Entangled between worlds: Swiss petroleum geologists, c. 1900–50

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Abstract: This chapter presents a collection of first-generation Swiss geologists, who, around 1900, went abroad in order to work for oil organizations, both public and private. With the rise of oil exploration after 1900, the demand for experienced oil geologists grew rapidly. Oil companies started hiring trained geologists from different parts of the world, which led to an increasing number of Swiss geologists finding employment abroad. One of the first to start his career abroad was Carl Schmidt (1862–1923) from Basel, highly esteemed and later renowned for his achievements as a teacher of younger oil geologists. Another was Josef Erb (1874–1934), who accomplished an unparalleled career at Royal Dutch Shell. Other examples include Hans Hirschi (1876–1964), who worked for the Union des Pétroles d’Oklahoma for a few years, and Arnold Heim (1882–1965), working nearly 50 years for major oil companies. Many more followed over the decades to come, so that virtual successions took place between them: specific territories and specific companies were ‘handed down’ between geologists of the same nationality. Where once the Swiss were employed, others took over; the pioneers acted as door-openers for future generations.

In 1919, Arnold Heim published his study on the question of whether there was any oil to be found in Switzerland. As a side-remark, he mentioned that there were as many as 50 geologists working in the oil sector outside Switzerland at the time:

It is little known that no other country – the U.S.A. exempt – has trained as many oil geologists as our small country [Switzerland]. There are about 50 [geologists], their sphere of action covering the entire world

(Heim & Hartmann 1919).

In the original German this is:

Eine Tatsache ist noch wenig bekannt, dass mit Ausnahme der Vereinigten Staaten wohl kein Land der Erde so viele tüchtige Petrolgeologen ausgebildet hat, wie unsere kleine Schweiz. Es sind ihrer bis heute etwa 50; ihr Arbeitsfeld reicht über die ganze Erde.

Many of these geologists we know by name, others we do not. Some of them spent just a few months abroad, others their entire lives. This was true not only around 1900, as in Venezuela alone, we know of 20 Swiss geologists who were working for Royal Dutch Shell after World War II. This is because the Swiss were respected as experts. They were extremely well educated; thanks to their studies of the Alps, they could grapple with complex geological environments, and they were flexible. It was relatively easy for them to find jobs in international oil companies, both in the public and private sectors. Thus, the Swiss played as significant a role in worldwide oil exploration as they had previously contributed to the colonization endeavours of the British and the Dutch.

Prior to 1900, there were only a handful of oil specialists worldwide – the first ever job in the oil industry is said to have come about in 1882 (Owen 1975). At this time, the demand was not so much for geologists, but rather for practitioners who had to deal with near-surface exploration. With the rise of oil exploration, particularly after 1900, the demand for experienced oil geologists grew rapidly. Oil companies hired trained geologists from different parts of the world, which led to an increasing number of Swiss geologists finding employment abroad.

Among the first to be recruited was the above-mentioned Arnold Heim (1882–1965) from Zurich. With extensive expertise gained from nearly 50 years of working for major oil companies, he was a pioneer and one of the leading oil geologists of his time. Even prior to Heim, however, geologists left Switzerland in search of the black gold in promising regions of the world. Successions have therefore taken place within the countries of origin. Specific territories and specific companies were ‘handed down’ to geologists of the same nationality. Where once the Swiss were employed, others took over. One of the first to start his career abroad and thus clear the way for many others to succeed was Carl Schmidt (1862–1923) from Basel (Fig. 1), highly esteemed and later renowned for his achievements as a teacher at the University of Basel. He was among the first to work for Royal Dutch Shell (then...
Royal Dutch Petroleum Company). Following on from Schmidt, the company hired dozens of Swiss geologists, initially to prospect for oil in the Dutch East Indies (now Indonesia).

Another Swiss geologist was Josef Erb (1874–1934), educated in Aarau and Zurich. He had an unparalleled career at Royal Dutch Shell, clearing the way for generations of Swiss oil geologists to follow. After 1960, it became a tradition that a Swiss national was appointed Chief Geologist at Royal Dutch Shell.

