HISTORY OF OCEANOGRAPHY

ISSN 1013-3917

Number 20 September 2008

CONTENTS

NEWSLETTER of the COMMISSION of the HISTORY OF OCEANOGRAPHY
DIVISION of HISTORY OF SCIENCE
INTERNATIONAL UNION of the HISTORY and PHILOSOPHY of SCIENCE

INTERNATIONAL UNION OF THE HISTORY AND PHILOSOPHY OF SCIENCE
DIVISION OF THE HISTORY OF SCIENCE
COMMISSION OF OCEANOGRAPHY

EDITORIAL – The History of Oceanography After Forty Years

Nearly twenty years ago, I began to write a review of the literature of the history of oceanography and an assessment of its position in the history of science. My starting point was the first International Congress of the History of Oceanography, held in Monaco in 1966 and the presentation there of a bellwether paper by Harold Burstyn titled "The historian of science and oceanography." Naturally, a further twenty years or so have seen some big changes in our field, but it is not my intention to update my review, but to take stock very briefly of where we stand at a time when I am standing down as the editor of *History of Oceanography* (twenty years is a long time) and when it seems to be time for new ideas, and maybe a new format for this publication.

The gist of my review (which was published in *Earth Sciences History* in 1993) was an assessment of what historians had available, circa 1989, if they set out to do research in the history of the marine sciences, especially oceanography. I hope it is not just hubris, but I think that the paper has weathered well, and is still more than a period piece. Disregarding the old internalism-externalism debate, and the then contentious role of social studies of science in providing an epistemological framework for historical studies, my claim then that general historians should be paying more attention to the history of science – and more specifically to the history of the marine sciences, which have so strikingly married the scientific and the social (in which I include technological innovation, political forces, and public interest in the environment) - still has force. But mainline history is intensely conservative, held within time-honored boundaries by the imperatives of undergraduate curriculums, the specialisms of historians themselves, and the still intense appeal of political history. As historians of the marine sciences, we are still on our own.

What then has changed in the past twenty years?

When I wrote last on this subject there had been three International Congresses of the History of Oceanography. In 2008, we have just completed our eighth, in Naples. With only one exception, a significant book has resulted from each, or is in the works. This publication, *History of* Oceanography, now online, was new; now it has an established place in the field, partly as a venue for publications that might not otherwise see the light of day, and as an outlet for annual bibliographies of the field. I am constantly surprised at the interest that is expressed in *History of Oceanography* and how often new readers and potential colleagues appear, apparently from nowhere. Younger historians have found their way into the field, often taking on the really interesting interfaces between the marine sciences and public policy, military establishments, exploration, and the environment. There is a host of new books on highly varied historical subjects: to mention only a few, we have detailed catalogues of oceanographic instruments; a study of the development of marine research in Norway; histories of the International Council for the Exploration of the Sea and the Fisheries Research Board of Canada; an analysis of the US Navy and its relation with civilian science; and the effect of the Cold War on the development of international ocean sciences. Many more could be included here. A new review of the literature of the field is merited before it has become too large to consider synoptically – and the time is certainly ripe for a deeply-researched textbook of the history of oceanography up to our own times when it is becoming more and more

difficult to see oceanography as a single discipline rather than an umbrella for several proto-disciplines or nascent specialist fields that may not claim ancestry within it.

I hope – and believe – that *History of Oceanography* has played its part in the expansion of historical studies on the marine sciences. I am looking forward to seeing what happens next.

Eric Mills

THE HISTORY OF THE CANCELLED OCEANOGRAPHIC EXPEDITION OF THE SCIENTIFIC RESEACH VESSEL *VITIAZ* IN 1948-1949

Julia Nikiforova
Museum of the World Ocean
naberezhnaya Petra Velikogo, 1
236006 Kaliningrad, Russia
elizvelm@mail.ru

People are always interested in ships' fortunes, especially ships that later became famous and legendary. The history of the scientific-research vessel *Vitiaz*, the central museum object in Kaliningrad, has been one of the main study directions; nevertheless its fortune is so complicated that even nowadays there are a lot of questions to answer.

Along with the history of construction, repairs, re-equipment, transmission to the USSR as a captured vessel, and expeditions there is much interest in its history of 1947-1949 when not only the dry-cargo ship *Mars* was being re-equipped into the scientific-research vessel *Vitiaz* but also matters of the first scientific expeditions were being discussed. According to different sources, originally the *Vitiaz* was intended to make a circumnavigation, but the matters regarding name, organization, initiators and route were unknown. Nowadays, owing to the documents found in Russian national archives, the history of this period is becoming clearer.

The Soviet period of the ship's history began in February 1946 when German ships were passed to the USSR by a Soviet expert commission headed by N. Novikov in the port of Liverpool. *Mars*, built in 1939, was among them. On the 22nd of March 1946 under the name *Equator* it went to the port of Tallin. And in summer 1946 the vessel came to a shipyard of the port of Szczecin, where repairs and replenishment of ship's property were made. That year it was decided to re-equip the ship *Equator* into the scientific-research vessel for the USSR Institute of Oceanology; the ship was renamed *Vitiaz*. The project of re-equipment was implemented by the First Central Planning and Design Office of the ministry of the merchant marine.

On the 18th of October 1947 the decision to organize a Pacific expedition of USSR Academy of Sciences was signed by a panel of the Academy of Sciences. According to this document, an academician, P. Shirshov, was to be a head of the expedition and the voyage was to start in the first quarter of 1948. In December 1947 an internal document signed by Y. Chadaev (an administrator of Council of Ministers) and addressed to A. Lavrizhev (USSR Gosplan) came to the administration of the USSR Council of Ministers. This was a request to make a decision on a letter to the panel of USSR Academy of Sciences about an oceanographic expedition for Pacific, Atlantic and Indian Ocean exploration in 1948-1949.

