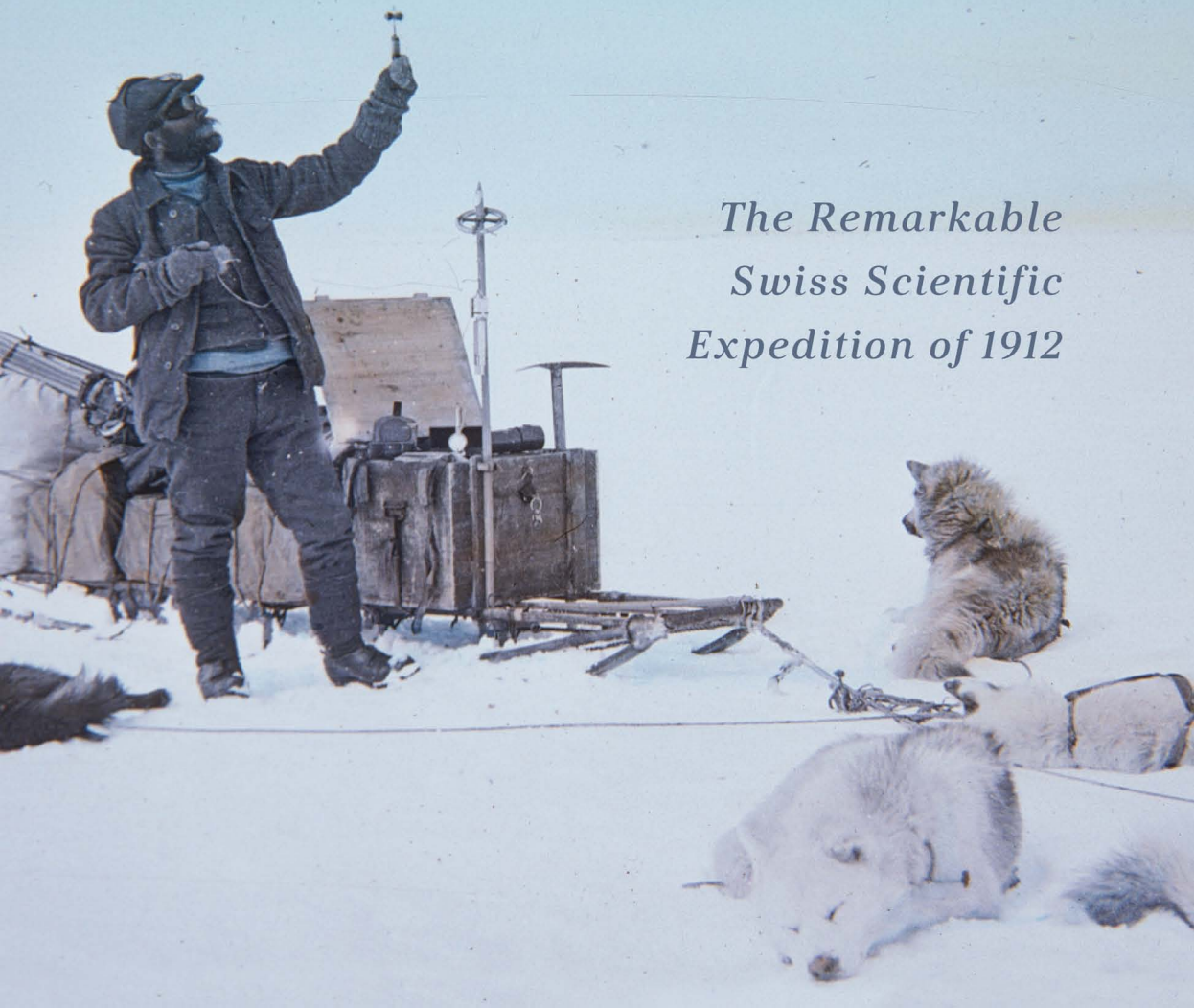
ACROSS GREENLAND'S ICE CAP

ALFRED DE QUERVAIN

The Remarkable Swiss Scientific Expedition of 1912



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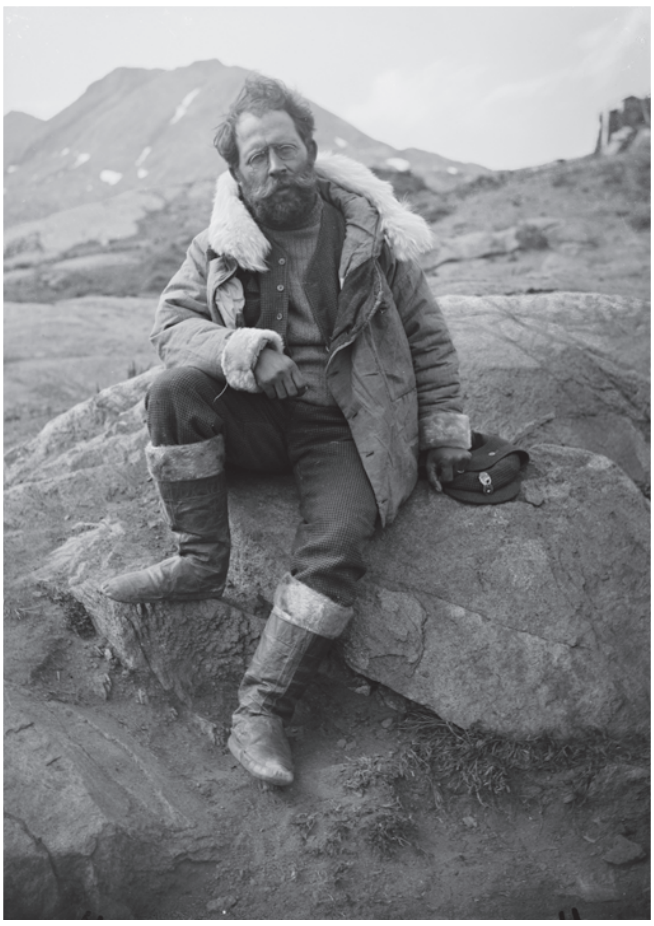

Alfred de Quervain in Greenland, 1909.

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The Remarkable Swiss Scientific Expedition of 1912

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This book is dedicated to the memory of Konrad Steffen (1952–2020)

Like Alfred de Quervain, Konrad Steffen was a pioneer of Swiss polar research. The coloured photographs of de Quervain's expedition, as published here, document a voyage through space, giving us a first glimpse of Greenland's cold, harsh beauty. For his part, Koni travelled through time on the Greenland ice sheet by researching its secrets for more than thirty years. His work opened the eyes of the world to the ice cap's vulnerability. Swiss Camp, the year-round monitoring station established by Koni, was located on the ice sheet near Ilulissat, from where de Quervain started his expedition in 1912. The data collected there afforded new insights into the physics of the ice sheets and the water flow in their deep interior. In recent decades, the measurements increasingly reflected the ice sheet's accelerated melting due to global heating. Koni raised an authentic and persuasive voice of warning against the dramatic environmental changes for which human activity is responsible. First and foremost, he was a dedicated scientist and a generous leader, a dear colleague and friend, whom we tragically lost on the Greenland ice cap.

Thomas Stocker
Professor of Climate and Environmental Physics, University of Bern

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PREFACE TO THIS EDITION

MARTIN HOOD

The year 1912 came in as a grand culmination of the heroic age of polar exploration. In January, a triumphant Roald Amundsen returned to his ship after attaining the South Pole. Just weeks later, Wilhelm Filchner had a narrow escape when his camp drifted out into the Weddell Sea on an errant iceberg.

In March, returning from the South Pole, Captain Scott and his companions reached the camp that would become their last resting place. That same month, all unaware of this tragedy and with minimal experience of polar travel, four young men left Zurich by train, fired with the ambition of making the first west-to-east crossing of Greenland's ice cap.