Another example is Hans Hirschi (1876–1964), who worked for the Union des Pétroles d’Oklahoma, where he recruited many fellow countrymen. In a similar manner, Arnold Heim enlisted fellow countrymen to join the Anglo-Persian Oil Company in the early 1950s. Many more followed over the decades to come, not only geologists but also engineers, chemists and physicists. Such successions were not specific to Switzerland, however, but were also true of other countries, such as The Netherlands, the UK and the USA.

Some of these Swiss pioneers will be introduced below. The decision of who to portray depends largely on the somewhat random availability of written sources. Whilst comprehensive literary remains can be found in archives and libraries for some protagonists (archival records and literary remains for...
Daniel Trümpy, Arnold Heim, Hans Hirschi and Augusto Gansser can be found at the Hochschularchiv der ETH Zurich, for others very little still exists – an obituary, the mention of a name in an article. Apart from biographical details, which are invariably fragmented, the local and international context is also of interest. The pioneers portrayed here were not lone warriors, but rather were part of a dense network of people operating in the oil fields of very different regions of this world.

This paper draws on my book published in German: Gisler (2014); see also Gisler & Ruetz (2014) and Gisler & Trümpy (2016).

Sought-after Swiss geologists

Swiss geologists were exceedingly sought-after from the very beginning of oil exploration activities, by both private companies and national governments. In the early twentieth century, for example, the Dutch government recruited Swiss geologists via newspaper advertisements, since The Netherlands itself had not yet begun to train oil geologists (von Wyss-Giacosa & Isler 2013). The Swiss, henceforth, were spoilt for choice: did they want to work for some government or for a private company? The decision was usually made for practical reasons. Wolfgang Leupold (1895–1986) from Berne, for example, decided in favour of the Dutch government because he was allowed to bring his family with him from the very beginning of his employment, something that would not have been allowed by Royal Dutch Shell, which usually included a clause in their contracts that forbade expatriates bringing their wives in the first year. Salaries in the early years of employment were low, however, and it was not unusual for families to face financial difficulties in their first years of employment.

Why, then, were the Swiss so highly sought-after, and why did they go abroad as young geologists at all? There were many motivations.

After 1900, the outward-looking focus of Swiss geologists came about partly as a professional and economic necessity, and partly because they were an attractive proposition to international and governmental companies. Coming from a neutral country was considered an asset in post-colonial times in many nations of the world. Furthermore, the Swiss commanded a rare understanding of the spatial arrangement of subterranean geological structures, skills that were as essential in the early years of oil exploration as they are today.

As mentioned previously, Swiss geologists mastered excellent expertise, both theoretical and field-based. After all, Switzerland provided the perfect conditions for training – unlike The Netherlands, for instance. The Alps and the Jura offered outstanding illustrative material for gaining geological knowledge; the Swiss thus acquired their skills from scratch in the outdoor laboratory (Trümpy 2014). This was essential, since the techniques of seismic exploration were not yet known. The key to the successful discovery of oil deposits lay in the geometry of the subsurface, analysed by means of a detailed mapping of the surface. Knowledge and expertise that went beyond mere theoretical studies were of profound importance. Creativity was required, as was the willingness to embrace the unknown, uncharted territories, harsh climate conditions and rudimentary living conditions.

How little the education at home had to do with the actual fieldwork, though, is shown in a citation by the young Eduard Blösch (1884–1980), who between 1911 and 1915 had joined Hans Hirschi on explorations in Oklahoma (USA):

> My work in Oklahoma, which began at the Kansas line, proved to be very different from what I had done before in Switzerland. On account of poor roads most areas could be worked only by camping out; I had to learn to handle horses. I had to add to my vocabulary words I had not encountered in the English classics, and I also had to familiarise myself with the methods of drilling and producing. There was very little known about the general geology of the area, and this lack of information made it necessary to trace beds over long distances, measure sections etc.

(Eduard Blösch, cited in Owen 1975).

