ad HOC

Newsletter 'Historie van de Oceanografie Club'

Issue 23 – May 2026

Weber-van Bosse, A., 1913. Siboga-Expeditie. Uitkomsten op zoölogisch, botanisch, oceanografisch en geologisch gebied verzameld in Nederlandsch Oost-Indië 1899-1900. Liste des Algues du Siboga. I. Myxophyceae, Chlorophyceae, Paeophyceae avec le concours de M.Th. Reinbold. Vol. LIXa, Livr. 68. Plate V [KK]

Contents

Editorial

This is issue 23 of *ad HOC*, the newsletter of the 'Historie van de Oceanografie Club' ('History of Oceanography Club'), or HOC.

In this issue we offer four papers and four short communications. One paper highlights the 150th anniversary of the Netherlands Hydrographic Service. The first International Congress on the History of Oceanography (ICHO-I) in Monaco is remembered, 60 years after its occasion. Another contribution is about the Norwegian Harald Dannevig, notably about his work for the development of Australia's fisheries industry and who sailed – and drowned - on FIS *Endeavour*. Linked to Baltic research there is the story of the Bornö Marine Research Station.

A short contribution is dedicated to the Centenary of the Marine Zoological Station 'Professor Ioan Borcea' (Agigea, Romania). Another deals with a glimpse into the History of Oceanography Studies in Greece, the decommissioning of the Dutch RV *Pelagia* after 35 years of service, and a brief introduction to the RV *Anna Weber-van Bosse*, its successor, that was christened in March this year. A new book on the woman whose name this vessel carries is reviewed.

As usual there are overviews of new publications and books, info on museums, and on other organisations. The 'Original' this time is from a booklet by Lieutenant Francis Higginson R.N., who in 1857 was convinced that laying the Transatlantic Cable was impossible as the increasing density of the seawater with depth would prevent the cable sinking deeper than 300 fathoms.

All previous versions of *ad HOC* are on view/downloadable from our website: https://www.historie-oceanografie.nl. For new readers: since 2015 we aim at publishing in English. Links were working at the time of publication.

If you want to receive *ad HOC* - the annual newsletter the History of Oceanography Club - just send an e-mail with your name/affiliation to the secretary of HOC and you will be on the list. No costs are involved, and communication is by e-mail. *ad HOC* is disseminated as pdf file. Your contributions, in electronic format and in English, are welcomed and we do appreciate if you would forward this *ad HOC* to your interested colleagues.

Kees Kramer, secretary and editor [kees.kramer@mermayde.nl]

Cover

Anna Weber-van Bosse (1852-1942) is a key person in this issue of *ad HOC*. Anne Antoinette, called Anna, was a remarkable woman that oceanographers and algologists might know from the Siboga Expedition (1899-1900) in the Dutch East-Indies (now Indonesia). She was the wife of the expedition leader Max Weber (1852-1937) and one of the scientific staff, albeit by training not a scientist, collecting and studying algal species.

The plate comes from the first of 4 issues of the Siboga expedition reports (Vol.LIXa; Livr. 68) Anna published. The Javanese draftsman of the plate, Jozef Willem Huijsmans (1880-1960) joined her and her husband on this expedition.

Dedication by the author

The general public may know Anna from the popular book she published on her 'adventures' during the expedition [1].

A new biography [2] provides a detailed overview of her life and works, notably also how she became a world leader on marine algae. She demonstrated, e.g. that coral reefs are living organisms that can only survive thanks to symbiotic coexistence with algae. A book review is included in this *ad HOC* issue.

On 12 March 2026 Her Majesty Queen Máxima of the Netherlands christened the new Dutch ocean research vessel RV *Anna Weber-van Bosse* at the Royal NIOZ-harbour on the island of Texel. More in this issue of *ad HOC*. Earlier, in 1933, the RV *Max Weber* named after her husband was commissioned by the Netherlands Zoological Society for research in the Wadden Sea. It was baptized by Anna the same year [3]. [KK]

HOC news

HOC website

HOC's website www.historie-oceanografie.nl/ provides information on HOC, and all issues of ad HOC can be viewed/downloaded. Most is in the English language, apart from the older articles, prior to issue 12 (2015), that appeared in *ad HOC* at the start of HOC (they remained in Dutch).

Other organisations

ICHO - International Commission for History of Oceanography

On the Official Website of ICHO (https://oceansciencehistory.com) you will also find the ICHO Bibliography and a crowdsourced Zotero group library, that is updated on an ongoing basis. Because of European privacy laws, you will have to register to search its contents (https://www.zotero.org/user/register).

International Commission of the History of Oceanography

If you register to become a member of ICHO (-> our community/membership form) you will receive ICHO's bimonthly Newsletter by e-mail.

The 2025 winner of the Jacqueline Carpine-Lancre [1] Early Career Scholars Prize is Meghan M. Shea, Ph.D. candidate in the Emmett Interdisciplinary Program in Environment & Resources at Stanford University. Her unpublished paper, 'From Encounters to Environmental DNA: The Stakes of Changing Evidentiary Frames in Intertidal Research' can be read on the ICHO website.

ICHO is linked to the H-Oceans initiative.

H-Oceans unites scholars across the humanities and social sciences who study the global oceans as sites with their own history.

[1] Weber-van Bosse, A., 1903. Een jaar aan boord van HM Siboga. E.J. Brill, Leiden, pp.348

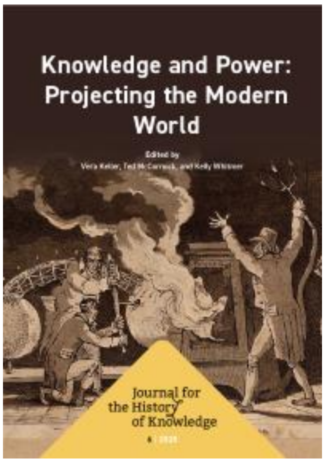
Weber-van Bosse, A., 1905. Ein Jahr an Bord I.M.S. Siboga. Beschreibung der Holländischen Tiefsee-Expedition im Niederländisch-Indischen Archipel 1899-1900. Engelmann, Leipzig, pp.370

[2] Kieskamp, A., 2026. In lange rok de koraalriffen op - Anna Weber-van Bosse (1852-1942), algendeskundige. Walburg Pers, Zutphen, pp.232

[3] In the Dutch East-Indies the 'Laboratorium voor Onderzoek der Zee' (Laboratory for Marine Investigations) at Batavia already in 1922 used a motorboat *Max Weber*

[1] Jacqueline Carpine-Lancre (1933-2022) was the librarian and scholar at the Institut Océanographique in Monaco

GEWINA



The Belgian-Dutch Society for History of Science and Universities (Belgisch-Nederlands genootschap voor wetenschaps- en universiteitsgeschiedenis / Société Belgo-Néerlandaise pour l'histoire des sciences et des universités), GEWINA, was founded in 1913. Articles, many in Dutch but also with contributions in English, are available online (http://www.gewina.nl/in-english/on-gewina/).

The 2025 volume 6 of the *Journal for the History of Knowledge* (JHoK), features a special issue 'Projects in the History of Knowledge'. Articles can be viewed on line (open access) at https://journalhistoryknowledge.org/issue/view/1748.

The journal *Gewina* - Tijdschrift voor de Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde en Techniek' (1978-2007) is now open acces online via Huygens Institute: https://resources.huygens.knaw.nl/retroboeken/gewina/#page=0&accessor=toc&view=homePane

Similarly the journal *Scientiarum historia* - tijdschrift voor de geschiedenis van de geneeskunde, wiskunde en natuurwetenschappen = Revue pour l'histoire des sciences et de la médecine (1959–1971 & 1990–2006): https://resources.huygens.knaw.nl/retroboeken/scientiarumhistoria/#page=0&accessor=toc&view=homePane

Challenger Society for Marine Science

The Society has a series of Special Interest Groups (SIG), including one on the History of Marine Science: https://www.challenger-society.org.uk/History_of_Marine_Science141

If you would like to join this Group, non-UK members are welcomed - contact John Gould [wjg@noc.ac.uk] with some info on your areas of interest/expertise on history topics, and your affiliation (past and or present) with approximate dates.

The Challenger Society Special Interest Group on the History of Oceanography organized a series of zoom webinars in 2025 and 2026.

- Pearson, Philip: Remembered Lives, The Remarkable Seamen of the Challenger Expedition
- Bowers, David (University of Bangor): The Loch Ness Monastery: a Tale of Edwardian Scientists and Monks
- Gould, John (National Oceanography Centre): From Swallow Floats to Argo, 50 years of Technology Development
- Griffiths, Gwyn (National Oceanography Centre): Snippets of Autosub History: A Tasting Menu
- Williams, Jo (National Oceanography Centre): Using Citizen Science to Rescue Historical Tide Gauge Data
- D'Arcy Wood, Gillen (University of Illinois Urbana-Champaign): The Wake of HMS Challenger
- McGregor, Anna (University of Glasgow): A short history of shellfish on the West Coast of Scotland: how understanding the past can lead to sustainable approaches for the future
- Rippeth, Tom (University of Bangor): Ocean microstructure developments and insights
- Kramer, Kees (Mermayde): The Bathythermograph: Rise and decline

Past presentations have been recorded and most can be viewed on you-tube: https://www.youtube.com/channel/UCABGwm9YiLHn1oD_vsLWxHA.

Arbeitskreis Geschichte der Meeresforschung

For the (German) Arbeitskreis '*Geschichte der Meeresforschung*' (History of Oceanography working group), Manfred Stein is the contact person.

Manfred Stein [manfredstein@aol.com]

Bedford Institute of Oceanography (BIO) Oceans Association

The Canadian Bedford Institute of Oceanography (BIO) Oceans Association (OA) was formed in 1998 by a group of retired public servants previously involved in Ocean Sciences and Hydrography who share an interest in BIO (www.bio-oa.ca).

Their quarterly Newsletters 'Voicepipe', since 1998, are available as pdf: https://www.bio-oa.ca/newsletters.php

The latest issue, No.97, October 2024 can be downloaded at: https://www.bio-oa.ca/newsletters/97_OCT2024.pdf

Bangor University

Tom Rippeth reports on the Bangor University - School of Ocean Sciences Newsletter, intended for staff and alumni called 'The Bridge'.

Previous editions can be downloaded from the site.
https://www.bangor.ac.uk/sos/newsletter
The winter 2025/26 issue can be viewed/downloaded at
https://www.bangor.ac.uk/sites/default/files/2026-01/the-bridge-winter-2025-26.pdf

Dundee Heritage Trust

Exhibition: 100 years of RRS Discovery
12 Sep 2025 – 13 Sep 2026

https://www.dundeeheritagetrust.co.uk/event/exhibition-100-years-of-rrs-discovery/

Conferences:

ESHS – HSS 2026

Joint Meeting of the European Society for the History of Science (ESHS) and History of Science Society (HSS)

'Shifting Perspectives: Plural Worlds, Contested Sciences'

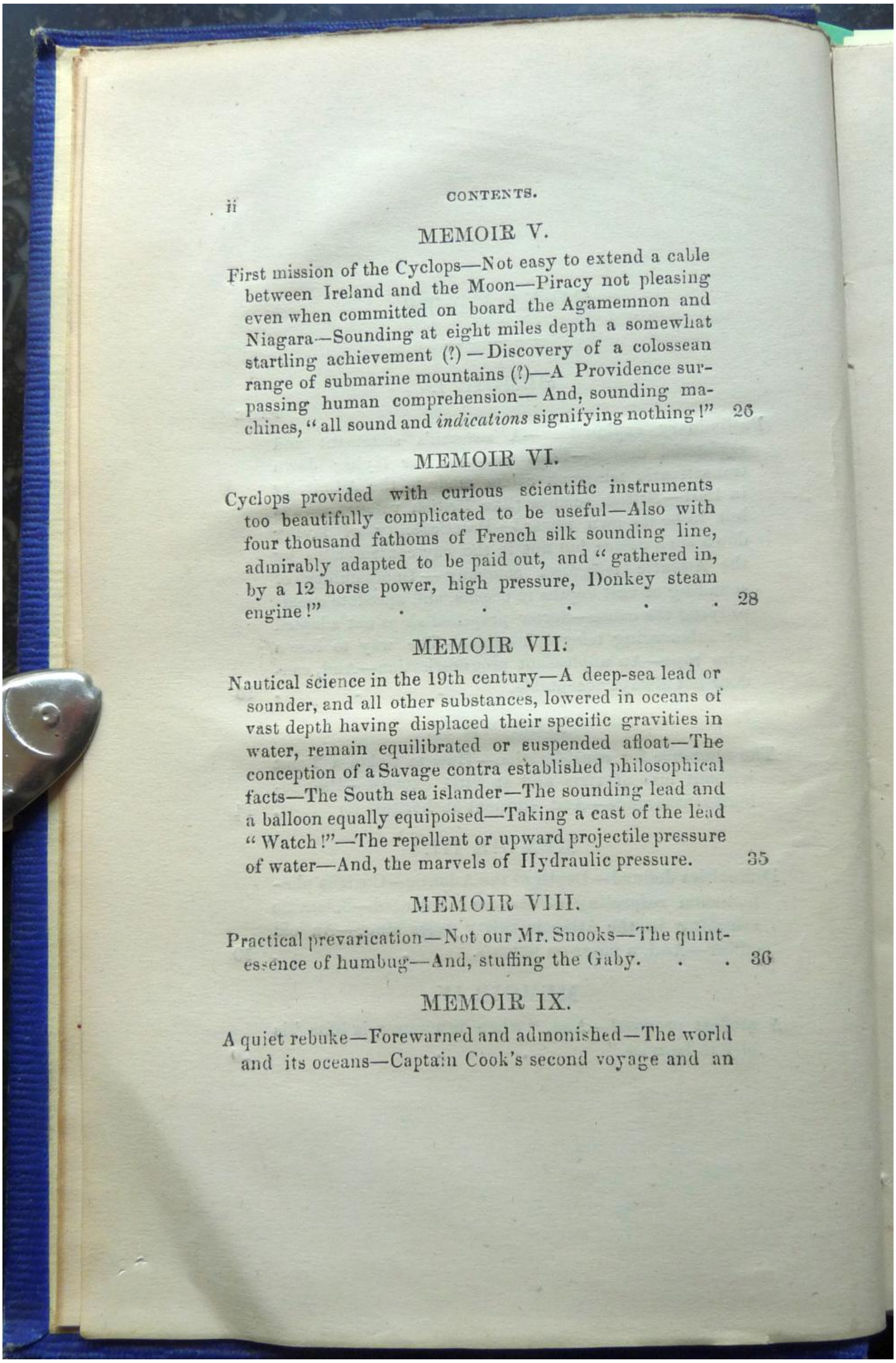
Edinburgh, Scotland, 13–16 July 2026,
University of Edinburgh
https://hssonline.org/page/Edinburgh26

ICOHTEC 2026

International Committee for the History of Technology
53rd Annual Meeting

'Engaging the History of Technology: Bridging Disciplines and Perspectives for Global Challenges'

Alexandroupolis, Greece, 8-11 October 2026
https://www.icohtec.org/w-annual-meeting/



ii CONTENTS.

MEMOIR V.

MEMOIR VI.

MEMOIR VII.

MEMOIR VIII.

MEMOIR IX.

Higginson, Francis, 1857. The Ocean, Its Unfathomable Depths and Natural Phenomena

The Original

Charles Wyville Thomson (1830-1882) wrote in 1873: "*There was a curious popular notion, in which I well remember sharing when a boy, that, in going down, the sea-water became gradually under the pressure heavier and heavier, and that all the loose things in the sea floated at different levels, according to their specific weight: skeletons of men, anchors and shot and cannon, and last of all the broad gold pieces wrecked in the loss of many a galleon on the Spanish Main; the whole forming a kind of 'false bottom' to the ocean, beneath which there lay all the depth of clear still water, which was heavier than molten gold*" (Wyville Thomson, 1873).

This view was still present in the 1857 as is evidenced by the curious book by Francis Higginson (1857). In a series of 28 Memoirs, in time ranging from 21 May– 29 September 1857, the author sent and received letters to/from several authorities, such as the chairmen and directors of the Atlantic Telegraph Company, the House of Lords and the House of Commons, the secretary of the Admiralty, and newspapers (Higginson, 1857). He is convinced that due to increasing density of the seawater with depth, any weight, such as while sounding, will not reach a depth of 300 fathoms and will "*remain equilibrated or suspended afloat*" [1] He 'warns' the officials that laying a telegraph cable across the ocean would thus become a failure. That in reality seawater is nearly incompressible and density only marginally increases with depth he was not aware of.

The year 1857 saw the events leading to attempts in laying of the first Transatlantic Cable between Ireland (Valentia Harbour) and Newfoundland (Trinity Bay). The British HMS Agamemnon and the United States USS Niagara were used as cable layers. The USS Arctic had sounded the track in 1856, while the HMS Cyclops repeated this action the following year. They confirmed the presence of the Telegraph Plateau in the mid-ocean. Both ships proved that the sea floor had been reached by collecting sediment in the sounders. This evidence was regarded by the author as "*…render this highly improbable; and, in short, display all the unmistakable characteristics of a regular built " fudge!"* [2] Thus, sounding operations were questioned: "*… the pretended soundings said to have been "found" by the Cyclops in 2,000 fathoms, is merely a foolish reiteration of a systemized falsehood, liable to practical refutation at any moment, as no such depth can be reached when attempts are made to sound-that is reach the bottom-with a lead and lines*." [3]

Likewise, he strongly believed that the proposed Transatlantic Cable will not sink the bottom: "*In like manner, a foot length of the telegraph cable cut off, slung horizontally, and lowered in the sea (where very deep) with white line, will speedily displace its gravity and float"* [4]

The first attempt to lay a trans-Atlantic submarine telegraph cable took place in 1857 but failed when the cable broke after about 330 nautical miles had been laid (Steele Gordon, 2002).