Few outside Switzerland have heard of this expedition or its leader, the meteorologist Alfred de Quervain. One reason was its very success. In just thirty-one days, the party crossed 640 kilometres of untracked snow and ice. Nobody died, fell into a crevasse, or suffered frostbite.

They didn't even run short of food, unlike Fridtjof Nansen's party during the first crossing of Greenland back in 1888. And while Nansen, travelling from east to west, had to take a shorter, more southerly line than planned, the Swiss expedition reached the opposite coast more or less on schedule.

Yet this was more than just a well-executed feat of Arctic adventure. On the way, de Quervain and his colleagues collected scientific data that, a century later, are more important than ever. Today's researchers still refer to the Swiss expedition's glacier survey and the height profile they made of the ice sheet while crossing it.

Like today's expeditioners, de Quervain struggled to pay off the expedition's debts. Some of the money came from subsequent lecture tours around Switzerland, showing hand-tinted lantern slides. (A selection of these illustrations

appear in this book.) He was also quick to write up a popular account of his adventures, publishing it in 1914 as *Quer durchs Grönlandeis: Die Schweizerische Grönland-Expedition 1912/13*.

Long after de Quervain's early death, his book was translated in the early 1980s by his daughter, Elisabeth de Quervain Schriever, and her husband, William, who had settled in Canada. As they explain in their original foreword (included this edition) to the unpublished manuscript, the Schrievers wanted to give their three children "a glimpse of a moment in the life of your grandfather."

It is this translation that we present here, in time to mark the 110th anniversary of de Quervain's expedition. The translation includes the two additional chapters that appeared in the 1914 edition. These were contributed by the scientists Paul-Louis Mercanton and August Stolberg, who remained on Greenland's west coast to research its glaciers and meteorology while de Quervain's quartet crossed the ice cap.

For this new edition, we have added an introduction outlining how de Quervain came to plan and execute his Greenland crossing. Glaciologists Andreas Vieli and Martin Lüthi of the University of Zurich weigh up the expedition's scientific results and explain why they remain significant to this day.

We hope this book will give you a glimpse of a remarkable adventure in science.

