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The life of René Malaise: from the wild east to a sunken island

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Abstract

A review is presented of the life of the Swedish entomologist René Malaise (1892–1978), the inventor of the "Malaise trap" and one of the most important 20th Century specialists on sawflies (Hymenoptera: Symphyta).

Key words: Biography, Malaise trap, Insecta, Hymenoptera, Symphyta, East Asia.

Introduction

Malaise is a familiar name to most entomologists, but less well known is the incredible life of the man who invented the effective and now ubiquitous insect trap. More than 30 years have passed since his death, and only a few people have memories of this passionate, humorous and generous man who conducted his various endeavours with such strong conviction. René Malaise (Fig. 1) participated in expeditions to remote locations such as Kamchatka and Burma, where he not only experienced nature in its most marvellous state and made astonishing visits to tribes of indigenous people, but also survived severe earthquakes, volcanic eruptions, as well as close encounters with armed opium smugglers and animals such as bears, wolverines, sables and wolves.

He made large and valuable contributions not only to the insect collection but also to the zoological (including palaeontological), botanical and mineralogical collections at the Swedish Museum of Natural History (NHRS) in Stockholm. His Burma material was one of the single largest contributions to the insect collection. Furthermore, he published important works describing the sawfly fauna of various parts of the world, primarily the far eastern and southeastern Asia. During the later years of his career he tried to prove the reality of Plato's myth of Atlantis in several papers and books. His reputation in the scientific community suffered greatly because of these idiosyncratic views, which after the 1960's no longer reflected prevailing thought in mainstream geophysics.

This biographical sketch is based on the following sources:

- Archive material associated with Malaise housed at the Department of Entomology at the NHRS including correspondence, newspaper cuttings, personal documents like CVs and letters, photographs and discussion on Malaise's publications.
- Protocols of the meetings of the entomological society in Stockholm published in Entomologisk Tidskrift.
- Books by Malaise and his travel companions as well as other publications about Malaise's life and the material he collected. See full bibliography at the end.

This paper provides a biographical background that is useful in understanding Malaise's work on Symphyta. Further publications on his scientific work are in progress.

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FIGURE 1. Portrait of René Malaise. Photographer: P. Larsson (Royal Photographer), 1920s. Photo from the portrait collection at the Department of Entomology, NHRS.

Childhood and studies

On September 29th 1892, Augusta Söderqvist and Edmond Malaise rejoiced at the birth of their first son René Edmond Malaise in Stockholm. Later two more sons and a daughter were born into the family. Malaise's French father was head chef at the fine Swedish restaurant Operakällaren for many years. Augusta Söderqvist Malaise was the daughter of a gardener, a background that possibly helped explain her grandson's early interest in plants.

Around the turn of the 19th century the family lived in an apartment on Sibyllegatan in Stockholm, where Malaise used a blowpipe to shoot feathers off hats of women walking by on the street (Sjöberg 2004). His interest in weapons, traps and hunting is evident in his texts.

In a newspaper article written for his 50th birthday, René Malaise explained how he was inspired by his butter-

fly-collecting cousin in France to start studying insects. Later he decided to focus on a virtually unexplored group, such as the plant wasps (Hymenoptera Symphyta, usually but somewhat misleadingly referred to as "sawflies" in English). Possibly the great diversity of nematine sawflies that he observed on his trips to Lapland during his studies also appealed to him.

René Malaise received his education in three different Swedish cities. On December 9th 1912 he graduated from high school at "Högre Reallläroverket på Norrmalm" in Stockholm, and went on after his military service (Fig. 2) to study at Stockholm's Högskola where he gained his Bachelor's degree on January 26th 1918. The licentiate degree was obtained at Uppsala University on September 15th 1938 and as late as May 4th 1945 he defended his PhD thesis at the Zoological Institute of Lund University.

FIGURE 2. René Malaise in his one-man-tent/sleeping bag invention while doing his military service in Vaxholm in 1914. Photographer: Unknown, but permission to use the photo obtained through middleman.

A decade in the Kamchatka wilderness

Malaise's first large expedition was to Kamchatka (Figs 3–8) in Russia together with Sten and Dagny Bergman, Eric and Elsie Hultén, and Ernst Hedström, between 1920 and 1922. The expedition was funded by a Vega scholarship and supported by a number of organisations and companies supplying them with food, weapons, skis, chocolate and even daily rations of alcohol. Apparently Malaise even induced the famous Swedish painter Zorn to support the expedition with a considerable amount of money in exchange for pictures of nude Japanese girls (Hultén 1973).

