Arnold Theiler and colleagues: a successful cooperation between Switzerland and South Africa

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Arnold Theiler und Kollegen: eine erfolgreiche Zusammenarbeit zwischen der Schweiz und Südafrika

The start of the Swiss-South African connection and cooperation dates back to the late 19th century, when a shortage of veterinarians in Transvaal (South African Republic, ZAR) motivated Arnold Theiler to seek his chance there. He became successful and famous fighting a smallpox epidemic and rinderpest after a difficult start as practicing veterinarian. Prior to the establishment of the «Veterinary Bacteriological Laboratories of the Transvaal» in 1908 Theiler as the head of the institution could motivate some Swiss veterinarians to come and work with him. The opening of the new laboratory made e. g. Walter Frei, later professor for veterinary pathology at Zurich and Karl Friedrich Meyer, becoming an eminent scientist in the USA later taking the opportunity to work with Theiler. World War I interrupted Theiler’s hiring activities of more Swiss veterinarians. Only after the establishment of the veterinary faculty at Onderstepoort in 1920 he was able to recruit more Swiss veterinarians, e. g. Werner Steck, who later became professor at the veterinary faculty in Berne. Many of the other veterinarians at the faculty were sent to Switzerland to obtain further qualification or to obtain the degree of Dr. med. vet. and thus continued the successful cooperation started by Theiler.

Key words: Arnold Theiler, Swiss-South African cooperation, Swiss veterinary scientists in South Africa

Summary

Schlüsselwörter: Arnold Theiler, Schweizerisch-südafrikanische Zusammenarbeit, Schweizer Veterinärwissenschaftler in Südafrika
Introduction

Migration is not a new, 21st century phenomenon. Until the 20th century, Switzerland was one of the many European countries from which people emigrated. The most common reasons for emigration were missionary work or trade, cheese-making or manufacturing, temporary work, permanent settlement or scientific enquiry. Between 1816 and the beginning of World War I approximately 400000 Swiss emigrated, which means that around 10% of the native Swiss population lived in foreign countries. Only from 1910 onwards, is detailed Swiss federal emigration data available. It shows that out of a total of 370000 Swiss-born emigrants, almost half found a new home in Europe, 132000 lived in North America, 45000 in Latin America and only a few thousand in Asia and Africa.

Start of the Swiss veterinary connection with the South African Republic (Transvaal).

The start of the Swiss-South African connection and cooperation dates back to the late 19th century, when a shortage of veterinarians in Transvaal (South African Republic, ZAR) motivated M. Constançon, the Swiss ambassador to the ZAR, to cable this fact to his home country in 1890. Constançon was at the time trying to increase the small Swiss community in Transvaal. The message reached, among others, Prof. Erwin Zschokke (1855–1929, fig. 1) from the Zurich veterinary school and Prof. Wilhelm Kolle (1868–1935, fig. 1) from the medical faculty of the University of Bern, Switzerland.

Swiss citizens working for A. Theiler

Prior to the establishment of the «Veterinary Bacteriological Laboratories of the Transvaal» in 1908. Theiler did not stop pursuing his research interests, and in 1893 another opportunity presented itself: a smallpox epidemic broke out in Swaziland and spread to the neighboring regions. He suggested to the government that he would be able to provide smallpox lymph vaccine, which he had learned how to make during his veterinary education in Switzerland. He immediately contacted his Swiss mentors, asking them to supply him with the latest information on vaccine production from animal lymph. When smallpox eventually did break out in the Johannesburg area in 1893, he was prepared to take up the challenge. He successfully produced the vaccine (fig. 3), first using five
rinderpest. They succeeded within only 6 weeks. In spite of border control measures, rinderpest invaded the Transvaal.4

The government of the neighboring Cape Colony invited Robert Koch (1843–1910; fig. 5), an international authority on infectious diseases to help in the fight against rinderpest. Wilhelm Kolle was part of his team. In addition, the rinderpest epidemic caught the attention of the Institute Pasteur in Paris. Thus, another team of investigators, Jules Bordet (1870–1961; fig. 5), and his Polish colleague, Jan Danysz (1860–1928; fig. 5), were sent to the Transvaal for 12 months in 1897.5, 6 They investigated the prevention and cure of the disease through inoculation with serum or defibrinated blood in collaboration with the Government Veterinary Surgeon of the Transvaal, Arnold Theiler.6 Danysz and Bordet used serum obtained from animals that had recovered from the disease and had subsequently received several large doses of virulent rinderpest blood. The inoculated cattle were then exposed to infected animals.