ACKNOWLEDGMENTS

Appropriately, work on this latest edition of Alfred de Quervain's book started during *Greenland 1912*, an exhibition at the Swiss National Museum in Zurich. Geoff Spearing, who worked on the exhibition's literature, let me know of Elisabeth and William Schriever's unpublished translation of de Quervain's 1914 text. This draft, kindly made available by the exhibition organizer, Dario Donati, has been a pleasure to edit; any remaining errors or omissions are the responsibility of the editor – namely, myself.

Then followed a pleasant supper with Daniel Meili, a grandson of Alfred de Quervain, who gave the family's blessing for this book project. Without Daniel's support and encouragement, and that of the other descendant families, this book could never have been published.

The same is true of Heike Hartmann of the ETH-Bildarchiv, part of the Swiss Federal Institute of Technology's library, and her colleagues, who left no effort unspared to locate, organize, and refine the image files from the original hand-tinted photographs for this edition. The book then found the ideal publisher, in the person of Richard Baggaley of McGill-Queen's University Press. Both the book's text and its selection of images have benefited immensely from his enthusiasm and judgment. I would also like to thank Maureen Garvie, whose unobtrusive yet expert copyediting lent wings to the flow of the text, and managing editor Kathleen Fraser, whose time discipline and high standards in producing this book matched those of the Swiss expeditioners themselves.

The book's introduction owes much to the pioneering work by William Barr, professor emeritus of the University of Saskatchewan, who was the first to present the 1912 expedition's achievements to the English-speaking world.[1]

Invaluable for setting matters in a wider cultural context was Lea Pfäffli's paper on Swiss scientific research in Greenland during the run-up to the First World War.[2] Key additional details for the introduction came from an appreciation of de Quervain's scientific career by Stefan Kern of the University of Hamburg.[3]

Meanwhile, Stephan Orth, grandson of expedition member Roderich Fick, provided a fresh and lively point of view in *Opas Eisberg* (Grandpa's Iceberg), published in 2015. The book is based on Fick's journal and Stephan Orth's own visits to Greenland to trace the expedition's route.[4]

We are also most grateful for an assessment of the expedition's scientific results to the glaciologists Andreas Vieli and Martin Lüthi of the University of Zurich, whose researches have built on the 1912 western party's survey of the Eqip Sermia glacier.

The expedition's legacy includes its trove of hand-coloured glass lantern slides. That we have been able to publish such a broad selection here is due to a generous subvention from the Swiss Polar Institute, the interdisciplinary body established in 2016 to coordinate the country's research programs in the Arctic and Antarctic regions, and the Swiss Committee on Polar and High Altitude Research (SKPH) of the Swiss Academies of Arts and Sciences.

As the researchers working with the SKPH and the Swiss Polar Institute are the true heirs of the scientific traditions established by de Quervain, their support has been particularly meaningful for all involved in the book's production. We would particularly like to thank Basil Fahrlaender and Christoph Kull for their unfailing encouragement for this project.

Martin Hood, Academic Alpine Club of Zurich
Zurich and Oxford, 1 August 2021

NOTES

1 Barr, "Alfred de Quervain's Swiss Greenland expedition."

2 Pfäffli, "Das Wissen, das aus der Kälte kam."

3 Kern, "Alfred de Quervain."

4 Orth, *Opas Eisberg*.

INTRODUCTION

MARTIN HOOD

After sledging all day through snow squalls or the ice cap's glare, the four men would unwind in their tent by having "learned conversations on Mach, Kant, Hume, and Schopenhauer." Even at rest, the 1912 Swiss expedition to Greenland was "a serious undertaking."

Every morning, an hour or so was dedicated to science. Inside the tent, the leader would boil up his hypsometer, an accurate way of gauging their height above sea level. Outside, a tall colleague used a theodolite to measure slope angles, whistling as he worked, a habit that intensely irritated the expedition leader.[1] Between the sledges, the expedition doctor attended to the dogs.

Meanwhile, the expedition's youngest member was shooting the sun through a sextant. All their lives depended on his position-finding. If they didn't find a pre-placed supply depot on Greenland's sketchily mapped east coast, no one would ever hear of them again.

None of the four explorers could have suspected that, a century hence, scientists would still be relying on the precision of their measurements.

To explain how four young men from Zurich crossed Greenland in the summer of 1912 requires a backwards glance into the history of meteorology and how that nascent science shaped the life of the expedition's leader.[2]

In hindsight, what took Alfred de Quervain to Greenland was the stratosphere. Nobody yet suspected its existence when he was born on 15 June 1879, the son of a rural pastor, at Uebeschi, a small village about thirty kilometres south of Bern, Switzerland's capital. By the time he reached his early twenties, de Quervain would be helping to bring about its discovery.