The letter, signed by an academician S. Vavilov (president of USSR Academy of Sciences) and an academician-secretary of USSR Academy of Sciences N. Brunichev, contained information about major preparatory work for implementation of a complex oceanographic expedition on exploration of oceans in 1948-1949, including the reasons for, the importance of, and need for this expedition. Special attention was paid to a programme of cosmic ray exploration and features of echo ranging, hydroacoustics and hydrooptics of the oceans. A summary concerning implementation of the expedition was attached to the letter. It contained information about terms (start – on the 1st of July 1948 at the latest), duration (17 months, 15 months of sailing, 2 months moorage in Leningrad), a port (Leningrad for departure and arrival) and number of people (55 persons). A register of equipment, tackle and materials was also attached to the letter. These items were to be delivered to the USSR Academy of Sciences by the following ministries and offices no later than the first quarter of 1948:

- Ministry of USSR mechanical and instrument engineering;
- Ministry of USSR electrical industry;
- Ministry of USSR machine-tool industry;
- Ministry of USSR ferrous metallurgy;
- Ministry of USSR nonferrous metallurgy;
- Ministry of USSR cellulose industry;
- Ministry of USSR textile industry;
- Ministry of USSR light industry;
- Ministry of cinematography
- Committee for measures and measuring devices under Council of Ministers of the USSR
- Glavlessbit (state planning institution for timber marketing and sales) and Glavneftsbit (state planning institution for oil marketing and sales) under the Council of Ministers of the USSR.

A route of the expedition was described in detail; work at 26 stations was mentioned (with precise description of their geographic location); time limits were given and ports were listed, both Soviet (Petropavlovsk and Vladivostok) and foreign (Plymouth, England; Boston or New York, San Francisco, Honolulu, in the USA; Colon, Panama; the Solomon Islands; India; and Naples, Italy). Separately there were documents regarding a 100% premium to the official salaries of expedition participants. These documents were written by V. Bogorov, deputy director of the Oceanographic Institute of the USSR Academy of Sciences. Certificates of Glavsevmorput (the Chief Directorate of the Northern Sea Route) and of the Karskaya expedition were attached to those documents; indicating the importance of expeditions into the high latitudes. In December 1947, after all the documents were examined, A. Lavrizhev, deputy chairman of the USSR Gosplan, signed a memorandum to V. Molotov, deputy chairman of Council of Ministries of the USSR. According to it, the expedition was reasonable, but there were four remarks on the project regarding reduction of costs in foreign currency, load computation and assignment of materials and equipment by the Ministries.

In addition, there were the following factors. During the re-equipment of the *Vitiaz* (by the Ministry of the merchant marine) the project of circumnavigation had been endorsed / agreed upon by the Council of Ministers. Originally, it was a project to explore the Pacific, which then was transformed into the complex oceanographic expedition intended for Pacific, Atlantic and Indian Ocean exploration. Due to much of

spadework and delay of a special ship re-equipment the date of the expedition start had changed from the first quarter of 1948 to the 1st July 1948. Expedition costs in foreign currency had been reduced by more than 50 %.

Despite this, the plans were not implemented. After Winston Churchill's speech in Fulton, Missouri in March 1946, the Iron Curtain between the USSR and the West began to go down and the political situation in the Soviet Union had changed; these factors, of course, affected the development of scientific work. Exploration of domestic resources became a priority. The Institute of Oceanology was given the task to explore the Far Eastern seas (they were not explored enough) and *Vitiaz* was used for this purpose. The first voyages were in the Sea of Okhotsk, the Bering Sea, and partially in the Sea of Japan. The original complex project was never implemented, it is known only by achieves.

Bibliography

1. "The "Vitiaz's" epoch" by A. Aksenov; the Priroda, 1996, issue 7. p. 18-25
2. The main stages of re-equipment of the SRV"Vitiaz" //The History of National Oceanology: theses of a paper (II International Conference) by I. Afonin, V. Strjuk; managing editor V. Strjuk; Kaliningrad, 1999, p. 3-7
3. Unknown pages of the history of the famed vessel (archives survey)// History of National Oceanology: theses of a paper (II International Conference) by S. Dolgova; managing editor V. Strjuk; Kaliningrad, 1999, p. 12-14
4. P. Shirshov Institute of Oceanology: Half a century of the World ocean exploration; Moscow, Nauka, 1999, 249.
5. Russian national archives, F. 4372, I. 48, L. 73-103
6. I was the 23d in the list. The first steps of the Institute of Oceanology; the Priroda, 1996, issue 7. p. 8-17

CALYPSO UNDER INTENSIVE CARE, BUT RECOVERING

Roger H. Charlier
Vrije Universiteit Brussel / Florida Atlantic University
rocharli@vub.ac.be
and
Marie-Claire P. Chaineux
Coastal research & Education Foundation

Colliding with a barge in the harbour of Singapore sent J-Y.Cousteau's mythical *Calypso* to the bottom. She had overlived a war, ferry service and thousands of sailings to un-gloriously end as a wreck (Figure 1).

Figure 1. The wreck, which was towed back from Singapore, moored in Marseille, then transferred to La Rochelle.

