

methodological study assessing the effectiveness of a variety of decontamination protocols for ice cores. A further challenge to biologic ice core researchers is the limited volume of sample that can be obtained following thorough decontamination, coupled with the low biomass typically reported in meteoric glacial ice 10^2 – 10^4 cells ml^{-1} . These challenges can preclude the typical triplicate experiments that are conducted in other fields of biology, and may make it difficult to get reproducible results.

The research articles in chapters 3–17 demonstrate the tenacity of life in frozen systems and report on the existence of life in all icy systems investigated from the accretion ice of Lake Vostok, 3600 m below the surface of the Antarctic ice sheet, to Siberian permafrost that may be up to 3 million years old. The book demonstrates the effectiveness of ice sheets as repositories for biological material that probably reflect both atmospheric and biospheric changes over glacial-interglacial cycles, for example, in chapter 5 (diatoms), chapter 6 (biogenic particles), chapters 11 and 12 (fungi), chapter 13 (viruses), and chapters 15 and 16 (bacteria). In chapter 7 a reasonable case is made for an active terrestrial biosphere at sub-freezing temperatures in permafrost using incorporation of ^{14}C to demonstrate bacterial activity. Chapters 8–10 focus on the ability to resuscitate fungi and phototrophic organisms (cyanobacteria and algae) from ancient permafrost that may be up to 3 million years old, and discuss the implications this has for microbial longevity and viability in frozen matrices.

Chapter 17 provides an overview of the accretion ice of Lake Vostok, situated beneath the East Antarctic Ice Sheet, and the physical setting of this intriguing environment. The chapter also provides a useful synthesis of the work prior to ~2001 on the biological components of the accretion ice. A number of papers have been published since ~2001 on the biological, chemical, and physical properties of the accretion ice of Lake Vostok. However, there is still an ongoing debate as to how the properties of the accretion ice can be utilized to infer the properties of Vostok lake water.

Chapter 18 highlights a new and innovative technique being pioneered by Price and colleagues in using the fluorescence properties of organisms as a possible method for their remote detection in ice using a 'biologger.' Chapter 19 describes living cells in terrestrial permafrost as a model environment for astrobiological exploration, and there are clear parallels between certain terrestrial and Martian permafrost environments. Additionally, the editors note more broadly in chapter 20 that life in ancient ice, whether it be in permafrost, ice sheets, or ice accreted from subglacial lakes, has important implications for the search for life in ancient ice on other planets/satellites in the solar system, most notably Mars and Europa. Further, an important principle in Earth Sciences that the present is the key to the past is highlighted in chapter 15 despite the overall biological nature of the book and the research. Christner and others note the importance of studies on ancient ice from the Pleistocene as poten-

tially being informative guides to icy biospheres during periods of pervasive low-latitude glaciation in the Neoproterozoic.

One minor omission in the book is that valley glaciers are a notable terrestrial icy environment where important findings were made during the infancy of biological research in ancient ice. Overall, however, the book is a good introduction to the subject and will stimulate significant interest in this emerging research field. (Mark Skidmore, Department of Earth Sciences, 200 Traphagen Hall, Montana State University, Bozeman, MT 59717, USA.)

THE WHITE DARKNESS. Geraldine McCaughrean. 2005. Oxford: Oxford University Press. 264 p, hardcover. ISBN 0-19-271983-1. £12.99. doi:10.1017/S0032247406295998

Almost at the end of *The white darkness*, Sym, the 14-year-old narrator, and heroine in the OED sense of 'a woman distinguished by exalted courage and fortitude,' asks what happened to the bodies of Scott, Wilson, and Bowers, and the death tent, on the Barrier. 'The search party burned them where they were...' A typo, presumably, but curiously symbolic in a novel where violence is the preferred mechanism for propelling the plot. Combining two genres — adventure story and ghost in the head — the highly successful and multiple award-winning children's writer Geraldine McCaughrean deploys conmen and murder, low cunning and madness, suicide, drugs, untrammelled innocence, and miraculous survival, over the icy wastes of unclimbed Antarctica.

The Pengwings Expeditionary Force uses a DC-6 to fly its rich clients to a blue ice runway at Camp Aurora on the eastern edge of the Ross Ice Shelf, with views of the Queen Maud Mountains, and an Otter to take them on to desired destinations — an emperor penguin colony, a 'fur seal colony.' The DC-6 catches fire and burns, stranding the party, all of whom, with the exception of Sym, Uncle Victor, and a Norwegian filmmaker and his handsome young son Sigurd, have sickened with stomach problems. While the camp sleeps unnaturally soundly the four drive away in a Hagglund packed with fuel and food, south across the ice shelf, towards Uncle Victor's obsession, revealed to Sym only days before: Symmes' Hole.

Despite Uncle Victor buying Sym a swirly red silk skirt and red camisole in Paris before whisking her to Antarctica without her mum's consent, despite not being her real uncle, despite Sym suffering not only the turmoils and insecurities of a deeply shy adolescence, plus a disability, deafness, but also a damaging, constricting interpretation of her life so far, sex with a 14-year-old does not feature. Symmes' Hole is the geographical soft spot in the Earth's crust, one in the north, one here in the south, letting sunlight penetrate to the Insiders living in the subterranean labyrinth beneath. Or so John Cleeves Symmes posited 140 years ago. Uncle Victor is a believer.