After studying geophysics and meteorology in Bern, de Quervain went to Paris to help Léon Teisserenc de Bort investigate the upper atmosphere. This was

in 1898, the year that the French meteorologist started sending up instruments under hydrogen-filled paper balloons of his own design. These soundings showed that air temperatures stopped falling at a point about eleven kilometres above the ground. This finding was later billed as "the most surprising discovery in the whole history of meteorology."[3]

For that reason, Teisserenc de Bort proceeded with caution. Before he felt able to confirm his results, he spent several years establishing how they varied in altitude with latitude and the seasons. Some of these observations would be made by de Quervain.

In late 1900, the twenty-two-year-old de Quervain was despatched to St Petersburg and Moscow. There he spent the winter sending weather balloons swaying up into the frigid night skies. On his return journey, the suitcase containing his results was stolen, but fortunately he was able to recover the precious notebooks, which were worthless to the thief.

Returning to Bern, de Quervain completed his doctorate in 1903. Building on his apprenticeship in Paris, his dissertation described how temperature boundaries tend to dome upwards in the winds flowing over the Alps.

This work led to a post in Strassburg, then a Germany city, under Hugo Hergesell, chairman of the International Commission for Scientific Aviation (the Internationale Kommission für wissenschaftliche Luftfahrt, founded in 1896). As secretary to this body, de Quervain helped to coordinate and standardize the launches of weather balloons worldwide. In 1905, he devised an improved theodolite for tracking them.

It was in Strassburg that de Quervain first met August Stolberg, a colleague at the International Commission. An expert photographer and aeronaut, Stolberg would twice accompany his Swiss friend to Greenland. Soon de Quervain qualified as a balloon pilot himself. Having taken his *habilitation*, a postdoctoral qualification, he returned to Switzerland in 1906 to serve as adjunct-director of the Swiss Central Meteorological Office, the forerunner of the country's present-day weather forecasting agency. He would stay in this post, supporting the agency's director, for the rest of his career.

Meanwhile, his mentors were continuing to send up pilot balloons in northern climes. Professor Hergesell launched them over the Arctic Ocean in 1906. The following year, Teisserenc de Bort embarked on a lengthy expedition to Kiruna in Lapland for the same purpose.[4] It was in 1908 that the French scientist coined the word "stratosphere" to describe the upper air above the tropopause, that remarkable temperature boundary.

PRELIMINARIES: 1909 EXPEDITION TO WEST GREENLAND

These projects must have renewed de Quervain's appetite for high latitudes. Going north to study the upper atmosphere made sense. The stratosphere dips lower in the far north, and if balloon soundings were conducted in Greenland, they would add to the knowledge of how winds circulate around the pole.

These arguments helped to convince potential sponsors. Funded in part by Count Ferdinand von Zeppelin, the founder of the eponymous airship company and a close confidant of Hugo Hergesell, de Quervain set off on his first expedition to Greenland in the spring of 1909. He was accompanied by August Stolberg and Ernst Bäbler, a botanist from Zurich. On the last part of their journey up the west coast, they travelled in the company of the Swiss geologist Arnold Heim.

Some weather balloons were duly launched from Godthaab on the island's southwest coast, filled with hydrogen from cylinders furnished by the Zeppelin works at Friedrichshafen.[5] More striking than the meteorology, though, was the travellers' first encounter with Greenland's original inhabitants. As de Quervain recorded, "Up there, what one finds most remarkable are the people … We Europeans speak of Greenlanders as if they were well-behaved children, but how they manage to live in those conditions is no child's play, and it's only natural that they see themselves as different ... and on journeys they feel responsible for us as one would for a non-adult."[6] Inspired by the native "kayakmen," de Quervain soon procured one of their "genial vessels" for himself and started practising in it. A more serious study of Inuit culture would have to wait, although Bäbler did collect some skulls from a grave site to take back to Zurich. The expedition then made its way further north to inspect a glacier previously surveyed by Erich von Drygalski in 1892–93.

The German geophysicist was not de Quervain's only inspiration. He had also equipped himself with two sledges, complete with sails, which he had ordered from Norway on the pattern established by Fridtjof Nansen for his pioneering traverse of Greenland's ice cap in 1888. However, Nansen had started and finished his traverse further south than planned, leaving the central reaches of the ice cap unexplored.

Since then, Robert Peary and other sledge parties had explored Greenland's fringes, but nobody had again ventured across the ice cap from coast to coast. Could the Swiss expedition complete what Nansen had left unfinished? The ambition was there. With Stolberg and Bäbler, de Quervain started out from a camp on the Sermilik Fjord north of Uummannaq on 9 July 1909, man-hauling the sledges as Nansen had done. Soon they found that they had underestimated the challenge.

So slow was their progress over the pitted and crevassed ice that, on 24 July, they decided that Stolberg would stay with the tent to make accurate altitude readings, while de Quervain and Bäbler would dash eastwards for one more day, unburdened by the sledges. In the event, the two men reached a height of 1,700 metres before reluctantly turning back: "One last time, we swept our gaze across the entire expanse of ice, lingering longest in the east. To have to turn back now that we had a clear path, when we felt so strong and enterprising, this was bitter, bitter. But we would return! Then we turned and skied through the evening and night."