Figure 2. La Rochelle, France. The old port

Miraculously lifted from the waters, she was towed back to France, first to Marseille, then to La Rochelle (Figure 2). The municipality of La Rochelle, a historical city with a glorious past as a port on France's Atlantic coast, had grandiose plans for her, eyeing her as a pole of attraction for the tourists who flock there every year. (Figure 3)

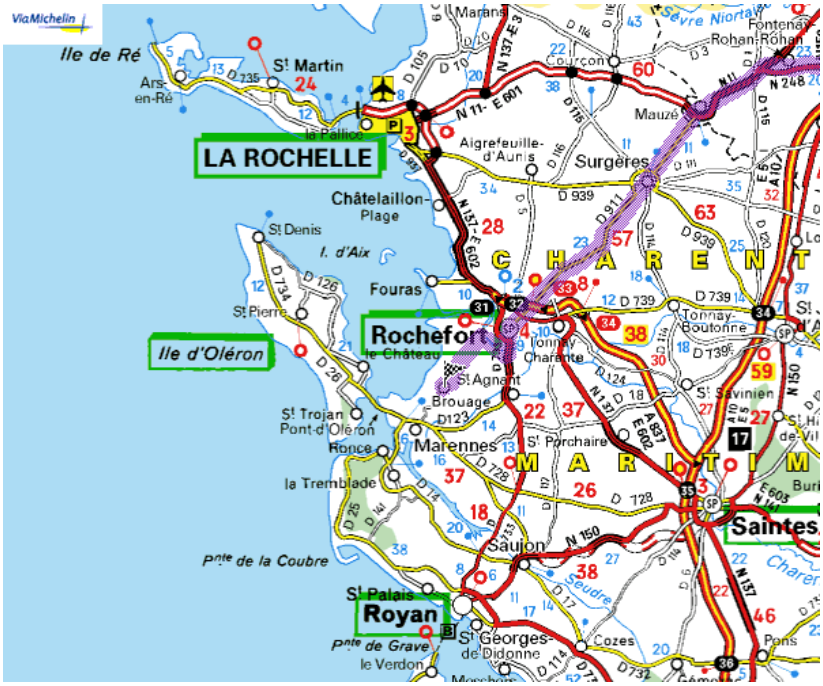


Figure 3. Location Map of La Rochelle, France and Brouage (just below Rochefort and above Marennes, famous for its oyster beds) where the ship had been planned, by some, to be sunk to become an underwater memorial that could be explored by divers.

Calypso was to be tied to a dock and be a pièce de résistance of the local maritime museum. But it soon became evident that the financial aspects of the undertaking had been underestimated. There was another La Rochelle, a namesake port on the USA's eastern seaboard, eager to give her a berth, and with the agreement of its sister city, the City Council (or was it the Chamber of Commerce?) sent a delegation to France to assess repair, towing, and all other costs involved to create a world renowned attraction on its shore. But that city's fathers also felt that their plans had to be shelved for financial reasons.

Carnival Lines, a giant of the tourism business (ships, airline, resorts, packaged tours) saw the potential of a big publicity stunt involving a mythical ship, and proposed to bring her to the Caribbean and incorporate her in a sport and show complex on an island they own. It is not clear why these plans also came to naught. Funds did not seem to be lacking, the tourist, divers', the merely curious' drawing potential appeared sufficient. True, the legal imbroglio in which *Calypso* bobbed up and down involved heirs to the Guinness interests and heirs to the Cousteau patrimony. The legal knots were far from unraveled. Perhaps there was a pique of national pride.

Anyhow, La Rochelle Museum's conservator—who in petto once ventured "I wish she'd sink"-- apparently was stuck with a former glory—a faded star--of the movies and of scientific research.

J.-Y. Cousteau's surviving son, Jean-Michel Cousteau, once involved in the *Queen Elizabeth* exhibit in California, proved resourceful and kindled French pride and interest. A foundation came up with sizeable funding and Cousteau junior thus managed to keep the ship in France, and afloat. All previous plans were shelved and she would not become a tourist attraction, nor an underwater memorial for divers to plunge to.

And thus *Calypso* has been brought to Concarneau, France's second fishing harbour on the coast of Cornouaille (Atlantic Ocean). She would not even become part of the tourist memorabilia of the fortified city. Concarneau is somewhat of a resort town and has naval yards nearby at Le Cabellou where artisans still have the skills to repair and refurbish smaller, older ships and the *Calypso* has found shelter in one of the shops. These "artists" see her plying the seas again within two years, and go on for another life, and if Jean-Michel Cousteau has his way, live again a scientific career.

REFERENCES

Charlier, R.H. and C.P. Charlier-Keating, 2004. The several lives of the Calypso. *Priroda* (Journal of the Russian Academy of Sciences) 12 (5): 79-85 (in Russian).

Charlier, R.H. and C.P. Charlier-Keating, 2005. Sic transit gloria navis. *Proceedings of the Second International Congress "Seas and Oceans"* 2 (5): 43-54.

Ciencia, 1996. El Calypso de Cousteau. *Cambio* 16 (1263): 84-97 (in Spanish).

Grajal, A., 1998. Jacques Cousteau and his world's surprising beauty. *Conservation Biology* 12 (2): 487.

ABORTIVE PLANS FOR SALINITY DETERMINATIONS AS A MEANS FOR POSITION FINDING AT SEA

By Jens Smed
Bygtoften 17
DK-2800 Lyngby
Denmark

When Martin Knudsen (1871-1949), Hydrographic Assistant to the Bureau of the International Council for the Exploration of the Sea (ICES), in January 1907 studied the material of surface salinities collected by the ICES member countries since the organization's start in 1902 he, as mentioned in his letter to Admiral Carl Frederik Wandel (1843-1930) of the Danish Navy, got the idea that determination of surface salinity on board ships might be an aid in determining their positions (1). He explained his ideas in a memorandum, which he distributed to a great number of oceanographers and fishery biologists in the Council's member countries. Knudsen pointed to the fact that the determinations of the surface salinity in the Atlantic, the Norwegian Sea, the English Channel, the North Sea, and the Skagerrak had shown that the curves of equal salinity, the isohalines, have a typical form and distribution, and this might perhaps be used as an aid to the determination of position at sea in thick weather. In the open sea soundings were impossible when the ship was steaming at full speed and it would therefore be of importance to get information about the position by other means. In the neighbourhood of the coasts soundings were possible. However, soundings and bottom samples would in many cases not give sufficient information about the position. So a series of salinity determinations might, according to Knudsen, be an important means for correct navigation (2).