On February 16th 1920, the expedition members left Stockholm by train to Italy. They then went by boat to Egypt where they spent three weeks in Cairo waiting for the ship "Japan" on which they travelled to Yokohama in Japan. The vessel Kommandor Bering that took the expedition members from Japan to Kamchatka floundered close to Cape Lopatka, the southern tip of Kamchatka. No lives were lost, but half the expedition's equipment and supplies disappeared with the boat. After spending almost a month at Cape Lopatka they managed to reach Kamchatka's capital Petropavlovsk, where they set up a base from which they embarked on their collecting trips. Often

the expedition members travelled separately from each other. Malaise seems to have stayed in the eastern parts of the country, whereas the Bergmans covered larger areas, mostly using dog-sleighs, as is so eloquently described in Bergman's books "Through Kamchatka by Dog-Sled and Skis" and "Kamchatka: account of a 3-year research expedition" (Bergman 1923, 1927).

FIGURE 3. Dog sleigh in Kamchatka. Photographer: René Malaise, 1920s. Photo from the Malaise archive at the Department of Entomology, NHRS.

FIGURE 4. A well-deserved bath in the hot springs in Kamchatka. Photographer: René Malaise, 1920s. Photo from the Malaise archive at the Department of Entomology, NHRS.

FIGURE 5. Hot spring in Kamchatka. Photographer: René Malaise, 1920s. Photo from the Malaise archive at the Department of Entomology, NHRS.

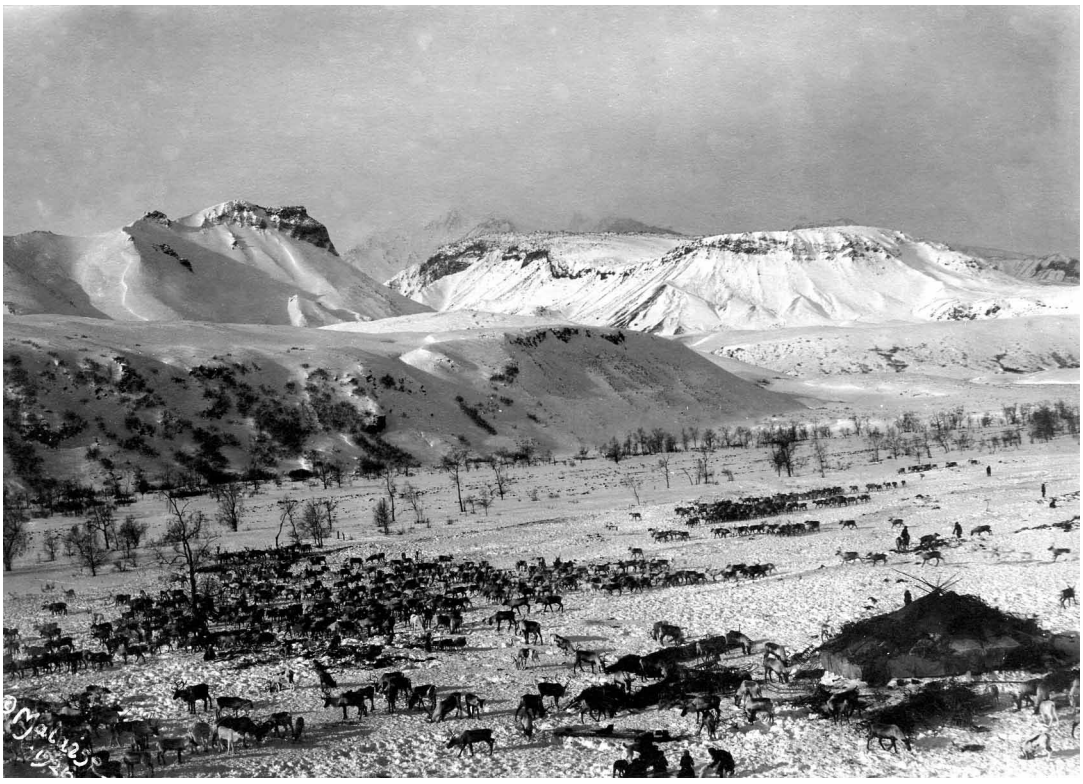

FIGURE 6. A camp of the reindeer-herding Even people in Kamchatka. Photographer: René Malaise, 1926. Photo from the Malaise archive at the Department of Entomology, NHRS.