The three expeditioners returned to the ice cap's edge on 1 August, the day on which the Swiss celebrate the founding of their confederation, and spent the next two weeks surveying and photographing the glacier studied by Drygalski. De Quervain's bid to follow in Nansen's ski tracks, albeit on a more northerly track, had lapsed into a mere reconnaissance. But the lessons would be absorbed.

Back in Switzerland, de Quervain took on responsibility for Switzerland's first permanent seismological observatory. This was sited at Degenried, on a hilltop above Zurich. He also continued to make balloon flights, often for scientific ends. In October 1910, he ascended from Schlieren, near Zurich – after filling the balloon with coal gas from the municipal gas works – and flew at up to 2,800 metres above the morning fog before landing near Olten. On board was the physicist Albert Gockel, who used the flight to investigate what would later be recognized as cosmic rays.

PREPARATIONS FOR THE 1912 EXPEDITION

The following year was even busier. De Quervain married Elisabeth Nil, a teacher from the French-speaking Jura region north of Bern. Meanwhile, preparations for his second expedition moved up a gear. This enterprise would be all-Swiss, at least in its funding. After a range of scientific institutions, commercial firms, and private individuals had chipped in, the *Neue Zürcher Zeitung* newspaper came up with ten thousand Swiss francs, about a third of the total costs.

Funding and time constraints meant that this would be a lightweight expedition. Especially for the traverse, a small party must suffice. First to be selected was Hans Hössli, a recently qualified doctor who had worked as an assistant to de Quervain's older brother Fritz, a surgeon working in Basel. Hössli's record as an expert alpinist and exponent of "guideless climbing" must also have recommended him.

Next to present himself was Roderich Fick, a German-born architect with many practical skills. Knocking on de Quervain's door, he glimpsed a slip of

paper bidding him to "please keep your visit short." This brusqueness would set the tone for much of their future working relationship. And with Fick came his friend Karl Gaule, also of German nationality, who had studied engineering in Zurich. These four would make up the traverse team, the so-called eastern party.

In addition, a supporting group was signed up. This comprised de Quervain's companion from the 1909 expedition, August Stolberg, as well as Dr Paul-Louis Mercanton of Geneva, a glaciologist and meteorologist, and Dr Wilhelm Jost of Bern, a glaciologist and accomplished photographer.

After helping the traverse party ferry their supplies onto the ice cap, this "western party" would spend the summer on the west coast, studying its weather and glaciers. Mercanton and Jost would also overwinter at Morten Porsild's Arctic research station at Godhavn, to continue their weather observations through the Arctic night.

As in 1909, the expedition would travel on scheduled steamer services, chartering a ship only for the last stage of their approach. This would keep costs down. Moreover, the traverse party would avoid overwintering in Greenland, as Nansen had been forced to do. And this, in turn, meant travelling fast – with dogs pulling the sledges.

De Quervain was well aware that the dogs were a weak point in his planning. Nobody in his team knew how to drive them. To perfect this vital skill, he had budgeted an interval of just a few weeks on their way up Greenland's west coast. Morten Porsild dismissed this scheme out of hand: "What would be your reply be to a good citizen of Copenhagen if he told you he would be travelling to Switzerland to climb Mont Blanc without a guide and, for practice, ascending the Blocksberg [a minor eminence in Germany] en route? … forget about the dogs; after six weeks of training at Holsteinsborg (!!) you will achieve nothing but anguish and unnecessary stress."[7]

Steamer schedules and summer sea-ice conditions added to the risk. These dictated that the Swiss expedition, unlike Nansen's, would start on the west coast, with its string of settlements, and finish on the sparsely populated east coast. But before they could reach the island outpost of Angmagssalik (today's Tasiilaq) on the east coast, they would have to find a pre-placed depot containing extra food and their kayaks. And such maps as existed could not be trusted.

De Quervain later admitted that they'd taken great risks. "But, on the other hand," he wrote, "so exact were we in devising and working out our preparations that perhaps some interesting but avoidable situations did not occur. For such would have been sensational and not to the credit of a serious undertaking."

Thus, for example, he sent Fick and Gaule on a winter foray to the high Engadine Valley to test the tent and supply a written report on the results. As the