Knudsen took as an example a ship that in hazy weather was making for the Channel from the Atlantic and found rapidly decreasing salinities. This would obviously be a warning that the ship was in the neighbourhood of a coast and perhaps on a dangerous position; for if the ship followed the middle of the Channel the salinities would decrease slightly and fairly evenly. As another example Knudsen took the situation at the northern coast of Scotland. From here 67 salinity observations were available, made at distances varying from 5 to 10 nautical miles off the coast and covering all seasons and all kinds of weather. The highest of these salinities was 35.16‰. Consequently, if a ship approaching the coast observed a salinity higher than 35.16 ‰ it might with a high degree of probability be concluded that the ship was more than 5-10 miles from the coast and in no risk of running ashore. If on the other hand the ship found a salinity of about 34.90 ‰ it would probably be within a distance of 5-10 miles from the shore. In his memorandum Knudsen pointed out that as the coasts in most cases are washed by relatively fresh water similar conclusions might probably be drawn for many other localities. The method might therefore be of importance for the prevention of damage to ships, men and cargo. Knudsen added that the ships' officers would easily learn to carry out the salinity determinations by the ordinary titration procedure.

It was not his idea, Knudsen stressed, that the above examples could be used as sailing directions at the then state of knowledge; however, sailing directions would be a result of systematic oceanographic observations carried out in sufficient number with this object in

view. Knudsen was therefore anxious that a much larger and appropriate material should be obtained, and he solicited the opinion of his colleagues as to whether this matter should in future be included into the working programme of the organization.

Undoubtedly to the surprise of Knudsen it turned out that the idea of using salinity determinations in the navigation was not a new one. As Otto Krümmel (1854-1912) informed him (3) the same proposal had been broached in the report on the cruises undertaken by the German gunboat "Drache" in the North Sea (Anon., 1886, p.7). As a matter of fact the method had also been used on board French and Russian warships during the 1890s (Lebedintsev, 1908, pp. 57-64).

Knudsen received several answers to his circular. Hugh Robert Mill (1861-1950), England, considered that such observations would in many cases be found useful. However, it seemed to him that in cases of emergency the time required for collecting a sample, carrying out a sufficiently careful titration and calculating the result would make the method useless. The situation would be different if a direct-reading instrument could be devised which would give the salinity without calculation. So at present he did not think it would be wise to lay too much stress on the method of salinity, except in such localities as the entrance to the Baltic. In this region the salinity differences sometime were so large that salinities measured by hydrometer were exact enough to allow determination of the position with great accuracy. Mill raised the question whether it would not be possible to make some useful suggestions as to sea surface temperature as a guide to navigation - taking into account also prevailing wind and the season. In any case Mill strongly agreed that an effort should be made to obtain additional material on which to base any recommendations (4). In this context it may be mentioned that Mill's idea about using temperature measurements as a navigation aid was by no means a new one. As early as 1795 Benjamin Franklin, in conjunction with Jonathan Williams, at Philadelphia published a paper called "Thermometrical Navigation", a work that materially assisted safe navigation in subsequent years (Barlow, 1933, pp. 18-21).

Ernest Holt, Ireland, was prepared to arrange for the taking of water samples for the purpose in question off the south-west coast of Ireland. He was afraid, however, that it might be found difficult to make practical use of the method there (5). Knudsen agreed that the salinity at those places would not be very suitable for the determination of the position, and suggested that Holt should not trouble himself with observations made especially for that purpose (6).

Leonid Breitfuss (1864-1950), Russia, stated that in the Barents and Kara Seas it was not possible to determine the position from the surface salinity as this varied much, not only from season to season, but also from year to year. It might perhaps be possible to use the salinity in deeper layers for the purpose; this procedure, however, would be too difficult for the mariner (7).

The Swedish oceanographer Otto Pettersson (1848-1941) emphasized his interest in studying the border waters and the variation of their extent, because all fishing was going on in these waters. It would be interesting, he thought, if such studies might be useful also for the navigation. He pointed out, however, that for instance in Skagerrak the surface salinity varies greatly with the season. On the other hand Pettersson mentioned a number of places, such as the entrance to the Channel, where the method might work. He would like to see a short paper from Knudsen about the plan before proceeding with it (8).

Walther Herwig (1838-1912), the President of the Council, stressed that the idea reported on in the circular might get greater importance for determination of the position at sea if it would be possible to develop it into a system of practical use. He suggested therefore that Knudsen worked out a programme to this effect, including an estimate of the expenses involved (9).

When Knudsen submitted his circular to the General Secretary of the Council, Paulus P.C. Hoek (1851-1914), he added that he would appreciate it if his memorandum might be issued in the publications of the Council (10). Obviously this was not done. Instead of that Knudsen, as suggested by Pettersson, published a short paper on the item (Knudsen, 1907). In the paper Knudsen pointed out the general conditions that must be fulfilled in order that the method might be used: the salinity should vary perceptibly between places not too distant from each other, and the variation at each point should not be too great compared to the salinity differences occurring within the area determined by the uncertainty of the dead reckoning. A necessity for using the method was therefore a good knowledge of the mean distribution and variation of the salinity. Here Knudsen could refer to a recent publication (Knudsen and Smith, 1906, pl. I and II) which for the North Sea and adjacent waters gives, inter alia, charts showing the distribution of isohalines at the surface and also a map which by means of curves indicates the salinity's mean deviation from the mean value.