Figure 1. Sample of the first trans-Atlantic submarine telegraph cable 1857/1858 constructed by the Atlantic Telegraph Company [Teylers Museum, Inv.Nr. FK 1056.1.002]

[1] Higginson, 1857; p.ii, etc.

[2] Ibid. p.70

[3] Ibid. p.145-146

[4] Ibid. p.192

A second attempt, using the same cable in 1858, was successful. The first communications occurred on August 16, 1858, but the line speed was poor. The first official telegram to pass between two continents that day was a letter of congratulations from Queen Victoria to President of the US James Buchanan. But the cable operated for only about a month before failing.

References

Higginson, Francis, 1857. The Ocean, its unfathomable depths and natural phenomena: comprising authentic narratives and strange reminiscences of enterprise, delusion, and delinquency: with the voyage and discoveries of Her Majesty`s Ship "Cyclops". Edward Stanfort, London, pp.202

Steele Gordon, J. 2002. A thread across the ocean. The heroic story of the transatlantic cable. Simon & Schuster, New York, pp.239

Wyville Thomson, C., 1873. The depths of the sea. Macmillan, London, pp.31-32

Articles

Thijs Ligteringen: *The Netherlands Hydrographic Service 150 years*

In 2024, the Hydrographic Service celebrated its 150th anniversary. A milestone is always a moment to reflect on history: in 1949 and 1999 [1] we did so with special editions of the Royal Netherlands Navy magazine 'Marineblad', while for the 100th anniversary in 1974, an exhibition was held at the Maritime Museum in Rotterdam. The descriptive catalogue accompanying this exhibition, titled 'Met lood en lijn' (With Lead and Line), still serves as a concise and excellent overview of the history of Dutch Hydrography [2].

Figure 1. Temporary logo for the 150th anniversary

Timeline 150 years Hydrographic Service

On the occasion of the current anniversary, a timeline was created displaying the 150-year history in words and images. This timeline has been printed on three panels, each three meters long. These have been given a prominent place in the Hydrographic Service building at the Frederik Barracks in The Hague.

The timeline was published in nine parts via LinkedIn through the account of the Hydrographic Service during the period from July to September 2024 (and can still be read there under the heading Contributions; in Dutch) [3]. Since it is impossible to reproduce the content in its entirety in this contribution, a description and a summary follow below.

Timeline Description

The timeline begins with a column describing developments in the field of hydrography (and cartography) prior to 1874; that column has been reproduced in its entirety here. Following this, the actual timeline begins, which is divided into four levels:

1. the ships of the Hydrographic Service and the Chief Hydrographers;
2. developments at the Hydrographic Office;
3. related developments: maritime, hydrographic, in the field of coordinate systems, regulations, at the International Hydrographic Organization (IHO), etc.;
4. developments elsewhere, to place the events in the correct historical context.

---

[1] Kool, Ferwerda & Schaap, 2000. Dienst der Hydrografie bestaat 125 jaar. Marineblad, 110(7-8): 228-242

[2] Anon., 1974

3 https://www.linkedin.com/company/dienst-der-hydrografie/

For this article a selection has been made. For a full version see Anon (2024).

Figure 2. The complete timeline on the wall of the Frederik Barracks in The Hague, with authors Thijs Ligteringen and Josephine Leertouwer

What is hydrography?

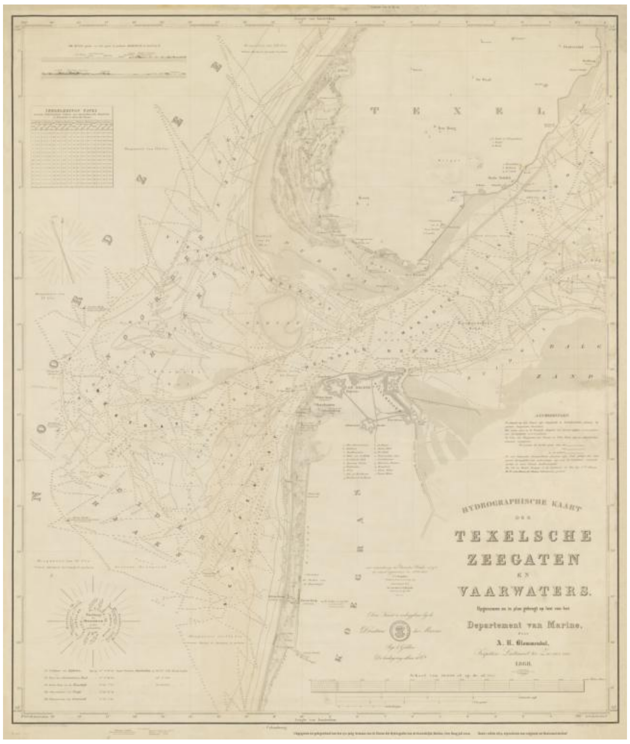
Hydrography is the science concerned with describing the seabed. Important aspects of hydrography include measurement, such as the composition of the water and the seabed, the tides, and, of course, water depth. This is important for safe navigation at sea. The history of hydrography (and cartography) runs parallel to the history of the Netherlands at sea.

How were the first nautical charts created?

Since as early as the 16th century, Dutch mariners have been busy charting coastlines, bays, and waterways on the world's oceans. They were not the first: the Portuguese, Spaniards, and Italians had already preceded them in this.

The first methods of determining location were performed by observing the coast. Many sailors sailed the same route for years, gaining a great deal of experience. Experience played a major role, especially for the dangerous Dutch coast. In the 13th century, one could determine one's position by taking a rough bearing to at least two landmarks on the coast. As soon as one moved out of sight of land, the navigator had to plot the course and estimate or measure the length of the distance travelled. The accuracy of this was limited, causing newly discovered islands and coastlines to often be mapped in the wrong location. This changed in the 15th century with the advent of astronomical navigation. Using a Jacob's staff, one could determine latitude at sea (the number of degrees of North or South latitude) by measuring the angle between the direction towards the North Star and the horizontal plane. This angle is approximately equal to the geographical latitude. To determine longitude (degrees of East or West longitude), precise time measurement is needed. However, proper timing instruments did not appear until the 18th century. This explains why the major errors on old nautical charts occur mostly in the east-west direction.

Figure 3. First nautical chart of the Hydrographic Service: Texel Sea Inlets and Fairways



In the Low Countries, it was Gerard Mercator (1512–1594), among others, who brought cartography to fruition. He developed the projection named after him, the so-called Mercator projection. This projection is a conformal cylindrical projection, which makes it easy for seafarers to plot a course on a map. In 1602, the Dutch East India Company was founded, and good maps became of literally great value. Good maps and means of positioning were (and are) of essential importance for trade and could make the difference between running aground or reaching the destination. After the middle of the 18th century, hydrographic activities in the Netherlands declined, and it was mainly the French - who established a hydrographic office in 1720 - and the English (1795) who made their presence felt. However, the Netherlands, still a seafaring power of considerable size, lagged behind.

But how did Hydrography end up with the Navy?

It was in 1798 that Lieutenant Commander A.A. Buyskes (1771-1838) charted the Texel estuaries in a scientifically sound manner (Figure 3). It was not until after 1815 – the Netherlands had by then become a Kingdom – that the charting of Dutch waterways began on a more extensive scale. Gradually, the surveys of many estuaries and the Zuiderzee (nowadays IJsselmeer) followed. With this, all important Dutch waterways were included. Activities were also increasingly undertaken in the overseas territories, particularly in the East. In the former Dutch East Indies, a Hydrographic Office was established in Batavia as early as 1860. In 1864 – with the establishment of the Department of the Navy in that capital – it became a department of this ministry. The results in the early years were disappointing, whereupon it was decided in the early 1870s to transfer the Hydrographic Office to the Netherlands, where it was housed within the Department of the Navy (together with the pilotage service). By resolution number 52 of July 8, 1874, the Hydrographic Office became an independent (the fifth) department of the Department of the Navy, under the leadership of Chief Hydrographer Captain A.R. Blommendal (1817–1875) (Figure 4). This date is therefore considered the 'date of birth' of the Hydrographic Service as we know it today.

Figure 4. Captain A.R. Blommendal, first Chief of Hydrography (1857-1875) (source: NIMH)

The period 1874-1899

From September 25, 1875, the Notices to Mariners (NtM) appeared weekly. A chart is merely a snapshot and becomes outdated at the moment of publication. Because the mariner is highly dependent on recent information, the most important changes on a chart are published as NtM as soon as possible. Initially, only reports of new dangers and changed local conditions were displayed. It was not until 1892 that the notices referred to the relevant Dutch or English nautical chart. People were not very happy with the transfer of the Hydrographic Office from Batavia to The Hague, so in 1877 a Hydrographic Office was once again established in Batavia. This situation lasted for almost two decades, as in 1894 the Indies Hydrographic Office traveled back to the Netherlands, although the depot of nautical charts and guides would remain in the Indies. At that time, just over 300 nautical charts of the Indonesian archipelago had been produced, but there were still areas that needed to be included, such as the south coast of Java and the north and southwest coasts of New Guinea. Until the beginning of the First World War, the 'white' areas were charted alongside routine work.

Figure 5. The execution of a (manual) sounding, in this case on board HNLMS Ever (source: NIMH)

The period 1900-1924

Under the leadership of Prince Albert I of Monaco (1848-1922), an international group of geographers and oceanographers took the initiative in 1903 for the GEBCO chart series, the General Bathymetric Chart of the Oceans (bathymetry is the determination of the position of the seabed). The aim of this series is to make depth data of the world's oceans publicly available. Since 1903, five editions of bathymetric charts covering the entire world have been produced. The International Hydrographic Organization was founded on June 21, 1921, then still as the International Hydrographic Bureau. To this day, the IHO ensures the coordination of the hydrographic activities of the member states. Monaco was chosen as the location following an offer from (once again) Prince Albert I, who dedicated a large part of his life to oceanography and hydrography.

The techniques for charting the seas were still in their infancy at the beginning of the 20th century. The echo sounder was invented in 1912 by the German physicist Alexander Behm (1880-1952), who sought a way to determine the location of icebergs after the Titanic disaster. Echography proved unsuitable for this purpose, but it did prove to be a good method for determining depth. The Titanic disaster also led to the International Convention for the Safety of Life at Sea (SOLAS Convention) in 1914: the most important international treaty for safety at sea. Hydrographic offices produce nautical charts in accordance with the SOLAS obligation.

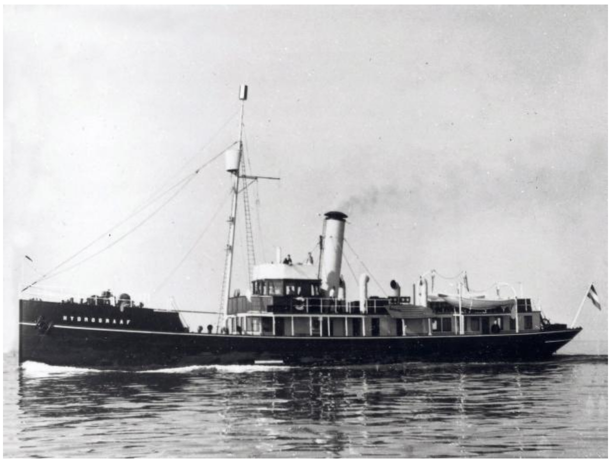


Figure 6. State Survey Vessel ROV *Hydrograaf* (1910) (source: NIMH)

A survey vessel with a distinguished service record dates from this period: the R.O.V. (Rijksopnemingsvaartuig; State Survey Vessel) *Hydrograaf* (1910), figure 6, naturally served primarily as a survey vessel, but was also used on several occasions as a royal yacht during visits by Queen Wilhelmina, Prince Hendrik, and Princess Juliana to locations in the South Holland and Zeeland waters. In May 1940, the ship sailed from Vlissingen to England. During the Second World War, it was used as an accommodation ship for the minesweeping service.

Figure 7. Badhuisweg 167 in The Hague: the Hydrographic Service was based here from 1924 to 2006 (source: NIMH)

After the war, the ship returned to service for the Hydrographic Service,remaining in operation until its decommissioning in 1962. What certainly could not have been foreseen in 1910 was the role the ship acquired from 1985 onwards as the steamboat for Sinterklaas and his entourage at the annual national arrival, under the name Pakjesboot 12. The ship's bell of the Hydrograaf has been given a prominent place in the hall of the Hydrographic Service building at the Frederik Barracks in The Hague. From 1924 to 2006, the Service was located in a beautiful building at Badhuisweg 167 in Scheveningen / The Hague (Figure 7).

The period 1925-1949

In the late 1920s, extensive surveys were conducted: from 1928 to 1930, a survey of the North Sea was carried out in the Netherlands up to approximately 22 miles from the coast. This included all sandbanks in the southern North Sea, such as the West and Noordhinder Banks, Steenbank and Schouwenbank. The new survey vessel HNLMS *Willebrord Snellius* conducted oceanographic research in the eastern part of the Indonesian archipelago during the Snellius Expedition of 1929-1930. During the expedition – which lasted from July 27, 1929, to November 15, 1930 – 34,000 nautical miles were covered. Water and sediment samples were taken, and deep-sea soundings were performed at 373 stations. The ship was equipped with two echo sounders.

In 1949, R.O.V. *Hydrograaf* was equipped with the first Decca receiver (Figure 8). The Decca positioning system meant a tremendous breakthrough in work out of sight of shore. Moreover, the hand lead became a thing of the past, and the echo sounder offered the possibility of more detailed surveys. These surveys revealed, for example, the existence of sand ripples. The use of electronic positioning made it possible to conduct structured research, which significantly improved insight into seabed dynamics. This was particularly important for safe navigation for ships with large drafts, of which there were increasingly many. In 1948, the Inter-Governmental Maritime Consultative Organization was established, the predecessor of the current International Maritime Organization (IMO).

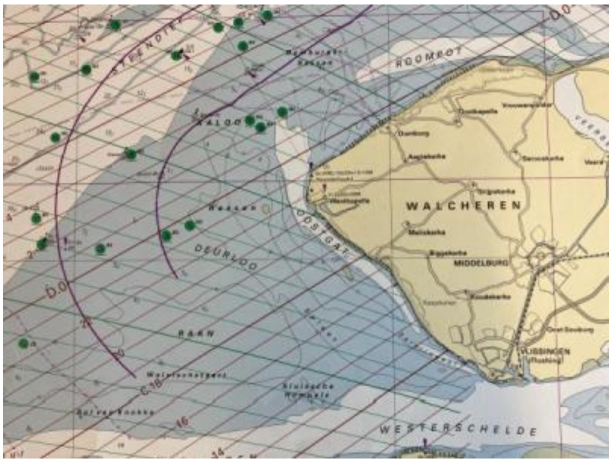


Figure 8. A nautical chart with Decca lines (source: Hydrographic Service)

The period 1950-1974

Safety of navigation is the essence of the existence of hydrographic services. In 1957, the IALA was founded, fully the International Association of Marine Aids to Navigation and Lighthouse Authorities: an organization concerned with the worldwide harmonization of maritime navigation aids, such as buoyage via the IALA maritime buoyage system. This system replaced 30 different buoyage systems.

In 1949, the transfer of sovereignty to Indonesia took place. The Hydrographic Service subsequently continued to carry out surveys in Indonesia until January 1, 1951. Pursuant to the agreement with the Republic of Indonesia, the Hydrographic Office continued to handle the publication of books and nautical charts under the responsibility of Indonesia. This work ceased on January 1, 1960. Charts of Dutch New Guinea continued to be published thereafter. However, effective October 1, 1962, the name Dutch New Guinea was replaced by Western New Guinea on all charts and books. After 1966, the production and sale of maps of this area ceased.

In the 1960s, we see a steadily increasing popularity of water sports. Following preparations with the ‘Bureau voor Watertoerisme’ (Office for Water Tourism, a collaboration between the organizations ANWB and KNWV), the first edition of the ‘Charts for sailing and motor yachts’ was published in 1968. The coverage of these charts, now known as the 1800-series charts, expanded rapidly in the following years from the IJsselmeer area to the Wadden Sea, the South Holland and Zeeland waterways, and finally to the Dutch coast in 1981.

Also in the 1960s: oil and gas extraction in the North Sea. The discovery of the gas field in the province of Groningen in 1959 raised presumptions that natural gas might also be found beneath the North Sea. After many exploratory drillings in the Southern North Sea, the (Norwegian) Ekofisk and (British) Forties fields were discovered in 1969 and 1970. Before these discoveries were made, the Convention on the Continental Shelf – now part of the UN Convention on the Law of the Sea – was concluded in 1958. This was the starting point for negotiations on maritime boundaries between the countries surrounding the North Sea. These boundaries are largely based on the principle of equidistance, with the exception of Germany, which successfully objected to it. The fact that the border negotiations took place before minerals were discovered (in this case, oil and gas) ensured that the border negotiations proceeded considerably more smoothly than in areas where the reverse was the case.

The period 1975-1999

In 1975, chart production was still entirely manual (Figure 9). There was a drafting room with drafters who created the chart based on a compilation model put together by a cartographer. At that time, the charts were still actually drawn using etching ink on a transparent PVC film material: Astralon or Astrafoil. This resulted in ‘final films’, one for each printing color: (black, blue, yellow, magenta, Decca red, Decca green, Decca brown, plus the back of the map).