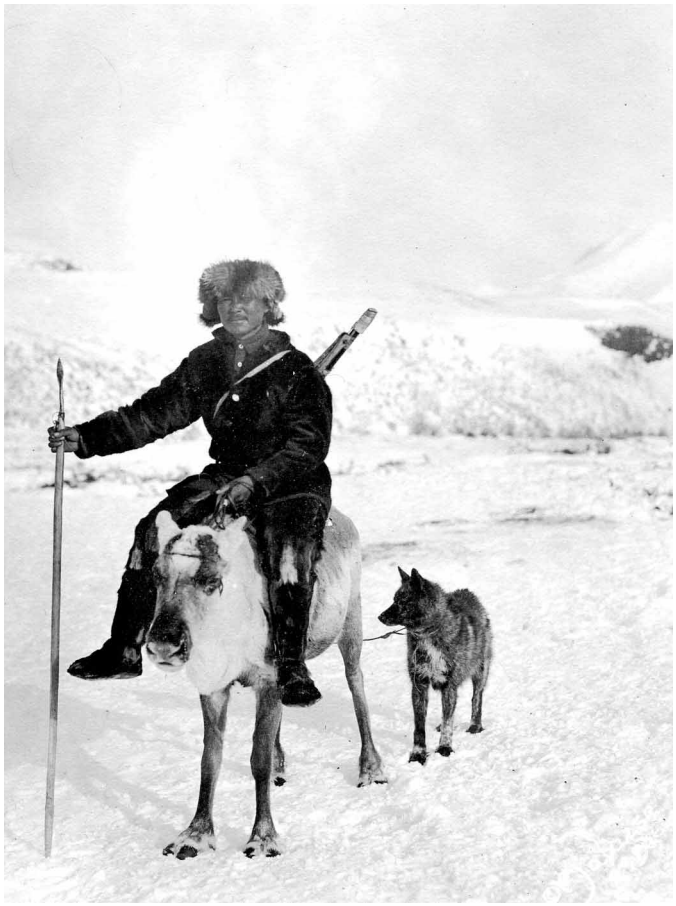

FIGURE 7. The Even people of Kamchatka commonly use their reindeer for riding. Photographer: René Malaise, 1926. Photo from the Malaise archive at the Department of Entomology, NHRS.

Sten Bergman and René Malaise concentrated on zoological collecting, assisted by Dagny Bergman and Ernst Hedström, whereas Eric and Elsie Hultén were responsible for botanical collecting. In addition to his main interest, the insects, notes exist on Malaise's archeological finds, including stone-age arrows and axes from Tarja close to Avatcha Bay on the north-eastern coast. In Mashura, in the central part of the peninsula, he found teeth, bones and horns of aurochs (*Bos taurus primigenius* Bojanus). It was also during this expedition that he shot his first bear in the middle of the night in the conifer forest at Nikolka River in the heart of Kamchatka.

Malaise fell in love with the beautiful peninsula and stayed in Kamchatka when his fellow expedition members left in 1922. He ended up spending the best part of a decade there, only interrupted by a short trip to Japan and Sweden from 1923 to 1924.

After his companions, the Bergmans, the Hulténs and Ernst Hedström, left Kamchatka, Malaise spent a very dramatic year on the peninsula described in a travel book (Malaise 1924). Malaise and two Russian hunters, Skorichin and Baranof, went to Olga Bay on Kamchatka's east coast. His companions were sable hunters and joined Malaise instead of getting involved in the political conflict between the Red (Bolshevik) Army and the loosely-allied anti-Bolshevik forces called the White Army in Petropavlovsk. In addition to hunting and collecting animals for the museum, Malaise intended to map the area using serial photographs taken from mountain tops.

Malaise described encounters with wild animals that most people would never see. It was necessary to keep food, including meat of animals killed during hunts, high in trees to prevent wolverines and bears from taking it. Malaise, in his usual manner, put up traps to guard the food, and on one occasion a wolverine, trying to get some reindeer meat, was caught in the trap and shot. Another time Malaise found himself in the middle of a pack of wolves when he was out to wash the dishes in a stream. Normally he would not go very far without a weapon in this country rich with wolves and bears, but he managed to keep a cool head and beat his pots and pans together hoping the noise would scare the wolves off. Luckily this worked.

After a couple of months wearing the same clothes, Malaise described the joy of finding hot springs to bathe in (Figs 4, 5). Imagine an eight meter high 62°C hot waterfall, which they found in the Valley of Tchuschovka River. A rich fauna was observed near the hot spring, and Malaise collected otter and grouse as well as numerous insects. The larva of an ephydrid fly of the genus *Scatella* Robineau-Desvoidy lives in the scolding hot water.