Knudsen declared that he had not investigated whether the method might be used in the Baltic, the Belts and the southern Kattegat: he considered the observation material in the Baltic to be too small, and in the Belts and the southern Kattegat the very irregular currents made it unlikely that the method could be used to any advantage. On the basis of the charts referred to above Knudsen concluded, however, that the method would be of use along the Dutch coast and along the French coast of the Channel. On the other hand it would not seem that it could be used in the Skagerrak or in the central part of the North Sea; as to the usefulness of the method near the coasts of the North Sea nothing could be said because of the scarcity of observations.

Knudsen pointed out that in the eastern part of the North Atlantic the positions of the isohalines were highly variable which, as explained above, was very unfavourable to the applicability of the method. The situation was different in the western part of the Atlantic. In the region between 40^{o} N and 50^{o} N British and Danish vessels throughout three years had collected a considerable number of water samples (about 1200). By plotting the surface salinities on a map Knudsen showed that the areas with salinities all above, respectively all below, 35 ‰ were separated by a zone about 100 nautical miles wide. However, the extreme positions of the 35 ‰ isohaline, as found on the basis of the data then available, might be somewhat in error, because of errors in the determination of the salinities and of the positions of the observation points. The only way to fix the extreme positions of the 35‰ isohaline would be, Knudsen stated, to carry out on board titration of water samples collected immediately before and after a safe determination of the position of the ship. Altogether it might be supposed that the distance between the extreme positions of the 35 ‰ isohaline was 60-100 nautical miles. It might very well be, Knudsen commented, that a navigator after days with thick and stormy weather would be grateful for the information about his position that he could get from salinity determinations. It might perhaps be better to use other isohalines, or to determine the limits of an area in which the salinity gradient had a certain value. Altogether, many

different investigations should be carried out when a really reliable material had become available, in order to find the best method for using the salinities in the navigation. As long as such investigations had not been undertaken the possibility of a useful application of salinity observations in the navigation should not be written off.

By an application to the Director of the Danish United Steamship Company Knudsen tried to make the Company interested in the matter. It would be a great advantage, he thought, if he at the forthcoming Council meeting could report that the Company had declared its willingness to organize the necessary investigations from its ships (11). Apparently, however, no reply to the application was received.

At the Council Meeting in London June 1907 Knudsen reported (Anon., 1907, p. 18) on the preliminary investigations carried out to test whether salinity determinations on board vessels might be used as an expedient in navigation. The following resolution was then carried (loc.cit., p. 30):

> "The Central Council recommends, with reference to the suggestion made in Publications de circonstance No.38, that the directors of the hydrographic work in connection with the international co-operation in the various countries, should devote attention to undertaking investigations on a large scale on appropriate lines in order to determine the salinity of the sea surface by modern methods, with the object of ascertaining the practical value of this method for fixing the position at sea in foggy weather".

In the following years regular observations were indeed undertaken along a number of lines. Apparently, however, the use of these observations for determination of the position at sea was not studied further. The lack of interest in the method may have arisen from the salinity determination on board a ship being considered a rather circumstantial piece of business. Knudsen was aware of that and realized that it might be a hindrance to the practical use of the method. He stressed, however, that this should not impede further investigations, as it with nearly complete certainty might be assumed that before long sufficiently fast and convenient ways of determination of the salinity would be found if the proposed method for position finding at sea proved useful. He thought that as long as the inapplicability of the method had not been proved or at least made very likely, one in the interest of mankind was obliged to carry out so comprehensive investigations that the method could be judged with certainty (Knudsen, 1907).

The fast and convenient method for measuring salinity, which Knudsen had in mind, was probably its determination by means of the electric conductivity of the seawater. He had already published a paper on this matter (Knudsen, 1900) and from his correspondence with Otto Krümmel it is known that he was still working on the problem (Smed, 2002, pp. 369-377). However, Knudsen did never publish anything more about it. As is well known, several decades elapsed before the problem was solved - and at that time more sophisticated methods for position finding at sea, also practicable in thick weather, had become available.

Acknowledgement. I am greatly indebted to Dr. Artur Svansson for assistance in processing the manuscript.

Literature

Anonymous. 1886. Die Ergebnisse der Untersuchungsfahrten S.M. Knbt. "Drache". Berlin.

Anonymous. 1907. Rapp. P.-v. Réun. Cons. perm. int. Explor. Mer, VII, part B.

Barlow, E.W. 1933. Notes upon the history of the survey and charting of ocean currents. - Mar. Observer, 10 (109).

Knudsen, M. 1900. Maaling af Havvandets Temperatur og Saltholdighed ved Hjælp af elektrisk Telefonbro. - Beretning fra Kommissionen for videnskabelig Undersøgelse af de danske Farvande, 2 (3).

Knudsen, M. 1907. Salzgehaltsbestimmungen des Oberflächen- wassers als Hilfsmittel bei Positionsbestimmungen an Bord. - Publ. de circ. Cons. perm. int. Explor. Mer, No. 38.

Knudsen, M. and K. Smith. 1906. The salinity of the North Sea and adjacent waters calculated on the basis of observations from the period August 1902 - May 1906. - Rapp. P.-v. Réun. Cons. perm. int. Explor. Mer, VI, Part A, Annex A.

Lebedintsev, A. 1908. Chemical analysis of seawater on board for use in the navigation. In: Vestn. Ryboprom, 1908. (In Russian).

Smed, J. 2002. Early attempts at determination of the salinity of seawater from measurement of its electric conductivity. In: Keith R. Benson and Philip F. Rehbock (eds): Oceanographic History. The Pacific and Beyond. University of Washington Press, Seattle and London.

Letters

The letters are stored in the archives of Kommissionen for Fiskeri- og Havundersøgelser, now in Rigsarkivet, Copenhagen. Archive no. 1935, Box D.2 or D.4 as specified below.