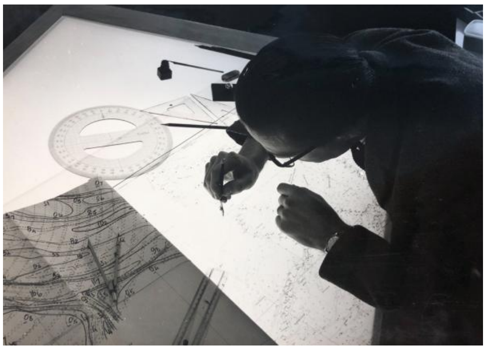
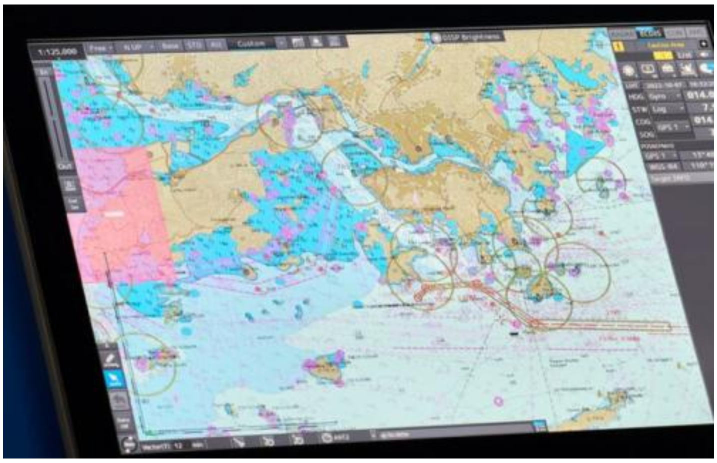


Figure 9. Engraving nautical charts (source: Hydrographic Service)

With the commissioning of the HNLMS *Buyskes* and HNLMS *Blommendal* in the 1970s, automation made its entrance: the HYDRAUT system was installed both on board and at the Hydrographic Office, allowing survey data to be processed automatically. These ships were specifically built for bathymetric surveys and wreck/obstruction detection on the Dutch Continental Shelf for the purpose of our charting obligation. They also represented an improvement over their predecessors in terms of sensors. With side scan sonar – since the early 1980s – the detecting wrecks and obstructions were significantly improved. The side scan sonar is a ‘fish-shaped’ sonar that is towed by the survey vessel. Wrecks or obstructions that were not detected by the echo sounder, because the echo sounder only looks directly under the ship, can be detected with this sonar. Side scan sonar works approximately like a grazing light. Hold a flashlight along a plastered wall, and only then can you clearly see how bumpy the wall is.

The foundation for the electronic chart was laid in the 1980s. In 1984, a working group focused on Automated Chart Production was formed within the NSHC (North Sea Hydrographic Commission), an initial indication that consideration of the electronic chart was beginning to take place. For the time being, this concerned the exchange, storage, and updating of data in digital form. With the aim of further developing the many aspects of the electronic chart, a working group emerged from this, chaired by the then Chief Hydrographer, L.H. van Opstal. In 1987, the group delivered the preliminary specifications for ECDIS (Electronic Chart Display and Information System) (partly based on a report from the ‘North Sea Project’ in Norway). To provide digital information to an ECDIS system (Figure 10), a universal standard exchange format was devised: S-57. The first edition of S-57 was published in 1992. Every object in an S-57 file has a predefined set of attributes as defined by the S-57 standard.

Figure 10. ECDIS on board a ship (source: Hydrographic Service)



These are short names that can be related to longer, more meaningful names using the S-57 object/attribute catalogue. At the Hydrography Office, the cartographers were retrained to work with the CARIS system, which was acquired in 1986. This represented a huge transition for the cartographers, who had to switch from traditional drawing and engraving work at the drawing board to digitizing on a screen.

The period 2000-2024

HNLMS *Snellius* was commissioned on December 11, 2003, followed six months later by sister ship HNLMS *Luymes*. The ships are equipped with advanced survey systems, including a multibeam echo sounder, side scan sonar, and magnetometer. As a result, the ships produce a multitude of data compared to their predecessors. The advent of GPS in the 1990s also contributes to the results: thanks to GNSS correction services, the Hydrographic Survey Vessels achieve vertical precision down to the decimetre level, which translates into more accurate depth data on the nautical chart, and thus an improvement in the safety of navigation at sea. Unlike their predecessors (the 'white fleet'), the current ships are grey, just like other naval vessels. This makes the ships multi-purpose and suitable for operating in (NATO) fleet formations. Current examples of this include the protection of critical underwater infrastructure or relief efforts following hurricanes in the Caribbean. After an agreement on maritime border demarcation was already reached with Venezuela in 1978, negotiations were also held with the other neighbouring countries in the Caribbean during the period 2000–2024: most have since been successfully concluded, while others are in an advanced stage (Figure 11).

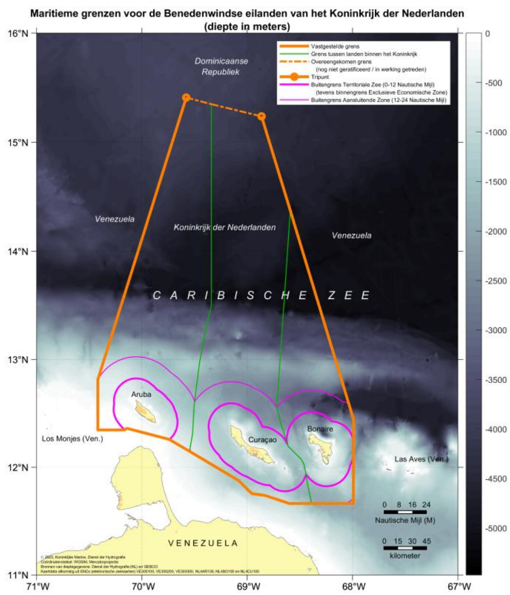


Figure 11. Overview map of maritime boundaries, in this case of the Leeward Islands of the Caribbean part of the NL Kingdom (source: Hydrographic Service).

The Service's environment is becoming increasingly data-driven: initiatives such as INSPIRE and EMODnet are being launched. INSPIRE is a European directive for making environmental data available online in a standardized manner. This includes marine data. This is done via web services, so that anyone with an internet connection can view and download the data directly within their own GIS system. In 2009, the first EMODnet bathymetry project was launched. The European Commission funds a program in which various data from the European marine area are brought together into a single dataset, which can be displayed and downloaded online. Almost all European hydrographic services are part of consortia, which further consist of universities, research institutes, and ICT companies.

An important development for the coming years is the transition to S100. This is a new hydrographic standard that can support a wide variety of digital sources and aligns with regular international standards. This enables easier integration of hydrographic data and applications. S-100 Electronic Navigational Charts (ENCs) are usable on new ECDIS systems since January 1, 2026. From 2029, all new ECDIS systems must be S-100 compatible. Existing systems may continue to operate on S-57 thereafter. Consequently, there will be a long transition period with dual coverage.

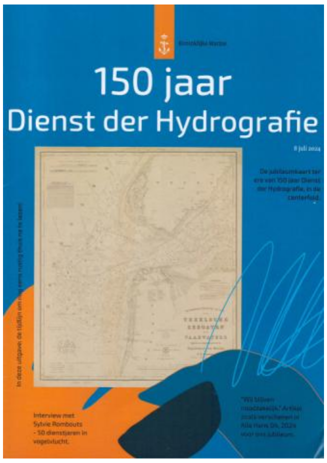


Figure 12. Front page of the 150th anniversary edition of the Hydrographic Service (Anon., 2024)

Want to read more?

For those wishing to read more (in Dutch), we can certainly recommend a special issue of Caert-Thresoor, dedicated to 150 years of the Hydrographic Service (Barten *et al*., 2024). Furthermore, the timeline has also been published as a brochure (Anon., 2024; in Dutch, Figure 12), which includes several interviews and an image of the first nautical chart published by the Hydrographic Office. For those interested: send an email to hydro.geo@mindef.nl and we will ensure that a copy is sent to your home.

Thijs Ligteringen
Head of the Geodesy & Tides Knowledge Centre at the Hydrographic Service
[hydro.geo@mindef.nl]

References

Anon., 1974. Met lood en lijn. Vier eeuwen hydrografie. Maritiem Museum 'Prins Hendrik', Rotterdam, pp.135 [Dutch and English versions)

Anon., 2024. 150 jaar Dienst der Hydrografie. Koninklijke Marine, Den Haag, pp.42

Barten, T., H. Ferwerda, J. Schaap, L. Dorst, J. Pietersma, F. Ormeling, R. Guleij, R. van Tijen & G. Boink, 2024. 150 jaar Hydrografische Dienst, Themanummer Caert Thresoor 43(4): 1-54

Blussé van Oud-Ablas, P., 2022. De Hydrograaf in kaart gebracht. Merifin, pp.81

NIMH, 2024. EX USE NAUTAE - ten dienste van de zeeman. Marineblad, 134(4): 27-29

Antoon Kuijpers & Wolfgang Matthäus: Monaco 1966
The 1st International Congress on the History of Oceanography

Background and Organization

In the year 1966, more precisely on June 12th, it was exactly 100 years ago that Prince Albert 1st of Monaco (1848–1922) had boarded the Spanish frigate 'Tetuan', which represented the start of his maritime engagement. In course of the following years, he developed an increasing interest for research of the ocean which in 1910 resulted in the opening of the Musée Océanographique in Monaco (Figure 1a,b). In addition, after having led a larger number of scientific expeditions Prince Albert 1st took the initiative for establishing the Institut Océanographique, where today the Museum is a part of. Later in the 20th century his great-grandson Prince Rainier III of Monaco (1923-2005) showed a similar interest for marine sciences and maritime policy, and had a close collaboration with Commander Jacques-Yves Cousteau (1910-1997). This French naval officer and oceanographer had been involved in the development of the first free diving gear and produced a wealth of underwater documentaries (e.g. Cousteau & Dumas, 1953).

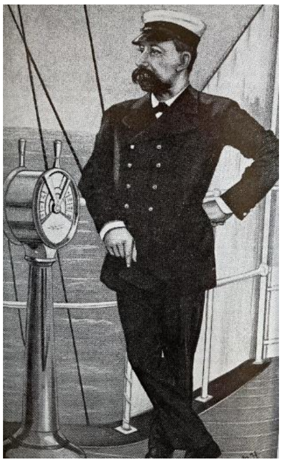


Figure 1a. Musée Océanographique (Oceanographic Museum of Monaco; Wikipedia, https://en-wikipedia.org)
Figure 1b. Prince Albert I of Monaco (cartoon 'Vanity Fair', 7 June, 1900)

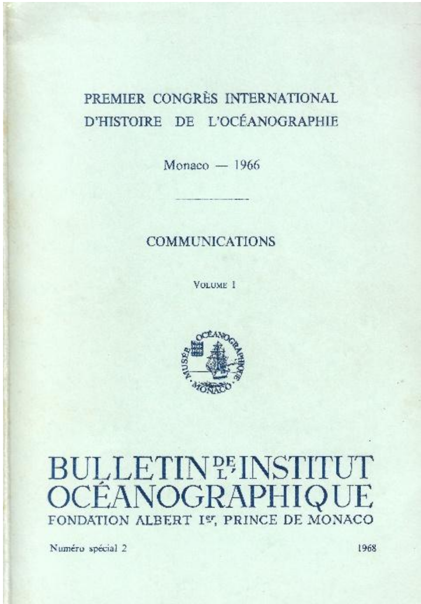
International collaboration on research into the history of oceanography had scarcely been undertaken on a large scale until the middle of the 20th century. The major international oceanographic congresses held in New York in 1959 and in Moscow in 1966 focused primarily on current issues in research of the world's oceans.

Therefore, it was an important milestone, that under the protectorate of Prince Rainier III of Monaco in December 1966 the 1st International Congress on the History of Oceanography (ICHO-I) was organized by the Institut Océanographique, the UNESCO, and the International Union for the History and Philosophy of Science and Technology. At the occasion of this year's 60th anniversary of ICHO-I the purpose of our contribution is to commemorate this important event in the history of oceanography and its status as an independent field of research.

Following after the congress detailed proceedings in the form of three volumes were produced (Anon. 1968, Figure 2) and in addition a special edition of Prince Albert I's book 'La carrière d'un navigateur' was published (Figure 3). Moreover, a commemorate stamp was issued (Figure 4). The proceedings form the main motivation and source for writing the present contribution. As for the timing of the congress, it was organized only 5 years after the first international conference of the Intergovernmental Oceanographic Commission (IOC) of the UNESCO held in Paris in October 1961. The chair of the Monaco organizational committee was held by Commander Jules Rouch (1884-1973), honorary Director of the Oceanographic Museum, together with his French colleagues, the physical oceanographer Henri Lacombe (1913-2000) and the zoologist Georges Petit (1892-1973) who acted as vice-presidents assisted by the secretary general Jean Théodoridès (1926-1999). The organizational committee was further made of an international board with representatives primarily from Monaco and France including, amongst others, J.-Y. Cousteau. Members of this board of in total 17 persons from other countries included James N. Carruthers (1895-1973, National Institute of Oceanography, Wormley, UK), Commander Damaso-Berenguer (Director of the Spanish Oceanographic Institute in Madrid, Spain), Ilmo Hela (1915-1976; Institute of Marine Science, Helsinki, Finland), and Gunnar Thorson (1906-1971, Director of the marine biology laboratory of Copenhagen University in Helsingør, Denmark).

Participants

This first congress on the history of oceanography was attended by more than 200 scientists and representatives from 17 countries all over the world. The largest delegations came from France and Monaco, in number followed by Italy, the United Kingdom, USA, East Germany (German Democratic Republic, GDR) and West Germany (Federal Republic of Germany, FRG) and USSR (Soviet Union). The Scandinavian countries Norway, Denmark and Sweden were each represented by only one scientist, whereas Yugoslavia had sent 5 representatives. Other participants came from Belgium, Egypt, Israel, Romania, Switzerland, and last but not least the Vatican. Worth noting is that there were no representatives from institutions in The Netherlands. Within the latter context it should be noted, however, that Egbert Duursma and Caroline Duursma did attend, but at that time they were affiliated with the Oceanographic Museum/IAEA in Monaco.



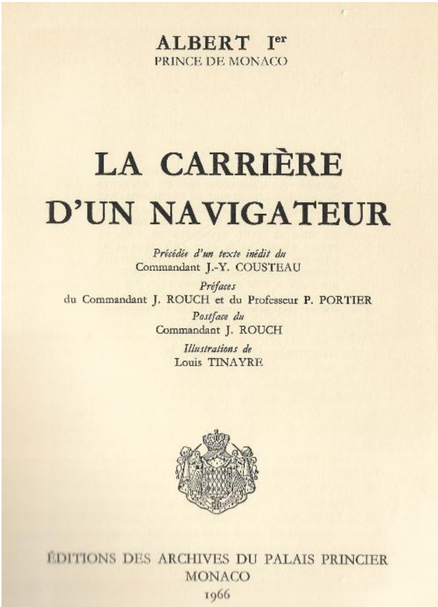


Figure 2. Title page of the 1966 Monaco Congress book, Vol.1. (Anon., 1968)

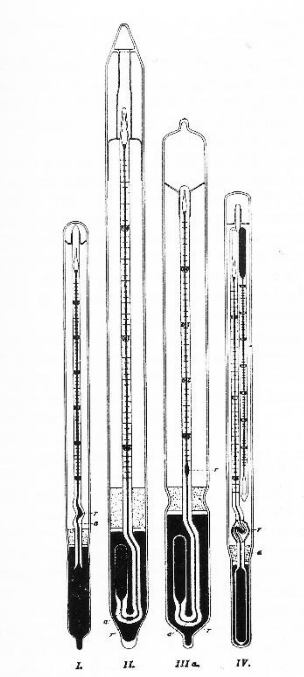
Figure 3. In relation to the congress, a special edition of Prince Albert I's 1902 book 'La carrière d'un navigateur' was published (Albert I, 1966)

Figure 4. At the occasion of the 1966 congress a commemorate stamp had been issued (private collection, W. Matthäus)

Selected Scientific Contributions

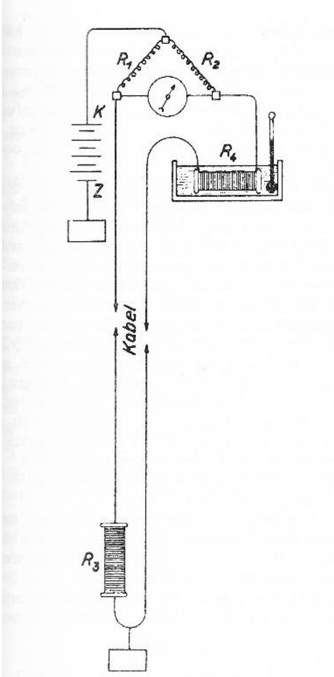
The participants of the congress presented more than 50 contributions with emphasis on the historical development of marine sciences. These presentations covered a great variety of aspects of marine research and related scientific fields. The presentations focused on topics ranging from physical, biological and chemical oceanography to geology, cartography, and development in medical treatment on board ships. Noteworthy is that there were only a few papers on the history of physical oceanography. Some of these contributions have been selected and cited here primarily based on the relevance of their content with respect to actual marine research today.

At the beginning of Volume 1 of the congress proceedings, two contributions by Wolfgang Matthäus (Institut für Meereskunde, Warnemünde, GDR) are worth mentioning, i.e. a report on water-level measurements in the Antiquity, and a description of the historical development of methods and instruments for the determination of in-situ depth-temperatures at sea (Matthäus, 1968a,b). The latter contribution starts with a reference to the history of French systematic depth-temperature measurements in the Gulf of Lyon at the beginning of the 18th century (Comte de Marsilli), which experiment later that century was followed by temperature measurements in the Atlantic conducted by British sailors at water depths beyond 1,000 m (Ellis). After further trials, a new measuring technique of the reversing thermometer principle was found by Negretti and Zambra in 1874 (Figure 5), which became possible after that in 1866 the Siemens brothers had introduced the metal-resistance thermometer (Figure 6). The latter instrumentation was used amongst others during the '*Challenger*' (1872-1876) and '*Valdivia*' (1898-1899) expeditions.