Figure 2: Arnold Theiler’s artificial left hand (arrow). Even working at his desk he used a white apron, a habit he copied from his mentor Erwin Zschokke.
from which they contracted a modified form of the disease under the protection of the serum. In this way, the two investigators became the first to convert the passive immunity conferred by serum into an active immunity. Theiler adapted their method for future use. Koch, however, used the subcutaneous inoculation of bile collected from infected or fallen animals to vaccinate other animals.14, 28 Theiler moved his vaccine laboratory to Daspoort, where two Swiss (Favre and von Berlacher; table 1) helped him. Theiler was promoted to lead a newly established Government Bacteriologic Laboratory, which produced vaccines and established the diagnosis of plague.

Early in 1899, the Transvaal government nominated him unexpectedly as their official delegate to the 7th International Veterinary Congress held at Baden-Baden, Germany. He took the opportunity to visit his family in Frick, Switzerland, to meet with Erwin Zschokke in Zurich and Robert Koch in Berlin. In addition, he was able to spend several months at the Institut Pasteur in Paris, renewing his contacts with Bordet and his colleagues.

During Theiler’s absence the political tensions in Southern Africa increased and the 2nd Boer War started on October 1st 1899. The origins of the war were conflicts between the Boers and the British that had lasted for more than a century. The actual trigger was the question as to who would own the lucrative Witwatersrand gold mines. Theiler received messages urging him to return to Transvaal, and he arrived on October 13th. Immediately upon his arrival he was conscripted into the Boer forces, serving as the only veterinarian on the ZAR side, compared to dozens in the British army.1 He published his war experiences in the Swiss journal «Schweizerische Monatsschrift für Offiziere aller Waffen» dedicated to his military commander Colonel Potterat,10, 31, 32, 33, 34. Theiler returned to his laboratory after the war and, after the British victory, continued his research as a British subject. He intensified his work on the diseases of horses, e.g. «malaria», or biliary fever in equines. He was able to prove that this latter disease was different from horse sickness, and in fact was due to a piroplasm, which was named Babesia equi (later becoming Theileria equi), and also that the disease could be transmitted by the inoculation of blood from a sick animal into a susceptible one. He published the results in «Schweizer Archiv für Tierheilkunde»,35 and successfully submitted the manuscript as his thesis to obtain the title of Dr. med. vet., under the supervision of Prof. Erwin Zschokke, to the recently established Veterinary Faculty of the University of Bern, Switzerland. Over a period of ten years, he published more than 100 manuscripts, many of them in the Swiss journal «Schweizer Archiv für Tierheilkunde», 25, 26, 27, 28. Politically he lobbied for the establishment of a large veterinary research institution at Onderstepoort, which was finally realized in 1907/1908.

Following the establishment of the «Veterinary Bacteriological Laboratories of the Transvaal» in 1908.2, 21

In preparation for the new laboratory, Theiler used a six-month absence to visit Europe, attending the 8th International Veterinary Congress held at Budapest in 1905 and, of course, visiting his mentors Zschokke and Kolle in Switzerland. He was, in particular, looking for more Swiss veterinarians to join him at Onderstepoort.24 Bernhard Kobler (1878–1964), later a practicing veterinarian in St. Gallen, Switzerland describes Theiler’s visit in Zurich and meeting with Zschokke in an autobiographic manuscript.13

Theiler gave Zschokke several jars containing tissue samples from South African infectious animal diseases. After Theiler had left, Zschokke told his assistant, Kobler, to discard the contents of the jars, commenting: «We certainly have enough animal plagues in Switzerland and who knows what would happen if one of the plagues were to escape through an open window and settle in Switzerland.».
Theiler tried to convince Kobler to work as his assistant in Onderstepoort. However, for a number of reasons, Kobler did not accept the proposed position and remained in Switzerland.