MK: Martin Knudsen

1. MK to C.F. Wandel 13 January 1907. - D.4.
2. Circular letter of 14 January 1907 from MK. - D.2.
3. Otto Krümmel to MK 16 January 1907. - D.2.
4. H.R. Mill to MK 25 January 1907. - D.2.
5. E.W.L. Holt to MK 21 January 1907. - D.2.
6. MK to E.W.L. Holt 25 January 1907. - D.2.
7. L. Breitfuss to MK 16(29) January 1907. - D.2.
8. Otto Pettersson to MK 20 January 1907. - D.2.
9. Walther Herwig to MK 28 January 1907. - D.2.
10. MK to P.P.C. Hoek 14 January 1907. - D.2.
11. MK to the Director of the Danish United Steamship Company 24 May 1907. - D.4.

THE USA'S AND CANADA'S LONG WAY TO ICES

Jens Smed
Bygtoften 17
DK-2800 Lyngby
Denmark

I. Introduction

USA and Canada were not among the founding countries of the International Council for the Exploration of the Sea (ICES). According to the programme annexed to the Swedish government's invitation to the International Conference for the Exploration of the Sea, held at Stockholm in 1899, the purpose of the cooperation was an exploration of the North Sea, the Baltic, and the "mer glaciale", i.e. the Norwegian Sea (Anon., 1899, pp. I-III). Already at this Conference, however, the Swedish delegation proposed that USA and Canada should be invited to join the observation system agreed upon by the Conference. This would seem to be a natural extension of the investigations. So the proposal was strongly supported by the British and Norwegian delegates. At first also the German delegates gave the proposal a kind reception, although they did not find an extension of the investigations to the western part of the Atlantic necessary. They considered that the British observations, which according to the adopted scheme should be carried out west of Scotland, would cover the eastern part of the so-called Gulfstream Drift. This would give sufficient information about the conditions in the Atlantic, in so far as they would influence the physical and biological situation in the North Sea and the Norwegian Sea, the German delegates judged. The idea of the Swedish proposal was to obtain as many physical and biological data as possible. As the Conference proceeded the German delegation got the impression, however, that this was not in the foreground with the British delegates, but that their main purpose was to get the centre of gravity of the new organization shifted as far to the west as possible. England, or rather Scotland, would then make out the natural centre of the whole system, and it was then evident that the Central Bureau of the organization must be placed in Edinburgh, the home town of Sir John Murray (1841-1914). When at last this purpose, according to the German delegates, was expressed openly they gave up their support. The Swedish delegate Gustaf Ekman (1852-1930) then withdrew his proposal, as a unanimous resolution now was out of the question (Krümmel, 1899, Blatt 281).

The idea that the Central Bureau should be placed in Edinburgh was by no means foreign to the Norwegians. In a letter to the "father" of ICES, Otto Pettersson (1848-1941), Fridtjof Nansen (1861-1930), one of the Norwegian delegates, discussed the matter. If it was possible to have Murray as president of the organization Nansen would vote for Scotland as domicile of the Central Bureau because of Murray's great advantages*, i.a*. as an administrator (Nansen, 1899). In the end, however, the German Walther Herwig (1838-1912) became president of the organisation, and the administration was split up in a Central Bureau at Copenhagen and a Central Laboratory at Christiania, now Oslo (Anon., 1902, pp. VIII-XV).

The Swedish delegates had not completely given up the idea of extending the observations to the western Atlantic. In a letter to Fridtjof Nansen Otto Pettersson declared that it should not be impossible to start also an "Atlantic cooperation", with John

Murray as a sort of honorary president of both bodies in order to get a unity out of it (Pettersson, 1899). This idea was not carried into effect. But the need for oceanographic stations in the open Atlantic continued to emerge. In a paper submitted to the Eighth International Geographic Congress, held at Washington, D.C. in 1904 Martin Knudsen (1871-1949), Danish delegate to the International Council and First Assistant to its executive body, the Bureau, pointed out that such stations were greatly wanted in order to understand many of the oceanographic changes in the waters studied by the Council. He expressed the hope that America some day would join the work and fill the gap in the European investigations (Knudsen, 1905, pp. 506-508).

The same hope was expressed by Nansen in a memorandum addressed to the other Norwegian delegate, Johan Hjort (1869-1948), in August 1906:

> "...if the investigations are to be extended to the Atlantic Ocean which I, for my part, regard as necessary hoping that the United States and even Canada might be induced to take part in the researches.." (Nansen, 1906).

II. The USA is approached

As time passed the Council became exceedingly interested in the USA becoming a member. In the meantime, however, a potential rival had emerged. The Ninth International Geographic Congress, held in Geneva in 1908, had proposed the establishment of an International Commission for the Scientific Exploration of the Atlantic. The Commission was formally set up at a meeting held in Monaco in 1910, in connection with the inauguration of the Musée océanographique. Prince Albert (1848-1922) agreed to take over the chairmanship. The question was now whether the USA would join this Commission, which would diminish the chances of her joining the Council. So the General Secretary of the Council, Christian Frederik Drechsel (1854-1927), approached the Danish minister in USA, Carl Moltke (1869-1935), asking him to make inquiries about the matter (Drechsel, 1910a). From application to various circles in USA Moltke had learned that there was an interest in joining the Atlantic Commission, but a proposal about this had apparently been defeated in Congress (Moltke, 1910a).

With regard to the USA's interest in the Council Moltke got positive reactions both from the Commissioner of Fisheries, C.M. Bowers, and from the influential Senator H.C. Lodge. The latter stated that he should be very glad personally to do anything he could "to promote the oceanography which had been the subject of the Conference at Monaco", and he "should be happy to support any recommendations which the Administration may take for the co-operation of the United States in that work" (Lodge, 1910).