<< Figure 5. Deep-sea reversing thermometers designed by Negretti & Zambra, London (I), F.C. Jacob, Copenhagen (II), V. Chabaud, Paris (IIIa), and C. Richter, Berlin (IV). (Matthäus, 1968b)

>>Figure 6. Resistance thermometer designed by the Siemens brothers to measure water temperatures at sea. (Matthäus, 1968b)



Another physical oceanographic issue was treated by Margaret Deacon (National Institute of Oceanography, Wormley, UK) who discussed some early current investigations in the Gibraltar Strait. In past centuries it could not be understood why Mediterranean Sea level did not rise, although the basin was fed by currents from both the Atlantic and Black Sea as well by river and surface water discharge from land. In the 17th century this phenomenon had got attention from several British scientists who, however, were not able to give an explanation. It was historically known from observation by sailors that their deep-sea lines were carried away against the surface current. This made the Royal Society in 1661 to ask the Earl of Sandwich to search for a possible counter current at depth. No acceptable clear clarification could be given. In the following, a British engineer, Sheeres working in Tangier, attributed the lack of Mediterranean Sea level rise to the rapid evaporation in this region. In addition, his colleague in Tangier came to another conclusion, and suggested the existence of a deep counter current, a hypothesis which the Royal Society still did not believe. The discussion continued until 1870-1871 when the right explanation was found and accepted after experiments by Carpenter and Nares.

A further oceanographic topic, today of high actuality, was presented by Georg Wüst (former director of the Institut für Meereskunde, Kiel, FRG) who discussed historical investigations of longitudinal (meridional) deep-sea circulation in the Atlantic (1800-1922). This issue is today known in relation to the tense debate whether the Atlantic Meridional Ocean Circulation (AMOC) system will collapse or weaken under further climate warming. In his contribution Wüst provided a very detailed listing of British, French, and German scientists who since 1749 had conducted temperature measurements at diverse water depths. Already in 1800 (J.F.W. Otto) and in 1814 (A. von Humboldt) had assumed a near-zero temperature in deep ocean basins suggestive of a polar origin of bottom waters. This was indeed confirmed by the first precise bottom temperature of 1.7° C measured onboard the French frigate '*Venus*' at 3,741 m in the tropical Pacific. Further evidence for the presence of bottom water of polar origin was provided during the '*Challenger*' Expedition as C.W. Thomson observed these water masses (Antarctic Bottom Water) in the west Atlantic. Owing to work by Scandinavian scientists such as e.g. F. Nansen, B. Helland-Hansen, and M. Knudsen, and at a later stage further improved by systematic measurements during the German ‘*Meteor*’ Expedition 1925-1927, an early version of a longitudinal depth section of Atlantic water mass temperatures could be published by Merz & Wüst (1922) (Figure 7).

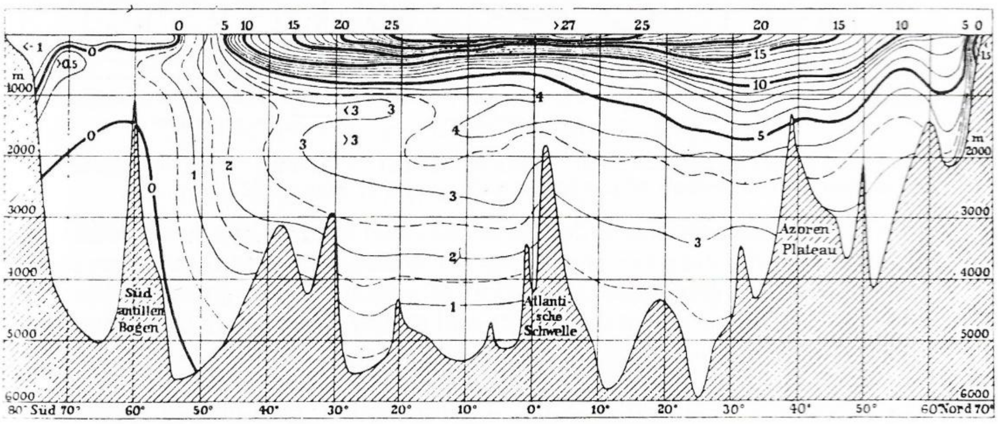


Figure 7. Longitudinal water mass temperature section through the central Atlantic along 30° W (Merz & Wüst, 1922)

As Arctic climate today is subject to much faster change than other parts of the world, it is important to pay attention to results from Arctic research in the past. At the congress this topic was addressed by Vasily F. Burkhanov (Academy of Sciences, Moscow, USSR) who gave an overview of Russian investigations in the Arctic, where Russians had already visited the coasts of the White Sea and Barents Sea in the 9th and 10th century. Later, in 1617, Russian sailors had rounded the northern coast of Eurasia, and in 1648 Semyon Dezhnev could prove that there is no land connection between Asia and America. Owing to the success of the Great Northern Expedition (1733-1743) a geographic map of the north coast of Russia could be compiled which allowed navigation in these areas. On initiation of M.V. Lomonosov during the 18th century a series of expeditions were organized for exploration of the Arctic Ocean. At the end of the 18th century and in the 19th century a larger number of Russian investigations had been carried out in many parts of the Arctic region by, amongst others, P.F. Anjou and F.P. Wrangel. At the end of the 19th century and beginning of the 20th century this was followed by further research (e.g. G.I. Sedov) which also included the first reconnaissance air flight carried out by A.J. Nagórski. After the Russian revolution the government became responsible for research in the Arctic, which in 1932 resulted in the O.I. Schmidt’s Expedition visiting most parts of the Arctic Ocean. In 1937 the first observation station on drift ice had been installed, whereas since 1954 two such stations were deployed in the Central Arctic basin. At these stations oceanographic and weather observations were made applying methods developed in the 1940s. This Soviet research has been crucial in enabling mapping of the seabed topography (e.g. Lomonosov Ridge) and understanding of water mass and ice dynamics in the Arctic Ocean.

In recent times major climate changes have now also been observed in the Southern Ocean and Antarctic region. Early scientific studies of ocean waters around Antarctica were the topic of a presentation by George E.R. Deacon (National Institute of Oceanography, Wormley, UK). One of the first scientific observations in this region dates from the 18th century and were made by an astronomer (Mr. Wales), who carried out water temperature measurements on-board Captain Cook’s second voyage. Sealers in the early 19th century made important geographical discoveries, but only few kept detailed journals. During their expeditions G. Powell and J. Weddell did, however, conduct sea and air temperature measurements, which could reveal increasing temperatures with depth below the cold Antarctic surface layers. The subsequent growth of national science expeditions led to an increasing interest for further scientific investigations of the ocean and seas around Antarctica. Bellinghausen, Ross, Wilkes and others were pioneers who made great efforts in this region, which included studies in physics, meteorology, geology, biology, hydrography and geography. In the wake of these expeditions' scientific publications such as 'Flora antarctica' (by J.D. Hooker) and 'Classification and Geographical Distribution of Crustacea' (by J. D. Dana) were published. During the late~~r~~ 19th century and in the early 20th century scientists and explorers became very active in the Antarctic region. Between the two world wars more systematic studies and the application of improved methods and instruments led to a significant progress in the understanding of ocean circulation around Antarctica.

Special attention to the development and history of quantitative marine biological research was paid in the presentation by Lev A. Zenkevitch (Institute of Oceanology, Academy of Sciences, USSR). This research discipline became possible only after the introduction of instruments that enabled a quantitative collection of flora and fauna species. An example is the plankton net, which in the late 1870s was used for the first time by Victor Hensen, and more systematically during a German expedition in 1889. The use of this device made it possible to study the quantitative distribution of plankton in the Atlantic on a large geographical scale, as can be illustrated by the map of the distribution of *Pontosphaera huxleyi* published by H. Lohmann. Twenty years after invention of the plankton net, an instrument for quantitative collection of deep-sea benthic fauna was constructed, and used for the first time by C.G. Joh. Petersen. In the following period this instrumentation was deployed by many Danish, German, Swedish, English, Finnish and Russian scientists. These investigations focused in particular on the North(west) Atlantic Ocean, Danish waters, and the Baltic Sea. Later on, Soviet scientists increasingly also investigated ocean waters at high latitudes and waters in the Far East. Quantitative marine biological research in relation to fishery became a specialization in itself, which since 1915 had been developed notably in Denmark by H. Blegvad, and later on a large scale applied by scientists in the USSR (e.g. by Zenkevitch).

Memories of the ICHO-I by Wolfgang Matthäus – 60 Years later

In the early 1960s, I began my scientific career in the history of oceanography as a young oceanographer at the Institute of Marine Research in Warnemünde of the German Academy of Sciences (DAW). Initially, little attention was paid to the history of oceanography in the GDR. It was not until the foundation of the Warnemünde Marine Research Institute that the first historical studies in oceanography began. At that time, I was working in the department 'Nautical Oceanography and Tides', which was headed by Günther Sager (1923-1991). He was also interested in maritime history, and more in particular in the history of tidal research. Surprisingly, in 1966 I had the opportunity to present my investigations on the history of oceanography at an international congress, the ICHO-I. Here is how this happened:

At the initiative of Gerhard Harig (1902-1966), director of the Karl-Sudhoff-Institute for the History of Medicine and the Natural Sciences at the Leipzig University, the Academy decided in March 1965 to establish a 'National Committee for the Philosophy and History of Science' within the DAW. In a letter dated July 28, 1966, the secretary of the National Committee had written to the ICHO organizing committee requesting that Günther Sager and I be accepted as participants, each to give two presentations. The organizing committee was strongly interested and paved the way to present and publish the papers.

However, the severe travel restrictions at that time, both by the GDR and the Allies (Travel Office in Western Berlin), and the permanent lack of foreign currency in the GDR made physical participation in the ICHO-I unfortunately impossible. Thereupon Sager asked the British oceanographer James N. Carruthers to present our papers that had been accepted by the organizing committee. He knew Sager who in the 1960s had published a tidal atlas series of the North Sea (Sager, 1963; Sager & Sammler, 1964). Carruthers who after World War II also co-founded the German Hydrographic Institute in Hamburg, kindly agreed to present our papers in Monaco. In this way, our papers still could be presented despite of the above problems.

Looking back over the past 60 years, I am still happy today that I was able to begin my international career in oceanography by working on various aspects of the history of this science thanks to the kind cooperation provided by the ICHO. I am also looking back with gratitude on James Carruthers who without any hesitation did present our four papers in Monaco.

Later, I continued my scientific career by investigating the oceanography of the Baltic Sea at the Institute of Marine Research (1963-1991) and the Leibniz Institute for Baltic Sea Research (1992-2002), always keeping in mind the history of oceanography and the special role it had played at the beginning of my career.

Selected References

Albert I, Prince de Monaco, 1966. La carrière d'un navigateur. Monaco 1902. Special edition by the Archives du Palais Princier, Monaco, pp. 238

Anon. 1968. Premier Congrès International d'Histoire de l'Océanographie, Monaco 1966. Bulletin de l'Institut Océanographique, Numéro spécial 2 , 3 Vols. Monaco, pp.805

Burkhanov, V.F., 1968. Russian researches on the Arctic Ocean. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 259-268

Cousteau, J.-Y. & F. Dumas, 1953. The Silent World – A story of undersea discovery and adventure. Hamish Hamilton, London, pp.148

Deacon, G.E.R., 1968. Early scientific studies of the Antarctic Ocean. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 269-279

Deacon, M., 1968. Some early investigations of the currents in the Strait of Gibraltar. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 63-75

Matthäus, W., 1968a. Water-level measurements of Antiquity. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 1-6

Matthäus, W., 1968b. The historical development of methods and instruments for the determination of depth-temperatures in the sea in situ. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 35-47.

Merz, A. & G. Wüst, 1922. Die atlantische Vertikalzirkulation. Zeitschrift der Gesellschaft für Erdkunde, Berlin, 1922: 1-35

Sager, G., 1963. Atlas der Elemente des Tidenhubs und der Gezeitenströme für die Nordsee, den Kanal und die Irische See. Dt. Akad. Wiss. Berlin, Institut für Meereskunde, Rostock, pp.1-45

Sager, G. & R. Sammler, 1964. Atlas der Tidewasserstände für die Nordsee, den Kanal und die Irische See. Dt. Akad. Wiss. Berlin, Institut für Meereskunde, Rostock, pp.1-6. Rostock 1964

Wüst, G., 1968. History of investigations of the longitudinal deep-sea circulation (1800-1922). Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 1: 109-120

Zenkevitch, L.A., 1968. Histoire des recherches biologiques quantitatives dans les mers et les océans avant la seconde guerre mondiale. Bulletin de l'Institut Océanographique, Numéro spécial 2, Monaco, 2: 491-504

Antoon Kuijpers
Dept. of Glaciology and Climate, Geological Survey of Denmark and Greenland (GEUS), Copenhagen [aku@geus.dk]

Wolfgang Matthäus
Leibniz-Institute for Baltic Sea Research, Warnemünde [wolfgang.matthaeus@iow.de]

Dennis Reid and Iain Suthers:
Harald Dannevig and the FIS Endeavour - pioneer of Australian fisheries and oceanography 1902-1914

Harald Dannevig – an insightful, inspiring adventurer

Harald Kristian Dannevig (1871-1914) was a contemporary of a richly talented cohort of young Norwegian fisheries scientists. His father Gunder Dannevig (1841-1911) was a successful sea captain and merchant, who championed the controversial activity of stocking larval cod into fjords to supplement the fishery. The elder Dannevig was a close colleague of the famous zoologist George Ossian Sars (1837-1927), who had discovered pelagic eggs of cod in 1865 and which overturned the view that all fish laid benthic eggs. While Dannevig did study for a year at University in Kristiania (now Oslo) under Professor G.O. Sars (1891/92), his formal educational qualifications were at secondary level. Dannevig was selected by the Fishery Board for Scotland to supervise the completion of marine fish hatcheries at Dunbar, 1894-1898 and Aberdeen 1898-1902. His major contribution was in marine stocking of flatfish, but he also studied fisheries methods of the North Sea, and became an expert in the new techniques of the trawl fishing industry.

Figure 1. Harald Dannevig in 1910

The improvement of native fish stocks by artificial stocking was very popular internationally in the late 19th Century, and there was a strong push for artificial stocking of the Australian New South Wales (NSW) marine waters, which had been depleted through overfishing and pollution of estuaries. This led to the NSW government in May 1902 inviting Dannevig to be the inaugural Superintendent of Fisheries Investigations and Fish Culture at the NSW Department of Fisheries. A mere two months later, a young Harald Dannevig had successfully arranged collection of more than 800 European fish and crustaceans, designed and supervised construction of facilities to keep them alive for the 23,000 km, 41-day voyage from Plymouth, England to Sydney on the passenger/cargo ship RMS *Oroya*, along with his wife and daughter. As he nurtured the fish through the warm waters of the Suez Canal, his mission and enthusiastic personality became an attraction for the passengers on board, to venture downstairs to see 'Dannevig's fish' and witness his experiment to test the effect of water temperature on fish mortality in a passenger's bathtub!

Figure 2. Dannevig family at Cronulla laboratory grounds in 1908, prior to Harald Dannevig's move to Melbourne. Front row: Daughter Sigrid aged 9, Harald Dannevig's brother Georg, Harald's wife Annie, Harald Dannevig, sister-in-law Janet Dannevig, wife of Georg Dannevig. [Photo courtesy Anne Dannevig Ballard]

When Dannevig arrived in August 1902 he found a country booming with confidence from federation and self-government in 1901 but also found significant overfishing of freshwater and estuarine resources, with no capacity or interest to harvest the coastal ocean. He soon established a research laboratory and hatching pond at Cronulla NSW, commissioned in 1904. The Cronulla laboratories were used by the NSW Government Fisheries Department until 1920, by the CSIR/CSIRO 1939-1984, and NSW Fisheries 1984-2012. The transportation of fish from England was hailed as a great success, but subsequent acclimatisation efforts on these fish failed. During the voyage Dannevig's thoughts were already moving towards the establishing of a commercial wild fisheries industry for NSW and the rest of Australia. He saw that Australia needed to establish a fishing industry and a fish transport, handling and marketing system that provided a relatively cheap product at a reasonable price.

In 1907 Dannevig remained in his NSW position and was co-opted as an advisor to the Federal Government on fisheries matters. In July 1908 he was appointed as Australia's first Commonwealth Director of Fisheries and scientific director of Australia's first research vessel. The exploration of Australian waters with a new state-of-the-art ship coincided with similar projects in the North Atlantic with a 1910 'Michael Sars Expedition' led by the renowned Norwegian fisheries scientist Johan Hjort, and in South Africa under the Scottish scientist John Gilchrist from 1896 to 1901 on the Scottish built trawler *Peter Faure*. Interestingly, in 1895 Gilchrist was working in Edinburgh, only an hour (50 km) away from Dannevig at Dunbar but there is no record that they met.

The FIS *Endeavour* and identification of fishing grounds 1909 to 1914

The Fisheries Investigation Ship FIS *Endeavour* (41 m long, 331 tons, draught 3.6 m) was built at the Eastern shipbuilding slipway adjoining the Fitzroy Dock, Cockatoo Island. At that time the shipyard facilities on the island were commonly known as the Fitzroy Dock. The ship's design was based on plans of the Norwegian research vessel *Michael Sars* - an English trawler (38m, 226 tons, 3.65m) rebuilt under Hjort's supervision in Norway in June 1900 for oceanographic and fisheries research. Plans and specifications of the Norwegian ship were obtained in March 1907 through renowned explorer and scientist Fridtjof Nansen (1861-1930), then Norwegian ambassador to the UK. The *Endeavour* was designed by Walter Reeks who modified the *Michael Sars* plans to suit Australian conditions and the requirements of the *Endeavour* project. Construction was supervised by Andrew Christie. The construction cost of the ship was approximately £STG 17,000 (Equivalent to $AU 24 million in 2021) and the vessel's annual operations cost ~£STG 4,800 ($AU 0.7 million in 2021). At the time there was strong political controversy over the cost and whether it should have been locally built. The keel was laid on 1 June 1908, the vessel was launched on 27 August 1908, trials were conducted in Sydney harbour and offshore in January 1909, and the first cruise commenced on 9 March 1909.