In Switzerland, on the other hand, there were virtually no job opportunities or earning potential for geologists. Studying geology around 1900 was known to be unprofitable; going abroad was therefore nearly the only prospect for a trained geologist. There were a handful of jobs for schoolteachers, a few opportunities for an academic career and some found work in mining or tunnel construction. These jobs were limited, however, a fact of which students were well aware (von Wyss-Giacosa & Isler 2013).

The prospect of finding a decent job as a geologist in Switzerland did not change until the 1960s, when more positions were created at universities (Trümpy 2014). The career profile for field geologists changed eventually too, as jobs in resource exploration were increasingly replaced by jobs in the environmental field. After 1970, private geology companies, such as geo-environmental consultants, started to emerge that employed ever-increasing numbers of geologists, now both male and female.

Fundamentals

Returning to the early twentieth century, the academic environment was fundamental for an excellent education. Swiss universities and their teachers
played a crucial role in the training of future oil geologists; hence, new faculties on the subject matter were founded in Zurich by Albert Heim (1849–1937) and Ulrich Grubenmann (1850–1924), and later Rudolf Staub (1890–1961) and Paul Niggli (1888–1953); in Basel by Carl Schmidt, August Buxtorf (1877–1969) and Heinrich Preiswerk (1876–1940); and in Berne somewhat later by Paul Arbenz (1880–1943), a student of Albert Heim (Fuchs 2001). In fact, all future oil geologists of the time passed through one or more of these schools. In Zurich, the Swiss Federal Institute of Technology (ETH Zurich) and the university were among the first educational establishments in Europe to create separate Institutes of Geology and Crystallography–Petrography, led by one full professor each. This was essential for the development of these disciplines because it facilitated the adaptation to evolving demands and the introduction of new fields of research. Whereas early on the focus lay on descriptive mineralogy, under Ulrich Grubenmann (Fig. 2) it shifted to petrography with a particular focus on metamorphism. With the establishment of laboratories to carry out geometric rock and mineral analysis, Grubermann established petrochemical research, which was to be of tremendous benefit to future oil geologists. No less important were the work and teaching of the great Albert Heim (Fig. 3), renowned geologist of his time and a pioneer in the field of ductile deformation (plasticity). With his theoretical and practical knowledge, Heim added significantly to the education of future oil geologists. Neither Grubermann nor Heim, however, were ever actively involved in oil research and exploration themselves.

In Basel, the situation was somewhat different. Carl Schmidt, who was pivotal in the education of geologists there, had gained his own experience in the oil fields. He thus played a central role not only as a teacher, but also as a mentor for young geologists. Schmidt, who had studied geology, mineralogy and petrography in Geneva and Strasbourg, was appointed Professor of Mineralogy and Geology in Basel from 1891 to 1923, where he founded the Mineralogisch–Geologische Anstalt (Mineralogical–Geological Institution) (Buxtorf 1923; Mülberg 1923). Schmidt had worked on the geological cartography of the Alps, namely the Simplon massif. Even prior to 1900, he went abroad to study potential ore, coal and oil reserves, and he was a sought-after expert for tunnel projects.

Schmidt was therefore not only an excellent teacher, but also equipped with practical knowledge. He had worked for Royal Dutch Shell for many years as a consultant. In fact, he was one of the first Swiss geologists to go abroad to work for an oil company. He gained experience in 1899 with consultancy trips to South Sumatra, Mid-Java and West Borneo (Brunei), and then again in 1903 in East Borneo. This experience was key to the establishment of petroleum geology as an independent discipline, opening the doors for future geologists.

In 1898, prior to Schmidt’s consultancy work, the Royal Dutch Company turned to him when experiencing problems with failed explorations and declining production in North Sumatra. In 1890, the company had founded one of the ‘world’s greatest petroleum enterprises’ (Owen 1975) in the Dutch East Indies, namely in North and South Sumatra, Java and Borneo. The shallow wells first exploited were soon to run dry, so the company was forced to change their approach. This is when Carl Schmidt, together with his Italian colleague Cesare Porro, was hired to conduct a geological examination of the region (Forbes & O’Beirne 1957; Owen 1975). Both had acquired prior experience in oil geology in Alsace and Galicia, and they happened to be the first explorers with scientific training to join the staff of Royal Dutch Shell.

