

The *Belgica* Antarctic Expedition, 1897-1899 – A view, 120 years later

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Abstract

In 1897-1899 the Belgian captain Adrien de Gerlache, carried out - on board of their ship the *Belgica* – a historic scientific Antarctic expedition. This expedition, a stepping-stone in Antarctic research and exploration, claims many first finds as well in the field of geographical exploration, its scientific results, its international staffing and achieving the first wintering in Antarctica.

Key words: *Belgica*, Antarctic, expedition, wintering, geographical discoveries, meteorological observations

1. Introduction

In the beginning of the 1890's, Adrien de Gerlache, a young Belgian naval officer, surprised the world by announcing his plans for a small (with respect to logistics and funding) scientific expedition to Antarctica. Such an initiative was rather expected to come from one of the larger countries with respect to polar research (e.g.; United Kingdom, Germany, ...). Indeed, in July 1895 the Sixth International Geographical Congress¹ met in London and passed unanimously a resolution which stated that '*the exploration of the Antarctic regions is the greatest piece of geographical exploration still to be undertaken... and this work should be undertaken before the close of the century*'.

But, already in October 1894, thus one year before the London resolution, de Gerlache had presented with success a memoir to the council of the *Société royale belge de Géographie* (Royal Belgian Geographical Society), entitled '*Project for the Organization of a Belgian Expedition for the Exploration of the Antarctic Ocean*'.

After having obtained the intellectual and moral support of the *Société royale belge de Géographie* and of important Belgian scientists and industrialists (e.g. Ernest Solvay), de Gerlache appealed to the *Société royale belge de Géographie* to launch in January 1896 a national subscription fund to raise the draft budget of 250 000 Belgian francs for the expedition. Having

collected in that way, the amount of 100 000 Belgian francs in only four months, de Gerlache knowing that this wasn't sufficient, contacted the government who intervened for 60% of the total costs of the expedition so that de Gerlache could finally leave in August 1897. Notwithstanding difficulties in the funding, the project sparked enthusiasm in the entire Belgian population. (Cabay, 2001; Barr, 2007)

Adrien de Gerlache participated from March to August 1895 on board of the Norwegian vessel *Cantor* in a seal and whale hunting campaign in the Arctic Ocean close to Jan Mayen and East Greenland. He experienced the navigation under icy conditions, learned Norwegian, selected Norwegian sailors because of their Arctic expertise and looked out for a suitable ship for his own expedition.

He returned to Norway in June 1896 where he bought the sealing vessel *Patria*, 30 meters long, 6.50 m wide at the main beam and weighing 244 tons, which was actually a very small but strong building. The vessel, renamed *Belgica*, had to be adapted for its future scientific mission, adaptations which were carried out under the direction of de Gerlache at the shipyard Framnoes in Sandefjord, Norway.

2. The remarkable men of the *Belgica*

2.1 The final crew of the *Belgica*

The final crew of the *Belgica* consisted of 19 members : Board Personnel: Adrien de Gerlache (Commander), Georges Lecointe (Captain), Roald Amundsen (Second Officer); Scientific Personnel: Émile Danco (Geomagnetician, deceased on June 5, 1898), Henryk Arctowski (Meteorologist, Geologist and Glaciologist), Emile Racovitza (Naturalist, Biologist), Antoni Bolesław Dobrowolski (assistant Meteorologist), Frederick Cook, (Surgeon, Photographer, Anthropologist); Other Board Personnel: Jules Melaerts (Third Officer), Henri

¹ Among the Belgian participants of the international congress, Albert Lancaster and Jean Vincent belonged to the meteorology department of the Royal Observatory of Belgium (ROB). The Royal Observatory had a leading role in the scientific aspects of the *Belgica* Antarctic expedition among other by providing scientific training. At the return of the *Belgica* several crew members were integrated in the ROB.

Somers (Chief Engineer), Max Van Rysselberghe² (Second Engineer), Louis Michotte (Steward), Jan Van Mirlo and Gustave Dufour (Sailors); Norwegian Crew : Adam Tollefsen, Ludvig-Hjalmar Johansen, Johan Koren, Engelbret Knudsen, Carl-Auguste Wiencke (deceased on January 22, 1898) (Sailors).