Endeavour was a side trawler, where the trawl and the trawl doors are deployed and retrieved from fore and aft gantries on the starboard side. Her task was to research fishing grounds on the continental shelf and to promote commercial fishing participation. George Cartwright was the first captain appointed but from the outset it was apparent that he resented the authority given to Dannevig (he felt that he was forced to be 'subservient to the Director') and the relationship remained fractious, culminating in Cartwright's dismissal after 2.6 years in August 2011. Captain George Pim, who replaced him, had considerable experience as master of fishing vessels in the tropics and an important scientific expedition in New Guinea, had a sound relationship with Dannevig, and was much more successful in the position.

Endeavour was also equipped with several oceanographic instruments for which Dannevig provided training for those on the Australasian Antarctic Expedition on at least two occasions (1911, 1912), including the crew of SY *Aurora*. In particular, they had problems with dredging, and Captain J.K. Davis of SY Aurora specifically expressed gratitude for experience on the *Endeavour* in dealing with the deep-sea trawl. Dannevig was very experienced in trawling as noted in a letter to a Sydney newspaper in August 1908 by Australia's federal Treasurer Sir William Lyle "I spoke to Mr (Fridtjof) Nansen, thanking him for what he had done, acting so promptly…(Mr Nansen said).. I could place full reliance in Mr Dannevig, and said he was one of the best men for trawling and fishing generally in Norway." On the 1912 voyage from Melbourne to Eden, Captain Davis noted use of the Ekman current meter, an Ekman reversing water bottle fitted with a Richter thermometer, and a Lucas sounding machine. Water temperature was recorded with depth and currents every 3 hours while at anchor, to determine tidal currents.

Figure 3. Construction of FIS Endeavour at Cockatoo Island Dockyard, August 1908 [Photo: CSIRO Archives]

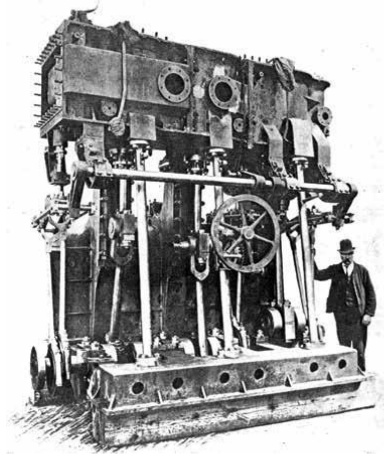


Figure 4. FIS Endeavour main engine ready to be fitted, August 1908, Superintendent of Cockatoo Dockyards, A.E Cutler on right [Photo: Government Dockyard, Biloela Annual Report 1908-09, Reproduced with permission]

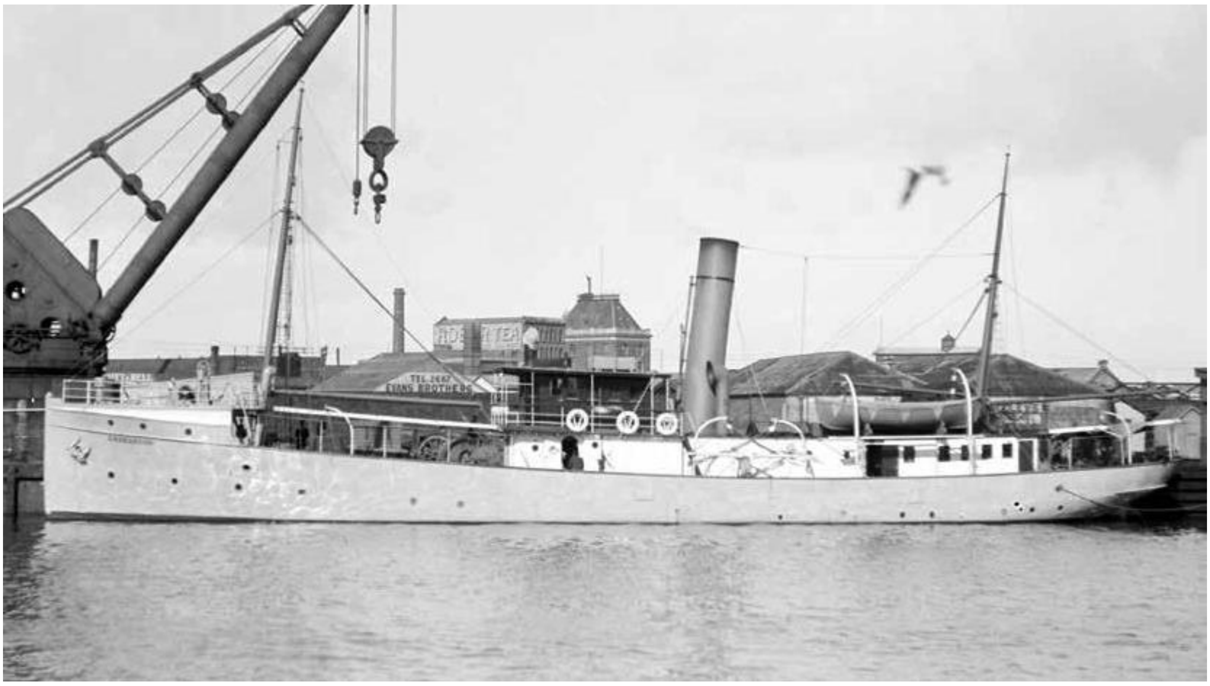


Figure 5. F.I.S. Endeavour photographed 1908–1914, moored at the south bank of the Yarra River, Melbourne. [Photo by A.C. Green, courtesy of State Library of Victoria].

The East Australian Current (EAC) and its high degree of scale variability was not realised until the 1980s. Dannevig in 1907 wrote about organising fast going steamers to record sea surface temperatures from steamers going to New Zealand and noted "it appears that the centre of the warm current is normally situated somewhere within 100 to 150 miles off the NSW coastline in the latitude of Sydney; its western border brushes along the headlands and is known to coasting crafts and line fishermen." He described strong currents of the EAC beginning at Sandy Cape (26°S, Fraser Island), and again evident at Smoky Cape (31°S), and the currents extended down several hundred fathoms. The EAC functions "as a soft broom" in depositing the sediments south of the major river mouths, and south of Gabo Island "where the final and largest eddy is formed". His appreciation of the EAC eddies is prescient of the studies of the 1980s by CSIRO and university oceanographers. In two papers published after his death, Dannevig described the depths, sediments and trawling potential of the continental shelf off south eastern Australia, and in Bass Strait. This area remains one of the most profitable trawling regions in southern Australia, known as the south east trawl.

Figure 6. FIS Endeavour officers and crew in 1912. Second row: Chief Engineer, A. Mackay; unidentified; Mate, J. Burkitt; Director of Fisheries, H. Dannevig; Master, G. Pim; Second Engineer, S. Ditchman; unidentified. Other crew members unidentified [Photo courtesy Anne Dannevig Ballard]

As Fisheries Director, his 99 research cruises in 6 years to determine suitable trawling grounds, covered ~7,000 km of coastline and led to the identification of 263 new species, including 96 new fish species and ~5,000 catalogued specimens. The specimens collected by Dannevig were delivered to Allan McCulloch (1885-1925) at the Australian Museum, who is regarded as one of the greatest Australian ichthyologists. In particular, one common and globally distributed viperfish was named *Chauliodus dannevigi* by McCulloch. McCulloch wrote [1] "*The specimen described …. was one of the last fishes preserved on board the Endeavour before she left on her ill-fated voyage to Macquarie Island. I associate with it the name of my friend, the late Mr Harald C. Dannevig, who collected it and whose untimely loss terminated a grand chapter in the fisheries investigation in Australia.*"

[1] McCulloch, 1916

From 1909-1914 the *Endeavour* surveys had identified 15,540 km² of fishing grounds suitable for trawling off eastern Australia, and 10,360 km² in the Great Australian Bight. Its surveys off southern Queensland in June 1910 discovered a large new prawn species (*Metapenaeus endeavouri, M. ensis),* locally known as Endeavour prawns. *Endeavour* also made preliminary surveys of fishing grounds off Western Australia as far as Geraldton. Dannevig was on most of the 99 research cruises over the six years of operation, each lasting two to three weeks.

Figure 7. On board Endeavour after a successful trawl, October 1913. In foreground Dannevig with large snapper at his feet, at rear from left, Captain George Pim, Unknown (possibly cinematographer's assistant), Senior engineer Angus McKay. [Photo courtesy Anne Dannevig Ballard]

The distribution of trawling areas explored by *Endeavour* off eastern Australia, Western Australia and the Great Australian Bight span an area as wide as the North Atlantic. Based on these trawls, which he cautioned were scientific trawls rather than commercially made, he found favourable quantities of fish compared to the North Sea.

Within a decade these catch rates nearly halved, and the trawl fishery that Dannevig discovered and promoted had collapsed by the late 1950s. However, such fluctuations have since characterised the south east trawl fishery for many reasons.

In 1913 Dannevig presented an economic case for investing in a trawler, the operating costs, catch rates, and an expected profit. He then quantitatively compared the demand for fish, by the per capita quantities of fish in Great Britain being threefold greater than Australia, while Australians ate more than double the per capita consumption of meat. He argued this was primarily due to the high price of fish in Australia, and due to irregular supply and quality. At the time, onboard freezing technology was just becoming available and Dannevig promoted the importance of constructing smokehouses, particularly important for remote Australia. In conclusion he stated that: "there is no apparent reason why the Australians should not have as regular and abundant a supply of prime fish in markets and shops as any other modern nation. It is, as will be seen, a matter of enterprise only".

Harald Dannevig employed posters, public and scientific presentations, pamphlets and even a 7-minute promotional film: "Day on a trawler" in 1913, which was filmed by Bert Ive, the pioneer Australian Commonwealth Cinematographer. In the film one can see the winches bringing large cod-ends of fish, sorting and gutting of fish by the crew, and the chiller rooms in the lower decks (National Film and Sound Archive Canberra, ID 13249). A short video [2].

Figure 8. Commonwealth Cinematographer Bert Ive on hero platform filming 'Day on a trawler' in October 1913. [Photo courtesy Anne Dannevig Ballard]

Dannevig had a major contribution to the 1912 Royal Commission on Food Supply, explaining the findings of the *Endeavour* program, and prospects for a future fishing industry. The momentum of fisheries research initiated by Dannevig was stopped in late 1914 when the Endeavour was assigned to the final, fatal voyage to Macquarie Island to service the meteorological station. The Antarctic Expedition ship SY *Aurora* was in refit and naval vessels were committed to WWI. The Australian military forces left Australia on 1 November 1914, only 24 days before *Endeavour* left Hobart on her last voyage. On the return voyage, a severe gale up to Beaufort 10 was recorded at Macquarie Island on 4 December, and the vessel disappeared without a trace. Multiple gales were recorded in the area in the following three weeks. Based on the approximate time of departure and steaming at less than 8 knots, the wreck probably lies in 4,000 m of water, ~400 km north-west of the island. In the 1915 Marine Court of Enquiry documents and newspaper reports it was noted that a set of questions was sent to Dannevig and Captain Pim to ascertain the suitability of the vessel, although their specific responses are unknown. It became clear from the enquiry just how involved Dannevig was with the construction at the shipyard. Despite the impending war, the loss of the *Endeavour* without a trace filled the national pages leading up to the inquiry, and three vessels searched the area for up to two months.

[2] See a short video: https://youtu.be/H8kpDctt1bY?si=wMU_QSfjv6b_-eVT

It is clear that Dannevig had a larger synthesis work underway in 1914, and it is likely that much of this work was on board *Endeavour* when it was lost. Besides some fauna, Dannevig's name is given to an island in the Glennie Group, on the western side of Wilson's Promontory in Bass Strait. A 23 m trawler commissioned in 1946 by the CSIR Marine Station Cronulla, MV *Dannevig*, was chartered in 1948 for trawl fish and oceanographic studies. At the Cronulla station, the laboratory originally built by Dannevig was named the HC Dannevig Laboratory in 2006 and in 2010 a NSW Fisheries patrol boat was named *Harald Dannevig*. In a 1915 obituary N. Lockyer, Dannevig's Department head wrote about Dannevig's legacy [3]: "*No more capable man could have been chosen to direct it than Harald Dannevig, who combined a knowledge of the habits and the life of fish, acquired from childhood, with the enthusiasm of one who loved his profession and spent most of his life on it. Out in all weather, in storm and sunshine, when he could have readily directed the work from a comfortable office on shore, his one thought and ambition was to succeed in bringing home to the many doubting minds in Australia that there is a rich reserve of food supply in the fisheries of our coast, simply waiting to be harvested.*"

Postscript

From 1913 to 1916 the Danish scientist Theodor Mortensen, a world expert on echinoderms, made a remarkable 900-day scientific voyage. A new book describing the voyage was recently published [4]. Chapter 6 describes his experiences in Australia, including a close friendship and collaboration with Harald Dannevig on a cruise of FIS Endeavour in September 1914, just 3 months prior to Dannevig's tragic last voyage. Mortensen was invited to join the ill-fated cruise to Macquarie Island and seriously considered accepting, but in a quirk of fate he was instead committed to planned fieldwork on the New Zealand segment of his expedition. He was deeply affected by the loss of Dannevig, Harrisson and the Endeavour crew.

Table 1. Harald Kristian Dannevig: Personal Timeline

1871, 2 February. Born at Hisøy Norway (father Gunder Dannevig, mother Elise Smith)

1891/2, Kristiania (Oslo) University. Studied 1 year under Georg Ossian Sars

1894, March. Appointed to Scottish Fisheries, Dunbar. Hatchery building transported from Norway

1897, 17 May. Married Annie Sanson at Dunbar, Scotland

1897, 31 Dec Daughter Sigrid born at Dunbar

1898 Transported Dunbar fish hatchery to Aberdeen

1902, March. Appointed NSW Superintendent of Fishery Investigations and Fish Hatcheries

1902, July/August. Transported live fish on RMS *Oroya* to Sydney

1902, October. Recommended Cronulla site for marine hatchery

1905, 3 August. Naturalised – Australian citizen

1905, March. Hatchery and laboratory at Cronulla completed, fully operational

1908, 8 May. Appointed Director, Commonwealth Fisheries. Commenced duties 27 July, Melbourne. Salary £600 p.a. Annie and daughter to Melbourne 8.9.1908

1908, 27 August. Fisheries Investigation Ship '*Endeavour*' launched in Sydney

1909, 20 Feb. Annie Dannevig (and Sigrid) to Dunbar Scotland on *Runic* (arrived Plymouth 6.4.09)

1909, 10 November. Son- Olaf Haakon Dannevig - born at Dunbar, Scotland

1910, November. Annie Dannevig returns on *Runic* to Melbourne with Sigrid and Olaf. Arrived Melbourne 5.1.1911).

1914, 24 November. Dannevig on *Endeavour* to Macquarie Island, trawling and changeover meteorologist

1914, 4 December. *Endeavour* left Macquarie Island for Hobart, lost in gale, all 22 lives lost

1915 Marine Court of Enquiry, *Endeavour* sinking

1915 Compensation to Dannevig's family announced - 1 year's salary

1915 Probate of Will, total estate £ 641

[3] Lockyer, 1915

[4] Fasmer Hansen & Fasmer Hansen, 2025

References & Further reading

ABC Podcast 2018. https://www.abc.net.au/radionational/programs/the-history-listen/the-man-who-made-us-eat-fish/10404854 (last accessed 31 March 2026)

Fasmer Hansen, Sara & Tine Fasmer Hansen, 2025. Livet i Havet, Theodor Mortensens Stillehavsekspedition 1913-1916. Lindhardt og Ringhof, pp. pp.432 [in Danish]

Jones, I. & J. Jones, 1992. Oceanography in the Days of Sail. Hale & Iremonger, Willoughby, NSW, Australia, pp.288 [p, 247-5]

Lockyer, N., 1915. In Memoriam: Harald Christian Dannevig, Director, and the work and loss of the F.I.S. *Endeavour*. Biological Results of the Fishing Experiments Carried on by the F.I.S *Endeavour*, 1909-1914. 3: i-vi. Commonwealth of Australia, Department of Trade and Customs, Sydney

Lucas, A. 2012. The Captain's Notebook: J.K. Davis at Eden, 1912. The La Trobe Journal, 90: 136-150

Lucas, A., L. Kriwoken, & E. Leane, 2011. Captain John King Davis on F.I.S. Endeavour: Preparing for oceanographic work in the Southern Ocean. Polar Record, 47: 356-370

McCulloch, A.R., 1916, Report on some fishes obtained by the F. I. S. "Endeavour" on the coasts of Queensland, New South Wales, Victoria, Tasmania, South and South-Western Australia. Part IV, Biol. Results "Endeavour": 4(4): 169-199: 181

Suthers, Iain M., Dennis D. Reid, Erlend Moksness & Hayden T. Schilling, 2021. Novel fisheries investigations by Harald Dannevig: some parallels with Johan Hjort on the other side of the world. ICES Journal of Marine Science, 78(2): 755–764 [doi:10.1093/icesjms/fsaa001]

This article is an adaptation of the Australian National Maritime Museum magazine Signals, 139(Winter 2022): 13-19

Dennis Reid, Australian Museum, College St., Sydney 2000, Australia [dennisreid8@gmail.com]

Iain Suthers, Sydney Institute of Marine Science, Chowder Bay Road, Mosman 2088, Australia [I.Suthers@unsw.edu.au]

Samuel Gutestrand Mandarić: *Bornö Marine Research Station and the Emergence of Swedish Hydrography*

Summary

In the late nineteenth century, oceanography underwent a gradual process of standardisation, fostering more coherent scientific methodologies and facilitating international collaboration. The Bornö Marine Research Station, founded in 1902 and situated in the Gullmar Fjord on the west coast of Sweden, serves as an illustrative example of the developments taking place during this period. Established by the Swedish marine scientist Otto Pettersson, the station reflected his forward-looking vision, emphasising systematic data collection and the internationalisation of Swedish marine science. Despite limited governmental funding, Pettersson, with the help of his friend Gustaf Ekman, personally financed the construction and early operations of the station, transforming it into an important centre for marine observation and research. The rise of marine research stations in the late nineteenth and early twentieth centuries marked a transformative phase in oceanography, characterised by increasing international cooperation and more standardised research practices. Bornö Station remains a representative example of these pioneering efforts and illustrates the institutional foundations that have evolved into modern marine science.