The world is hollow; inside, lesser hollow spheres nest one inside the other, like Russian dolls.

Sym was named after Symmes by her dad, Uncle Victor's fellow obsessive, who died young, barking mad, hating Sym: or so Uncle Victor says. Uncle Victor's IQ and knowledge are almost boundless. He is, unavoidably, a scientist. He has been improving Sym's brain for years, and filling her, via a shelf full of books about the 'Heroic Age,' with the desire to go to Antarctica.

Antarctica cannot be ring fenced. It is open season to the imagination, irrespective of the passion that might be felt for the continent, the understanding and experience some have gained of it. McCaughrean has researched diligently, including Francis Spufford's seminal *I may be some time* (Spufford 1996). She has sniffed out the sense of ownership and mockingly invests several of the Pengwing tourists with obsessive knowledge, and 'ice' interests. The narrative is replete with detailed descriptions — the Barrier, whiteouts, sastrugi, travelling over the Polar Plateau, the agony of snow blindness, the terrible beauty of hanging in a crevasse. But there can be a distance, a curious flatness. Sym desperately wanted to see Antarctica. Now at last she is here — but long-desired experiences seem to happen, nodded at in passing. There is a sense in the writing of Antarctic phrases and trigger words scavenged and inserted, descriptions and ideas added like attachments to an email. One of the camp technicians tells Sym how Shackleton and a companion sensed a third person during their desperate crossing of South Georgia. Shackleton tackled that fierce journey with two companions; they sensed a fourth. But for most readers, errors like this are irrelevant. This is an adventure story, fiction. Yet — McCaughrean's novel is by definition a part of a very small genre of Antarctic fiction. In this context, a line of critical judgement can be followed.

In one sense the Antarctic setting is a mechanism, a way of accessing an unfamiliar, inherently dangerous, frightening terrain for the purposes of plot. But McCaughrean has tied her novel tightly to Antarctica in more complex ways. The continent is a tabula rasa into which she inserts a limited cast of characters, and on which she pastes two constructs of the mind — the nineteenth-century fantasy of John Cleves Symmes, and the 90 years dead Titus Oates.

Sym has a companion, an imagining, in her head. He is her guide, mentor, saviour, and unfailing friend. She can summon him when she wishes. Titus Oates is dead and it doesn't matter. She loves his tweedy smell, his steady gaze, his dark hair, his stubborn mouth. McCaughrean creates Titus with deft, thoughtful sensitivity. Some of the dialogue in this book clumps, uncomfortably. But every sparse, clipped sentence Oates says, sings. To the outer world Sym is clumsy and often incoherent. In her head she is articulate and remarkably mature. Part of the story is — inevitably — the coming together of the two persona, and part of the plotting is Oates' role in Sym's maturing. Antarctica's ice symbolises the negative force of frozen emotion. McCaughrean gives a quote from Kafka as the

trigger for the writing: 'a book must be the ice-axe to break the sea frozen inside us.'

The white darkness is an exciting read, tightly constructed, with extreme action and unanticipated twists. There are spirited interchanges, incisive passages of introspection and interpretation, deft characterisations, and trails of muted hints to follow back and gain enlightenment. But the various parts of the book stick a bit. Sym's theoretical love of Antarctica stands little chance of flowering and fails fast under the dreadful realities she experiences. Surely, she thinks, on first seeing the interior of Antarctica from her aeroplane seat, 'if I was ever to set foot down there, even I might finally exist. Surely, in this Continent of Nothingness, anything — anyone — had to be highly alive, by comparison.' Parallels with Oates invest her with an open wound in her leg, inflicted by an ice stalactite slicing through her snow suit. Uncle Victor's rationale for educating her up for a role in Symmes' under earth empire creaks. An ordinary English suburban 14-year-old, Sym endures physical horrors, yet, somehow, like Superwoman, draws on a kitbag of significant and arcane knowledge (how to get a Hagglund to burn, using a length of her own hair) — and somehow survives.

In an effort to map the whereabouts of Paradise, pre-modern map-makers focused on spiritual navigation, depicting the Garden of Eden imaginatively, and confidently (Scafi 2006). In the spirit of intellectual navigation, map-makers added a hypothetical southern continent to their depictions of Earthly topography. Eden, with ever-widening geographic discoveries, shifted to the periphery of maps. The true continent of Antarctica slowly materialised in the extreme south, boundaries unformalised until the mid-twentieth century. Paradise became finally not just inaccessible, but out of this world. But — at first — Antarctica seemed to be invested with a kind of pre-lapsarian grace. Animals showed no fear of humans. The air was clear, the water pure. The post-lapsarian world impinged with the first sightings of commodities, seals and whales. But even now, internationally neutral, devoid of post-colonialism and indigenous people, reserved by the Antarctic Treaty for peaceful purposes, the continent has remnants of Eden. A kind of austere status (Hooper 1997). There is, without any doubt, space for spiritual navigation.

