. They had to register as aliens immediately on arrival at their nearest police station, and were subject to supervision at their place of work by a colleague. They were paid the same salaries as people with equal qualifications in the Commonwealth service. The same conditions of employment with respect to leave, taxation, social service etc. as temporary Australian employees, applied. Scientists retained by a Commonwealth authority were on the pay roll of the Secondary Industries Division, but on loan to that authority; if working for a State authority they were on loan to that authority.

Each German scientist was to be brought to Australia for a probationary period of nine months at the expense of the Commonwealth. If, after this period, there was mutual satisfaction, and he desired to stay, the contract would be extended for a further six months.

Naturally, the pay-packet was an important part of the contract. Salaries were in accordance with Australian Public Service Board scales for scientific personnel under the *Supply and Development Act (1939-44)*.[23] Before signing a contract each prospective scientist was given a booklet, which contained information about cost of living, housing, schooling, and other important details of life in Australia. Unfortunately, this booklet was apparently quite out of date by the time the majority of scientists arrived in Australia.[24] Housing was extremely scarce and expensive. Inflation had pushed up prices. The relatively low salary generally paid to scientists in Australia, combined with the very limited material possessions the scientists could bring with them, made a new beginning very difficult.[25]

2. Function of the Division of Secondary Industries.

Australia's Division of Secondary Industries, within J.J. Dedman's Ministry of Post-War Reconstruction, set up a screening committee, known as the Employment of Scientific and Technical Enemy Aliens (ESTEA) Committee. This committee included representatives from the Council for Scientific and Industrial Research (CSIR[26]), the Chamber of Manufactures, Combined Australian Universities, Commonwealth Office of Education, the Australian Council for Trade Unions (ACTU), the Department of Immigration and the Secondary Industries Division.

The function of the ESTEA committee was to deal with applications by German scientists and engineers holding special qualifications, and it considered requirements and requests for specific people by industry, Commonwealth or State authorities, as well as universities. It examined the availability of Australian or British personnel with similar qualifications, capable of performing the required work and willing to do so. This was intended to avoid public criticism of the introduction of the German personnel. At this point I have no evidence of adverse publicity regarding the ESTEA scheme, but several applications by German scientists were rejected by the committee.

The ESTEA committee also screened advice received from time to time from the London based Australian Scientific and Technical Mission (ASTM) regarding the availability of scientific and technical personnel. Finally, it made recommendations to J.J. Dedman, who approved the introduction of the specialists, and to the Minister for Immigration, who issued the necessary landing permits[27]

The first meeting of the Employment of Scientific and Technical Enemy Aliens (ASTEA) scheme committee took place on 23 December 1946, when it dealt with the first specific cases, those of Dr. Danulat and Herr Brüggemann, two leading experts on the gasification of low grade coal. Both men were in high demand by the US, the UK and the Soviet governments. However, Australia persuaded the other Allies to suspend their claims for twelve months.[28] These two men were to work on the gasification of the brown coal at the Yallourn fields in Victoria and, later, at the Leigh Creek fields in South Australia and the Collie fields in Western Australia.[29]

On 14 February 1947, the Secondary Industries Division issued a statement by J.J. Dedman who had approved a proposal appertaining to reparations, which was intended to interest Australian industrialists and research institutions. He also stipulated the conditions applicable to the employment of German specialist personnel. Dedman stated that with the introduction of these proposals it was hoped that new Australian industries would develop and that existing ones would benefit appreciably from the experience brought by German scientists. Industry would also acquire valuable working information made available by outstanding German specialists.[30]

The Minister specified pure research, metallurgy and electronics, utilisation of brown coal, the chemical industry and the production of aluminium, as fields in which "German knowledge far outstrips our own".[31] The services of specialists would be available to state authorities and to interested private firms. Working through its Secondary Industries Division, the Commonwealth Government was anxious to make specialised knowledge accessible to those who could best use it and thus derive the maximum benefit for Australia. An important function of the Secondary Industries Division was the promotion of the project, which initially was treated with some suspicion by industry in particular. The matter of publicity had to be handled delicately in order to attract interested parties without focusing on the emotional nature of the subject.

In early 1948 the Secondary Industries Division was replaced by the Division of Industrial Development with Mr. G. Sharwood as its Administrative Officer. However the ESTEA scheme[32] which began in December 1946, faded out in 1952. This was mainly due to a resurging German economy but Australian industrialists and research organisations continued to show a strong interest in the scheme.[33] The German experts remained in Australia for periods ranging from a lecture tour of a few months to a lifetime. The Division's activities included acting as liaison and adjudicator between employer and specialist, mentor for individual scientists, and adviser to industry, government and semi-government agencies, as well as liaising between Australian parties and the Australian Scientific and Technical Mission (ASTM) in London.