The international rise of marine research stations

In conjunction with the broader recognition of marine research as an independent scientific discipline during the 1870s, permanent oceanographic research stations began to appear in various parts of the world. The global expansion of marine stations was driven mainly by commercial interests within the fishing industry, but also by considerations of national prestige, the development of experimental scientific methodologies, and the systematic surveying of natural resources. In total, around forty marine stations had been established along the coasts of Europe by the beginning of the twentieth century. These stations were financed through governmental appropriations or by private fortunes and donations.

The Stazione Zoologica in Naples opened in 1874 and early on developed into an international centre for marine research, while also serving as a model for several later European research stations.[1] The British Marine Biological Association established the Plymouth Laboratory in 1888 with the aim of conducting experimental zoological research, particularly focused on embryology and physiology, with financial support from the British fishing industry. In Germany, the state collaborated with the fishing industry and representatives of academic institutions to establish a permanent research station on the small island of Helgoland in the North Sea in 1892. At the mouth of the Gulf of Finland in the northern Baltic Sea, the Tvärminne Zoological Station was founded with private funds in 1902, and its activities came to encompass biological research in both zoology and botany. During the same period, Prince Albert I of Monaco founded the renowned Institut Océanographique in Paris, which became a central institution for oceanographic research and education in Europe.[2]

In Sweden, the Kristineberg Zoological Research Station was founded in 1877 by Sven Lovén (1809-1895). By the time Kristineberg was formally established near the inlet of the Gullmar Fjord in central Bohuslän, the site had already served for decades as a field station for the exploration of Swedish marine fauna.[3] During the summer months, the station functioned as an informal academy of marine research, where Swedish and foreign marine biologists gathered in scientifically equipped facilities to carry out biological investigations and experiments.[4]

Kristineberg's activities were conducted with the approval and support of the Royal Swedish Academy of Sciences, which during this period exercised considerable influence over, and control of, scientific work in Sweden. The necessary funding came from private donations and annual appropriations from the national parliament. Hjalmar Théel (1848-1937), curator of the invertebrate department at the Swedish Museum of Natural History, later became responsible for the operations at Kristineberg. Under his leadership, the station began to remain open during the winter season with the intention of gaining knowledge about the overwintering of marine organisms and investigating how the microscopic flora and fauna changed with the seasons.[5] Kristineberg was not strictly a zoological station; botanical and plant-physiological studies were also conducted there, and on certain occasions the station also served as a site for geological, hydrographic, and meteorolo-gical observations.[6]

The formation of the Swedish Hydrographic Commission

After the official foundation of the Kristineberg Zoological Research Station, several decades passed before a new research station with a hydrographic and biological orientation was established by Gustaf Ekman (1852-1930) and Otto Pettersson (1848-1941). The construction was financed with their own funds, and the chosen location was Stora Bornö, situated near the innermost part of the Gullmar Fjord, approximately 16 km

---

[1] Kofoid, 1910, p.9ff.

2 Ibid., p.37f.

3 Théel, 1928, p.12ff.

4 Eriksson, 1978, p.38.

5 Ibid., p.39.

[6] Bernhard, 1989, p.10

northeast of Kristineberg and about 100 km north of Gothenburg. Before Bornö Station was built, the analytical work carried out by the Swedish Hydrographic Commission, whose executive committee consisted of Ekman and Pettersson, was divided between Stockholm, Uppsala and Gothenburg.

Known as one of the driving forces behind the formation of the International Council for the Exploration of the Sea, Pettersson served as a professor at Stockholm University College, carried out extensive analytical work in both Gothenburg and Stockholm, and significantly contributed to the development of hydrographic research in Sweden and internationally. Ekman was a close friend of Pettersson, and during the 1870s they worked together at Uppsala University. Ekman later moved to a position as technical director in Gothenburg's industrial sector, where operations focused on the production of sugar and porter. Through him, hydrographic instruments and necessary equipment were made available to the Swedish Hydrographic Commission, and the repair work-shops of the sugar refinery could be used for maintenance and preparations ahead of expeditions.

Already at an early stage, a collaboration was initiated with the plankton specialists Per Cleve (1840-1905) and Carl Aurivillius (1854-1899), both of whom were active at Uppsala University. The biological work of the Commission was limited to the microscopic animal and plant life that drift freely in seawater.[7] Cleve undertook the investigation of marine phytoplankton, while Aurivillius was responsible for the zooplankton. These small organisms followed the ocean currents and were therefore considered to be strongly dependent on hydrographic changes and water exchange. The analytical work was conducted in Stockholm and Uppsala, but Aurivillius also spent considerable time at the Kristineberg Zoological Station.

In 1892, an international programme for hydrographic and plankton-related research in the Baltic Sea, the Kattegat, the Skagerrak, the North Sea, and the North Atlantic was developed. To enable Swedish participation, a memorandum was submitted to the Royal Swedish Academy of Sciences requesting financial support to join the Scandinavian collaboration. Following the customary preparatory process, the Academy forwarded a request for funding to the government, and support was granted in the spring of 1893 by King Oscar II.[8]

However, the state allocations were insufficient for the extensive investments required in equipment, instruments, and expeditions. To secure the continuation of the work, Pettersson and Ekman succeeded in mobilising substantial contributions from patrons and marine insurance companies. The research also received financial support in the form of interest-free loans, something made possible through Ekman's position at the sugar refinery.[9] The combined funding made it possible to carry out investigations on a larger scale than the state resources alone would have permitted.

The establishment of the Bornö Marine Research Station

With the Gothenburg and Bohuslän coast as its operational base, an extensive maritime observation network could be established, which became a central component of the emerging Swedish marine research enterprise. Although Ekman was responsible for much of the practical and technical infrastructure, it was still necessary for a substantial portion of the collected samples to be sent to Stockholm University College for analysis, where Pettersson carried out his principal research activities and had access to established analytical resources.

To streamline the work and reduce the need for time-consuming transport, Pettersson attempted to persuade August Wijkander (1849-1913), head of the Chalmers Technical Institute, to make their chemical laboratory available. With access to a laboratory in

[7] Anon, 1903, p.3

[8] Crawford & Svansson, 2003, p.43

[9] Anon, p.17

Gothenburg, the analyses could be carried out closer to the sampling areas and in direct connection with practical fieldwork. Attracting Wijkander's interest proved difficult, and after several attempts to engage him in the matter, Pettersson began to consider the possibility of establishing an oceanographic station of his own.[10] In a letter to Ekman he explained that they needed a land-based stronghold and that he was already sketching such a plan. When completed, he emphasised, Ekman would examine it carefully and keep in mind that he had placed almost all their future hopes in it.[11]

Aurivillius, the plankton researcher, wrote in a letter to Pettersson that the Gullmar Fjord is distinguished by its position adjacent to greater depths and by its distinctive hydrographic conditions.[12] The fjord is approximately 25 kilometres long and has a maximum depth of about 125 metres. In its deep-water areas, inflowing cold, saline water from the Skagerrak is stratified beneath surface waters of considerably lower salinity. This is partly due to the inflow of Baltic Sea water, as well as surface runoff and freshwater inputs to the inner parts of the fjord.[13] The correspondence between Aurivillius and Pettersson resulted in concrete proposals for suitable locations for establishing a hydrographic–biological station in the Gullmar Fjord. Aurivillius considered one question of particular importance: the possibility of obtaining water suitable for the investigations during all seasons.[14]

The correspondence between Pettersson and Ekman shows that the plans for a marine research station, including the initial architectural drawings, were sent to experts abroad in order to obtain their written opinions before the project proceeded further. Among the recipients were the oceanographer John Murray (1841-1914), who had participated in the renowned British expedition with HMS *Challenger*, and Anton Dohrn (1840-1909), director of the Stazione Zoologica in Naples.[15]

The final proposal for the location of the station was a rocky plateau on Stora Bornö, where the sea depth exceeded 50 metres, with free connection to the open ocean at all levels, and with a sheltered position protected from storms, waves, and tidal influences.[16] The island belonged to Pettersson's Holma estate and lay within sight of his residence. Between 1901 and 1902, a three-storey stone building was built on the island to serve as a permanent research station for the work of the Hydrographic Commission.

Earlier Swedish hydrographic expeditions had shown that water currents of both southern and northern origin were drawn into the Skagerrak, and likewise into the Gullmar Fjord.[17] It was assumed that the location of the Bornö Station in the inner part of the fjord's deep basin meant that water exchange could be shown to be delayed in comparison with the corresponding levels in the open outer Skagerrak. The hydrographic conditions in the deep basin of the fjord varied between years and seasons, largely due to changes in the levels of the different Skagerrak water masses outside the fjord's entrance.[18] Bornö Station is consequently in direct connection with the adjacent Skagerrak and the circulation of the Atlantic Ocean.[19]

---

[10] Svansson, 2006, p.207

[11] Crawford & Svansson, 2003; p.55. Undated letter [probably autumn 1895] from Otto Pettersson to Gustaf Ekman

[12] Ibid., p.208. Letter from Carl Aurivillius to Otto Pettersson, dated 22 March 1896

[13] Bernhard, 1989, p.5

[14] Svansson, 2006, p.207

[15] Crawford & Svansson, 2003, p.62. Letter from Otto Pettersson to Gustaf Ekman, dated 27 June 1896

[16] Anon., 1903,p.14

[17] Ibid., p.15

[18] Pettersson & Ekman, 1891, p.99

[19] Pettersson, 1904, p.110

Figure 1. View from the Holma Estate toward the research station on Stora Bornö. From Bergwik 2016

The international cooperation and the contribution of the commission

At a research conference held in Stockholm in 1899, participants from countries around the North Sea and the Baltic Sea gathered to discuss prospects for the development of fisheries. At this conference, a preliminary programme for systematic marine investigations was adopted. The research programme included proposals for conducting hydrographic and fisheries-biological observations, as well as plankton studies and surveys of the benthic fauna.[20] The marine collaboration also encompassed planned meteorological investigations carried out on a scientific basis.

Following an invitation from the Norwegian government, a second international scientific conference was held in Kristiania in 1901, at which a decision was taken to establish an international central organisation that was given the name 'the International Council'. The organisation was directed towards coordinating and promoting marine research in the North Sea and remains active today under the name International Council for the Exploration of the Sea, ICES. The aim for the organisation was to conduct negotiations with the various states and to serve as the body from which the joint investigations would be directed and their results published.[21]

The Swedish marine researchers were well prepared for the conference in Kristiania. An important step was that, in 1900, the Swedish commission had been instructed by King Oscar II to develop a permanent organisational structure. This resulted in a formal collaboration between Swedish hydrographers, plankton specialists, and fisheries biologists under the name Swedish Hydrographic Biological Commission.[22] The commission's overarching responsibility was to organise the nation's participation in international hydrographic and fisheries-biological marine investigations.[23]

[20] Svansson& Pettersson,2006, p.148

[21] Pettersson, 1904, p.100.

[22] Ibid., p.108.

[23] Fonselius, 2001, p.115f

The first task of the Swedish commission was to annually submit to King Oscar II a proposal outlining Sweden's planned participation in the international hydrographic and biological investigations. Subsequently, and in accordance with the approved programme, the commission was also given the responsibility to direct Sweden's participation in these investigations and to account for the commission's activities and the use of the funds placed at its disposal by the state.[24] Pettersson was appointed director and, as such, was entrusted with the immediate leadership of the work, the supervision of the use of materials, and the keeping of the financial records.[25]

According to the organisational proposal prepared by the Hydrographic Biological Commission, it was considered necessary to rent a depot somewhere in the Bohuslän archipelago for the storage of instruments and fishing gear. The proposal presented a detailed justification for why the Bornö marine research station ought to be integrated into the commission's activities, emphasising that a station would provide significant practical and economic advantages. Without a permanent facility, the hydrographic instruments would need to be sent to factories or mechanical workshops for storage and inspection after each expedition, something regarded as incurring substantial costs. It was also noted that the extensive and specialised fishing gear required for the investigations was manufactured only in places such as Bergen and Copenhagen, and that their sheer size made it unrealistic to transport them for repairs. Therefore, a permanent station was considered essential to store, maintain, and repair the equipment in a suitably equipped facility.[26]

Figure 2. Bornö Marine Research Station. From Pettersson, 1904.

The Swedish government gratefully accepted the offer, made by the commission, to rent the Bornö Station, particularly since it was not merely a storage depot, but a fully equipped marine experimental station situated in a favourable location in the deepest fjord in Bohuslän.[27] The station contained two fully equipped laboratories, one chemical and one biological. It also housed aquaria, storage rooms for fishing gear, instruments and trawls, as well as a floor with living quarters, a library, and rooms for microscopic

[24] Pettersson, 1904, p.108

[25] Anon., p.11

[26] Ibid., p.11

[27] Ibid., p.11

work.[28]

Swedish hydrography was founded on the aim of producing a sound long-term plan and of establishing a genuine institution that would preserve and make use of the working methods developed within the field.[29] Science derives its continuity and stable core from institutions, which serve both to safeguard scientific knowledge and to enable its renewal. Pettersson and Ekman organised hydrography as a discipline almost single-handedly, both in Sweden and in the rest of Scandinavia. The Bornö Station became a small-scale but decisive stronghold for Swedish hydrography and provided a permanent base for the research.

Pettersson later resigned from his professorship in chemistry at Stockholm University College and chose to permanently reside at the Holma estate. This allowed him to devote himself fully to hydrography and to develop the scientific field he had always dreamed of. Holma became organised around scientific work, and the distinctive line between marine research and domestic life became blurred.[30] In a letter to Ekman, Pettersson wrote that never before had his gratitude for the creation of the Bornö Station felt more tangible. Without this well-kept and fully equipped house to which he could withdraw, it would have been difficult to get through this period, and the scientific work could hardly have proceeded with the same calm and continuity as it did. Here, he wrote, he found a true sense of home.[31]

References

Anon., 1903. Svenska hydrografisk-biologiska kommissionens skrifter 1, Stockholm

Bergwik, Staffan, 2016. Kunskapens osynliga scener: Vetenskapshistorier 1900–1950. Makadam, Göteborg, pp.207

Bernhard, Carl Gustaf, 1989. Kristineberg marine biological station. Royal Academy of Sciences, Stockholm, pp.60

Crawford, Elisabeth & Artur Svansson, 2003. Neptun och Mammon: Otto Petterssons brev till Gustaf Ekman, 1884–1929. Tre Böcker, Göteborg, pp.220

Eriksson, Gunnar, 1978. Kartläggarna: Naturvetenskapens tillväxt och tillämpningar i det industriella genombrottets Sverige 1870–1914. Umeå univ.-bibl., Umeå, pp.230

Fonselius, Stig, 2001. History of hydrographic research in Sweden. Proc. Estonian Acad. Sci. Biol. Ecol., 50(2) 110–129

Kofoid, Charles Atwood, 1910. The Biological Stations of Europe, GPO, Washington. pp.360

Pettersson, Anna, 1904. Den internationella utforskningen af de nordiska hafven. Ymer, 24(2): 179-192

Pettersson, Otto & Gustav Ekman, 1891. Grunddragen af Skageracks och Kattegats hydrografi enligt den svenska vinterexpeditionens 1890 iakttagelser samt föregående arbeten å deltagarnes vägnar redigerad. Norstedt, Stockholm. pp.161

Svansson, Artur, 2006. Otto Pettersson: Oceanografen, kemisten, uppfinnaren. Tre Böcker, Göteborg, pp.376

Théel, Hjalmar, 1928. Bidrag till Kristinebergs historia. Almqvist & Wiksells, Stockholm, pp.48

Samuel Gutestrand Mandarić
Institute for Globally Distributed Open Research and Education, Gothenburg, Sweden
[samuel.gutestrand-mandaric@igdore.org]

[28] Pettersson, 1904, p.110f

[29] Crawford & Svansson, 2003, p.62

[30] Bergwik, 2016, p.72

[31] Svansson, 2006, p.82

Anna Batzeli: *A Glimpse into the History of Oceanography Studies in Greece*

The sea has always played a significant role in Greek history, culture, and economy. With a coastline measuring 13,676 km and more than 6,000 islands and islets (of which approximately 227 are inhabited), the establishment of a university department dedicated to marine sciences and oceanography was a natural development. Surprisingly, however, the first university department devoted to oceanography studies in Greece was established only in 1997, as part of the University of the Aegean, and is based on the island of Lesvos in the city of Mytilene.

The department was initially named the Department of Marine Sciences and was later renamed the Department of Oceanography and Marine Biosciences in 2018. The aim of this piece is to briefly present the difficult beginnings of this department, which today plays a pioneering role in the field in Greece, with notable scholars and important contributions to oceanographic science.