The scientists belonged to 5 nationalities: Belgian, Norwegian, American, Polish and Rumanian. Several like Arctowski (1903), Cook (1900), de Gerlache (1902), Dobrowolski (1899, 1950, 1962), Lecoite (1902, 1903, 1904), Racovitza (1998) and Amundsen (see Declair, 1998b) kept diaries which were printed and hence available for the general public. For their publishing details, see the reference list at the back of this paper.

2.2 Adrien de Gerlache de Gomery

Adrien Victor Joseph de Gerlache de Gomery (1866-1934) (Fig. 1) started engineering studies at the *Université Libre de Bruxelles* but, being more attracted to maritime life, he went as a ship boy on intercontinental travel during his vacations. He graduated at the Nautical College of Ostend and sailed extensively in the North Sea. He became captain at the same Nautical College on August 22, 1894. De Gerlache dreamed of a more adventurous life and developed interest in polar regions with the *Belgica* expedition (1897-1899) as result. After his successful expedition to Antarctica, Adrien de Gerlache participated in several other scientific expeditions to the Arctic as well as being the reorganizer of the Belgian Maritime Administration. (Verlinden, 2001)



Fig. 1 Adrien de Gerlache de Gomery.

2.3 Georges Lecoite

Georges Lecoite (1869-1929) (fig. 2) entered the *École Royale Militaire (ERM)* at Brussels in 1886 and in 1891 he was appointed second lieutenant of artillery. The Belgian government detached him in 1894 to the French Navy, where he was ultimately promoted to ship-of-the-line lieutenant in 1897. Lecoite got reckoning of his degree in the Belgian army. In 1897, Lecoite was attached to the Observatory of the



Fig. 2 Georges Lecoite

² Max Van Rysselberghe (1878-1952), son of François Van Rysselberghe (1846-1893), meteorologist at the Royal Observatory in Brussels and later professor in Applications of Electricity at the University of Ghent, Belgium. (Courtesy Hilde Langenaken, ROB)

Bureau des Longitudes at Montsouris, located in the south of Paris. At the request of the Belgian Government he returned to Belgium end of June 1897. In October 1900, he became the scientific Head of the Astronomical service of the Royal Observatory of Belgium and from August 1913 till May 1925 its Director.

2.4 Roald Amundsen

Roald Amundsen (1872-1928) (Fig. 3) already interested at early age in polar exploration contacted de Gerlache during his stage in Sandefjord, Norway. He was accepted as second mate. As a matter of fact, the *Belgica* expedition was a training ground for all Amundsen's later successful explorations. Amundsen was the first to navigate the Northwest passage and with his Antarctic expedition to reach the South Pole in 1911. Tragically, Amundsen disappeared in a plane crash in the Arctic Ocean in June 1928, while on a rescue mission for Umberto Nobile.



Fig. 3 Roald Amundsen.

2.5 Henryk Arctowski

Henryk Arctowski [Artzt] (1871-1958) (Fig. 4), studied at the University of Liège (Belgium) and at Paris (France) and, while working with prof. Walthère Spring at Liège, found himself strongly recommended to de Gerlache. Arctowski also requested de Gerlache to recruit his countryman, Antoni Bolesław Dobrowolski (1872-1954) who joined the expedition at the last moment. After the *Belgica* expedition, Arctowski started to work at the Royal Observatory of Belgium under the direction of Albert Lancaster, Head of the Meteorological Service. Besides operational tasks in the Meteorological Service, he mainly devoted himself to the research and analysis of the meteorological, oceanographic, geological, glaciological, optical and aurora material collected in the Antarctic expedition. His stay at the Royal Observatory was a turbulent stopover on a road to an international scientific career as he left to become Head of the division of natural sciences at the New York Public Library. After World War I, he became a well-known scientist in Poland, his home country. (Demarée, Declair & Orvanová, 1995)



Fig. 4 Henryk Arctowski

2.6 Frederick Albert Cook

Frederick Albert Cook (1865-1940), became the surgeon of the *Belgica* expedition, after having joined Robert E. Peary's expedition to Northern Greenland.