Throughout, the overseas administration was handled by the ASTM which operated from Australia House in London. It received thousands of applications from specialists who believed they fulfilled the conditions of the advertisement.[34] Applications had to be translated, processed and verified. From London, field officers also regularly visited Germany in order to contact, recruit and chaperone potential candidates and their families. They were often expected to fulfil the role of nursemaid, food provider, care giver and counsellor once the husband and father was in Australia.[35]

But there were many difficulties connected with these field trips. First, during the immediate postwar period petrol and food were only available in Germany on special occupation forces' ration cards. German public transport was almost nonexistent and with the country in chaos, locating individual scientists was laborious. Obtaining a recruit's address signified the beginning of an uncertain quest. The Australian agents were unable to operate in the Soviet occupied territory and generally confined their activities to the British zones. Berlin, where joint occupation by all four Allies produced peculiar rules, was most rewarding, due to its uncertain political future, especially during the blockade.

Besides the problems associated with tracking down scientists, there was also considerable competition between various interest groups operating on behalf of various nations. It is worth remarking that at that time, due to the situation in postwar Europe, communication with Australia was slow, difficult and often unpredictable. Furthermore, the partition of Germany into French, US, Russian and British zones brought not only innumerable regulatory restrictions, but also constant changes to those regulations, due to an unpredictable political climate and the onset of the Cold War.

3. The Selection Process.

In Great Britain and the Dominions, the Darwin Panel was the controlling authority for employing Germans in civil industry. Before the scientist could sign a contract and obtain permission to leave Germany, several conditions had to be fulfilled. Whether he was a resident in US or UK zone, his name had to be submitted to Washington for approval by the British and American Joint Staff Mission. This consisted of officers from the Navy, Army and Air Force and its task was to discuss the profiles, placement and possible vetoes. Those vetoed were people deemed essential to the rebuilding of Germany.[36] Once a scientist had been allocated to a country, the necessary documentation could be organised. The scheme for the employment of German scientists was a voluntary one, and until the contract had been signed, the German scientist had a right to decide by whom he was to be employed, was free to take up other offers, and negotiate conditions of employment.

A contract was offered and an exit permit was issued to applicants only after political and health criteria had been met.[37] After the probation period, according to the contract, the specialist was permitted to send for his family or return to Germany. All costs associated with the scheme including a salary for the specialist from the day he left his home in Germany, and family removal charges were borne by the Commonwealth Government.

What kind of experts did the Commonwealth require or seek out? Government, semi-government departments and industry were asked for suggestions. They responded by offering job or problem descriptions and suggested names of people regarded as experts in certain fields. Another way of gaining access to German scientists and technicians was through a British list of experts. ASTM in London was able to track down leading scientists in Germany, who had been, or were, heads of research in institutes or universities and in many cases were sought after by other nations. Often they did not want to leave Germany or were ineligible for various reasons. But they cooperated with ASTM, recommending assistants and colleagues. The opinion of these German departmental heads was very important, because in many cases recruits had little international reputation because very little was published during the war and most war research was classified by the German government. In some cases applications received by the ASTM in London, were sent to Australia and then circulated in order to ascertain whether a position could be found or even created for a particular person.

THE PURPOSE OF THE SCHEME

Why did the Australian government invest in a scheme that had no precedent? In official correspondence there was emphasis on 'the denial factor' [an attempt to prevent the leakage of German scientists eastwards], on the principle of 'scientists as reparation' and on the moral aspect of "once again allowing German scientists to become accepted members of the community of science".[38] There was also the suspicion, voiced by some of the German scientists, that Australia rather opportunistically jumped onto the bandwagon without a great deal of planning.[39]

Whether these ambitious programs were every fully realised or even adhered to is beyond the scope of this paper. However, there is sufficient evidence to suggest that certain aspects of the scheme were successful, others could have been improved, and some were misguided.