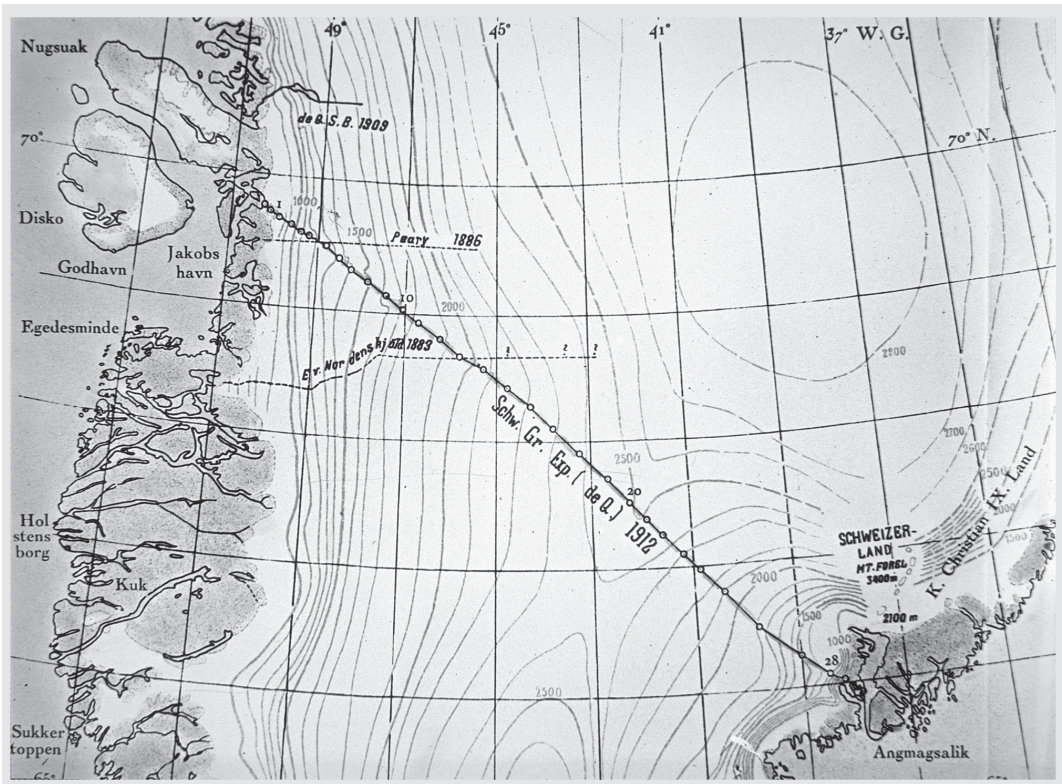

Figure 1

Map showing expanded view of the routes of the 1909 and 1912 expeditions.

Source: *Quer durchs Grönlandeis: Die Expeditionen 1909 und 1912/13.*

expedition's handyman, Fick also lit up a Nansen stove in his home workshop to find out how much fuel they would need, proved tent fabrics with a spring balance, and hand-built three kayaks. The first try at kayaking, on Lake Zurich, ended ignominiously when Gaule and Fick capsized.

The expeditioners left Zurich in late March 1912. In his diary, Roderich Fick recorded that, to reassure his family, he had likened the trip to spending half a year in military service, a duty that he'd already discharged in Germany. "But privately," he added, "I did have some fears or worries, as I thought our enterprise was rather hazardous."

There was reasonable cause for concern. Hardly any recent expedition to Greenland had escaped scot-free. Robert Peary had lost eight toes in 1899 on his third expedition, after breaking a leg on his second. Even fresher in memory was the Denmark expedition to Greenland's northeastern coast in 1906–08, from which its leader Ludvig Mylius-Erichsen and two companions had failed to return.

Taking ship in Copenhagen, the expedition reached Holstensborg in late April, leaving themselves less than a month to learn how to drive dogs. Progress was slow at first – the dogs' everyday savagery appalled the Swiss tyros, and learning how to wield a whip like a Greenlander hurt them more than it did the animals. And then de Quervain had a stroke of luck. His expedition doctor, Hans Hössli, turned out to have an aptitude for both dog handling and repairing the mission-critical sledge gear.

THE CROSSING

By 20 June, the expeditioners had hauled their sledges and supplies up to the ice cap. De Quervain felt himself at home: "Strange as it may seem, for me this cold ice felt neither sterile nor forbidding. It seemed quite familiar to me." A day or so later, the traverse party parted from their supporting group and headed into Greenland's unknown interior.

On 23 June, the expedition almost met its nemesis. Two of the three sledges, together with their dogs and drivers, crashed through the thin ice of a frozen lake. Only Hössli and the lead sledge escaped this "summer bath." Fortunately, the sleeping bags and the matches had been packed in waterproof bags or tins. One of the all-important chronometers was waterlogged, but de Quervain managed to get it running again.

After this near-disaster, the journey picked up pace. On the smoother snows of the interior, they started to exceed twenty kilometres day. And they settled