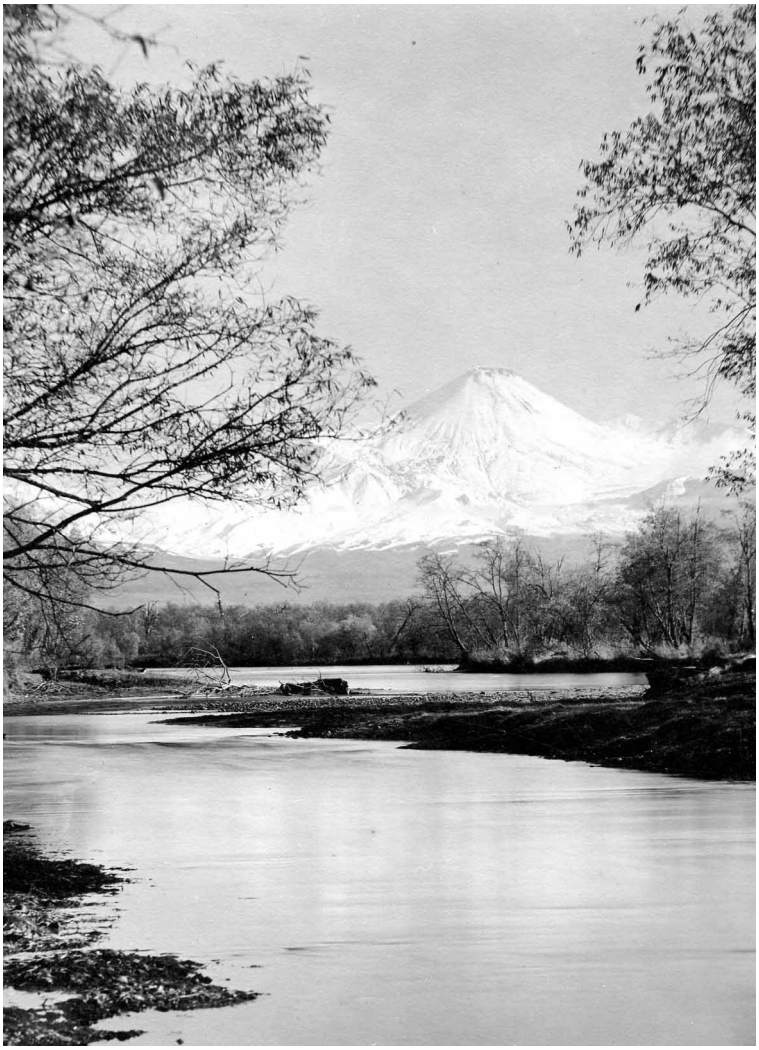

FIGURE 8. Volcano in Kamchatka. Photographer: René Malaise, 1920s. Photo from the malaise archive at the Department of Entomology, NHRS.

A sable which was later exhibited at the Swedish Museum of Natural History was caught here by Malaise.

The life of a hunter in Kamchatka was certainly not comfortable. Snowstorms or purgas lasting for weeks were amon the serious challenges, earthquakes being another. In February 1923, on his way back from their supply depot at the coast, Malaise was staying in a hunter's shelter (jurta) when a strong earthquake struck Kamchatka. The jurta more or less collapsed above his head, and he barely managed to get out of it. The aftershocks continued until July, when Malaise left the peninsula. A giant tsunami followed the earthquake and swept everything along the coast into the ocean including their boat, food supplies, collections and photographs. Malaise's companions left Olga Bay on foot for Petropavlovsk soon after, but Malaise stayed behind trying to make up for lost work. He lost his dogs in a purga, but gained unexpected company from another sable hunter named Voronof, who decided to accompany Malaise until Skorichin and Baranof were able to arrange for a boat to come and pick them up from Petropavlovsk. After a long fight for power, the Bolshevik army finally took over and as a way of controlling the only major town on the peninsula, which existed for the hunting of game, new hunting laws were introduced and enforced. Eventually, this led to most of the region's men being imprisoned or put to punishment work, as were Malaise's friends. Thus, it took several months longer than expected before a boat came and picked up Malaise and Voronof from Olga Bay.

The hunt for sea lions and bears and the preparation of skins and meat are described in detail in Malaise's book (Malaise 1924). One way of cooking a large bear steak was to dig a shallow pit in the ground, fill it with dry wood and rocks, burn the wood to ashes to heat the rocks, fill with grass, herbs and meat, cover with several layers of twigs, grass, hay and soil and leave it to cook overnight. According to Malaise, the pads of bear feet are the most delicious treat the wilderness can offer. The pit-cooked bear was for special occasions, but as everyday food a simple bread called lepjoshki was made directly in the flour bag and fried in bear fat.

Malaise happened to be in Japan during the great earthquake in 1923. He and some friends were in Kamakura to celebrate a national holiday on August 31st. On the following day he was lying on his bed on the second floor of the hotel and after having experienced more than 3000 earthquakes during his time in Kamchatka he immediately recognized what was happening. He went to stand in the doorway, which is supposed to be the safest place in a house, but the room started falling apart around him and he realized he had to leave the building. He also saved a couple of women staying in the hotel. Many fires broke out in the aftermath of the earthquake because it occurred around lunchtime and most households and restaurants had fires lit for cooking. Also, a nearby typhoon helped the fires spread. The fires killed more people than the earthquake itself. An estimated 100000 lives were lost in the disaster, excluding another 40000 who went missing, making this earthquake one of the most devastating in Japan's history.

A delegation of five Swedes started out to seek medical help for the injured at Kamakura, but the devastation was total throughout the entire area, including the larger cities Yokohama and Tokyo. Along the way almost all the houses were in ruins and the ground was cracked open. Crowds of refugees were trying to escape the inferno. Criminals escaped from prisons, resulting in plundering, further fires and murders. Malaise and his friends witnessed people administering "justice" by killing criminals on the spot.