REASONS FOR MIGRATION

From the end of the war in May 1945 until the lifting of the Berlin blockade, conditions in Germany, particularly Berlin, were chaotic. The invasion of seven and a half million German refugees from east of the Oder/Niesse line and those expelled from Poland, Hungary and Czechoslovakia, brought the country close to total collapse.[40]

Seven and a half million refugees, added to the fact that 40 per cent of Germany's housing had been destroyed by the war, left many millions homeless and without hope of finding immediate shelter. Food and fuel were severely rationed everywhere and the general outlook was so bleak, that migration seemed the only chance to build a new future. One chemist, in spite of offers from Canada, the US and the Soviet Union, opted for Australia precisely because it was in his words "small and insignificant", but also far away from a potential war between the two super powers.[41]

Besides these immediate concerns of survival, there was also high unemploy-

ment and employment uncertainty in Germany. Most of the scientists and engineers had been associated with research institutes which had been destroyed by bombing, closed down by the Allies, or were temporarily inoperative due to lack of essentials like electricity and raw materials. Also several heads of research institutes had been interned, coerced by the Soviet Union into working in the East, killed or had disappeared. Under these circumstances opportunities for research were almost negligible. The offer of peaceful research in a country physically untouched by war was an enticement to scientists who were also concerned about their children's future. One scientist voiced the opinion that Australia had no obvious interest in the exploitation of Germany or German individuals; Australia was interested in migrants.[42]

For some of the specialists the break was made easier because they had visited Australia in the course of their professional lives and liked the country and its people. Others felt the offer of a free trip to the other side of the world would be a wonderful experience and an opportunity too good to miss.

IMPLEMENTATION

It is extremely difficult to unearth the records of the scientists and engineers who came to Australia under the ESTEA scheme.[43] A few of the experts were brought out for a specific purpose and on completion of their tasks, returned home. Several specialists ultimately accepted lucrative offers from German or US industry or universities while others remained in Australia with the government or semi-government research institution which had originally employed them.[44] A few found profitable positions in private industry but those who stayed in Australia commonly found the peace of mind they had sought, but perhaps at the cost of a successful career.

One of the problems facing those of the specialists in Australia who worked for government or semi-government departments, was that for a period of five years, until they were eligible for naturalisation, they were in temporary positions and without security. Superannuation and permanency in the public service only came after they had passed their fortieth birthday. Further disadvantage was caused by lack of experience with regulations and traditions in the Australian public service. On the other hand, some of those who returned to Germany or who decided to represent German companies in Australia, had lucrative packages negotiated with a familiar administration, and based on interrupted, rather than new, careers.

SELECTED BIOGRAPHICAL NOTES.

The achievements of the specialists are just as varied as their expertise. Archival information suggests that during the initial probationary period as employees of the Commonwealth, overall performance by the specialists was generally satisfactory. But there is little doubt that the most spectacular feat of the ESTEA scheme was the recruitment of experts for the Snowy Mountains Hydro Electric Scheme which involved a specific focus, analysis and co-ordination of applications, interviews and negotiations with engineers and surveyors on the project team.[45] The following examples illustrate just a few of the spheres of activity.

By contrast to the specific job description, there was the recruitment of a specialist, whose cv was circulated until an employer was found, a government instrumentality position created for him, or he was informed that his services were not required. Some of these experts were stationed temporarily in the offices of the Secondary Industries Division as consultants. They were on call to advise industry and wrote reports on their consultations with various companies all over Australia.[46]

In a confidential January 1952 report entitled 'Australian Industry' F. Kreide, one of the scientists brought out under the ESTEA scheme, advised: "Australia has greater possibilities of industrial expansion than any other country I have visited ... Considerable reserves of the important raw materials such as coal, iron ore, tungsten, zinc and lead still remain to be mined."[47] The report covered many aspects of the operation of the 300 (mainly engineering) companies he had visited during 1951.

Industrial development in Australia had been rapid. In Europe, according to Kreide, "big factories needed a growing period of perhaps 50 to 100 years".[48] In Australia this had, in his view, been reduced to 15 to 20 years. However, rapid growth caused shortages of raw materials and there were difficulties in procuring both materials and labour. He also saw problems in the "mass production methods developed in the US for its large local and export markets" which were not necessarily applicable to Australian industry.[49] He concluded with the suggestion that it would be better for Australia to follow developments in Britain and Germany as conditions there were similar to those in Australia. The general impressions were followed by detailed descriptions, with suggestions, applicable to the engineering companies he had visited in Australia.

Albert Seyler, a man with enthusiasm energy and tenacity, proved to be a most effective engineer. Born in 1913, he was engaged from 1937 to 1945 on research and development on navigational aids, radar and radar countermeasures at the Air Radio Research Institute near Munich. He completed his PhD thesis just in time for the Allies to confiscate it as classified material.[50] Recruited by Australia, together with Fred Ruf, Wilhelm Otto and Ernest Rumpelt, Albert Seyler joined the research laboratories of the Postmaster General's Department (PMG) in 1948 to work on television research. In 1966 at the age of 53 he was the first student to be awarded the Doctor of Applied Science from Melbourne University.