To Sym, Antarctica has no qualities of Eden. It moves from Nothingness, to Hell. 'Fortunately,' Sym summarises at the end of the book, 'Hell happens to be tucked away here at the bottom of the planet, in the last place on earth.'

Using Antarctica as a paradigm for Hell is McCaughrean's third construct of the mind. But, as a device, it constrains, and diminishes. There is an alternative; and McCaughrean displays it throughout the novel. She peoples the unpeopled spaces of Antarctica with largely human dregs. They abuse each other. They hammer at the physical realities with technology. 'L'enfer — c'est les autres.' As Jean-Paul Sartre understood, hell is other people (Sartre 1955). (Meredith Hooper, London.)

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DOKUMENT OM DE RYSKA SAMERNA OCH KOLAHALVÖN [Documents on the Russian Saami and the Kola Peninsula]. Leif Rantala (Editor). 2006. Rovaniemi: University of Lapland (Publications in Education 15). 156 p, soft cover. ISBN 952-484-022-7. €18.00. doi:10.1017/S0032247406305992

The Saami, the indigenous inhabitants of northern Scandinavia and the Kola Peninsula have been divided by a number of cultural, linguistic, and political boundaries through the ages. Perhaps the most significant line of demarcation has been that between the East and the West, resulting in the present situation, in which the Saami of Russia have been largely isolated from their western kinsmen since the beginning of the Soviet era. Even though the times have been changing, one of the major obstacles to mutual understanding is the fact that nearly all Saami studies conducted in Russia have been published only in Russian, and only a few western Saami — laymen and academics alike — master the language. For these very reasons, Leif Rantala, the lecturer in Saami language at the University of Lapland (Rovaniemi, Finland), has now compiled a number of Russian documents on Kola Saami and translated them into Swedish, a language understood by virtually all western Saami scholars and, hopefully, by many other potential readers as well.

The book, entitled *Dokument om de ryska samerna och Kolahalvön*, consists, quite literally, of miscellaneous documents on the Russian Saami and Kol'skiy Poluostrov. The main focus of the collection is on the life of the Saami and their fate during the first decades of the Soviet regime; however, the reader also gets glimpses of similar experiences of local Komi and Nenets who had migrated to the area in the nineteenth century.

One cannot deny the importance of making the contents of the book available outside Russia, but it is sad to say that the editorial work could have been done a lot more carefully. The main obstacle in approaching the book is that its content is highly inconsistent. A part of the manifold documents gathered in the book have already been published elsewhere — during the period from 1840 to 2004! Another part of the writings seem to be previously unpublished, but more than once the reader is left to wonder where the original Russian manuscripts could be located. The genres vary from travel accounts to Soviet examination records and letters to newspaper editors, and the contents of the book have not been arranged in any

kind of logical (that is, chronological, alphabetical, or topical) order. Moreover, it is quite difficult to identify the less-known authors whose first names are initialized throughout the book.

Despite the editorial shortcomings, the book as a whole certainly fulfills its stated aim of making the recent history of the Kola Saami better known in neighboring countries. The main contribution of the volume is that it offers a unique — albeit rather incongruous — collection of detailed documents that shed light to what really happened among the Soviet Saami before the Second World War. The central figure in the book is Vasilii Kondratyevich Alymov (1883–1938), a Russian ethnographer and government official who actively and enthusiastically worked for Leninist national policy by striving for the development of Saami literary languages, educating the first Saami teachers, improving communication and sanitary conditions on the Kola Peninsula, and so forth. As an ethnographer, Alymov studied and promoted the local culture and its transition to the new era; his interests covered both material and spiritual culture, from the collectivisation of reindeer herding to collecting and publishing folkloristic material that he considered fragments of the Saami epic.

In addition to the two articles and a letter written by Alymov himself, the volume includes three retrospective articles — by V[ladimir?] Sorokazherdyev (2003, 2004) and S[tanislav?] Dashchinskiy (s.d.) — on Alymov's life and work and his ultimate fate as a victim of Stalin's purges in 1938. Somewhat unexpectedly, however, as much as one-third of the publication consists of detailed records of the interrogations (from February to October 1938) where Alymov and many of his associates were accused of a counter-revolutionary plot to foment interethnic tensions on the Peninsula and eventually to establish an independent Saami state. Having been subjected to torture, Alymov finally signed the imaginary charges of conspiracy and was executed near Leningrad on 22 October 1938. By that time, his invaluable ethnographic collections in Murmansk had already been destroyed by the secret police, and his published work was suppressed for decades.

Other documents in the collection include two reports and some additional demographic statistics based on two expeditions made in 1933. The main purpose of the journeys was linguistic: many distinct varieties of the Saami languages were spoken in the area, and it was important to find out what kind of — and how many — literary languages were needed. According to the reports, the work progressed quite rapidly, and the Soviet Saami soon got their own literary language based on the varieties that are considered as dialects of the Kildin Saami language. As soon as the new alphabet and the first spelling books were created, they were followed by contemporary propaganda, such as a translation of a brochure entitled 'What has the October Revolution given to the working Saami?'. Nevertheless, as with many other minority languages of the Soviet Union,