Although Malaise wanted to get back to Kamchatka to continue his work and take care of his new sleigh dogs, he missed the last boat of the year from Japan to Kamchatka and as he could not afford to spend a winter in Japan, he was forced to travel back to Sweden. He travelled by land through Russia and displayed creativity, courage and willpower by managing to get into the country in Vladivostok and take one of the longest rail trips in the world, the Trans-Siberian railroad to Moscow, without having a proper Russian visa in his passport. He managed to enter the country by acting as a courier of important papers from a Russian businessman that he met in Japan. On his journey through Russia he sometimes pretended to be a non-Russian speaking foreigner unable to understand what the officials said. On other occasions he managed to talk influential people into signing papers.

A visit to the Vladivostok restaurant Solotoy Rog (The Golden Horn) is humorously described by Malaise: "Of living beings were no signs. This observation turned out to be considerably exaggerated as Mark Twain once said about his own death, as a sleepy waiter suddenly materialized like a spider from its cover, from which it half-asleep wonders if a fly is going to get caught in its web" (Malaise 1924).

He finally arrived in Sweden, via Finland, sometime in the late fall of 1923.

On his second trip to Kamchatka, Malaise's old friend Ester Blenda Nordström, a journalist and writer, came along. They left Sweden in 1924, got married in Kamchatka in 1925, and divorced when she left Kamchatka in 1927. Ester Blenda Nordström was an excellent writer and is possibly more famous than her husband. She travelled incognito, writing about the lives of ordinary and extraordinary people and injustice in society. She wrote the book "The Village in the Shadow of the Volcano" (Nordstöm 1930), about the years that she spent in the village Klutoni in Kamchatka, close to the majestic volcano Kluchevskaya.

After Ester Blenda Nordström went back to Sweden, Kluchevskaya erupted. Malaise later recounted his experiences of this event. The entire north of Kamchatka was covered in volcanic ash, making it impossible to use dog sleighs and forcing him to travel partly on home-made skis and partly on foot. What was even worse, was that on one walk lasting 15 days they only had food rations for three days and were already suffering from vitamin C deficiency, or scurvy, after living only on reindeer meat for one and a half months. In addition to being a hunter, Malaise founded and ran a sable farm for the Russian state in Kamchatka between 1927 and 1930. In the Swedish Museum of Natural History there is also much material that he collected in Vladivostok on his way home to Sweden in 1930. Vladivostok is one of the only areas where a tropical fauna meets elements of the Arctic fauna, resulting in pythons, tigers and tropical birds living side by side with sables and foxes. This makes it an irresistible place in which to collect. Malaise apparently spent about three months collecting around Vladivostok. During the same year he was also able to collect in areas close to Moscow and St. Petersburg for about two months.

Trapping and trading in Burma

Malaise stayed in Sweden for a few years at the beginning of the 1930s, but during this time he kept applying for scholarships for new expeditions. In 1933, Malaise married Ebba Söderhell, who was to be his partner until she died shortly before him. She was a teacher of biology and religion in Lidingö outside Stockholm, where the couple then lived. His wife accompanied him on his expedition to Burma from 1933 to 1935. Ebba Söderhell was an extraordinary woman who apparently was the perfect partner for Malaise, even on expeditions. She was extremely good at communicating with people, often in her native Swedish, and making people accept and trust her. This was valuable when travelling and collecting in places where no foreigners normally ventured.

FIGURE 9. Ebba and René Malaise (in the middle) having a picnic with friends on the island Ingarö outside Stockholm in July 1934. Photographer: unknown. Photo from the Malaise archive at the Department of Entomology, NHRS.

Around Christmas time in 1933 Ebba and René Malaise (Fig. 10) left Stockholm for an expedition to the valleys of the eastern Himalayas, more specifically Burma and its surroundings. The main objective for both was to collect insects. Ebba also intended to collect ethnographic items.

Malaise had noticed that insects coming into his tent were attracted to the light and climbed to the top of the tent instead of searching for the entrance. Based on this observation he constructed the prototype of the tent-like Malaise trap, in which the insects are led from the top of the tent to a bottle of alcohol (Fig.14). The Malaise trap has become the world's most commonly used type of trap for sampling winged insects. The paper describing the idea behind and the construction of the trap was published later (Malaise 1937). A small number of the traps were made in a sewing shop in Yangon (Rangoon) in 1934 and tested for the first time during the Burma expedition.

During the first three and a half months their base camp was at Kambaiti, 2000 meters above sea-level and only five kilometres from the Chinese border. The area was populated by head hunters, and during the year when the Malaises were there about 40 people vanished in the close surroundings, although the villagers of Kambaiti claimed to have abandoned the custom of headhunting. They lived by burning the forest and growing corn for a few years before the jungle was allowed to grow again. The men carried out the burning and cutting of trees and perhaps some opium smuggling, whereas the women tended the crops as well as taking care of the household. For

hunting, the men used knives and crossbows. Sometimes for larger game the arrows were tipped with the poisonous root extract of the plant *Aconitum* (Ranunculaceae).