In 1948, in a memo to the Secretary of the Attorney-General's Department, "his presence in Australia was [seen as] an offence against reason".[51] Twenty-two years later Seylor contributed a chapter to H.G. Gelber's *Problems of Australian Defence* (1970).[52] Australia had come a long way insofar as its treatment of aliens was concerned. In his address as outgoing president of the Institution of Radio and Electronics Engineers (Australia), in 1972, Seyler warned of "the pollution and exhaustion of the mental and intellectual human environment and resources" arising from "radio, electronic and communication engineering". His address not only pointed to advantages of telecommunications but also foreshadowed what he saw as inherent future dangers. To quote Dr. Budrikis who worked with him, Seyler had "an outstanding clarity of mind, married to exceptional *Tatkräftigkeit*" (levels of energy and purpose).[53]

At the time of his death in 1977, Seyler was Assistant Director of the Telecom Australia Research Laboratories, Melbourne, a member of the Faculty of Engineering of Monash University, and Honorary Consultant in Communication Engineering at the University of Adelaide, South Australia. He was a Fellow of the Australian Academy of Technological Sciences and Fellow and Past President of the Institution of Radio and Electronics Engineers, Australia.[54] Although he enjoyed a relatively short career, his contribution warranted an entry in *Who's Who in Australia*, because he had "made important contributions to television research".[55]

Dr. Erich Brüggemann like the SMHES specialists was recruited for a particular project. He was, in a sense, regarded by the Commonwealth government as part of the flagship of the ESTEA scheme because he was one of the first four German specialists to arrive in Australia. Born in 1909, he came to this country in 1947 directly from a project in the Russian Zone, as Dr. Danulat's assistant. As the inventor of the Lurgi process for the extraction of town gas from brown coal, Dr. Danulat was approached by several headhunters. But in spite of other offers he chose to come to Australia where the utilisation of brown coal was a top priority for the country's development. While Danulat was the inventor of the Lurgi process, Brüggemann was involved with the associated engineering technology. At the end of the year's contract, and the completion of a comprehensive report and feasibility study on brown coal, Danulat returned to Germany but Brüggemann stayed in Australia until his retirement. He was awarded his PhD. in 1951 by the Technical University, Berlin, although it was generally unknown at that time that this was Erich Brüggemann's third attempt to complete his doctorate. The first thesis was destroyed when a bomb hit his house in Berlin. The second was lost at sea when the ship on which he was returning to Germany from Japan in 1943 sank of the coast of Spain when he spent five hours in the water before being rescued.[56]

Unlike Seyler, Brüggemann left his government employer when his contract ended in December 1948. He then joined Pyrox Ltd., the Australian representative of the German Lurgi Gesellschaft, which had been his employer before leaving for Australia. But Pyrox also represented such companies as Krupp and Siemens and it was with the help of Brüggemann that these companies were able to establish offices in Australia. In 1962 his old company Lurgi offered him the position of first managing director of its Australian operation. He accepted and held this post until his retirement in 1974. In his capacity as managing director of Lurgi Australia, Brüggeman was able to advise various instrumentalities and state government agencies on Lurgi processes. He was, for example, instrumental in the building of six metallurgic sintering plants for Broken Hill Pty. Ltd. (BHP), and the erection of two zinc installations and three sulphuric acid plants for CRA and Pasminco. Erich Brüggemann was an outstanding representative of things German in Australia and things Australian in Germany.[57]

In 1948 Sir Richard Woolley, then director of the Mount Stromlo Observatory, wanted to expand work in stellar spectrometry. After corresponding on the subject with Dr. Gollnow at the University Observatory in Göttingen where spectrometry was his main field of research, Woolley offered Gollnow a position on his staff.[58] For Gollnow there was an added attraction in Australia and that was the amount of

work still to be done in the Southern hemisphere. His first task was to finalise the design and construction of a Cassegrain stellar spectrometer for the 30 inch telescope and to commence a radial velocity program. He was also involved with the aluminising of the Observatory's telescope mirrors. When the Anglo-Australia 150 inch telescope was set up on Siding Spring Mountain, Australian Capital Territory (ACT), he was also involved in the choice of a suitable large aluminising plant for its main mirror. In his spare time Dr. Gollnow actively participated in setting up a German school in Canberra which taught to matriculation standard. For his contribution he was awarded the Officer's Cross of Merit from the Federal Republic of Germany in 1968.[59]

Several of the specialists introduced under the ESTEA scheme were recruited by the CSIRO. Dr. Zimmermann, employed by the CSIRO, but working at Melbourne University, was in charge of a micro analysis laboratory that had been set up by Dr. Tettweiler, another of the ESTEA scheme scientists. Micro analysis had previously not been carried out in Australia and as a result, Dr. Zimmermann was carrying out analyses for the CSIRO, the universities, the Defence Research Laboratories (DRL Maribyrnong), as well as interstate and overseas institutions.[60]