This sounded promising, and the Council's President, Walter E. Archer (1855-1917), suggested that Moltke should point out which individuals in America might be invited to the forthcoming meeting in September 1910. Archer was, however, somewhat alarmed by the tone of the letter from Senator Lodge, when he referred to the Monaco Conference, which had dealt with purely scientific work. Archer, who had fought to bring the work of the Council onto a more practical footing, was sure that Great Britain would not continue her membership if the Council adopted as a basis of its programme such proposals as those decided upon at Monaco. The support of America would be very dearly bought, if it led to the secession of Germany and Great Britain, he added. So it should be carefully pointed out to the Americans that the object of the organization was

not the pursuit of pure science, but the solution of definite fishery problems (Archer, 1910a).

Letters in accordance with these instructions were sent to the US Secretary of Commerce and Labor, C. Nagel, and the Commissioner of Fisheries, C.M. Bowers. The hope was expressed that they would be able to come and discuss the matter in a more private way in order later to proceed through official channels, if possible. It was added that Archer had invited Professor E.E. Prince in Canada to attend the next Council Meeting, and that it was the intention to approach French experts with the same in view (Drechsel, 1910b).

As the two USA persons approached were not able to attend the Meeting, the Deputy Commissioner of Fisheries, Hugh M. Smith, was directed to informally represent the Department of Commerce and Labor. In order to furnish him with some advance information about the views and wishes of the Council relative to the nature and extent of a possible cooperation with the USA, Drechsel sent him a brief memorandum, "Facts which speak in favor of co-operation between North America and the countries of Northern Europe as regards international study of the sea." (Drechsel, 1910c)

III. The USA shows interest in membership

Hugh Smith did attend the Council Meeting. In the session of the Fisheries and Statistical Section he gave, upon invitation, some information about USA's mackerel fishery, from early times her great high-sea fishery. During the last 25 years, however, a great decline in the catches had taken place. The cause of this diminution was not clear, but Hugh Smith was inclined to believe that physical conditions acting on the eggs and young were responsible. He would welcome and support investigations from the side of the International Council to solve the problem (Anon., 1911, p. 58).

That the relevant US administration was seriously interested in cooperation appears from a communication of 11 November 1910 from the US Department of Commerce and Labor to the Secretary of State, quoted by Drechsel in an appendix to a letter to Archer (Drechsel, 1911a):

> "Judging from the important results already obtained by the council and from the announced programme for future work, the department feels that it will be of very decided advantage for the United States Government to have a place in this council and to cooperate therewith in the consideration of questions that affect the prosperity of our marine fisheries. The most important fishes of the North Atlantic are identical on the two sides, and the economic problems connected therewith are the same. By joining with the other great fishing nations in this practical work the United States will have the invaluable advantage of cooperation with the leading specialists in the world in the elucidation of problems that would otherwise have to be solved independently at great loss of time and money and will be able to anticipate some of the developments in the marine fisheries that have given much trouble to the European powers."

In the autumn of 1910 official invitations to join the International Council were then communicated by the Danish Ministry for Foreign Affairs to the USA and France, who both had been represented at the Council Meeting (Moltke, 1910b). As Canada had not sent a representation to the meeting it was considered preferable not to invite this country for the time being (Archer, 1910b). Otto Pettersson became momentarily uneasy

about the invitations. He felt that the Council's member countries should have had an opportunity to approve the procedure (Drechsel, 1911b). Fortunately it turned out that there was no problem.

The USA seemed to accept the invitation. In January 1911 the reply was received that a proposal for the necessary appropriation had been submitted to Congress. This was, of course, a gratifying message, though the Danish Ministry felt that it was too early to anticipate events. The normal procedure would have been that the US government declared their willingness to participate and then asked for the appropriations. Archer felt that USA now was likely to cooperate (Archer, 1911). The necessary appropriation for participation was, however, in the first instance turned down by Congress. Nevertheless the Council's Bureau felt that time had come to ask the member countries for their consent to the participation of USA (Drechsel, 1911c).

IV. The USA becomes a member of ICES

In the USA the matter was again taken up by Congress. In December 1911 the Secretary of State, P.C. Knox, submitted an appropriation to the Secretary of the Treasury, explaining the background for the proposed cooperation (Knox, 1911). On 20 April 1912 the Senate and the House of Representatives in "joint committee" voted the necessary amount for USA's participation in the Council (Danish Ministry for Foreign Affairs, 1912). An official application for membership was now submitted by the US Government and was duly agreed by the member countries.

At the next Council Meeting, in September 1912, USA was represented by Hugh Smith. An informal meeting was held in which the programme for the cooperation with the USA was discussed. Johan Hjort (1869-1948) lectured on the results of his last expedition in the Atlantic Ocean. He drew attention to the importance of the hydrographical [footnote: In ICES the word hydrography was used for physical oceanography] conditions in the western Atlantic being studied after the same plan as that used in European waters. These conditions would influence the life and propagation of fish off the coasts of the USA and Newfoundland. Hugh Smith stated that the study of the life and propagation of the mackerel on both sides of the Atlantic was one of the most important problems for a continued investigation. Otto Pettersson expected that the cooperative investigations would bring important information also in marine meteorology (Anon., 1913a, pp. 54-57).

At the Council Meeting in September 1913 Hugh Smith again represented the USA. In the session of the Hydrographical Section he reported that the US Bureau of Fisheries had for many years been conducting hydrographic investigations on various parts of the Atlantic coast. It was the intention hereafter to carry out these investigations in accordance with the practice prevailing in the other member countries. To this end the physical apparatus and methods recommended by the Council's Hydrographical Laboratory would replace those formerly used. The Bureau of Fisheries had now taken steps to carry out the hydrographic work called for by the Council Meeting in 1912 (Anon., 1913a, pp. 78-79). Hugh Smith then reported on some work undertaken during the past year under direction of Henry Bryant Bigelow as well as on observations made by the Bureau of Fisheries in cooperation with US Coast and Geodetic Survey (Anon., 1913b, pp. 88-91).