The polar experience he collected in the Arctic was extremely useful for the *Belgica* expedition during the long winter conditions in Antarctica. His medical expertise helped several members of the expedition to overcome psychological diseases and the prevention and treatment of scurvy. His claim to have discovered the North Pole in 1908 made him a controversial figure.

3. The Odyssey of the *Belgica*

3.1 The travel route of the *Belgica*

The Odyssey of the *Belgica* can be split up into 6 parts: (i) from August 16 till October 22, 1897: crossing the Atlantic Ocean from Antwerp to Rio de Janeiro; (ii) from October 22 till January 14, 1898: different stops in South America and slow progress through the channels of Tierra del Fuego; (iii) from January 14 till February 27, 1898: geographical discoveries at the western side of the Antarctic Peninsula; (iv) from February 27, 1898 till January 7, 1899: first wintering in the Antarctic pack ice of the Bellingshausen Sea; (v) from January 7 till March 14, 1899: deliverance from the pack ice; (vi) from March 14 till November 5, 1899: home journey to Antwerp (Decleir, 1998a) (Fig. 5)

3.2 Crossing the Atlantic

On August 16, 1897, in the morning, the *Belgica* left Antwerp, heavily loaded with the deck barely some 50 centimeters distance from the waterline. Sailing a few miles in the North Sea, a problem occurred with the machine. It was decided to go back and repair it in Ostend. There, two men asked to disembark. Fortunately, the Polish researcher, Antoni Bolesław Dobrowolski, could be embarked, making the crew more complete.

Continuing their voyage, the *Belgica* anchored in front of Funchal, the main port of the Madeira Islands on September 11, 1897.

3.3 Stops in South America and through the channels of Tierra del Fuego

On October 22, 1897, the *Belgica* entered the harbor of Rio-de-Janeiro. Here, Dr. Frederick Albert Cook, who had been invited by de Gerlache to serve as surgeon of the Antarctic expedition joined the expedition. The expedition was heartily welcomed by the authorities, the Brazilians and the Belgian colony, among them Luís Cruls³.

As the crossing from Rio (Brazil) to Punta Arenas (Chile) took at least several weeks and Emil Racovitza had been suffering a lot from seasickness during the crossing of the Atlantic, he was allowed to travel with the fast steamer *Oravia* of the Pacific Steam Navigation

Company in order to study the fauna and flora of Patagonia and Tierra del Fuego. He departed from Rio de Janeiro on October 27, made a brief stop at Montevideo, Uruguay, and arrived at Punta Arenas, Chile, on November 3, 1897. Here he travelled to various places in the area waiting for the *Belgica* which arrived only on December 1, 1897, at Punta Arenas.

At Punta Arenas, de Gerlache had to drop four sailors for disciplinary reasons, as well as the Swedish cook. Afterwards, the *Belgica* traveled through the channels of Tierra del Fuego, visiting Ushuaia, Argentina. Special ethnographical and anthropological interest was shown in the tragic situation of the Amerindian tribes of Tierra del Fuego. Coal provision was completed at the Argentine coal deposit of Lapataia while the embarkation of water was carried out at San Juan del Salvamento, Isla de los Estados (Staten Island), Argentina. On January 14, 1897, the *Belgica* left that last place pushing into the mysterious South (de Gerlache, 1902).

3.4 Geographical discoveries at the western side of the Antarctic Peninsula

The *Belgica*, with a crew of nineteen, among them seven sailors, was heading for South Shetland Islands and Hughes Bay. It is possible, due to this reduced crew, that de Gerlache changed his sailing programme for the *Belgica*.