Such was the success of the scheme for German scientists that they were able to use Australia, as it were, as a springboard for careers in the more lucrative US market. Dr. Gorges, an aeronautical research engineer, was involved in the design, construction and operation of supersonic tunnels in England before joining the CSIRO Division of Aeronautics in June 1949. Today he has his own company in the US.[61] One scientist who found his niche in Australia, while contributing to Australia's export potential, was Dr. Kaess, a biochemist, who worked for the CSIRO in food preservation and transport. In 1959 he attended the 10th International Congress of Refrigeration in Copenhagen, as a representative of his department.

A scientist who could not be persuaded to stay in Australia after the initial nine months, was Professor Dr. Ramdohr, a mineralogist and specialists in microscopy and ore deposits. He had been recruited because he was an international authority in whom the Soviet Union was very interested. Having completed his contract in Australia, he returned to Germany to take up a leading position at Heidelberg University. In the case of Ramdohr all parties seemed to have profited. The professor took leave of absence from the University of Berlin during the chaotic and uncertain period following the currency reform at the end of June 1948, in order to visit Australia with all expenses paid. This allowed him to keep all his options open while sending money, and possibly food parcels, to his family in Germany. The Australian government, for their part, had contracted a man of noted repute for nine months, benefited by his work in the mineragraphic section of the CSIRO, and tried to temp him with a long-term contract. Unfortunately, he had five children, was sixty years old and was prohibited from transferring any of his assets from Germany to Australia.[62] Finally, the Allies profited by denying the Soviet Union Ramdohr's expertise.

Another contributing scientist who arrived in 1948 was Dr. Ritter who was accompanied to Australia by his technical assistant, Miss Ingeborg Herberg. ASTM, London had strongly recommended the application by Miss Herberg as she aided

Dr. Ritter not only technically but also acted as his interpreter. He was a physicist and expert in the design and development of scientific instruments for optical, metrological, physical geodesy and trajectory measurement purposes. He was engaged by the Division of Metrology for the design of equipment and apparatus for the construction of a large interferometer to measure lengths from 1 metre up to 24 metres. This instrument was to play an important part in the National Mapping Program.[63] Unfortunately, the last archival reference to Dr. Ritter was in April 1950. Apparently Mrs. Ritter had refused to come to Australia with her two children.[64] I have also been unable to trace Miss Herberg.

Several of the people who came to Australia also took on students or lectured in universities. Dr. Schwietzke, a physicist, was invited in 1962 by Professor E.O. Willoughby of the University of Adelaide to give an annual series of lectures on basic electronic physics to fourth year electrical engineering students. He continued these lectures after his retirement and later, in a wheelchair, until his death in 1987. His enthusiasm for physics and the relativity theory as explained to him by Einstein at the University of Berlin, are said to have made his lectures memorable.[65]

It is virtually impossible to obtain details about the activities of more than a few scientists and engineers who came to Australia. Once the contract with the Commonwealth Government expired, in most cases contact and documentation ceased. The actual number of 145 specialists is based on archival information (see footnote 3) and, to date, I have only been able to trace 15 to 20 individuals. Many are no longer living, some returned to Germany or went elsewhere, and some are still publishing or actively participating in their field of expertise. I expect that further research on the remaining scientists, based on further exploitation of the sources used in this paper, and on other official and unofficial sources and impressionistic evidence, will bring further insights into their experiences and reactions to their life and work in Australia.

CONCLUSION

In this paper I have tried to explore the Australian participation in a scheme that used German scientists as a source of technological and scientific information in order to stimulate research and industry. The Australian government, basing its decision on the British experience, accepted the opportunity to acquire some ready-made German experts. Given the conditions of the contract, the government had little to lose. With few employment opportunities for such specialised people in Australia, the scientists were compelled to accept their employer's offer, look for work independently, or go home.

Besides the actual gain of experts, calling the scientists "the most valuable form of reparations to be obtained from Germany", could be seen as an expedient political ploy to satisfy voters. By seeming to extract compensation from a bankrupt Germany, and at the same time justifying the admission of aliens, the government avoided criticism of its actions.

Scientific evaluation of the scheme is difficult. But there is little doubt that the significance and actual influence of these highly qualified and experienced scien-

tists is greater than has been previously understood. They were a disparate group of men, with different backgrounds and expectations who were chosen for their individual abilities. By investigating the requirements of Australian science in the period following World War II, it may be possible to assess individual contributions and then make generalisations, but that is beyond this paper.