Porro and Schmidt delivered their preliminary findings a year later, in 1899, describing in detail the geology of the areas they had examined. According to Forbes & O’Beirne (1957), the report was of

![Fig. 2. Ulrich Grubenmann (1850–1924), Teufen. (Verhandlungen der Schweizerischen Naturforschenden Gesellschaft, 105, 1924).](image-url)
exceptional quality, considering the period in which it was written. Amongst other things, the report advocated an entirely new fieldwork procedure for oil geologists in the Dutch East Indies, a technique that was adhered to, essentially unaltered, for the following 20 years. This new procedure consisted of first traversing the stream courses, where most of the natural exposures occurred. In areas where oil seeps appeared or favourable structures were suspected, tracks were hacked out through the jungle, and pits were dug along them at intervals. The pits usually penetrated through 4–8 m of weathered soil down to bed rock, and were wide enough for the geologists to enter to determine the dip and strike of the strata (Fig. 4). A rough survey was carried out to locate the pits, and a sketch map was drawn showing the topography and structural observations. This kind of work required a vast amount of cheap labour, and the company employed young Dutchmen who had been raised in the Indies and knew the native language to supervise the work crews (Owen 1975).
In the years to come, the company expanded rapidly and acquired new territories, thereby attracting more geologists, many of whom were Swiss. One of these was August Tobler (1872–1929), who followed Schmidt to South Sumatra in 1903–04, where he established the tertiary stratigraphy and found several anticlines on which small fields were later developed (Gerretson 1953–57). Another of these Swiss geologists was Josef Erb, who, on the advice of his teacher Albert Heim, travelled to Sumatra in mid-1900, where he engaged in petro-geological exploration first in Palembang (South Sumatra) and later in North Sumatra. He went on to play a leading role in the Royal Dutch Shell Company.

**Geology and management: not such an unusual combination**

Josef Theodor Erb (Fig. 5), born in 1874 in Volkach (Germany), grew up in Aarau and studied sciences in his hometown of Zurich with Albert Heim at ETH Zurich (Hirschi 1935; Van Waterschoot van der Gracht 1935; Forbes & O’Beirne 1957; Owen 1975; Wannier 2018). He later worked as an assistant to Ulrich Grubenmann at the University of Zurich, where he obtained a doctorate in 1899 with a dissertation on ‘Die vulkanischen Auswurfsmassen des Höhgaus (Hegau)’ (‘The Volcanic Cone Mountains of Hegau’).
It was the above-mentioned recruitment by the Royal Dutch Petroleum Company that brought Erb to the Dutch East Indies. From then on he worked for the company continuously until his early death in 1934.

Erb is said to have left Switzerland ‘with enthusiasm for his first journey to distant lands’ (Hirschi 1935). It not only released him of the burden of financial constraints, but also provided him with the opportunity to become a renowned geologist and a successful manager in the services of Royal Dutch Shell. Thus, Erb was instrumental in establishing the new field of petroleum geology, paving the way for subsequent Swiss geologists to carve a career at the heart of the company to this very day.

The colonies of Dutch East India were the forerunners of present-day Indonesia. The oil fields were situated on East Java, North and South Sumatra, and on East Seram (Moluccas). Borneo, the third largest island worldwide, was divided between: Kalimantan, today belonging to Indonesia; Sarawak in today’s Malaysia; and Brunei, situated on the northern coast of the island (Fig. 6). Over roughly 350 years, The Netherlands colonized the Indonesian part of this enormous island empire between the Asian mainland and Australia.

From the second half of the nineteenth century onwards, geologists searched for coal in the area and in 1885 they started drilling for oil, primarily in North Sumatra and later in East Java. A few years later, oil fields were found in South Sumatra (Palembang), and in 1890 the Royal Dutch Petroleum Company entered the region. In 1900, Josef Erb travelled to Palembang for the first time, and then on to North Sumatra and Java, where he remained for the coming years, interrupted only by short trips to Europe.