Henryk Arctowski made the first bathymetric soundings in the Drake Passage. On the second day of sailing (January 15, 1898), as well as on the following

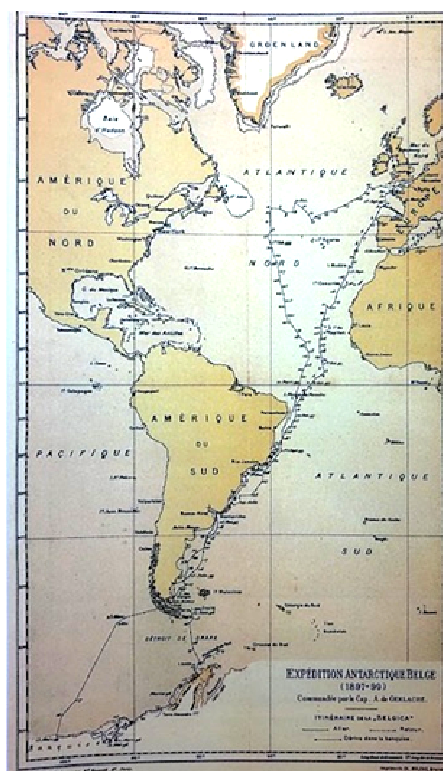


Fig. 5 Travel route of the *Belgica* from Antwerp to Antarctica and its home journey to Antwerp

³ Luís Cruls, Belgian-Brazilian astronomer (1848-1912) who helped Lecointe with the calibration of his instruments.

days, depths of around 4000 meters were measured indicating deep water lying close to the Andes mountain chain, which was unexpected. The South Shetland Islands, as well as seeing the first icebergs, were reached on January 19, 1897. On January 22, 1898, with a view to Low Island, South Shetland Islands, the Norwegian sailor Auguste-Karl Wiencke (born at Oslo in 1877), having fallen overboard, perished despite the courageous rescue trial by Georges Lecoinge.

On January 23, 1898, the *Belgica* entered the Brialmont Cove, at the south-eastern end of Hughes Bay. Next, the *Belgica* sailed crisscross through the strait, which later would be called de Gerlache Strait, situated between Danco Land (West coast of Graham Land) and the Palmer archipelago (Anvers and Brabant Island) and this in order to investigate more thoroughly the Antarctic Peninsula.

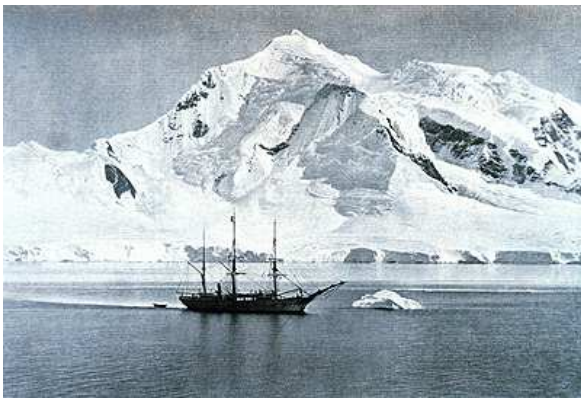


Fig. 6 The *Belgica* anchored at 'Mount William' near the south extreme of Anvers Island.

The only existing maps, but differing rather fundamentally, were the British Admiralty Chart No. 1238 and the German Friedrichsen's Map (1895). It became immediately clear that the existing maps were inadequate and, under the direction of Lecoinge, they started to take bearings for an improved mapping of the region. The initiative to undertake not less than 20 landings provided fixed positions for the hydrographic work but also for the scientific task of the expedition. De Gerlache numbered these 20 landings by a Roman numeral. On a landing, Lecoinge and Dobrowolski could make astronomical observations (Latitude & Longitude), Danco magnetic observations, Arctowski geological observations while Racovitza searched for plants (mostly mosses and lichens) and animals, among which the *Belgica antarctica*, the largest purely terrestrial animal native to the continent, a flightless midge (Fig. 8).

