Perspectives

Instant appropriation–Heinz Brücher and the SS botanical collecting commando to Russia 1943

Carl-Gustaf Thornström✉[1] and Uwe Hossfeld[2]

[1] Associate Professor, Swedish University of Agricultural Sciences, PO Box 7007, 75007 Uppsala, Sweden. Tel.: +46–18–672717; Fax: +46–18–673480; Email: Carl-Gustaf.Thornstrom@cbm.slu.se or cgt@sida.se

[2] Institut für Geschichte der Medizin, Naturwissenschaft und Technik, Ernst-Haeckel-Haus, Friedrich-Schiller-Universität, University of Jena, Berggasse 7, 07745 Jena, Germany. Tel.: 03641–949 505; Fax: 03641–949 502; Email: b7houw@nds.rz.uni-jena.de

Introduction

This is an abbreviated summary in English of a paper written in German to be published in Germany in early 2002. The original paper in German will be one of some ten papers published in a volume with the title: 'Autarkie und Ostexpansion. Pflanzenzucht und Agrarforschung im Nationalsozialismus' (Autarchy and expansion towards the East. Plant breeding and agricultural research under National Socialism), edited by Susanne Heim, Wallstein Verlag, Göttingen.

Background

Plant genetic resources are the basis of food security. Over the millennia people have experimented with plants to select and improve characteristics that enhance useful traits to meet human needs. Breeding of plants (and animals) is thus a skill as old as humans. But it was in the early decade of the 20th century that plant breeding became a more sophisticated skill and a science in itself through the rediscovery of Gregor Mendel's laws (formulated in the 1860s) regarding genetic inheritance. In Germany, Sweden, the USA, Russia and Great Britain formal and systematic plant breeding expanded at a great pace. To map the genetic variation of cultivated plants and their wild relatives including the origin of the germplasm became a great challenge for the early 20th century scientists. One of the most famous contributors in this field was the Russian geneticist and agronomist Nikolai I. Vavilov, who in the first two decades of the 20th century led numerous collecting expeditions all over the world to map origins and explain the genetic variation of cultivated plants, including wild and primitive forms. Through the work of Vavilov and his colleagues a first rough theory of the geographical origin of cultivated plants (Vavilov centres) could be developed.

During the 1920s and 1930s formal plant breeding developed into an important instrument to improve agricultural production. Through selection of preferred plant traits such as resistance to certain pathogens, improved protein content, etc. crossing of new plant varieties could be made. In the USA and Germany early forms of intellectual property protection of bred plant material were introduced to facilitate commercialization of seed varieties. By the late 1930s Germany, the USA, Sweden and the Soviet Union were the leading nations in plant breeding. In the Soviet Union in the late 1930s, Nikolai Vavilov faced increased opposition following the rise of Trofim D. Lysenko as Stalin's scientific protégé who was increasingly influencing Russian botany and plant breeding. In short, Lysenko's concept of genetic evolution and plant breeding was built on the assumption that acquired traits (such as high response to commercial fertilizer) automatically were inherited even if the external input was withdrawn. Thus the need for mapping and selecting from genetic variation was less necessary. This concept better suited the Bolshevik world view of non-Bourgeois science, and in August 1940 Nikolai Vavilov was arrested by Stalin's police. In Germany much of the leading plant breeding efforts took place at the Kaiser Wilhelm Institutes (KWIs). At the outbreak of the Second World War it was clear to the nazi-German leadership that continued access to external and new plant genetic material was of great importance to national food security and for scientific reasons. Thus scientists from the KWI followed behind the German armies as they conquered geographical areas that also contained plants of special interest in terms of genetic variation to botany/taxonomy and plant breeding. In this way great amounts of new plant material were brought back to Germany. Today (after the entry into force of the Convention of Biological Diversity in December 1993) we would call such expeditions 'biopiracy'.

After the German defeat at Stalingrad in early 1943 it became clear that important duplicates of the so-called world collections from the Vavilov genebank in Leningrad, and of base collections and improved germplasm stored *ex situ* in some 200 Russian agricultural research field stations on the Crimea and in the Ukraine still under German control, would have to be given up. In the mid-1930s the Reichführer SS Heinrich Himmler had set up a special science unit named 'SS Ahnenerbe' to deal with, among other things, ancient history and genetics. The Ahnenerbe recruited many leading German 'race experts', biologists, phycisians, historians, botanists, zoologists, geneticists and plant breeders. One young lieutenant of the Wehrmacht and botanist with a PhD degree was recruited to the personal staff of Himmler and appointed as SS Untersturmführer (Second Lieutenant). His name was Heinz Brücher and in June 1943 the SS leadership (Himmler and Pohl), authorized Dr Brücher to lead a 'SS Sammelkommando' to secure *ex situ* plant genetic material in the Ukraine and Crimea.