According to its founding act, published in the government gazette, the mission of the department was:

> "*to cultivate and promote Marine Science and to train scientists capable of:*
>
> 1. *Studying and understanding the physical, chemical, biological, and geological processes of the marine environment in order to draw conclusions related to the exploitation of its wealth-producing resources; and*
> 2. *Providing, on the one hand, knowledge of marine engineering for understanding the interaction between the sea and human structures related to the marine environment (coastal structures, floating facilities), and on the other hand, knowledge of the economics and legislation of marine and coastal activities for the understanding of the issues related to them.*"[1]

While the mission of the newly established department was ambitious, its early years were marked by a number of challenges. One of the main concerns, frequently highlighted in the press, related to the professional prospects of graduates in this emerging field. Journalists often commented on the difficulties students faced in securing employment after completing their studies. For instance, Figure 1, published in May 1999 in the newspaper To Vima, illustrates the dilemma faced by students enrolled in departments such as the Department of Marine Sciences, particularly regarding their uncertain employment prospects after graduation.

Over time, the department gradually gained greater visibility. By 2011, reports in the local press of the Aegean islands indicated that it was the only department experiencing an increase in interest from prospective students,[2] although no significant changes in entry competition were recorded in the following year.[3] Nevertheless, overall interest remained relatively limited. This trend was common for many departments of the University of the Aegean, as well as for university departments located outside Greece's major urban centres, such as Athens and Thessaloniki. Journalists analysing this phenomenon pointed to several contributing factors. These included accessibility challenges to the Aegean islands during the winter months, as well as the increased financial burden associ-

[1] Governmental gazette (Εφημερίς της Κυβερνήσεως της Ελληνικής Δημοκρατίας), 4 November 1997.

2 Newspaper Limnos (Λήμνος), 31 August 2011.

3 Newspaper Limnos (Λήμνος), 28 August 2012.

ated with student accommodation in smaller island communities hosting university departments. Moreover, during this period the Greek government-debt crisis had already begun to unfold, affecting university departments across the country on multiple levels. Despite these challenges and the limitations in available resources, the contributions of the University of the Aegean to the scholarly community at local, national, regional, and international levels were widely acknowledged.[4]

Figure 1: Source: Newspaper Vima (Βήμα), 16 May 1999. AEI is the abbreviation for university-level Higher Education Institutions. Departments to choose from are indicated: Marine Studies, Fashion (design and clothing), Plant production or Zoo production

Today, just one year before its 30th anniversary, the department continues its valuable work in the field of oceanography and marine sciences in Greece.
More information about its activities, programs, and research can be found on its website, which is also available in English: https://www.mar.aegean.gr/?lang=gr&pg=0

Anna Batzeli
Democritus University of Thrace [abatzeli3@gmail.com]

Alexandru Ș. Bologa: *The Centenary of the Marine Zoological Station „Professor Ioan Borcea", Agigea, 2026*

March 1, 2026 marks the 100th anniversary of the founding of the Marine Zoological Station (MZS), at Agigea, Constanța county, by Royal Decree No. 810 of March 1, 1926, the first marine research establishment in Romania. Founder - Professor, biologist Dr. Ioan Borcea, illustrious representative of the oldest Romanian higher education institution, the "Alexandru Ioan Cuza" University of Iassy. The MZS marked the founder's most remarkable professional achievement, in addition to numerous other public dignities held as well

4 Newspaper Limnos (Λήμνος), 16 December 2014.

as significant teaching and organizational successes.

The importance and evolution of the MZS was synthesized, among other articles on the history of science, in monograph. [1]

Figure 1. The Marine Zoological Station, Agigea, 1926

The unfortunate fate prematurely ended the life and reduced the founder's already remarkable scientific work, only 10 years after the establishment of the MZS, but it did not erase the profound mark left by this prestigious institutional achievement in the development of biology in Romania, on the contrary.

During the period 1970 and 1990, the MZS functioned as part of the Romanian Marine Research Institute (RMRI, currently the National Institute of Marine Research and Development 'Grigore Antipa'). It was created at the initiative of Academician Mihai C. Băcescu (Bucharest) and Academician Eugen A. Pora (Cluj-Napoca), at Constanța, in 1970, as the biology section.

Since its founding, the MZS has been led by 12 directors, starting with the first - Professor Ioan Borcea (1879-1936), to the current one - Associate professor, biologist Dr. Emanuel Baltag, both from the aforementioned University and three Heads of department during its membership int the RMRI.

The settlement, which was initially named the 'King Ferdinand' Marine Zoological Station, was renamed, at the initiative of Academician Radu Codreanu, to the 'Professor Ioan Borcea' Marine Zoological Station and later into the 'Professor Ioan Borcea' Marine Biological Station, operating continuously until today.

The documentation on the establishment of the MZS is kept at the Constanța County Service of the National Archives (Fund No. 323 / Inventory No. 339, files 1/1926-11/1932 and No. 324).

Articles and interviews have been dedicated to the Station and its periodic anniversaries throughout its existence. Tributary volumes were published on the occasion of the celebrations of 30, 40, 70, 75 and 80 years. The history of the MZS includes the administration of the Station, the scientific activities carried out continuously, the teaching activities through student training/practices, the results of international scientific cooperation,

[1] Bologa, 2022

especially with France, Italy and the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) in Monaco. After 1990, the MZS returned to the "Alexandru Ioan Cuza" University of Iassy.

This jubilee event cannot fail to mention the outstanding personalities, directly linked to the MZS, such as the Emeritus professor, biologist Dr. Ionel Andriescu (director of the Station between 1966 and1970) and the Associate professor, biologist Dr. Maria S. Celan, both of international stature, who have substantially contributed to increasing the national and international scientific prestige of this institution.

Among the notable personalities who have visited the MZS over time, there are Dr. R.I. Călinescu, Professors M. Niculescu-Duvăz, Alexandru Borza, I. Grințescu, I. Popescu-Voitești, E.J. Nyarady, G. Marinescu, Fr. Rainer, G.E. Palade – Nobel Prize laureate (1974) and other scientists from the former U.S.S.R., Bulgaria and the U.S.A. Let us just recall that the PhD thesis of George Emil Palade for a doctorate in medicine and surgery *The urinary tube of the dolphin - a study of comparative morphology and physiology*, was initiated at the Station, "carried out with the invaluable support of Dr. I. Popovici, director of the [Bio]oceanographic Institute of Constanta, ..." and defended on June 27, 1940.

At the MZS Academician E.A. Pora organized in 1969, in collaboration with the Mediterranean Association of Marine Biology (MAMBO), the first International Course on Brackish Water Biology, with the publication of the lectures in the two volumes *Biologie des eaux saumâtres.*

This major centenary for Romanian biology should involve organizationally and professionally at least the 'Alexandru Ioan Cuza' University of Iassy, the Romanian Academy / Romanian Committee for the History and Philosophy of Science and Technology / Constanța branch, the Romanian Academy of Scientists / Constanța branch / the section of Biological Sciences, the National Institute for Research and Development 'Grigore Antipa' Constanța, the GEOECOMAR Bucharest-Constanța, the National Institute for Research and Development of the Danube Delta Tulcea, the "Ovidius" University of Constanța and other universities such as those in Bucharest and Cluj-Napoca, the "Grigore Antipa" National Museum of Natural History Bucharest, local authorities in Constanța and the City Hall of Agigea.

Relevant institutions and potentially interested guests will be informed in advance of the location, date and programme of the event, in order to participate with messages, scientific and/or memorial articles or other contributions.

The Scientific session dedicated to such a significant moment in the history of Romanian biology should be at national level and with international participation, meaning guests from representative marine research institutions from the Black Sea coastal states, some of which, from the former U.S.S.R. and Bulgaria, have maintained and maintain fruitful collaborative relations with the MZS / MBS respectively the RMRI / NIMRD 'Grigore Antipa'.

Of course, the jubilee should be immortalized by publishing a festive volume, which would include, in addition to the Presentation Poster, a Foreword, the Inaugural Addresses, the Articles presented during the scientific session, the List of participants, the List of researchers employed at the MZS / MBS Agigea from its inception to the present, the Sponsors of the event and a selective Bibliography dedicated to Ioan Borcea and the MZS Agigea.

Without a doubt, the event that must be organized on site, at the modernized headquarters of the MBS, will not be able to live up to expectations without the benevolent and generous support of indispensable sponsors.

Vivat, crescat, floreat!

References

Bologa, Alexandru Ș., 2022. Institutul Național de Cercetare-Dezvoltare Marină "Grigore Antipa" Constanța – Repere istorice / The National Institute for Marine Research and Development "Grigore Antipa" Constanța - Historical Highlights. Publishing House of the Romanian Academy of Scientists, Bucharest, pp.414

Alexandru Ș. Bologa
Former Scientific Director of the National Institute for Marine Research and Development „Grigore Antipa" Constanța, Romania [alexbologa1813@gmail.com]

Tjeerd C.E. van Weering: *RV Pelagia decommissioned*

Over three hundred scientists and technicians from all over Europe attended the farewell party on the occasion of the decommissioning of the *RV Pelagia*. This Dutch ocean-going research vessel during 35 years of service conducted internationally recognised successful operations in both the north and south Atlantic Ocean, as well as in the Mediterranean and Nordic Seas. The Pelagia was designed in 1990 bij MSC Naval Architects in Dordrecht, in close cooperation with Royal Netherlands Institute for Sea Research (NIOZ) scientists and technicians. The design benefitted from five years of practice and experience in developments in marine sciences by handling mobile equipment on board rented freighter vessels using converted 20 ft shipping containers equipped as laboratories.

Pelagia was built by Verolme shipyard in Heusden and was commissioned in 1991. It had a length of 66.05 m over all, a width of 12.8 m, a draught of 4.2 m, and a displacement of 1671 tons. Pelagia, call sign PGRQ, provided space for 15 scientific/technical staff in single person cabins and 11 crew. There was a wide A-frame at the stern as well as an A-frame in the (very stable) midships-position, annex to a wet laboratory. The winches were equipped with drums allowing kilometers of multi-purpose Kevlar cable to be paid out in various depth areas of the ocean. For accurate mapping of the seabed a multibeam transducer array was installed on board Pelagia in the mid-90s giving significant 3D-information on seabed structure at sampling stations, accurate mapping of the seabed along trawling tracks and positioning of bottom landers. Cruising/maximum speed was 9/11 kn. It was christened 5 April 1991.

Figure 1. RV *Pelagia* (from Anon. 2016)

The ship was equipped with diesel-electric propulsion, which provided an acoustically 'silent' vessel giving the scientists occasionally the idea of being on a 'cruise'. She was also designed to house a significant number of containers on deck (4) and in the hold below deck (5). These containers were equipped with research equipment and analytical tools appropriate for the specific research cruise.

Pelagia was an elegant research vessel with magnificent seagoing characteristics and provided a very stable platform during adverse weather conditions, for all kind of operations. She formed the national oceanographic research vessel of the Netherlands and was the flagship of the Royal NIOZ.

References

Anon., 2016. RV Pelagia Technical Specifications, Appendix A. NIOZ Royal Netherlands Institute for Sea Research, Texel, pp.9

Tjeerd C.E. van Weering
NIOZ, retired [tjeerdvanweering@kpnmail.nl]

Kees Kramer: *RV Anna Weber-van Bosse christened*

On 12 March 2026 Her Majesty Queen Máxima of The Netherlands christened the new Dutch ocean research vessel RV *Anna Weber-van Bosse* at the Royal NIOZ-harbor on the island of Texel.

The nearly 80-metre vessel of the Royal Netherlands Institute for Sea Research (NIOZ) is considered by researchers to be one of the most advanced research vessels in the world and will enable a major step forward in research into climate change, ocean circulation and biodiversity. It was designed by identifying the future needs of the Dutch marine research community. For instance, the new ship will be prepared for the use of methanol and has the ability to work close to the edge of the sea ice in the Arctic and Antarctic. She is equipped with laboratories more accommodations and state-of-the-art equipment.

The Anna Weber–van Bosse is configured to carry multiple layers of laboratory containers on deck, as well as additional units in the hold. The concept of containerized laboratories was initially developed and used at hired freighters in the 1970s. Standard 20 ft shipping containers are converted and prepared onshore, fully equipped and tested, then installed as complete units. Instead of rebuilding laboratories at sea, containers can be swapped during port calls. Because of increased space and capacity sediment studies, water-column observations or biological work can now be carried out in parallel.

The RV *Anna Weber-van Bosse* was designed by Netherlands-based C-Job Naval Architects and built by Astilleros Armon Shipyards in Vigo (Spain).

SPECIFICATIONS

Type of vessel:	Research vessel
IMO	9992919
Call sign	PCNG
Classification:	Ice class 1C
Flag:	Netherlands
Owner:	Royal Netherlands Institute for Sea Research
Length overall:	79,98 m
Beam:	17 m
Draught:	5.5 m
Gross tonnage:	3,481 T
Cruising speed	10 kn
Other deck equipment:	A-frame
Crew:	16
Research staff:	31

To enable a stationary position for research purposes the RV has, in addition to a classic propeller, a number of adjustable and rotatable 'propulsion systems' in and under the hull that provide dynamic positioning.

Figure 1. The new Dutch ocean-going research vessel RV *Anna Weber-van Bosse* in 2026 [Photo: Flying Focus]

With the RV *Anna Weber-van Bosse* and the two new research vessels RV *Wim Wolff* and RV *Adriaen Coenen*, that were christened in 2024 and 2022 respectively, the fully renewed Dutch research fleet is completed.

References

Reichart, G.-J., 2026. Welkom op RV *Anna Weber-van Bosse*, het nieuwe Nederlandse oceaanonderzoeksschip. Geo brief, 50(3): 3-5 [in Dutch]

van Wegen, W., 2026. Designing RV *Anna Weber–van Bosse.* A focus on flexibility, data and dialogue. Hydro International, 30(1): 28-33

Kees Kramer [kees.kramer@mermayde.nl].

Book Review

Kieskamp, Andrea, 2026. In lange rok de koraalriffen op Anna Weber-van Bosse (1852-1942), algendeskundige

Walburg Pers, Zutphen, pp.226 [in Dutch]

In parallel to the christening of the new Netherlands' ocean-going RV *Anna Weber-van Bosse,* a bibliography of the amazing woman the ship was named after, was published. Who was she? To many oceanographers/biologists she is best known as the woman who took part in the Dutch Siboga Expedition (1899-1900) – named after Hr.Ms. *Siboga* - as the wife of its expedition leader Max Weber (1852-1937).

A woman on a navy vessel was – until the 1950s - highly exceptional. That she was on board one may think that she acted as secretary of the scientific staff, but on the contrary, she was an experienced algologist and she actively took part in sampling algae on the shores visited during the expedition, and subsequently studied them.

This biography provides an interesting insight in her life, how she became the internationally famed algologist, as a woman in science, albeit without formal education as scientist.

The book is divided into seven parts. The first deals with her early life. She was born in a well-to-do family as Anne Antoinette (Anna) van Bosse in Amsterdam in 1852. At young age her mother dies, and – not uncommon in wealthy families in those days - education was by a governess. Visits to the Amsterdam Zoo 'Artis' will have contributed to her life-long fascination for plants. During summer holidays the family stays at the country estate in Doorn, amidst forests.

At the age of 19 she marries Wilhelm Willink van Collen on 5 October 1871. He is more interested in art than business and applies for the Art Academy. Anna's social activities (e.g. initiation of a 'Leesmuseum voor Vrouwen' (Reading Museum for Women) is highlighted in the 2nd chapter. Because of bad health (tuberculosis?) Wilhelm dies after only 7 years (late 1878). Anna inherits a considerable fortune, which also renders her financially independent.

In her late 20s Anna starts to follow lectures at the University of Amsterdam. Without appropriate education she may follow classes, but cannot be admitted to exams. Her favorites lecturers are Profs Oudemans and de Vries, botanists. She enjoys their practical classes and excursions, certainly including the drying of plants and compiling an herbarium.
In 1881 Anna meets Max Weber, then zoology professor at Utrecht University, who the same year embarks on the 4th Willem Barents Expedition to the arctic seas. That Max sends his sweetheart the algal collection to investigate also demonstrates that he sufficiently trusted her knowledge about algae. In 1883 they marry. During several trips to Norway, they collect marine animals and algae. Anna continues sampling in Dutch fosses and along the North Sea coast. Her first article, on a contribution to the Netherlands' algae is published in 1886, followed by a prize-winning essay on algae found in the hair of sloths, and proof of symbiotic coexistence (a theme that she continued to study).
In 1888-89 Max, accompanied by Anna, visits the Dutch East-Indies (now Indonesia) on a zoological/ethnographic expedition. She has no official appointment but adds algae to het herbarium during their, also 'adventurous', journeys. In 1894 follows an expedition to South Africa to study the fresh-water fauna. After their return they purchase the Manor House Eerbeek, which would include also space for their working life: a laboratory for Max, and space for Anna's studies and herbarium.

In 1898 the Webers travel, on a holiday trip via British India, to Surabaya to join the Hr.Ms. *Siboga* for the start of the Siboga Expedition. The Hr.Ms. *Siboga* was a navy vessel converted for the expedition to become a floating laboratory. It was operated by the Netherlands Navy, under the command of lieutenant-commander G.F. Tydeman, an accomplished hydrographer. The title of the biography 'Visiting the coral reefs in long dress' clearly expresses the discomfort she must have felt, but it was the moral/fashion codes of the turn of the century. Imagine her, in corset, long dress, sun-hat and parasol in the tropical heat sampling her algae. One woman among 60 men on board the ship, albeit with one female Javanese servant (*baboe*). For these practical experiences in sampling and sample handling she was invited by the Challenger Society, as non-fellow and only woman, to contribute to a Handbook on sampling and sample preparation [1]. Her major discoveries are the identification of a new species of *Coccosphaera sibogae* and

[1] In: Weber-van Bosse, A., 1912. B. Fixed plants. In: Fowler, G. Herbert: Science of the sea. An Elementary Handbook of Practical Oceanography for Travellers, Sailors, and Yachtsmen. John Murray, London, pp.126-161

presence of *Lithothamnion* on coral reefs, a red, calcareous seaweed.