However, at the Xth landing, on Sunday, January 30, 1898, in the Buls Bay, a party consisting of de Gerlache, Danco, Amundsen, Cook and Arctowski was organized equipped with two Nansen sledges, sleeping bags, a silk

shelter tent, a little aluminum stove, Norwegian ski, Canadian snow-shoes, ice-axes, a 40-foot rope for a seven days' excursion. Arctowski considered that there was too much baggage, and indeed the sledges were horribly heavy. The original idea of Danco and de Gerlache was to land on Brabant Island and try to climb one of the mountains where a levee by the method of Admiral Mouchez would be done. However, the observations carried out with a theodolite Brunner by Danco and de Gerlache did not give the expected results due to the bad weather conditions and the geographical obstructions (Derwael, 2013).

On Sunday, February 6, 1898, the party got on board of the *Belgica* again. Meanwhile the *Belgica* had sailed through the South and South-West of the de Gerlache Strait with Lecoinge as captain. Lecoinge and Racovitza had also made meanwhile the landings XI and XII. On February 10, 1898, the *Belgica* sailed into Flanders Bay noting that it wasn't a gateway to the Weddell Sea and discovered the Moureau Islands. On February 12, 1898, they entered Lemaire Channel between the Antarctic continent and the Dannebrog Islands and sailed again in the Pacific Ocean. Under bad weather conditions and severe pack ice, the *Belgica* sailed skirting the pack ice and on February 16, 1898, they saw the Alexander I Island, the last piece of coast to be seen in more than 17 months to come. (Arctowski, 1901; de Gerlache, 1902; Declair, 1998)

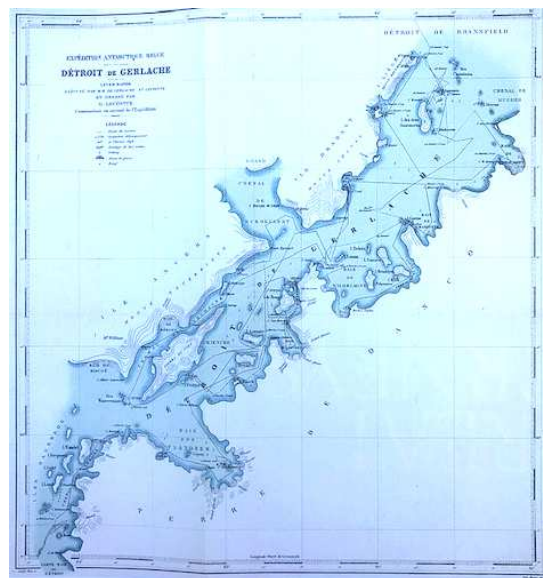


Fig. 8 Lecoinge's map of de Gerlache Strait with the route of the *Belgica* and the landings

3.5 First wintering in the Antarctic pack ice of the Bellingshausen Sea

From 17 February till 28 February, 1898, the *Belgica* sailed along the edge of the pack ice. The depth soundings showed that the *Belgica* had left the continental plateau. Entering then the pack ice on

February 28, 1898, and on March 4, 1898, it became obvious that the *Belgica* was become beset in the pack ice at $71^{\circ} 22' S$ $84^{\circ} 55' E$ and a wintering became reality (Fig. 9 and 10). Cook, Arctowski and Amundsen thought that the wintering, was not originally planned, but secretly wished by de Gerlache and Leconte for various reasons.



Fig. 9 The *Belgica* in the ice



Fig. 10 The *Belgica* in moonlight during wintering.

The *Belgica* drifted from about 85° to 103° W and between 70° and $71^{\circ}30' S$. In March and April 1898, the *Belgica* drifted westerly to $92^{\circ} 25' W$ on April 25, 1898, while from May to October 1898 drifting backwards to a place near the starting point. From October 31, 1898, to February and March 1899, the *Belgica* drifted rapidly westward. The Antarctic winter drift is eastward and the Antarctic summer drift is westward. The farthest point south, $71^{\circ} 36' 05'' S$, was reached on May 31, 1898 (see figure 11).