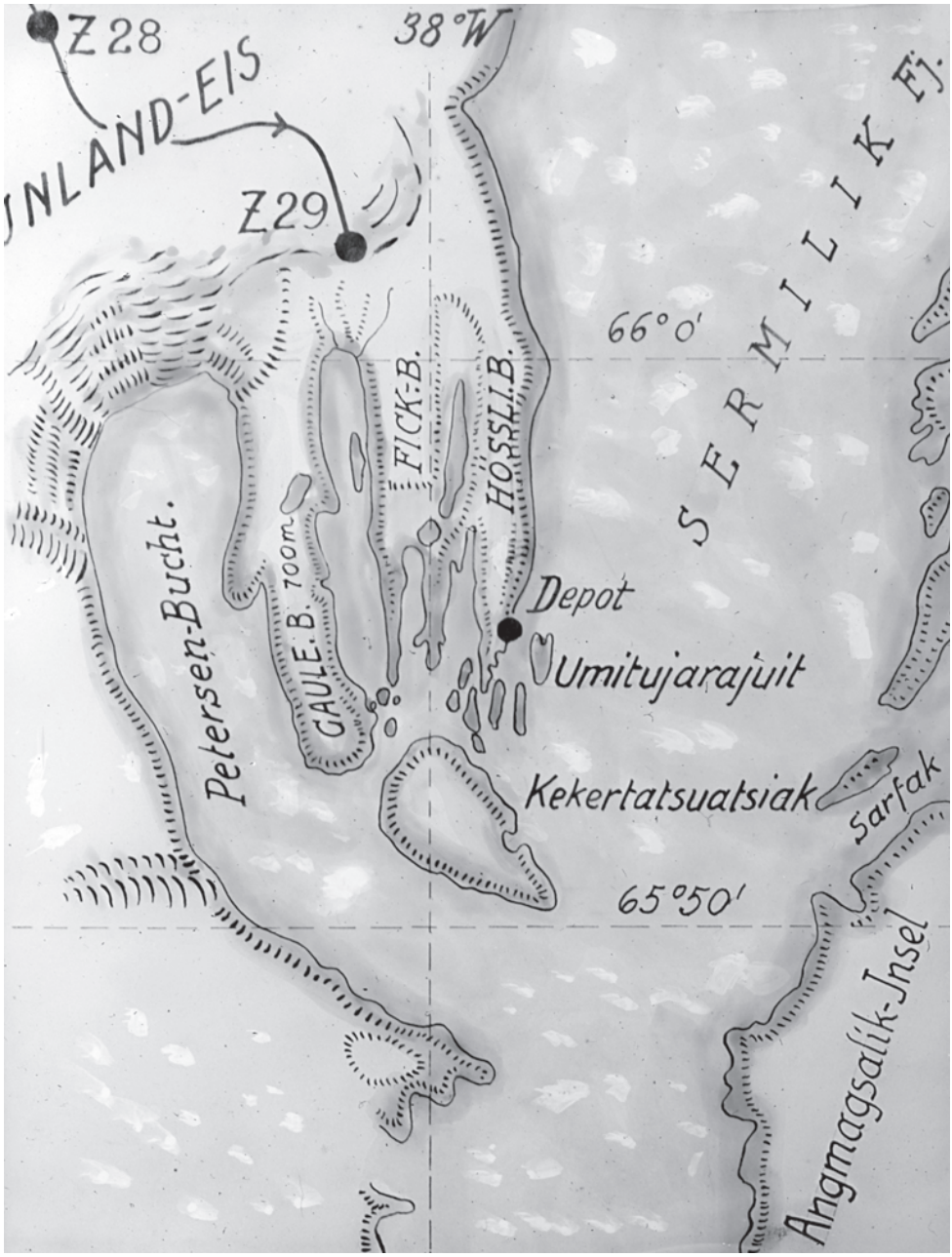

Figure 2

Sketch map of the depot's location on the east coast, 1912.

Source: de Quervain, *Quer durchs Grönlandeis: Die Expeditionen 1909 und 1912/13*.

Figure 3

Route of the 1912 expedition's ice cap crossing, also showing sea approaches and route of Nansen's 1888 crossing. Source: de Quervain, *Quer durchs Grönlandeis: Die Expeditionen 1909 und 1912/13*.

into a routine. As de Quervain was to recollect, "Never in my whole life had I been even remotely as well-organized as I was there on the ice cap." Having mastered the arts of travelling and survival, they could allow more time for scientific observations, which they usually made before setting out in the morning.

On 13 July, their readings suggested that they'd passed over the ice cap's ridgeline, much further to the east than expected. In camp that evening, they ran up the flags of Switzerland and Bern on a sounding pole. And on 19 July, they sighted the mountains of the eastern coastal ranges.

Finding the all-important supply depot was not straightforward. When they reached the ice cap's edge, the coastal terrain spread out below bore no resemblance to their map. Leaving Fick and Hössli at a campsite, with instructions to slaughter most of the dogs for food, de Quervain and Gaule set out to find a way down to the coast. It took them three days to find the depot, and a further two to paddle the kayaks down the coast and then climb back up to their companions and descend to the coast again with the full team and sledges.

After two more days paddling along the coast, the expeditioners were in their tent when they heard voices. Rushing out, they encountered three "kayakmen," who may have been sent to find them. With their help, de Quervain himself reached the settlement of Angmagssalik on 1 August, the Swiss National Day. A few days later, boats were sent out to bring in the rest of his party. The first west-to-east traverse of Greenland's ice cap was complete.

THE RECKONING

"We can be satisfied with our scientific results," wrote de Quervain in October 1913. In listing the expedition's achievements in chapter 12 of this book, he first cites the "new profile across the seven-hundred-kilometre breadth of the island of Greenland, the longest and most accurate to date," with altitudes usually exact to within a few metres. In time, it would be one of the expedition's most enduring legacies to science. The second part of this introduction weighs up that contribution in more detail.