Walter Frei (1882–1972)
On the recommendation of Zschokke, Walter Frei (fig. 6) was then offered the position in South Africa. He had qualified as a veterinarian at the Zurich Veterinary Faculty in 1905. In 1906, he was awarded the degree of Dr. med. vet. by the University of Zurich with a thesis titled «Zur Theorie der Hämolyse». He then worked as an assistant in the Physiological Laboratory of the Poppelsdorf Agricultural Academy (Prof. Oskar Hagemann) near Bonn, until he was appointed assistant Government Veterinary Bacteriologist of the Transvaal under Arnold Theiler in November 1906. Theiler arranged for him to be trained in the preparation of rabies vaccine by Jules Bordet at the Pasteur Institute in Brussels during the first three months of 1907. After arriving in Daspoort, he started the production of this vaccine with the Pasteur vaccine strain later that year. When the new laboratories were completed at Onderstepoort he was put in charge of the physical laboratory, doing physical-chemical research related to diseases such as horse sickness, piroplasmosis and lambsiekte. In January 1908, Frei became a founding member of the Transvaal Biological Society and, during that year, read two papers before its members dealing with the viscosity of blood and surface tension of serum.

Despite a good publication record, Frei’s work was not highly regarded and he returned to Switzerland after his contract expired in October 1910.7, 8, 9, 10

Gutsche reports frankly that: «He (Frei) expressed himself disloyally to the staff and worse had occurred in the case of Karl F. Meyer …, who had pursued his assignment, not in accordance with Theiler’s direction, but in conformity with his own ideas.»11

The next year Frei was appointed Director of the Veterinary Pathology Institute in Zurich, a post he retained until his retirement in 1952.22

Figure 4: Theiler (1), Favre (2) and other unidentified persons
Karl Friedrich Meyer (1884–1974)

Theiler had interviewed another potential candidate during his Swiss visit: Karl Friedrich Meyer (fig. 7). Meyer studied at the universities of Basel, Zurich, Munich and Bern, and was awarded the degree of Dr. med. vet. from the University of Zurich in 1908, although the research for his thesis («Über die durch säurefeste Bakterien hervorgerufene diffuse Hypertrophie der Darmschleimhaut des Rindes. [Enteritis hypertrophica bovis specifica]») was carried out in Bern under Professor W. Kolle. Since Meyer’s father was reluctant to finance an unpaid academic career further, Kolle suggested he have an interview with Theiler, who hired him immediately. As the corresponding address on his published thesis, Meyer already put: «Pathologist in the Veterinary Bacteriological Division of the Department of Agriculture of Transvaal in Pretoria». In October 1908, he arrived at the Veterinary Research Institute in Pretoria, then in the process of moving to Onderstepoort, where he took charge of the pathology laboratory (fig. 7, 8). Though he remained in South Africa for only two years, he published several scientific reports.16, 17, 18, 19 He worked long hours preparing rabies vaccine and performing hundreds of routine diagnostic post-mortems on farm animals. For recreational breaks in his laboratory work he went horseback riding in the vicinity of the institute. Many colleagues working for Theiler had serious problems with Meyer’s personality. He later described their cooperation as follows: Theiler «was a typical Lucerne square-head (although he was actually not from Lucerne but born in Frick, Canton Aargau, Switzerland), and a Lucerne square-head cannot get along very well with a Basel square-head,» as he ironically called himself. The final clash occurred in 1908, when Meyer published results from his research against Theiler’s wishes; Theiler wanted results from research done in his institute to be published under his name alone. Meyer continued to work at the institute until 1910, but Theiler and he did not speak to each other anymore. Meyer left Onderstepoort in May 1910 to ac-

Table 2: Swiss citizens Theiler recruited for Onderstepoort between 1913 and 1920

<table>
<thead>
<tr>
<th>name</th>
<th>training at</th>
<th>function</th>
<th>year</th>
<th>remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Ernst Hedinger</td>
<td>Human pathology, Bern (1899)</td>
<td>Guest scientist</td>
<td>1913/1914</td>
<td>1922–1924 Professor pathologische Anatomie, Medizinische Fakultät, Universität Zürich</td>
</tr>
<tr>
<td>Werner Steck</td>
<td>Veterinary medicine (1917) Bern</td>
<td>Research officer, lecturer</td>
<td>1922–1926</td>
<td>1926: Professor internal medicine, pharmacology, equine medicine Veterinary Faculty Bern</td>
</tr>
<tr>
<td>Gerhard Gottfried Kind</td>
<td>Veterinary medicine (1918) Zurich, Dr. med. vet. Zurich 1922</td>
<td>Research officer- (anthrax laboratory)</td>
<td>1919–1922</td>
<td>1922–1942 private practice in Pretoria and Johannesburg</td>
</tr>
<tr>
<td>Zschokke Markus</td>
<td>Veterinary medicine (1919) Zurich</td>
<td>Bacteriologist</td>
<td>1919–1922</td>
<td>1926–1953 (1965) State Veterinarian Southwest Africa (Namibia)</td>
</tr>
<tr>
<td>Scheuber Joseph R.</td>
<td>Veterinary Medicine (1918) Zurich</td>
<td>Bacteriologist</td>
<td>1919–1952</td>
<td></td>
</tr>
<tr>
<td>Meier, Hans (Jakob),</td>
<td>Veterinary Medicine, 1917, Zurich, Dr. med. vet. Bern 1919</td>
<td>Government Veterinary Officer</td>
<td>1919–1921</td>
<td>Returned to Switzerland 1921</td>
</tr>
</tbody>
</table>
cept a post as assistant professor of pathology and bacteriology at the School of Veterinary Medicine, University of Pennsylvania. In 1913, he went to the University of California as professor of bacteriology and experimental pathology.²⁰