Being trapped in the ice and as a long and tedious wintering became inevitable, the interior of the *Belgica* was developed as comfortably as possible and isolating the vessel by a layer of snow to limit the energy losses. De Gerlache installed a strict time-schedule on board of the *Belgica*. The bi-hourly meteorological observations were carried out by Arctowski (1904b) and Dobrowolski (1903), magnetic observations by Danco, cloud, snow and frost observations by Dobrowolski, the organisms collected by depth soundings by Racovitza.

By May 19, 1898, the sun disappeared and a long Antarctic night of another 63 days till July 22, 1898, started. Imbalance in the food consumption caused signs of scurvy to start. In the long and harsh conditions of isolation, dark and bitterly cold, stormy weather and high humidity, several sailors began to show signs of

mental illnesses. Fortunately, the ship's surgeon, Dr. Cook, took the necessary steps. Émile Danco fell ill from his heart condition and, cried by everyone, died on 5 June.

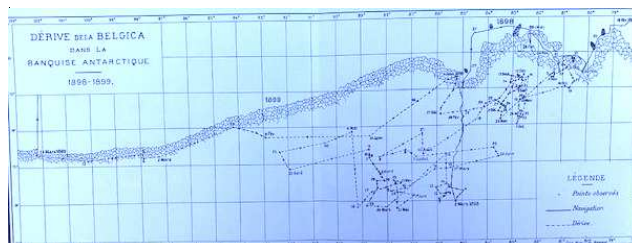


Fig. 11 Drift of the *Belgica* in the Antarctic pack ice.

3.6 Deliverance from the pack-ice and home journey

In the Antarctic spring the *Belgica* was still ice-bound. At the suggestion of Cook, two trenches were cut and sawn to open water so that the *Belgica* could emerge from its frozen-in position on February 14, 1899. It still took another month to reach open water at $103^{\circ} W$, $70^{\circ} 45' S$, on March 13, 1899. The *Belgica* reached Punta Arenas on March 28, 1899, at 6 o'clock in the morning.

However, de Gerlache did not want to waste precious time for the scientific collaborators: it was agreed that Racovitza, Arctowski and Dobrowolski would return directly to Europe, where they could usefully work, upon their return, on the classification of the collections that had been collected and on the coordination of certain observations. In 1899, Arctowski and Dobrowolski were appointed members of the *Belgica Commission* Editorial Board. In fact, Arctowski and Dobrowolski started to work at the Meteorological service of the Royal Observatory of Belgium while Racovitza officially became attached to the Sorbonne, as deputy director of the Arago Laboratory in Banyuls-sur-Mer in the *Pyrénées-Orientales* department in southern France. Leconte, for his part, started to explore the Andes in Patagonia. Amundsen left the *Belgica* returning home with a passenger ship in order to be at home before the end of the holidays. Finally, Cook continued his studies on the Amerindian tribes in Tierra del Fuego before returning to the United States.

Lacking coal and funds, the *Belgica* crossed the Atlantic only on its sails. The crossing took a long time (see its route on figure 5) and was tedious but the *Belgica* expedition was enthusiastically welcomed in Antwerp on 5 November, 1899.

5. Meteorological observations in the wintering period

The most interesting meteorological results are of course those that span an entire annual cycle including the polar winter in Antarctica. In the early publications on his meteorological data carried out on the *Belgica*,

Arctowski (1899, 1900)⁴ lists: the monthly mean temperature and the monthly minima and maxima of the temperature (in °C and in °F), the monthly means of the atmospheric pressure and the monthly minima and maxima of the atmospheric pressure (in mm Hg) with their day of occurrence. Arctowski presents further: a monthly table of wind expressed in 16 directions, the monthly number of days of continuous fog or overcast sky, the monthly number of days with sky partially clear, the monthly number of days on which fog was observed, the monthly number of days on which snow was recorded, the monthly number of days on which rain was observed, the number of days of calm, or of wind not exceeding wind force 1, and the number of days with wind force less than 4 (Fig.12).



Fig. 12 The deck of the *Belgica* during the wintering with the thermometric screen in the background.