FIGURE 10. Ebba and René Malaise in unknown location in February 1932. Photographer: unknown. Photo from the Malaise archive at the Department of Entomology, NHRS.

On one occasion Malaise avoided being shot by armed opium smugglers by turning his back to the armed men, sweeping his insect net and hoping that rumours about the presence of the harmless insect collectors had reached them. Fortunately they left him alone.

René and Ebba brought simple medical equipment to Burma. This helped them maintain good relations with the locals. For instance, they had eye drops that would easily cure a bad eye infection. Rumours about their medical skills started spreading. In return, people helped them collect insects. René and Ebba also traded animals and household items for sweets, safety pins and sometimes money (Fig. 11).

The translator they had hired did not know all the local languages, and thus they were forced to rely on sign language to communicate with some of the locals. In many cases this worked surprisingly well. Ebba talked them out of a potentially dangerous situation with armed men on the Chinese side of the border where they had ventured to look at national costumes and jewelry and collect insects. She took out a butterfly box and showed it to the men, speaking Swedish all the time!

The monsoon came with heavy rains, forcing them to leave Kambaiti in order to save the collection and also to allow them continue their work. The collections were sent to Rangoon, and René and Ebba went on to the south-east of the country to the Shan States, inhabited by a number of peoples and clans, each with their own languages and traditions.

A part of the territory is calcareous high steppe surrounded by mountains. The valleys are about 1000 meters above sea level and have an ideal climate for growing crops such as strawberries, potatoes, bananas, mangos, pine-apples, mandarins and oranges.

The couple visited the Intha people living around and even on Lake Inle. This lake also supports a number of endemic animal species. The Intha people are well known for a special rowing style called leg rowing, in which the leg is wrapped around the long oar and the whole body is used in a wave-like motion to move the boat through the

reed-filled water. Some of the larger canoes can have as many as 66 rowers. The Intha build bamboo houses on poles in the water and mainly live on rice that they grow and fish caught in the lake. They visited a number of other tribes in this region and the interesting meetings are vividly described in Malaise's travel report (Malaise 1936).

FIGURE 11. Ebba Malaise handing out sweets to children in Kambaiti, Burma in exchange for insects. Photographer: René Malaise, 1934. Permission to use photo is granted from the Museum of World Culture.

The range and quantity of material collected is impressive. The ethnographic collections were very extensive and included items that probably have never been collected before or ever since. Most of these objects were donated to the Gothenburg Museum (Fig. 12), with some duplicates going to the Ethnographical Museum in Stockholm. The ethnographic materials were donated to Gothenburg rather than to Stockholm partly because the expedition was sponsored by private persons from Gothenburg and because a friend of Malaise, Walter Kaudern, was working as a senior curator at the ethnographical department of Gothenburg Museum. This museum was later divided into several independent museums, for instance Gothenburg Natural History Museum and the Ethnographical Museum, which together with three other museums in Stockholm united as the Världskulturmuseet (Museum of World Culture) in 1999.

The botanical material from Burma contains about 600 sheets of pressed plants, mainly from the Chinese border and the Shan States. In addition, about 100 birds and mammals were skinned. Some rarities are found especially amongst the mammals preserved in alcohol. A small panda (*Ailurus fulgens* F.G. Cuvier) was among the vertebrates collected. About 1700 freshwater fishes of considerable scientific value were collected and Malaise encouraged his contacts in Burma to send additional material to the NHRS. This material constitutes one of the best collections of Burmese fish in the world and is the foundation for research that is still ongoing at the NHRS. Hialmar Rendahl initiated studies of the material (Rendahl & Vestergren 1941, Rendahl 1943, 1948). Since then numerous taxa have been described and revised based on Malaise's material, and quite recently two new species of badis fish, *Badis kyar* and *B. pyema* were described by Kullander and Britz (2002). Myanmar is a hotspot for freshwater fish, rich in endemic species that are highly at risk due to deforestation and dam building.

About 100 herptiles were also collected. Lars Gabriel Andersson worked on the amphibian material and described a new frog species, namely *Amolops* (as *Rana*) *longimanus* (Andersson, 1939), whilst Hialmar Rendahl dealt with the reptiles (Rendahl 1937).

FIGURE 12. Ebba and René Malaise with some of their donation of ethnographical items from Burma outside Gothenborg Museum (now Museum of World Culture) after returning from Burma. Photographer: The newspaper Morgonbladet, 1935. Permission to use the photo granted by the Museum of World Culture.

Malaise's main interest nevertheless remained with the insects, and the phenomenal success in collecting them during the Burma expedition is certainly a result of the use of Malaise traps. He collected more than 100000 insects including 10000 butterflies, more than 10000 beetles and 4000 sawflies. About 75 % of the sawfly species were new to science and probably a similar number of new species occurred in the other insect groups. Most primary types are kept at the NHRS. As soon as mounting of a group was completed, the specimens were sent to specialists throughout the world for identification and description.