In 1909/1910, when Theiler went on his five-yearly leave overseas, one of his objectives was to recruit more staff, preferably specialists in their disciplines. On his way to the ⁹th International Veterinary Congress at the Hague, in Holland, he of course visited Switzerland and met with Zschokke and other colleagues. Because veterinary medicine in Zurich had become part of the university in 1901, Zschokke, as the most senior professor, was very much involved in university politics. Although involved in local politics as a young man, he took a dislike to university politics. When Theiler asked him to propose recent veterinary graduates able and willing to work in Onderstepoort, administrative duties led to Zschokke replying only several months later, in March 1912, telling Theiler that there were no suitable candidates at the moment, but that he could see potential ones among the current students.

The sudden outbreak of World War I had a dramatic effect on staff positions in Onderstepoort: eight of Theiler’s men had enlisted and Hedinger (table 2) had returned to Switzerland. Moreover, due to obligatory military service, Swiss applicants were no longer available.

Swiss veterinarians recruited by Arnold Theiler after World War I

In 1920 the Veterinary Faculty at Onderstepoort was founded. In preparation, Theiler again went to Switzerland in 1919 to recruit veterinarians (table 2).²³ They were Werner Steck (1893–1977) who served from 1922 until 1926, returning to Switzerland he became professor at the Veterinary Faculty in Bern until 1965. Further, there was Joseph Remigius Scheuber (1892–1975), Markus Zschokke (1893–1972), Gerhard Gottfried Kind (1893–1942) and Hans (Jakob) Meier (1892–1975). Theiler realized that this would be the last batch to be recruited from Switzerland.

In 1919 the government decided to establish a veterinary faculty at Onderstepoort, later to be integrated into Pretoria University. No Swiss were on the profes-
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Figure 8: Staff at The Veterinary Bacteriological Laboratories of the Transvaal (1908), 1: Arnold Theiler; 2: Walter Frei; 3: K.F. Meyer; 4: James Walker.

Table 3: Professrial staff for the foundation of the Onderstepoort Veterinary Faculty23

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Further Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Theiler (1867–1936)</td>
<td>Dean of the Faculty (1920–1927), Professor of Pathology, later Tropical Medicine.</td>
<td>Dr. med. vet., 1901, Bern</td>
</tr>
<tr>
<td>P. J. du Toit (1888–1967)</td>
<td>Infectious Diseases (1920–1948), Dean of the Faculty (1927–1948)</td>
<td>Dr. phil. (Zoology), 1912, Zurich; Dr. med. vet., 1918, Berlin</td>
</tr>
<tr>
<td>G. van de Wall de Kock (1889–1973)</td>
<td>Anatomy (1923) Pathology (1920–1949)</td>
<td>Dr. med. vet., 1921, Bern</td>
</tr>
<tr>
<td>P. R. Viljoen (1889–1964)</td>
<td>Veterinary Science (1920–1933)</td>
<td>Dr. med. vet., 1921, Bern</td>
</tr>
<tr>
<td>C. P. Neser (1889–1929)</td>
<td>Veterinary Medicine (1920–1929)</td>
<td></td>
</tr>
<tr>
<td>James Walker (1868–1952)</td>
<td>In 1908 assistant to W. Frei at Onderstepoort</td>
<td>Dr. med. vet. 1933, Zurich</td>
</tr>
</tbody>
</table>