As shown in Fig.13, the month of February 1899 was the warmest month with a mean temperature of -1 °C and a minimum temperature of -9.6 °C while July 1898 was the coldest month with a mean temperature of -23.5 °C and a minimum temperature of -37.1 °C. The extreme minimum of temperature was observed on 8 September 1898, at 4 a.m., with -43.1 °C. The maximum temperature is between -1 °C to 1 °C, the Antarctic winter months of June, July and August included. Arctowski's monthly temperature data clearly indicate a warm period in August 1898 where the monthly mean temperature raised to -11,3 °C. Such episodes of mid-winter warm periods have been regularly detected in temperature time-series of Antarctic stations and have been coined as 'coreless winter (CW)'. In a first instance, a CW can be recognized by the simple formula $t_{m-1} < t_m$ and $t_m > t_{m+1}$ where t is the monthly mean temperature for the succeeding months $m-1$, m and $m+1$.

These time series could therefore be compared with

⁴ The figures represented in this paper are based upon the earliest published data in Arctowski (1899). Later on more elaborated data were published (Arctowski, 1904a, b).

the observations during the First International Polar Year (1882-1883) in the Arctic region. Noteworthy were not so much the low winter temperatures measured on the *Belgica* which are comparable to those of the Arctic, but rather the cold summer temperatures which rarely rise above zero degrees (Fig. 13).

The atmospheric pressure observations were carried out with a marine barometer and with an aneroid barometer. Arctowski (1899) lists the tables:

- monthly (approximate) means expressed in 0.1 mm only and without corrections to these observations. For February 1898 the atmospheric pressure observations concern only the latter half of the month;
- monthly minimum and maximum atmospheric pressure data, expressed in 0.01 mm, with their data of occurrence and reduced to freezing point and the latitude correction to 45° according to the contemporaneous International Meteorological Tables.

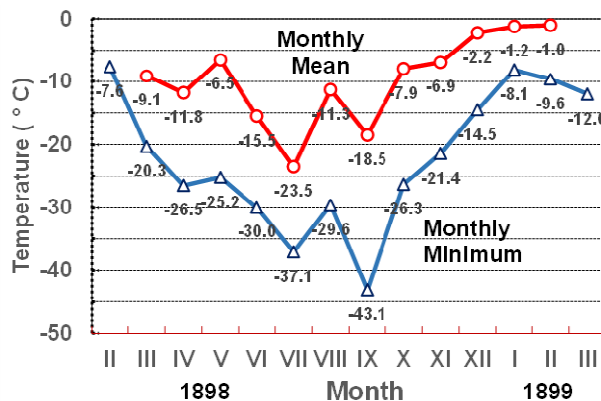


Fig. 13 Monthly mean (upper) and monthly minima temperature (lower) for the months February (II) 1898 till the month of March (III) 1899. The Roman numerals indicate the number of the month.

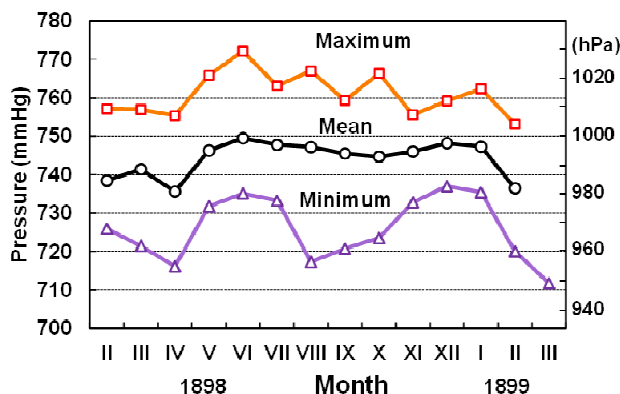


Fig. 14 Atmospheric pressure observations expressed in mm Hg and in hPa during the stay in the pack ice of the *Belgica*: monthly average (approximate) observations (middle), monthly maximum observations (upper) and monthly minimum observations (lower). The Roman numerals indicate the number of the month.