In 1907, the Royal Dutch Petroleum Company merged with the British Shell Transport and Trading Company Ltd to become Royal Dutch Shell (Beaton 1957; Forbes & O’Beirne 1957; Van Zanden et al. 2007), and appointed Erb as head of the Geological Service. Erb was one of only a few geologists at the time who were both experienced technicians and strategic thinkers. Highly respected, he was entrusted with the task of exploring completely unknown territories, and negotiating new purchase leases and concessions for Royal Dutch Shell.

The appointment of Erb as head of the central offices, and thus the company’s first chief geologist, heralded the arrival of the Swiss in the inner circles of Royal Dutch Shell Management. This position also marked the first permanent position in Erb’s career. The new department began by exploring new fields and developing its geological understanding of how to maximize oil production in existing fields. Alongside everyday tasks of geological exploration, Erb became increasingly involved in negotiating new concessions and targeting new exploration sites. As chief geologist, he was also responsible for the growing number of geologists in the field. As a scientist, though, Erb left little legacy behind. In his managerial position, he was not allowed to publish any research findings.

His new duties forced Erb to travel widely, to North America (Oklahoma), Egypt, Galicia (today’s Poland and Ukraine), Russia, Mexico and back to Sarawak, where he achieved his most important geological accomplishments. The Sarawak region, located on the NW coast of Borneo (part of present-day Malaysia), provided excellent conditions for geological success – a prime example of Swiss participation in the exploitation of oil in Borneo.

From 1910 onwards, the Royal Dutch Shell group was active in Miri, a small fishing village in northern Sarawak, where, as in other oil regions, oil seeps provided initial indications of possible deposits. For centuries, the inhabitants had extracted oil by hand from dug wells, using it for lighting lamps, waterproofing boats and medicinal purposes (Sorkhabi 2012). The first to concentrate on commercial oil exploitation in the region was the self-taught British naturalist Charles Hose, who started mapping oil seeps in and around Miri. Eventually, the management of Royal Dutch

Fig. 5. Josef Theodor Erb (1874–1934) (Gerretson 1953–57, vol. 2, p. 86).
Shell endorsed the first ‘Mining Lease’, and put Erb in charge of it.

Arriving in Miri in 1910, Erb immediately began an independent examination of the area, mapping several anticlines where oil seeps were to be expected. Eventually, he located his first exploratory well. This was unique, as until then drilling was always carried out at a visible oil seep. Prior to 1920, practically all major oil fields, with the exception of Mexico, were situated on prominent anticlines, most of which were associated with major Tertiary or Quaternary orogenies. The geologists of the time rarely recommended new prospects without evidence of anticlinal structures, even when located in the vicinity of surface seepages (Owen 1975).

The drilling campaigns conducted by Erb were carried out with a wooden derrick, using a technology developed and used in China for centuries to prospect for brine (Sorkhabi 2012). The drilling operation was so successful that the small village of Miri quickly turned into a booming city. The Miri oil field remained open until 1972, but Erb’s work in Miri ended much earlier. After having finished the first drillings, he moved on to the USA in 1911.

When in 1912 the new Central Geological Bureau was established as a consultancy office to the strategic management of Royal Dutch Shell, a new opportunity opened up for Erb. Now one of the most experienced of Royal Dutch’s geologists, with 12 years of uninterrupted service to the company, he was appointed director of the new department (Forbes & O’Beirne 1957). The Central Geological Bureau was basically responsible for co-ordinating the geological activities of the various co-operating companies, unifying methods of reporting, exchanging knowledge gained from practical experience and considering the possible introduction into other companies of a particular mode of organization that had been developed and proved satisfactory in one company. In short, the Central Bureau, in addition to its scientific functions, was given an equally important organizational and administrative responsibility.

Ultimately, in April of 1921, Erb was appointed Managing Director of Royal Dutch Shell, one of the most important positions in the oil industry at the time (Forbes & O’Beirne 1957). Erb was now part of the senior management of what was then the largest oil company in the world. At the same time, he and his family were awarded Dutch citizenship (Hirschi 1935).