The return of the Malaises from the Burma expedition was front page news in Sweden, and Malaise spent considerable time lecturing on the Burma expedition. His lectures were much appreciated, as he could be very humorous and showed magnificent photos.

Research and curatorial work at the Swedish Museum of Natural History

Being well known made it much easier for him to raise funds for his next expedition, that was scheduled to leave Stockholm for Sri Lanka (Ceylon), South India and the Himalayas on November 4th 1939. However, World War II put an end to the plans and the expedition to Burma turned out to be his last major journey, if smaller trips to museums around Europe are disregarded.

Malaise had been loosely connected with the Swedish Museum of Natural History ever since he started collecting, and he worked there from time to time between 1915–1918 and 1931–1935. However, it was not until 1935 that he obtained a more permanent position as a museum assistant in the Department of Entomology. He held this position (with a promotion in 1939) until his retirement in 1959 often stepping in as head of the department. He was a member of several organisations and associations like the Swedish Association of Scientists, Minerva (an association for science and popular science writers) as well as the national and local entomological societies. He was especially active in the Entomological Society of Stockholm, of which he was a member between 1914 and

1978, and also held offices such as board member and editor of the journal Entomologisk Tidskrift. At the meetings, he often demonstrated new traps and rearing apparatus developed through his constant effort to improve his collecting techniques. At a meeting in November 1939, he announced that he had caught several rare insects in one of his automatic insect traps which was put up behind the museum, namely the endangered clearwing moth *Synanthedon* (as *Sesia*) *vespiformis* Linnaeus and the sawfly *Blasticotoma filiceti* Klug previously only known from Scania (Ahlberg 1940). When he heard about swarming stag beetles (*Lucanus cervus* Linnaeus) in Storängen close to the museum, he immediately initiated a detailed inventory of the beetle's occurrence in the Stockholm region.

During his employment at the museum, he mounted part of the enormous material he had collected during his travels. He was responsible for curating large parts of the entomological collections. Other duties included sending out loans and taking care of most of the international correspondence, as he, apart from Swedish, was fluent in German, English, French and Russian.

René Malaise apparently had a tendency to become involved in dramatic events. He would not remain silent about injustice and gladly went to the newspapers when something was on his mind. There are numerous newspaper cuttings in the museum archives about a feud between him and his colleagues on one side and their boss Professor Lundblad on the other. This culminated in a letter to the king of Sweden. Malaise complained in correspondence and in public about the museum's lack of technical staff necessary to mount all the specimens within a foreseeable future. He remarked that this could probably not be accomplished within 10 years, even though the British Museum mounted a quarter of the specimens in fulfilment of its commitment as one of the sponsors of the expedition. He felt there was a great risk that the specimens might be lost to pests or that species could be described by other authors. Despite his reputation as an odd character, Malaise's correspondence with entomologists across the world during the post-war years 1946–1948 gives a picture of a person who was not only strongly devoted to the insect collection, but also cared a lot about his researcher friends in countries which were struck hard by the war. He and Ebba kept sending food parcels and other necessities to them. His colleague at the Department of Entomology, Felix Bryk, described him in a newspaper contribution celebrating Malaise's 50th birthday as frank and fearless, though at the same time shy and reserved, but first and foremost the best of friends. Tord Nyholm, another colleague, appreciated Malaise's enthusiasm, optimism, generosity and kind heart.

Atlantis

Malaise's ideas about the sunken land Atlantis gave him massive media attention in the 1950s, also in the international press.

During the later years of his career Malaise developed a companionship with Nils Hjalmar Odhner, an expert on molluscs at the invertebrate department at the museum. Odhner proposed the constriction theory in 1934 (Odhner 1934). This tries to explain how mountains and valleys are formed by vertical movements of the earth's crust as a result of the high pressure caused by temperature variations between the core of the earth and the cold waters of the oceans. The theory states that the earth's crust is made up of valves that expand or are constricted depending on temperatures, but that these valves do not move relative to each other, unlike the plates in the nowadays generally accepted theories of continental drift and plate tectonics. It probably did not make matters easier that the new head of the entomology department, Lars Brundin, was a pioneer of ideas on phylogenetic biogeography, in which continental drift is an important factor in explaining distribution patterns of organisms.

Malaise believed he could prove that parts of the mid-Atlantic ridge had been above sea level in the recent past and had subsequently sunk, thus verifying Plato's myth of Atlantis. His evidence consists partly of composition of the sediments taken from both sides of the presently more or less submerged mid-Atlantic ridge. Sediments forming the northern parts of the ridge contain humus, which probably can only have been produced above water, whilst sediments from the southern Atlantic ridge contain remains of freshwater diatoms. In his PhD thesis, published in 1945 as a lengthy paper which is arguably Malaise's most important single entomological publication, he explains the distribution of plant wasps by the existence of land bridges (Malaise 1945). These ideas are further refined in the books "Atlantis, en geologisk verklighet" and "Atlantis: a verified myth" (Malaise 1951, 1973). His interest in geology and biogeography was induced as he was contemplating the fact that a sawfly in Patagonia, Argentina, had its closest relative in Europe. Malaise believed that this was better explained by a land bridge between the continents than by continental drift. Apparently he did not consider that sawflies in southern Argentina and Chile have just as close, if not closer counterparts in North America.