Scientific point of departure for the collecting commando

In early 1943 Dr Brücher wrote a paper in which he stated that the conquest of the 'Ostgebiete' (Soviet Union) had put Germany in control of geographical areas of botanically high importance as sources for plant breeding and thus the present and future food security of the German people. It can further be noted here that Nikolai Vavilov had died in Stalin's prison in Saratov in early 1943.

Given Lysenko's strong scientific position in the Soviet Union after 1940, the *ex situ* collections in territory then occupied by the German armies were of little importance. Interestingly enough the *ex situ* collections in the Ukraine and Crimea had not been evacuated east of the Ural mountains, as happened with other strategic infrastructures when the German armies invaded the Soviet Union in 1941. Thus in Summer 1943 when strong Soviet armies forced the Germans to withdraw westward, the agricultural research field stations were still intact and operating, albeit most of them in a state of more or less stagnation or even neglect.

Short biography of Heinz Brücher

Heinz Brücher was born in Darmstadt, Germany in 1916. He started his academic studies at the University of Tübingen in 1933 (botany, zoology, anthropology and genetics). He joined the NSDAP (German national socialist party) in 1934 with membership number 3498152. In 1938 he defended his PhD thesis at the University of Tübingen, which dealt with genomic influence of reciprocal differences during race-crossing of *Epilobium hirsutum* (Great willowherb). After the outbreak of the Second World War Brücher volunteered in the German army (Wehrmacht) and participated in the conquest of Belgium and France in 1940, and later as artillery lieutenant in the Operation 'Barbarossa' in Russia during the Winter of 1941/42. In January 1941, at the age of 25, Brücher was appointed associate professor at the University of Jena. Protected by influential science policy institutions like the SS Ahnenerbe, Brücher, at the age of 27, was appointed leader of the collecting commando and in November 1943 appointed director of the SS Institute for Plant Genetics in Lannach, Austria. In February 1944 Brücher was appointed Untersturmführer in the Waffen SS headquarters on the personal staff of the Reichsführer SS (Himmler). After the Second World War Brücher emigrated through Sweden to Argentina where he held positions as professor in plant genetics from 1949 to 1954 at the University of Tucuman, Caracas (Venezuela) Ascuncion (Paraguay), Port of Spain (Trinidad), and from 1954 in Mendoza and Buenos Aires, Argentina as well as in 1964/65 in Pretoria (South Africa). In 1972 he was named UNESCO adviser in biology. Brücher became scientifically known for his work on the origin of cereals (1950) and useful plants of neotropical origin and their wild relatives (1977/1989). During his 40 years of residence in South America his work, together with his Swedish wife Ollie Berglund-Brücher, focused on comprehensive studies of wild potato (*Solanum*) and the common bean *(Phaseolus*). On 17 December 1991 at the age of 75, Brücher was murdered at his fruit and vineyard 'Kondorhausi' in the Mendoza district (Argentina), allegedly the victim of a burglar. As a possible motive for the murder it can be mentioned that Brücher at the time was working on a viral disease (Virus Estalla) to combat the coca plant, thus challenging very strong political and economical interests in the cocaine trade in the Andes.

Course of events and realization of the collecting commando

At the death of Vavilov (early 1943) the German side (KWIs and army headquarters) estimated that between Minsk and Stalingrad there were some 200 agricultural research field stations, many of them with *ex situ* collections of plant genetic material important for food and agriculture. A few of the field stations had duplicates from collection of the All Union Institute of Plant Industry, VIR in Leningrad, which the Germans never captured.

On 1 June 1943 Brücher, together with SS Sturmbannführer (Major) Dr Ernst Schäfer (leader of the SS Ahnenerbe expedition to Tibet 1938/39), proposed to the director of the department for resources management of the Reichsführung SS, Obergruppenführer (General) Oswald Pohl, that a collecting commando would be set up to secure samples of the Vavilov world collections. The directors for the KWI centres for plant breeding and biology had already developed a detailed plan to secure interesting plant material in territories occupied by the German armies. Upon authorization by the SS Reichsführung Brücher set off for Russia on 16 June 1943 together with his interpreter Mr Steinbrecher and SS Hauptsturmführer (Captain) Konrad von Rauch in two SS lorries (zwei Kraftfahrzeugen der SS) to collect important seed and plant-material and bring it back to the SS Research castle in Lannach. Through the assistance of influential SS Police generals such as Obergruppenführer Prutzmann, Police general Bomhardt and the Police leader on the Crimea (General von Alvensleben) all important research stations could be visited.