Even as a director, Erb was in the field quite often. He visited exploration sites in Mexico, Venezuela, East and NW Borneo, and Romania. He was well known and popular. One of the assistants he worked with in Mexico in 1912, Arthur H. Noble – the first

Fig. 6. Map of Java, Sumatra and Borneo (Owen 1975, p. 421).
British geologist with Royal Dutch Shell – paid tribute to his mentor, describing Erb as:

[Of medium height, stocky, tough and undaunted by difficulty, […] gentle and considerate, with a pleasant sense of humour – a great asset at the end of a tiring or disheartening day

(Noble, cited in Owen 1975).]

In 1929, at the peak of his career, yet in poor health and mentally exhausted, Erb resigned. He remained a member of the board of Royal Dutch Shell, and from 1931 until his death he also served as chair of the Geologisch–Mijnbouwkundig Genootschap voor Nederland en Koloniën (Geological Mining Company of the Netherlands and the Colonies). His plans to return to Switzerland and to resume his scientific work remained unfulfilled, however, owing to his early death in 1934.

‘Les Hommes du Pétrole’

No other person, however, was more important to early oil exploration – at least from a Swiss point of view – than Arnold Heim. Heim, a citizen of St Gallen, was introduced to geology by two important people, his father Albert Heim (Gansser 1962; Egli 1966; Franks 2011) and Hans Hirschi, who served as both mentor and friend.

Hans Hirschi (Fig. 7), a citizen of Zurich, had studied chemistry, physics and notably geology at the University of Zurich with Albert Heim, as well as mineralogy and petrography with Ulrich Grubenmann (de Quervain 1965, 1972). As early as 1901, he followed his fellow student and friend Josef Erb into the field. He spent his professional life in Borneo, Sumatra, Mexico, the USA, New Guinea, Siam (present-day Thailand) and Iran, either as a senior geologist in a private company or as an independent expert.

Hirschi gained recognition largely for his work in the USA. In 1911, he was appointed chief geologist by the newly founded Union des Pétroles d’Oklahoma. Apparently, Hirschi and his assistant were the first geologists ever to work in this region (Forbes & O’Beirne 1957). Hirschi already had previous experience working and travelling in the USA when he took on the role, which clearly stood him in good stead.

Fig. 7. Hans Hirschi (1876–1964). (Hochschularchiv der ETH Zurich (Bildarchiv) Dia_017-043.)
As an experienced geologist, Hirschi was soon promoted to director of the technological–geological service of the Union. From then on, he spent roughly 4 months a year in the USA and the rest of the time at home. His main task then was to review reports from the field. From the point of view of his colleague and co-worker Eduard Blösch, this was a somewhat complex and exhausting process:

The organization of the geological department was complicated – my reports went to Dr. Hirschi in Switzerland (he usually made two trips to the States a year). He forwarded them with his comments and recommendations to Holland, from where orders or suggestions went to the local management. The latter did not believe in geology and was slow to act.

(Blösch, cited in Owen 1975).

As chief geologist, Hirschi was now in a position to appoint his own employees, and thus to continue the practice of succession for Swiss geologists. Hirschi initially tried to recruit Heim for the region, but Heim at first declined, being engaged in India and not yet ready to leave. Instead, fellow countrymen Blösch and Emil Kluth arrived in the USA, followed by yet another compatriot, Otto Fischer (1876–43). When Hirschi left the company after a few years, Eduard Blösch succeeded him as chief geologist (Fig. 8).