There are many questions about the ESTEA scheme left unanswered at this time. Specifically, why is it so difficult to find information on the scheme or its participants in spite of some media coverage at the time? Was the issue of German scientists too sensitive for a public debate?[66] Was the scheme a success? What was gained and what could have been done to improve its effectiveness? What happened to the scientists? How did the transplanting of highly skilled and specialised people affect Germany? Further research may help to answer some of these questions.

What is my personal interest in this project? I am the daughter of one of the scientists. My father, Dr. Proske, was a chemist and rubber specialist. Like some of the others, he started at Defence Research Laboratories (DRL) in Victoria. But, in spite of his initiative, there was little challenge. After two years he went into private industry and used his specialist knowledge to improve the production of various rubber products essential to the automobile industry. He developed new formulae for rubber mixtures that were much more suitable for local conditions (factories were not air-conditioned at that time), and improved hundreds of others. He was substantially supported in his activities by the Bayer A.G. Leverkusen and was also able to set up a laboratory for research. In spite of difficult working conditions, remuneration was modest. After thirteen years, Dr. Proske accepted a position as technical director of a rubber company in Germany. At 65 he retired and returned to Australia for family reasons. He was immediately engaged as consultant by the management of his old company. At the same time he continued his professional activities as representative of his German employer, which included a license agreement with Dunlop. Today Dr. Proske has reduced his activities to the promotion of goodwill between Australia and Germany.

One of the criticisms which might, at this early stage, be levelled at my study is its lack of focus. Based on the meagre information supplied by my father, I started asking questions with the intention of simply recording what promised to be an interesting story. I now find that the project is far more complex and multi-faceted than I first thought. Consequently it has been my aim, in this paper, to develop a narrative framework; to untangle some of the complexities, and to pose new questions based on previously untapped archival material.

Given my background and relationship to this group of scientists, I have been in a unique position to gain the confidence of all those I have approached. The recording and collation of interviews with the specialists, their widows, children and colleagues is, in my view, an urgent and important task with personal and archival data at least, for the time being, remaining my principal focus. These sources can be expected to reveal a deeper understanding of the past and a valuable guide for future research.

NOTES AND REFERENCES

1 This work is based on PhD work-in-progress is entitled, *Post-War German Scientists in Australia*.

2 Michel Bar-Zohar, *The Hunt for German Scientists*, New York, Hawthorn Books, 1967; Tom Bower, *Blind Eye to Murder*, London, Andrew Deutsch, 1981; Franz Kurowski, *Allierte Jagd auf deutsche Wissenschaftler. Das Unternehmen Paperclip*, Munich, Kristall bei Langen Müller, 1982; Tom Bower, *The Paperclip Conspiracy: the battle for the spoils and secrets of Nazi Germany*, London, Michael Joseph, 1987; John Gimbel, *Science, Technology, and Reparations: Exploitation and Plunder in Postwar Germany*, Stanford, California, Stanford University Press, 1990; Linda Hunt, *Secret agenda: The United States government, Nazi scientists, and project paperclip, 1945 to 1990*, New York, St. Martin's Press, 1991.

3 *Australian Archives*, ACT Regional Office series CP 982/5, item 1 states, week ending 13 February 1952, a total of 145 experts had been obtained under the ESTEA scheme. General information and figures in the archival files pertaining to the movement of scientists, does not give a final figure.

4 *Australian Archives*, ACT Regional Office series A 461/1, item AC 387/1/1.

5 Bower, 1987, *op.cit.*, p.5.

6 Samuel A. Goudsmit, *Alsos*, with new introduction by R.V. Jones, Los Angeles, Tomash Publishers, 1983.

7 Bower, 1987, *op.cit.*

8 *Australian Archives*, ACT Regional Office A 816/1, item 37/301/337/Pt. 2. (From a secret dispatch of the Australian Mission, Berlin, to the Secretary, Departments of Defence and External Affairs, dated 19 November 1946, entitled 'The deportation of German workers to Russia').

9 Bar-Zohar, *op.cit.* p.134.

10 *Australian Archives*, ACT Regional Office series A 3317/1, item 293/46; *CSIRO Archives*, series 9, item M 30/36. The Board of Trade set up an interdepartmental panel under the chairmanship of Sir Charles Darwin (The Darwin Panel), to examine the requirements of British industry in this matter and to scrutinise the credentials of those whose names were put forward.

11 Robert J. Wegs, *Europe since 1945*, London, Macmillan Educational, 1984, p.6.

12 Based on the literature on the subject of reparations (see footnote 2), the exact number of specialists who left Germany between 1947/52, appears to be rather vague. The Allies worked secretly and independently of each other and had no interest in publishing information about their activities.