In all, 18 stations were visited (none of them formally belonged to VIR field stations). They included: Station *Alexandria* at Bjelaja Zerkow, Station *Mironovka* south of Kiev; *Agricultural Institute,* Uman; *Research Centre Ukraine-South* at Cherson; *Botanischer Garten Nikita* near Jalta, Crimea; *Marine Biology Station Kawadak,* at Feodosia; *Plant Breeding Station Taschlik-Kyptschak* at Dschankoi; *Botanical Garden* at Dnjepropetrovsk; *Plant Breeding Station Alexandrovska* at Dnjepropetrovsk; *Plant Breeding Station Sinelnikovo; Plant Breeding Station Charkov* and other Stations; *Plant Breeding Station Jevanovka; Plant Testing Service Poltava* and *Fodder Institute Poltava; Plant Breeding Station Gorbanovka* at Poltawa; *Plant Breeding Station Wesselje-Podol* at Chorol; *Medical Plants Station Beresototschat* at Lubny; *Plant Breeding Station Drabov* with field station *Palmira* northeast of Tscherkassy and *Plant Breeding Station Batei-Berg* in Kiev. The research stations visited can be divided into five categories: (1) Cereal and fodder trials, (2) Cereal and fruit trials, (3) Botanical gardens, (4) Marine biology, and (5) Plant breeding stations. At *Sinelnikovo* a considerable number of duplicates of the Vavilov world collection material were in place, such as 2000 accessions of spring wheat, 1000 accessions of winter wheat, 2000 accessions of barley/grains, around 300 accessions of oats and in addition a comprehensive collection of fodder and rubber plants, maize, sunflowers and castor oil plants. Other interesting accessions were found at the *Batei-Berg* station, whose director was the Russian Professor Savitsky, who after the war immigrated via Germany to the USA and became a famous sugar-beet breeder. In retrospect one may assume that the visits by the SS collecting commando to the stations in the Ukraine and Crimea were not without problems and even resistance from the local staff. But according to Brücher's personal report to the SS Reichsführung after successfully completing the task, most 'transfers' of material went smoothly.

Structure and mandate at the SS Institute for Plant Genetics

The institute was established at the Lannach castle near the city of Graz in Austria. The main task given to the institute was to work with material collected by the SS Ahnenerbe Tibet expedition under Schäfer (1938/39) and the SS collecting commando in Russia (1943). Plant breeding objectives included development of barley and wheat material for earliness, frost tolerance and mildew resistance. The castle and institute, located on the lower slopes of the Koralpe mountains at an altitude of 337 m asl, comprised 120 ha of land for research trials (43 ha agricultural land and 63 ha forest land). During the autumn planting season of 1943, Russian winter wheat, rye, barley, oats and a number of wild fodder grasses were planted. In the spring planting season of 1944, both Russian and Tibetan as well as German cereals and vegetables were planted. By replanting wheat and barley material the same year for ripening in greenhouses, Brücher estimated that by spring 1945 it would be possible to determine the desired combination of traits/characteristics. However in February 1945, Brücher was ordered by the SS management to literally blow up the Lannach facilities so that the Russian loot would not be captured by the enemy (i.e. approaching American and Soviet troops). However, Brücher declined to follow the order.

Relations between Brücher and the Kaiser Wilhelm Institutes

Aside from service in the German army, Brücher served during 1941–43 for a few months at the KWI in Müncheberg (near Berlin). The KWI in Vienna, led by Dr Hans Stubbe, was the only institute with a mandate similar to the SS Institute in Lannach. It was Stubbe who in November 1942 met Dr Ernst Schäfer (Tibet expedition leader) and both Heinz Brücher and Konrad von Rauch were recommended as coworkers at the KWI in Vienna, and Brücher would be a science liaison officer. However, when Brücher and von Rauch set off for Russia in June 1943 there was a lack of confidence between Stubbe and Schäfer. In subsequent letters Stubbe even complained that Brücher could profit from having a strong political organization (the Waffen SS) behind him. In preserved letters between Schäfer and other high-ranking SS officers, Brücher was characterized as willful and headstrong, preferring to run his own institute at Lannach rather than subordinating himself to Dr Stubbe and the KWI in Vienna.