By the time Arnold Heim arrived in Oklahoma in late 1912 to join Hirschi, he was still an unsteady young geologist, undecided about the shape of his future career. In 1907, he had completed his post-doctoral habilitation (a second degree after a dissertation) in Zurich. To the disappointment of his father, he rejected the option of an academic career and chose a professional occupation in oil (Philipp 1981). As an independent geologist, Heim henceforth undertook many expeditions, starting in Sumatra, then Oklahoma, and from there heading to California in 1913 to supervise the exploitation of an oil field. In early 1915, Heim was back in California, leading a Swiss expedition to evaluate potential territories (Philipp 1983). Between 1917 and 1919, expeditions on his own initiative and for various companies followed, taking him to Galicia, Poland and France. Furthermore, he was commissioned by a Swiss engineering company to explore potential oil reserves in Switzerland, prompted by precarious supply conditions during World War I. Heim also found the time to accompany the Swiss flight pioneer Walter Mittelholzer on his first crossing of the African continent in a seaplane, crossed the Sahara by car.

Fig. 8. Eduard Blösch (left) and Arnold Heim (right) working on reports (1912). (Hochschularchiv der ETH Zurich (Bildarchiv) Dia_004-074.)
and even joined an expedition in the mountains on the Chinese–Tibetan border (Philipp 1983).

In-between excursions, Heim was obliged to return to his hometown of Zurich, which remained his primary place of residence throughout his entire life. This was due to the precarious situation affecting the oil industry in those years. Oil from North America flooded the world market, which in the 1920s was still emerging, creating a completely new situation. Exploration activities were being constrained, and at the same time more and more oil geologists were entering the job market (Philipp 1981). In 1923, Heim asked Daniel Trümper (1893–1971), at the time working in Patagonia, to act as a broker for Royal Dutch Shell, initially without success (Trümper 1971). Earlier that decade, Heim had complained in his journal that Swiss geologists, once greatly appreciated, now faced stiff competition from colleagues from all over the world. Years later, he had to deal with the situation again when he lost to British and American colleagues when applying for a second expedition tour to the Arabian Peninsula (Philipp 1983). In early 1924, however, he led a research expedition to the Persian Gulf for the Eastern and General Syndicate Ltd, London. The rich oil deposits in the region had not yet been explored because efforts so far had focused on the Dutch East Indies, the Antilles, and parts of North and South America.

Heim, therefore, led a 60-strong expedition into the geologically little-explored areas of Kuwait, al-Hasa (in present-day Saudi Arabia) and Bahrain in NE Arabia in search of oil and water. After a gruelling 2 months of exploration, during which he suffered tremendously from the hot climate of the Persian–Arabian Gulf, he was less convinced of a favourable outcome for future oil drillings than of the success of future water drillings in some places in those regions. The findings of his voluntary water explorations in Bahrain were exploited with great practical benefits not long after Heim’s departure. Ironically, Heim had just missed the anticline that 14 years later successfully produced Saudi Arabia’s first oil. Thus, it was the New Zealander Frank Holmes who entered the annals of exploration history as the ‘father of the Arab oil’ (Philipp 1981, 1983).

Heim returned to the Far East several times on exploratory expeditions, one of them an oil exploration for the government of Siam together with Hans Hirschi. He also returned to Sumatra frequently and travelled to different countries in South America, as well as to Russia. When not working on behalf of a private company or a government, he travelled at his own expense. In 1936, he undertook the first Swiss scientific expedition to the Himalayas, together with Augusto Gansser (1910–2012); and in 1947, Heim met up with Daniel Trümper in South America to explore the oil field in Pirin (Heim 1948). Between 1929 and 1932, he held a professorship at Sun-Yat-Sen-University in Kanton (China).

In the autumn of 1949, Heim, now almost 70 years old, was appointed as the chief geologist of the public Iran Oil Co. – his first ever permanent position. His job was to explore for oil in Iran, excluding the concessionary areas in the southern parts of the country belonging to the British-owned Anglo Iranian Oil Co. (prior to 1935 the Anglo-Persian Oil Company, and BP since 1954). In the first half of 1950, Heim gathered a team of seven oil geologists to be assigned to the service of the Iran Oil Company (Heim 1952; Oberli 2013). The team consisted entirely of Swiss nationals: Jovan Stöcklin (1921–2008) was the first to travel to Iran, followed by Karl Goldschmid (1896–1982), Heinrich Huber (1917–?), Ernst Frei (1894–1974), Max Furrer (1920–2013) and Pierre Soder (1922–2008). The last to arrive was Augusto Gansser, who until then had been employed as Chief Geologist by Royal Dutch Shell in Trinidad. The geologists then focused their main activities around the city of Qum, where major oil deposits were expected (Gansser 1957) (Fig. 9).