13 Food in late 1945 was in extremely short supply and the German population was on rations of 1000 calories per day. As a result, large sums of money or material goods changed hands on the black market until, with the currency reform on 24 June 1948, all assets were frozen. *Australian Archives*, ACT Regional Office, series A816/1, item 37/301/337 PT7; Photocopy of letter form Dr. Brüggemann to his wife and in author's possession. On 4 July 1948 he told his wife that a 'food box' containing fifty pounds of unperishable food, was on its way to his family in Germany.

14 *Australian Archives*, ACT Regional Office, series A 461/2, item AB 387/1/1. See also Bar-Zohar, *op.cit.*

15 *Australian Archives*, ACT Regional Office, series A 816/1, item 37/301/337 Pt. 2. See also Bower, 1987, *op.cit.*, p. 226. He mentions fifteen thousand people which included the families of the scientists.

16 Bower, 1987, *op.cit.*, p.152.

17 *Australian Archives*, ACT Regional Office, series A 1068/1, item E 47/15/11/6; series A 816/1, item 37/301/337 PT2 dispatch no. 3/46; Bower, 1987, *op.cit.* p.140.

18 See footnote 12, series A 1068/1, item E47/15/11/6. The question of whether this was also intended to further deprive Germany of its scientists, and so hobble further attempts to achieve technological advantage, is beyond the scope of this paper.

19 Bower, 1987, *op.cit.*, p. 152.

20 *Australian Archives*, ACT Regional Office, series A 1068/1, item E47/15/11/6.

21 *CSIRO Archives*, ACT Regional Office, series 9, item M30/36.

22 A chest X-ray (for tuberculosis) and various vaccinations were compulsory.

23 *CSIRO Archives*, ACT Regional Office, series 9, item M30/36.

24 The scientists may have been given the same brochure as all prospective migrants. One scientists told me that it had been printed before the war, while somebody else suggested 1946. The actual brochure, remains, as yet unidentified.

25 *Australian Archives*, Victoria series MT 105/8, file 1/6/2649. In Germany all assets had been frozen with the currency reform in June 1948 and starvation was avoided by selling or exchanging goods. (*Australian Archives*, ACT Regional Office series A4231/2, item Berlin 1948, supported by information from the Control Commission for Germany. In the same file is a letter from Dr. Woltersdorf written in transit to Australia to ASTM, London, explaining the situation of the migrating scientists).
26 In 1949 the name was changed to Commonwealth Scientific & Industrial Research Organisation (CSIRO).
27 For details see Agendum No. 1266A of 6.12.1946. *CSIRO Archives* series 9, item M30/36. The Department of Immigration issued a *Certificate of Exemption* to each scientist, for a period of nine months.
28 Why they were successful or whether there was a hidden agenda to develop the coal fields urgently, is unknown.
29 *Australian Archives*, Victoria, series MT 105/8, file 1/6/2328, page 24.
30 *Australian Archives*, ACT Regional Office, series A1068/1, item E47/15/11/6.
31 *Ibid.*
32 Cabinet Agendum 1266C, 10.11.1947.
33 Jürgen Tampke & Colin Doxford, *Australia, Willkommen: A history of the Germans in Australia*, Kensington, New South Wales University Press, 1990, p. 248. In 1952 the immigration agreement between the Australia and west German governments allowed for an intake of 3000 assisted and 1000 unassisted German migrants per annum.
34 I have only sighted a small percentage of the applications, and therefore at this stage cannot comment on details such as nationality, profession, age etc.
35 The situation in Germany was chaotic and the provision of necessities of daily importance. Also, after the currency reform, all assets were frozen and people had to rely on wages earned in new currency, which meant that ESTEA scheme families were often desperate.
36 Australian Archives Victoria, series MT 105/8, file 1/6/1158 box.
37 Each specialist was thoroughly vetted by US/UK authorities in Germany and the Australian Military Mission Berlin, prior to the issue of exit permits.
38 *CSIRO Archives* series 9, item M30/36. Confidential letter to Sir David Rivett, from British Commonwealth Scientific Office, signed Alexander King and dated 12 August 1946.
39 Personal communication to author, by Dr. Woltersdorf, who arrived in Australia in 1948 and left in 1955.
40 *Australian Archives*, ACT Regional Office, series A 4231/2, item Berlin 1949. David Child, *Germany since 1918*, London, B.T. Batsford Ltd., 1971, p. 113.
41 Personal communication to author by Dr. V. Garten, December 1992.
42 Personal communication to author, n.d., by Dr. W. Woltersdorf.
43 Personnel at the *Australian Archives* and the *Department of Immigration* advised me in 1993, that it was virtually impossible to trace a group of people who came to Australia so long ago and once here, did not spend any time in a holding camp, but were dispersed all over the Continent immediately.
44 I have traced some of the German scientists through others living in Australia. With most of the specialists no longer alive, and the companies they worked for no longer in existence, it is only with time and networking, that I hope to find more of them.
45 To date no research on this group has been done by the author. In the minutes of the ESTEA committee, the names and prospective employers of German scientists and engineers are given and it is noticeable that in 1951/52 thirty people were listed for SMHES.
46 *Australian Archives*, ACT Regional Office, series CP 982/5, item 1.
47 *Ibid.*, week ending 23 January 1952 refers to Mr. Kreide's activities while with the DID. According to his cv, he travelled extensively in Europe before coming to Australia and from 1928 to 1935 was a member of a group that studied the best methods of economic production in industry (*CSIRO Archives* series 9, item M30/36, German scientist — F. Kreide. Ministry of National Development, Division of Industrial Development, 13 June 1952; Memo to G.B. Gresford, CSIRO, 'Confidential Report "Australian Industry" by Mr. F. Kreide').
48 *Confidential Report "Australian Industry" by Mr. F. Kreide*, p. 1.
49 *Ibid.*
50 Personal communication to the author. In the government files it states that Seyler could not complete his doctorate because he was never in his university due to military commitments. In another document it says he completed part of his doctorate in 1944 but could not finish it because the three examining