Soon after the expedition she wrote a popular book on her adventures during the Siboga Expedition, published in 1903, the translation in German in 1905 [2]. After the return from the expedition the results of the algae she collected and studied, were published in four 'Livraisons' in the Siboga Expedition Reports series. This took quite a number of years to complete [3].
In parallel to this work Ana participated in four exhibitions where samples of her work were on display: from South Africa and the Siboga Expedition. Two exhibitions were organized under the theme Women's Labor (1898, 1913), two related to the colonies (1906, 1923).
In the period after the Siboga she intensifies her international contacts, becoming an internationally recognized algae specialist. As a recognition she received – as first woman in The Netherlands - in 1910 an honorary doctorate from Utrecht University. She does not come to collect (it's too much honor), but from that time her publications bear the dr.-title.

Near the end of her life Anna continues to work at their House in Eerbeek. In 1933 the RV *Max Weber* is christened by Anna in Den Helder. Together Max and Anna celebrate their 80th birthday in 1932. Max Weber's health declines, and he dies in 1937. Anna lives for another 5 years until 1942.

This biography on Anna Weber-van Bosse provides a well-documented and well-researched overview of the life of this remarkable woman. It not only provides a time-line of her life but also gives insights in the inter-relations with the family of her first husband, not so much on Max Weber's family though. It clearly demonstrates the social and academic climate in the late 19th century, where a young woman, even well born, had to struggle against the opinion that women were not fit for an academic career (even to work when married).
The book provides informative side-paths to women in science that – like Anna – 'survived' in such a system (such as Jeanne Baret (17040-1807), Anna Vickers (1852-1906), Nathalie Karsakoff (1863-1941), Ethel Sarel Barton (1864-1922)).

The many illustrations, often in color, well support the text. The book's system of endnotes works well, as does the register of persons, its sources and references section, which includes a bibliography of Ana's published works. The chapters are interlaced with cyanotype impressions of algae, made by the British Anna Atkins (1843-1853): a joy to view and they fit very well to the topic of this biography.

Kees Kramer [kees.kramer@mermayde.nl]

Publications

Books

Aili, Hans and Pietsch, Theodore W., 2024. Peter Artedi: reformer of 18th century zoology. Volume 1. Peter Artedi's life and works. Stockholm University Press, Stockholm, pp.421 [Free download: https://doi.org/10.16993/bcm]

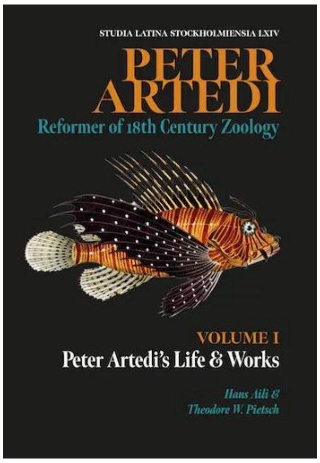
Aili, Hans and Pietsch, Theodore W., 2025. Peter Artedi: reformer of 18th century zoology. Volume 2. Peter Artedi. Ichthyologia, Leiden 1738. Stockholm University Press, Stockholm. pp.532 [Free download: https://doi.org/10.16993/bcv]

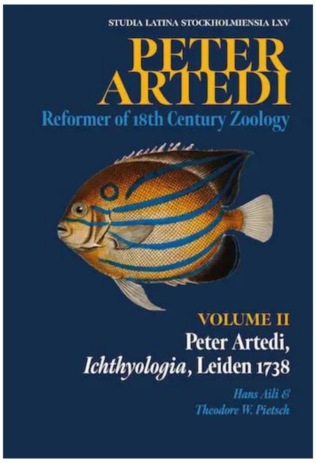
---

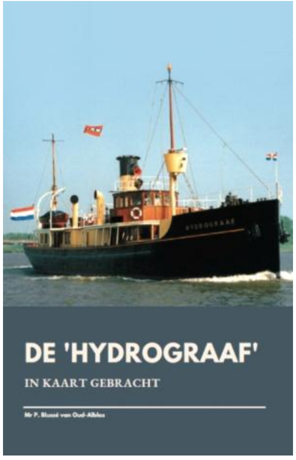
[2] Weber-van Bosse, A., 1903. Een jaar aan boord van HM Siboga. E.J. Brill, Leiden, pp.348
Weber-van Bosse, A., 1905. Ein Jahr an Bord I.M.S. Siboga. Beschreibung der Holländischen Tiefsee-Expedition im Niederländisch-Indischen Archipel 1899-1900. Engelmann, Leipzig, pp.370

3 Weber- van Bosse, A., 1913, 1921, 1923, 1928. Siboga Expedition Reports, Vol.LIXa,b,c,d; Livr. 68, 89, 94 and 108

Anon., 2024. 150 jaar Dienst der Hydrografie. Koninklijke Marine, Den Haag, pp.42 [in Dutch]

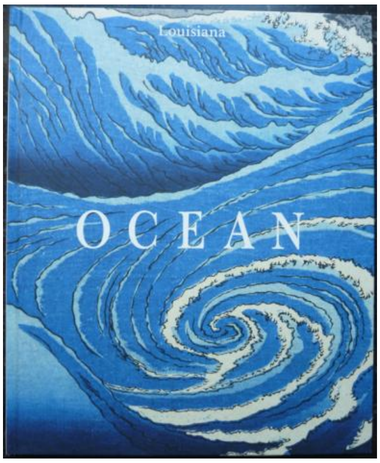


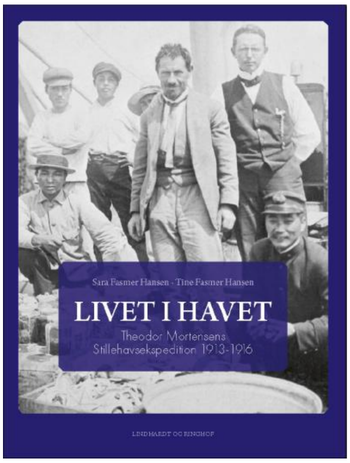


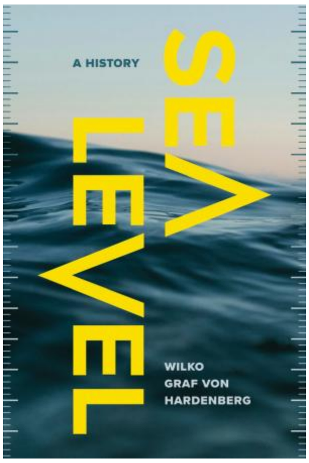


Anon., 2024. Ocean. Luisiana Museum of Modern Art, Humlebæk, pp.128 [also in Danish]

Blussé van Oud-Ablas, P., 2022. De Hydrograaf in kaart gebracht. sailing.nl, pp.81

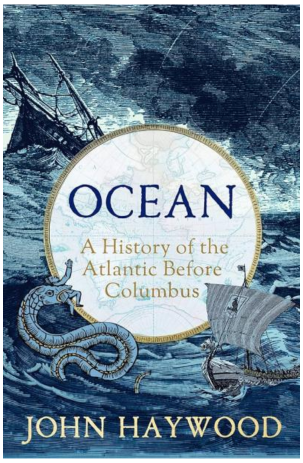


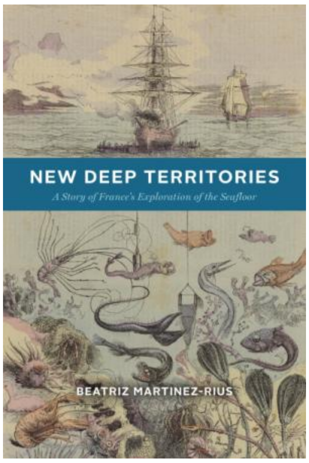


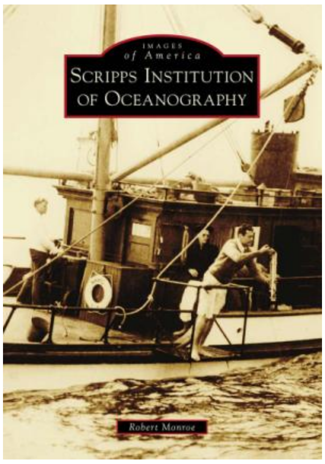


Fasmer Hansen, Sara & Tine Fasmer Hansen, 2025. Livet i Havet - Theodor Mortensens Stillehavsekspedition 1913-1916. Lindhardt & Ringhof, København , pp.432 [in Danish]

Hardenberg, Wilko Graf von, 2024. Sea Level - A History. University of Chicago Press, Chicago, pp.200



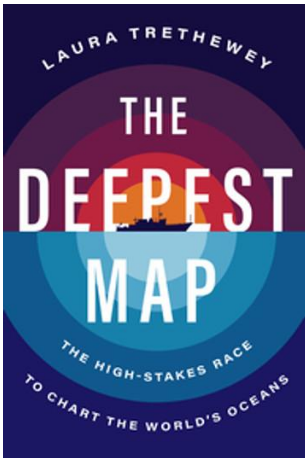


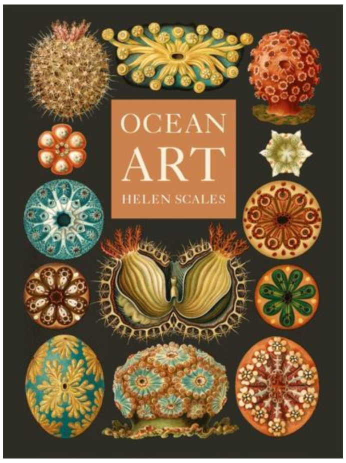


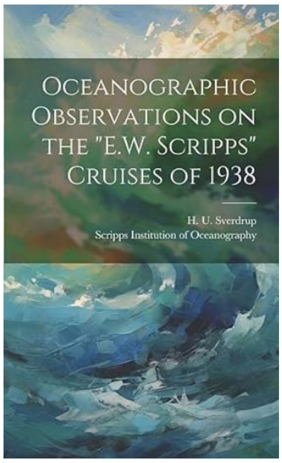
Haywood, John, 2024. Ocean. A History of the Atlantic Before Columbus. Apollo, pp.560

Kieskamp, Andrea, 2026. In lange rok de koraalriffen op - Anna Weber-van Bosse (1852-1942), algendeskundige. Walburg Pers, Zutphen, pp.232 [in Dutch]

Martinez-Rius, Beatriz, 2026. New Deep Territories - A Story of France’s Exploration of the Seafloor. University of Chicago Press, Chicago, pp.272







Monroe, Robert, 2021. Scripps Institution of Oceanography - Images of America. Arcadia Publishing, Mount Pleasant, pp.128

Scales, Helen, 2025. Ocean art: From the shore to the deep. Reaktion, London. pp.240

Sverdrup, H.U., 2023. Oceanographic Observations on the "E.W. Scripps" Cruises of 1938. Scripps Institution of Oceanography, La Jolla, pp.68

Trethewey, L., 2023. The Deepest Map. The High-Stakes Race to Chart the World’s Oceans. HarperCollins, New York, pp.294

Journals

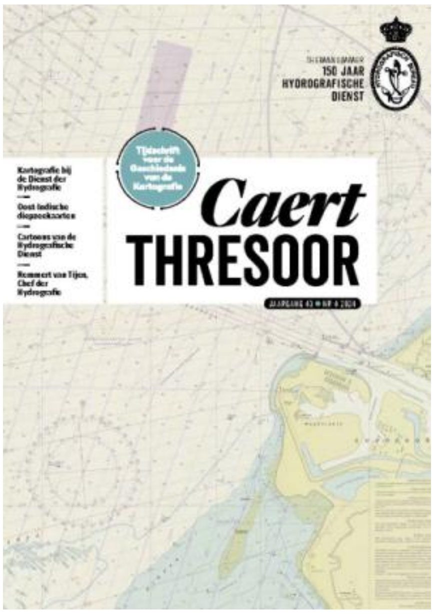
Dolan, John R., 2025. On Einer Steemann Nielsen’s 1952 “The Use of Radio-active Carbon (C14) for measuring Organic Production in the Sea”. ICES Journal of Marine Science, 82(4): [doi.org/10.1093/icesjms/fsaf041]

Dolan, John R., 2025. Per Theodor Cleve (1840-1905): The Prolific Part-Time Protistologist and Oceanographer. Acta Protozool. 64: 1–10 [doi.org/10.4467/16890027AP.25.001.21142]

Ligteringen, Th., 2025. Dienst der Hydrografie 150 jaar. De Hollandse Cirkel, 27(4): 134-141 [in Dutch]

On-line (Dutch) journals, (a.o.) on geodesy & cartography:
https://hollandsecirkel.nl/documentatie/tijdschriften/

Caert-Thresoor
is a Dutch journal devoted to the History of Cartography. Articles are available online 3 years after publication
https://caert-thresoor.nl/onderwerpen/digitale-edities/



Volume 43(4), 2024, offered the Special Issue '150 jaar Hydrografische Dienst' (150 years Hydrographic Office), with the following articles, all in Dutch with English summary):

- Ferwerda, Hans, Jan Schaap & Leendert Dorst, 2024. Ex Usu Nautae: ten dienste van de zeeman. Caert-Thresoor, 43(4): 4-11
- Pietersma, Josse, 2024. Cartoons van de Hydrografische Dienst. Caert-Thresoor, 43(4): 12-13, 25, 36, 42-43, 48
- Ormeling, Ferjan, 2024. Oost-Indische diepzeekaarten en de GEBCO. Caert-Thresoor, 43(4): 14-24
- Guleij, Ron, 2024. Remmert van Tijen, hydrografisch opnemer en Chef der Hydrografie. Caert-Thresoor, 43(4): 26-35
- Boink, Gijs, 2024. Kaartencollecties in de Nederlanden: Het archief van de Hydrografische Dienst. Caert-Thresoor, 43(4): 37-41

[Digital] Collections

Annalen der Hydrographie und maritimen Meteorologie, since 1873
https://digitale-bibliothek.bsh.de/viewer/toc/124048/1/

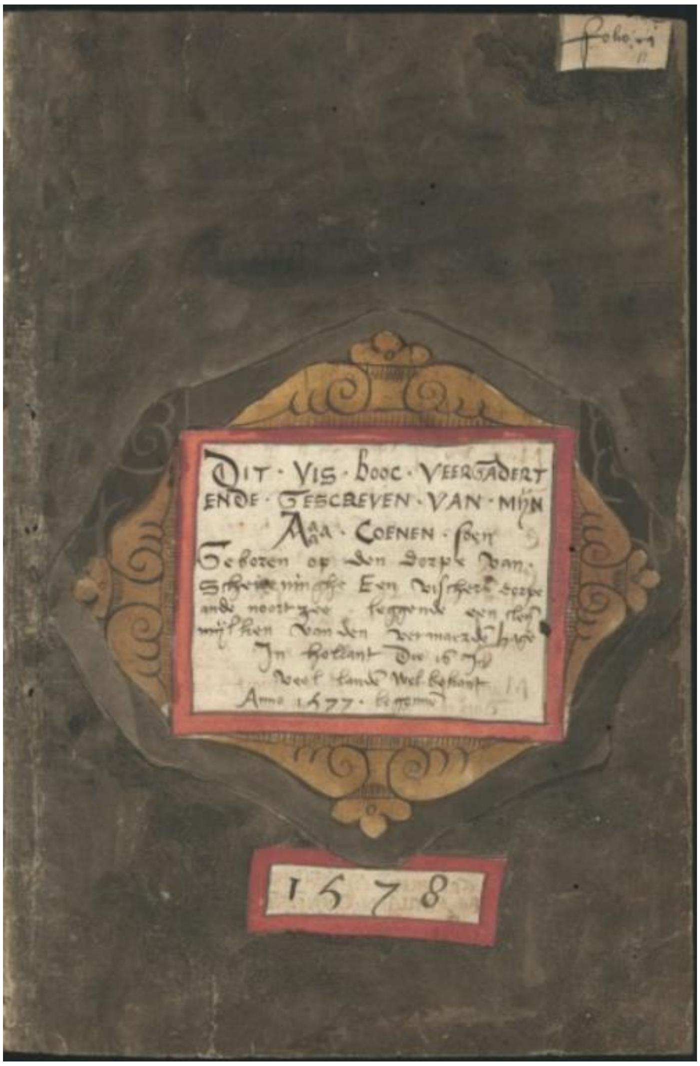
Challenger Society Special Interest Group on the History of Oceanography (SIG) talks:
https://www.youtube.com/channel/UCABGwm9YiLHn1oD_vsLWxHA

The German Maritime Museum / Deutsches Schiffahrts Museum
DSM- Digital: https://digital.dsm.museum/digitales-erleben
DSM - Depot digital https://digitaldepot.dsm.museum/

Woods Hole Oceanographic Institution (WHOI) photo-archive
https://images.whoi.edu/subject-search?WINID=1770634151883

Koninklijke Bibliotheek / The National Library of the Netherlands, with a Video about the 16th century (1578) manuscript 'Het Visboeck' ('The Fish Book') by Adriaen Coenen (= Adriaen Coenensz van Schilperoort), 1514-1587)
https://www.youtube.com/shorts/z_Qjl_b3dGM

or leaf through this book on-line:
https://galerij.kb.nl/kb.html#/nl/visboek/page/15/zoom/3/lat/-55.12864906848878%E2%80%A6



Cover of 'Het Visboeck', mauscript by Adriaen Coenen (1578)

https://galerij.kb.nl/kb.html#/en/visboek/page/15/zoom/1/lat/-79.81230226556366/lng/217.96875

[Source: KB, The National Library of the Netherlands]