At the time, though, it may have been the meteorologists who made the most impact. In particular, by launching some 120 weather balloons through the Arctic winter, one possibly reaching the immense height of 39,000 metres, Jost and Stolberg overturned a fashionable theory of the time. Instead of the stable "polar vortex" of air circulation the model called for, they found that wind directions varied considerably.

SEQUELS

Back in Switzerland, de Quervain and Hössli embarked on a busy program of public lectures illustrated with lantern slides. Their takings went to pay off the expedition's substantial debts. Probably for the same reason, de Quervain brought out his expedition book with admirable celerity.

Hans Hössli too was prompt in writing up his observations. An article in the 1913 yearbook of the Swiss Ski Association deals with polar expeditions and their equipment. The Swiss Army, he suggested, might do well to adopt the *kamik*, a soft Inuit boot for snow work. In 1914, he married Gertrud Haerle, also a doctor of medicine, and two children came along in the next few years. Hössli published a scholarly article in 1914 on the craniological measurements of Inuit skulls, building on studies he'd made at remote settlements in East Greenland. His academic excursions did no harm to Hössli's professional career. In 1917, still in his early thirties, he was appointed medical director of the Universitätsklinik Balgrist in Zurich, a top orthopaedic hospital. But just eight months later, the young doctor was dead, a victim of the 1918–19 influenza pandemic.

The expedition's youngest member, Karl Gaule, published little or nothing about his Greenland experiences. Instead, he took up a post at the Aeronautical Institute at Aachen's technical university as an assistant to Theodore von Kármán, who would later be known as a father of modern aerodynamics.

When the Great War broke out, Gaule joined a snowshoe battalion in the Carpathian Mountains, winning the Iron Cross before being repatriated to Germany. From mid-1915, he continued to apply his engineering skills to aircraft development and, latterly, water turbines, until his early death in 1922.

For his part, Roderich Fick went out to the German Cameroon in 1914 to head up the public works department. As an officer in the colony's defence forces, he was then interned by the Spanish authorities, first in Africa and then in Spain. Fick whiled away his captivity by working up his unpublished memoir of the Greenland expedition. These reminiscences inform *Opas Eisberg* (Grandpa's Iceberg), a book published in 2015 by Stephan Orth, Fick's descendant, who visited Greenland twice to trace his grandfather's footsteps.

After Hitler came to power, Fick's talents found favour with the regime and even with the Führer. A series of architectural commissions led up to his appointment as an advisor on a project to remodel the Austrian city of Linz where Hitler had spent his youth.

Ironically, the Linz assignment marked the start of Fick's fall from grace with the authorities. Even so, this association and his party membership were

enough to earn him the postwar designation of "Mitläufer" (fellow traveller). Fick died in 1955, making him by far the longest-lived of the expeditioners.

THE LEGACY

After the expedition, Alfred de Quervain returned to his office at the Swiss Central Meteorological Office. He also continued to make balloon ascents. On occasion, these public and private activities flowed productively together.

In April 1913, for instance, a balloon lifted away from the playing field alongside Zurich's municipal gasworks. Accompanying de Quervain was the physicist Auguste Piccard, who was just then working towards his doctorate at the Federal Institute of Technology (ETH) in Zurich. As a balloonist in his own right, Piccard would later become the first aeronaut to reach the stratosphere.

The aeronauts carried with them an experiment on the balloon's gas temperatures, prepared with the help of Albert Einstein, then a recently appointed professor at the ETH and Piccard's supervisor.[8] But the apparatus was apparently not the main topic of conversation as the craft drifted southwards through the night. Instead, before landing the balloon at Buchs in the Rhine Valley, de Quervain and Piccard had roughed out the design for a new type of seismometer. To pick up weak subalpine earthquakes, they decided that the device would need a pendulum weighing more than twenty tonnes.

When installed at the Degenried observatory in 1922, this massive counterweight was assembled from shell case blanks loaned by the Swiss Army. A condition was attached: that, if war broke out, the metal blanks would be returned to the military authorities within forty-eight hours.

De Quervain also renewed his acquaintance with glaciers. In 1914, he surveyed the Claridenfirn glacier for the first time, initiating a series of measurements that would be repeated yearly up to the present day. Whether or not by coincidence, the spacious views of this gently sloping ice sheet in the Glarus Alps are curiously reminiscent of Arctic expanses.

Although de Quervain never returned to Greenland, a substitute locus for high-altitude research soon suggested itself. In the year he returned from the ice cap, the Jungfrau Railway was opened, after its engineers had spent more than a decade and a half blasting and tunnelling their way through the refractory limestone of the Eiger.

The project's founder and promoter, Adolf Guyer-Zeller, had always intended to support scientific endeavours at the Jungfraujoch but died before either the railway or a high-altitude observatory could be completed. It fell to de