Malaise's books got a mixed reception, but Odhner's and Malaise's ideas about how the movements of the crust occurred were largely rejected by geologists and geophysicists who claimed that the temperatures found at the crust of the earth could not possibly cause such abrupt movements. It is however clear that areas that are now submerged have been above sea level in the recent past. An example is the Doggerland at the present Dogger Banks near the coast of the Netherlands and Belgium, where remains of forests, mammoth tusks and stone tools of hunters have been found in areas now submerged. Iceland and the Azores are parts of the mid-Atlantic ridge that are presently above sea level and therefore the idea of a larger mid-Atlantic island may not be entirely unlikely.

Retirement

After his retirement Malaise's focus apparently shifted even more towards geology and old paintings (Malaise, 1961) and after his last publication on sawflies (Malaise, 1964) he seemed to have rather suddenly decided to stop working. He abruptly terminated long-running correspondence and exchange of material with colleagues, left some work unfinished and did not return large amounts of material borrowed from museums around the world (Smith, personal communication).

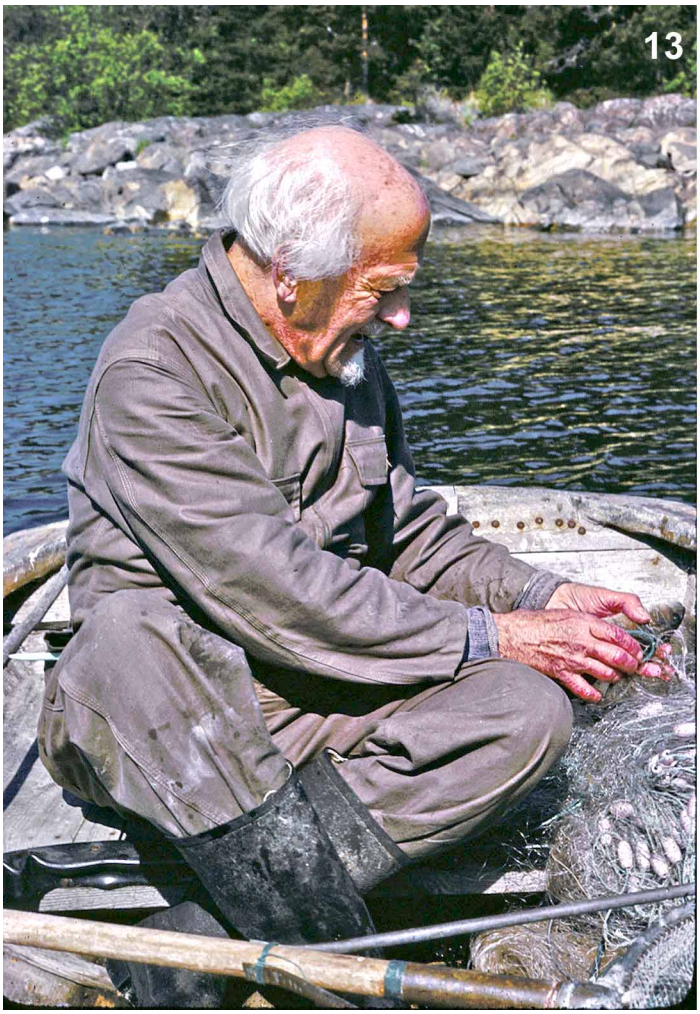

FIGURE 13. René Malaise at 85 years fishing with a net, close to his summer house at Simpnäs in the Stockholm Archipelago. Photographer: Torbjörn Kronestedt, NHRS, June 10th, 1976.
FIGURE 14. One of the original Malaise traps erected on the island of Öland in 1980. Photographer: Lars-Åke Janzon, NHRS.

He developed a strong interest in art during the post-war years, during a time when many important pieces were circulating in Europe. He bought older European paintings at auctions, flea markets and antique shops in London and Stockholm. There were rumours about the authenticity of a putative Rembrandt, but Malaise generally claimed that the paintings he owned were the originals and their pendants in the art museums and galleries were

fakes. He could be quite convincing, but at least in some cases he was proved to have been wrong. Malaise's art collection was donated to the Art Sciences department at Umeå University in the 1970s.

After his travelling days were over, he bought a summer house at Simpnäs on the island of Björkö in the Stockholm archipelago. This property was later donated to a foundation associated with the Riksmuseets vänner (The friends of the Swedish Museum of Natural History). This foundation also manages Ebba and René Malaise trust fund, which funds entomological research. During the later years of his life, he apparently spent more and more time at Simpnäs (Fig. 13), where a heart attack put an end to his long and exciting life on 1st July 1978.

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