From May 1898 through January 1899 the average values are between 990 and 1000 hPa while its values for February through April 1898 and February 1899 lay between 980 and 990 hPa (Fig. 14). It is noteworthy that none of the monthly average values and even 7 of the monthly maxima values do not reach the value of the standard atmospheric pressure of 1013.25 hPa.

The wind force data expressed in the Beaufort scale are given as follows: the number of days of calm, or with wind not exceeding wind force 1, and the number of days with wind force less than 4. The Fig. 15 represents the monthly ratio of wind force according to the Beaufort scale; the blue represents the number of days with wind force [0-1], calm and light air, with wind speed $< 1.5 \text{ m s}^{-1}$; the green represents the number of days with wind force [2-3], light breeze and gentle breeze, with wind speed $< 5.5 \text{ m s}^{-1}$; the yellow represents the number of days with wind force 4 and stronger.

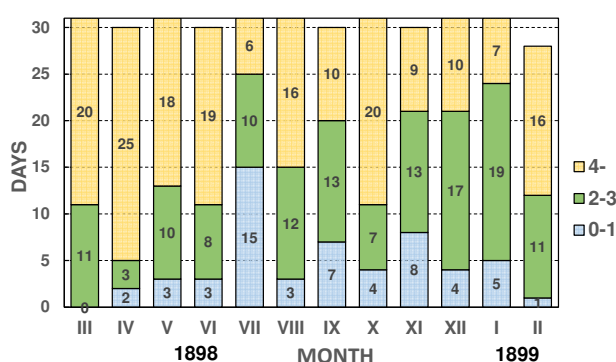


Fig. 15 Monthly Ratio of wind force scale. Wind force [0-1] means calm and light air, [2-3] means light and gentle breeze, [4-] means moderate breeze and more strong wind.

The wind direction observations betrayed the existence of a polar semi-permanent anticyclone⁵. Arctowski (1899) showed how the *Belgica* was under the influence of this anticyclone during the Antarctic summer (wind directions north-east to south-east from November to February), but in the Antarctic winter (June, July and August) it came under the grip of the circumpolar westerly wind.

⁵ The Norwegian cyclone model was introduced by a group of meteorologists led by Vilhelm Bjerknes just after WWI. The model explains the generation, intensification and decay of mid-latitude cyclones, and introduced the idea of fronts. At the Royal Meteorological Institute of Belgium, Jacques Van Mieghem (1905-1980) collaborated in the early 1930s with Jacob Bjerknes and introduced the frontal model in the daily weather forecasts at the Institute.

5. Conclusion

The *Belgica* expedition is notable for its first wintering in Antarctica, for its purely scientific nature and for its internationally staffing (Machowski, 1998; Barr, 2007; Decleir, 2011, 2012). The *Belgica Commission* published the *Rapports Scientifiques* volumes (see e.g. Arctowski (1904b) and Dobrowolski (1903) for meteorology). Later on, these volumes gave rise to numerous scientific publications.

In this review the numerous interactions between the *Belgica* Antarctic expedition and the Royal Observatory of Belgium are highlighted.

The *Belgica* expedition was special remembered in the *Belgica Centennial Symposium* in May 1998 at Brussels (Decleir & De Broyer, 2001). However, 120 years later, it would be highly interesting to confront the original scientific findings of the expedition with the view of climatic and environmental Antarctic science under present-day Climatic Change conditions.

Acknowledgements

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G.D. has been motivated in co-authoring the review article because of the numerous interactions of the scientific staff of the *Belgica* with the Meteorological service of the Royal Observatory of Belgium which was the institution preceding the founding of the Royal Meteorological Institute of Belgium as an independent research institute.

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Summary in Japanese

和文要約

1897-1899 南極探検船ベルジカ号の越冬記録 — 120年後の視点から

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1897-1899 にかけてベルギーの Adrien de Gerlache 船長はベルジカ号で歴史的な南極科学探検を行った。この探検は、南極での科学調査としての探検を飛躍的に高めるものであり、国際的な隊員によって初めて南極海域での越冬を行い、地理的調査や各種科学観測など多くの成果をもたらした。その歴史的経緯を解説し、科学成果の一部を紹介する。

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