Materials acquisition and scientific interest after 1945

An analysis of Brücher's work after the Second World War reveals that he dealt almost solely with cytogenetic and plant breeding tasks. Three main areas dominated his research work after 1945: (1) genetic history of cereals, (2) investigations on wild relatives of potato and the common bean, and (3) South America as a region of origin for useful/cultural plants (the genetic boundary theory). In 1947 Brücher was 'screened' by the US Army Field Information Assistance, Technical unit (FIAT) (compare the famous so-called 'paper clip process'). For FIAT Brücher wrote a report on enzyme oxidation and earliness in barley. In a letter in November 1947 to a German colleague (Professor Theodor Herzog) Brücher mentions his cooperation in 1943–45 (!) with the English citizen William Denton-Venables (later director of Taylor & Venables Ltd., Agricultural Seed Merchants). He also mentions his FIAT contact Dr A. Viehoever, Director of the FIAT Pharmaceutical & Food unit. From letters to Prof. Herzog there is also evidence that plant genetic material from the SS Institute in Lannach was hidden among farms in villages around Lannach and recovered in 1947 by Brücher and brought to West Germany, most probably to the genebanks in Braunschweig and Gatersleben. There is further evidence that after the Second World War Brücher took part of the Russian material with him during his move via Sweden to South America. In late 1947 he was invited to Sweden by the famous explorer Sven Hedin (then 82 years old) who was an old friend of Dr Ernst Schäfer and also a friend of the former director of Svalöf Plant Breeding Station, Prof. Herman Nilsson-Ehle (then 74 years old).

Between March and August in 1948 Brücher visited Svalöv in Sweden (Nilsson-Ehle?), Stockholm (Sven Hedin) and most probably also Uppsala (and a Swedish scholar of plant husbandry with whom he was working on a paper about barley from Tibet). It is probably not possible to track even in well-kept records and plant variety pedigrees if in fact Russian war loot in the form of robbed accessions from the Ukraine and Crimea ever went into Swedish plant breeding or genebanks after the Second World War. But the close historical links between German and Swedish botanists and plant breeders during the 1920s and 1930s certainly do not exclude this possibility. If this is the case one can probably also assume that in addition to Swedish plant breeding and agriculture, West Germany, Great Britain, the USA and Austria may have profited from the SS collecting commando.

The 1943 biopiracy in the context of today

The SS botanical collecting commando of 1943 can—in one sense— be termed as one of the most spectacular biopiracies in the history of mankind. It condenses all the relevant ingredients of high science, politics and social conflict. During war times the real links between these seemingly unrelated topics become even more obvious. And those links certainly did not cease in 1945. The fact that, at the time of the visit of the SS collecting commando to the Ukraine and Crimea, Vavilov was dead and Soviet biology and genetics were dominated by Lysenko's science ideology, left the Vavilov world collections almost free for anybody with the military or political means to collect. Brücher's SS commando had those means. There are many issues still to address regarding the aftermath of the collecting commando. Brücher himself decided in 1948 to proceed to South America. In personal letters of 1948 to his colleague, Theodor Herzog, Brücher complains about having been disgraced in Germany after the war. The real reason may have been that he lost the backing of a very powerful political and military organization (the Waffen SS) that had now been dismantled.

The 1943 biopiracy *per se* seems never to have impacted negatively the future scientific life of Brücher. In 1958 VIR's director (1951–1961) Pjotr M. Zhukovski met Brücher by chance (?) during a field expedition to South America at Tucaman University in Argentina, where Brücher shortly afterwards started to deliver potato germplasm to VIR! In any case the Russian scientific community was still unaware of the 1943 events–a situation that would continue until the late 1990s. In the 1970s Brücher visited the CGIAR centres CIP in Peru (potato) and CIAT in

Colombia (common beans) and as late as May 1991 he sent a letter to the then-IBPGR in Rome, the international genebank (now IPGRI) on issues related to wild bean relatives. Thus Brücher was scientifically very active up to his sudden death in December 1991.

The 1943 biopiracy of course is not just a historical anecdote. Brücher's work on the 'Virus Estalla' taps directly into present discussions and initiatives to combat coca cultivation and the cocaine trade in South America and the conference in late 2001 on 'biowarfare'. The 1943 biopiracy is also pertinent to today's discussions about national patents on genetic material, such as the Enola bean, Quinoa, Neem tree, Basmati rice and/or active biochemical substances obtained from other geographical locations. It reconfirms the need to understand genetics and politics properly together and it reconfirms that control over genetic material and genetic information constitutes an enormously powerful political instrument for the maintenance of agriculture and thus food security. This is further exemplified with the present geopolitical negotiations on access and benefit-sharing in the global use of biodiversity and genetic resources as they appear in FAO, CBD, WTO/TRIPS and in other international fora. The somewhat frightening science policy lesson to reflect upon from the 1943 SS collecting commando is that as early as the mid-1930s Reichsführer SS Himmler and his Ahnenerbe clearly understood the geopolitical importance of biodiversity and genetics. It would be irresponsible not to realize that the present international struggles regarding biotechnology and genetic resources relate to the same old geopolitical issues. And, that they in the first instance date back to the rediscovery of Mendel's laws on genetic inheritance 100 years ago.