professors went to the US and he could never arrange to meet them. All personal copies of reports were frozen by the American Government and others were never available for distribution (*Australian Archives* Victoria, Series MT 105/8 File No. 1/6/3707).

51 *Australian Archives*, ACT Regional Office, series A 367/1, item C83656. Letter to the secretary Attorney-General's Department, Canberra, dated 12th May, signed 'director' Commonwealth Investigation Service.
52 H.G. Gelber (ed.), *Problems of Australian Defence*, Melbourne, Oxford University Press, 1970.
53 Personal communication to author, 11 July 1993.
54 *Newsletter Australian Academy of Technological Sciences*, Volume 1, Number 2, September 1977. Listed under 'Biographical Memoirs'.
55 Ann Moyal, *Clear Across Australia. A history of telecommunications*, Melbourne, Thomas Nelson, 1984, p. 195; Cf. John Barth, '25 years of television', *Telecom News*, November 1981, p. 23; *ATR*, May 1970, 4, 1, p.47. For his obituary: *Newsletter*, Australian Academy of Technological Sciences, 1, 2, September 1977.
56 In the introduction to his PhD thesis Dr. Brüggemann thanked staff members of his employer, the newly founded Gas & Fuel Corporation of Victoria. Photocopy supplied by Harro Brüggemann, son of the late Erich Brüggemann.
57 Personal communication to author by Franz J. Dörr, Managing Director, Lurgi (Australia) Pty. Ltd., 1 December 1992.
58 Personal communication to author by Dr. Gollnow, 28 January 1993.
59 *Ibid.*
60 Personal communication to author by Dr. Zimmermann, 9 December 1992; *Australian Archives* Victoria, series MT 105/8, file 1/6/5718.
61 Based on personal communication to the author by Dr. Gorges, dated 4 March, 1994. *Australian Archives*, Victoria series MT 105/8, file 1/6/6276 refers to the first part of his stay in Australia until April 1951, one month before his contract with the Commonwealth expired.
62 *Australian Archives*, Victoria, series MP61/1, file 1/6/3360.
63 *CSIRO Archives*, series 3, item PH/RIT/10.
64 *Australian Archives*, Victoria, series MT 105/8, file 1/6/5767.
65 Personal communications to author by Mrs. G. Webling, Mr. E. Hirsch, Mr. D. Pawsey and Prof. A. Downing.
66 Clippings relating to the German scientists from most of the major Australian newspapers, with few exceptions, are small columns simply announcing the purpose and arrival of one or more of the specialists. One of the first of these in the *Daily Telegraph* 16 August 1947, 'German Scientists to work in Australia', included a photo featuring three men: Tettweiler, Danulat and Brüggemann; *Australian Archives* Victoria, series MT 105/8, file 1/6/5564; Copy of draft of a Radio Australia broadcast: 'German Scientists Help Our Industry', 10 August 1949, *ibid*; Copy of radio interview for 'News Review 'with Dr. Albert Gross, n.d.; *House of Representatives*, 7 May 1947, question by Mr. Turnbull to the Minister for Post-war Reconstruction, *upon notice*, on subject of German scientists.