It was not entirely by chance that the Iranian government had appointed a group of Swiss geologists to work in the area. With the Cold War evolving and the region suffering from the intense friction between East and West, Switzerland’s neutrality was a distinct advantage. The contract that Heim received from the Iranian Planning Administration explicitly requested strict neutrality, and forbade all political activities and any involvement with the internal affairs of the host country.

The first drill results in the region were very promising, hinting at favourable prospects, if not yet an exploitable production. There was, however, a problem: huge salt deposits proved very difficult to bypass, preventing access to the oil beneath for many years.

Heim left Iran in 1952 for health reasons. Thus, he did not witness the huge Qom wildcat blow-out (Alborz-5 well; Gisler & Trümper 2016) that occurred on 26 August 1956. Augusto Gansser, student, mentee and expedition companion of Heim (Markus & Eichenberger 2008), was now in charge, having succeeded Heim as the chief geologist of the Iran Oil Company. Heim, however, had the privilege of publishing a paper on the tectonics of the region, its major potential for oil and gas, and of describing the event:

There followed one of the largest eruptions of gas and oil on earth. It was still spewing a plume of oil over 100 m high even after 30 hours. Roads and railways were immediately closed by troops and a 6-km long stream of oil was channelled into a dammed desert basin. A. Gansser estimates production at 10 000 tonnes.
a day. A reflective, rippling lake of light oil emerged in the distance, without a drop of water in it. The event that took place at 3 am on 26 August will have incalculable scientific and political consequences as an entire oil field develops around Qum.

In the original German this is:


For almost his entire career, Heim remained an independent scholar and researcher, repeatedly working for different oil and mining companies over the years on mandate contracts. His principal geographical regions were Mexico, Peru, the Andes in Argentina, West Africa, Iran, the Himalayas, and the south and SW of China (Trümpy 1969). Many extensive trips to all parts of the world not only contributed to his geological research, but also served his interests in environmental and ethnographical studies. Heim developed a scepticism for the Western lifestyle, and became an advocate for decolonization and nature conservation. He found little interest in purely technical discussions about the new methods of geophysics; preferring instead the thrill of scientific exploration.

Many of Heim’s research findings initially remained unpublished as, like many others, he had to subscribe to the policy of non-publication when working for private companies. Travel journals, which combine geological as well as ornithological and anthropological observations, offered a means of circumventing this ban on publication. Heim’s overarching work on Central Himalaya (Heim

Fig. 9. Swiss geologists in Iran: Pierre Soder, Augusto Gansser, Heinrich Huber, Bagher Mostofi (Managing Director of the Iran Oil Co.), Arnold Heim, Jovan Stöcklin, Karl Goldschmid, Ernst Frei and Max Furrer. (Hochschularchiv der ETH Zurich (Bildarchiv) Hs 494: 82.4.)
1939) became a classic, as did his book Weltbild eines Naturforschers (Worldview of a Naturalist) (Heim 1942), in which he advocated a wholesome lifestyle, and respect for humans and the environment.

Epilogue

‘The geologists returning from the tropical forests were trailblazers brimming with professional pride’ (Lehner 2004; original German: ‘Die aus den tropischen Urwäldern heimgekehrten Geologen waren von Berufsstolz strotzende Pioniergestalten, die auf ihre Welterfahrung pochten’). This is how a geologist of a younger generation described the pioneers of the oil exploration. Shell too, in an illustrated book from 1956, Les Hommes du Pétrole, depicted the work of the oil geologists as romantic and adventurous (Melland 1956). The thirst for adventure and discovery may, indeed, have been a rationale for any funding agency in the public, commercial or not-for-profit sphere.

Correction notice: The caption to Figure 1 had omitted the attribution details.

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References