The Swiss connection continued for several years in the reverse direction. Several of the newly appointed professors went to Switzerland for postgraduate training and further degrees. These were for instance (table 3): Philippus R. Viljoen (1889–1964), who studied at the Bern veterinary faculty to obtain the degree of Dr. med. vet. in 1921, with a thesis entitled: «Das Vorkommen von Sarcosporidien in Südafrikanischen Tieren (Haustiere und Wild)». Petrus Johann du Toit obtained the degree of Dr. phil. in zoology from the University of Zurich in 1912, and Dr. med. vet. from the Tierärztliche Hochschule in Berlin (1918). Gilles van de Wall de Kock in 1921 spent a year in Bern to obtain the degree of Dr. med. vet., submitting a thesis entitled «Beiträge zur Kenntnis des Erregers, zur Haematologie und pathologischen Anatomie und Histologie der infektiösen Anaemie der Pferde, wie sie in Südafrika beobachtet wird.». Finally, in 1921 Eric M. Robinson (1891–1982) obtained a degree of Dr. med. vet. from the Veterinary Faculty, University of Bern, submitting a thesis entitled «Die Virusträger beim seuchenhaften Verwerfen des Rindviehs.»

Over the years the more recent additions to the veterinary staff of the Onderstepoort faculty have been South Africans who trained locally or in the UK.
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Arnold Theiler et ses collègues: une coopération réussie entre la Suisse et l’Afrique du Sud

Le début des relations et de la coopération Suisse-Afrique du Sud remonte à la fin 19ème siècle, quand une pénurie de vétérinaires au Transvaal (République sud-africaine, RSA) a motivé Arnold Theiler à y tenter sa chance. Après un début difficile en pratique vétérinaire, il y obtint un succès dans une célèbre campagne de lutte contre une épidémie de variole et de peste bovine. Avant même la création des «Laboratoires bactériologiques vétérinaires du Transvaal » en 1908, la présence de Theiler à la tête de l’institution a pu motiver certains vétérinaires suisses à venir travailler avec lui. L’ouverture du nouveau laboratoire a pu par exemple que Walter Frei, plus tard professeur de pathologie vétérinaire à Zurich, et Karl Friedrich Meyer, devenu un éminent scientifique aux États-Unis, ont saisi l’occasion de travailler avec Theiler. La Première Guerre mondiale a interrompu les efforts de Theiler visant à embaucher de nouveaux vétérinaires suisses. Ce n’est qu’après la création de la faculté vétérinaire d’Onderstepoort à 1920, qu’il a pu recruter davantage de vétérinaires suisses, par exemple Werner Steck, qui devint plus tard professeur à la Faculté vétérinaire de Berne. De nombreux autres vétérinaires de la faculté ont été envoyés en Suisse pour se perfectionner ou obtenir leur doctorat en médecine-vétérinaire. C’est ainsi qu’a continué la fructueuse coopération entamée par Theiler.

Mots clés: Arnold Theiler, coopération Suisse-Afrique du Sud, vétérinaire suisses en Afrique du Sud

Arnold Theiler e colleghi: una collaborazione di successo tra Svizzera e Sud Africa

L’inizio del legame e della cooperazione svizzero-sudafricana risale alla fine del XIX secolo, quando una carenza di veterinari nel Transvaal (Repubblica sudafricana, ZAR) spinse Arnold Theiler a cercare in questo paese la sua occasione. Divenne famoso e di successo combatendo un’epidemia di vaiolo e la peste bovina dopo un inizio difficile come veterinario praticante. Prima della costituzione nel 1908 del «Veterinary Bacteriological Laboratories of the Transvaal» (Laboratorio veterinario di batteriologia della Transvaal), Theiler in quanto direttore dell’istituzione poté motivare alcuni veterinari svizzeri a raggiungerlo per lavorare con lui. L’apertura del nuovo laboratorio ha convinto, ad esempio Walter Frei, in seguito professore di patologia veterinaria a Zurigo e Karl Friedrich Meyer, divenuto in seguito un eminente scienziato negli Stati Uniti, a cogliere l’opportunità di lavorare con Theiler. La Prima guerra mondiale interruppe le attività di assunzione di altri veterinari svizzeri di Theiler. Solo dopo l’istituzione della facoltà di veterinaria a Onderstepoort nel 1920 Theiler poté nuovamente reclutare più veterinari svizzeri, ad esempio Werner Steck, che in seguito divenne professore presso la facoltà di veterinaria di Berne. Molti degli altri veterinari della facoltà furono inviati in Svizzera per ottenere ulteriori qualifiche o per ottenere il grado di Dr. med. Veterinario continuando così la cooperazione di successo iniziata da Theiler.

Parole chiave: Arnold Theiler, Cooperazione Svizzera-Sudafrica, Scienziati veterinari svizzeri in Sud Africa
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