V. Canada not interested in membership

It would obviously be an advantage if also Canada joined the cooperation. As a matter of fact Archer had suggested that both Canada and Newfoundland be invited. If they considered the matter favourably it might lead to their opening negotiations with France as problems had arisen because of fishing in late years on the fishing banks in their neighbourhood by French trawlers. In that case the two countries might induce France to join the cooperation (Archer, 1911). Also Hugh Smith stressed the importance of cooperation with Canada. So the Danish minister in Washington, Carl Moltke, approached the Canadian Minister of Fisheries, L.P. Brodeur, who expressed Canada's strong interest in the work carried out by the International Council. However, because of the great work at that time falling upon the Canadian Fisheries Department it could not at present take on new tasks. But he hoped that in some years his country would be able to join the Council (Moltke, 1911).

Time passed, and Canada still did not express any wish to take part in the cooperation. Early in 1913, however, the Canadian Commissioner of Fisheries, E. E. Prince, came to see Hugh Smith about the participation of Canada in the International Council. Hugh Smith pointed out the great advantages to both Canada and USA and to the entire fishery work in the North Atlantic that would accrue if Canada joined the Council. Prince was personally in favour of Canada's participation (Smith, 1913). At the instigation of the Council's Bureau the English delegate Henry Maurice (1874-1950) now induced the British government to approach the Canadian government on the matter. The Canadian authorities, however, did not find it desirable that Canada should join the International Council at that time. The Bureau then decided to invite Prince to attend the meeting privately in September 1913, so that he might be acquainted with the Council's work, programme, and deliberations. Prince did not come to the meeting but indicated that he might visit Europe in September 1914 and should then be pleased to attend the Council Meeting. Thereafter it might be possible for him to induce the government of Canada to revise their decision with regard to membership of the Council (Anon., 1913b, pp. 18-19).

VI. World War I: the USA leaves ICES

Then the war broke out in August 1914, and no Council Meeting was held. The war would obviously bring the Council in a difficult financial situation as no contributions could be expected from the belligerent countries. The Council's Bureau struggled to keep the organization alive (Smed, unpublished MS). The Scandinavian countries and The Netherlands promised to pay their contributions for the year 1914-15. Great Britain did the same, although engaged in the War. As the USA at that time was a neutral country, Drechsel approached Hugh Smith to obtain an undertaking that the USA's contribution would be paid also (Drechsel, 1914). But he was informed that although the contribution was included in the budget passed by Congress the US government was not likely to pay, referring to the probable discontinuance of all Council work during the year and the indefinite postponement of the Council Meeting. However, if it could be shown that the work would continue and that the usual expenses of the Council would go on, the matter would at least be reconsidered (Smith, 1914). Drechsel, with support from the US ambassador in Copenhagen, M. F. Egan, succeeded in

persuading the US authorities that the above requirements were fulfilled and that USA was due to pay, which they finally did in December 1914.

In February 1915 the German government informed the Danish Ministry for Foreign Affairs that Germany during the war would abstain from further cooperation in the work of the Council. Consequently the German Fritz Rose, who had followed Archer as President, resigned from the post. The delegates for Sweden in an official letter to the Council's General Secretary proposed that the delegate of the USA, Hugh Smith, be elected President (Pettersson and Ekman, 1915). A motive for the proposal may have been to keep USA connected with the Council. The proposal does not seem to have received any support, and Otto Pettersson was unanimously elected President.

Although the USA did not formally withdraw from the Council the US Congress would not make any financial provision for the country's membership after the year 1914-15. According to Hugh Smith the reason was:

> "1. the very unsettled state of affairs in Europe and the withdrawal of the principal countries in the work,
> 2. the failure of Canada to join the council when Canada's fishery interests in the North Atlantic are larger than those of the United States and are closely connected therewith, and
> 3. lack of interest in Congress in scientific or fishery investigations whose center is so remote from our shores."

Hugh Smith stated that personally he wished the cooperation to continue, and he would be pleased to present the matter to his government at the proper time with a view to resuming the relations. He expressed the hope that they might not be entirely cut off from communication, pending a time when they might expect again to be associated (Smith, 1915a).

The Council decided to abstain from requesting any contributions for the year 1915-16 from the governments. Drechsel hoped that in this case the USA would stay a member during the year (Drechsel, 1915). The decision was received positively by Hugh Smith who again expressed the hope that nothing would prevent the re-adherence of USA as soon as international affairs became a little more settled (Smith, 1915b).

Apparently the USA had still not officially withdrawn. For in February 1916 Drechsel again wrote to Hugh Smith. It was now desirable to call for contributions for the year 1916-17. The question was whether the USA, still a neutral country, could be approached or not. The inquiry should be unofficial to begin with, for if the attitude of the government were unfavourable there might come an official answer which would mean the withdrawal of the country from the Council (Drechsel, 1916a). The answer from Hugh Smith was in the negative. The authorities had reached the decision that it would be impracticable for the USA to resume active affiliation with the Council until the European conflict was over and conditions had assumed a more or less normal state. It would probably be futile to bring up the subject in Congress until peace had been established. Hugh Smith reiterated that as soon as time was ripe he would bring the subject to the attention of the US Department of State in the expectation that it might prevail upon Congress to authorize resumption of the relations with the Council (Smith, 1916).

Drechsel again mobilized the US ambassador. In 1916 negotiations were going on about the relinquishing of the Danish West Indies (now the Virgin Islands) to the USA.

Apparently Drechsel saw a chance that these negotiations might induce the USA to pay the contribution for 1916-17. He stressed, however, that the amount itself was not the main thing, but it was essential that the USA stayed a member of the Council (Drechsel, 1916b). When this did not give any result, Drechsel in the autumn of 1917, when the ambassador was on the point of leaving for USA, again approached him and furnished him with a memorandum about the desirability of the USA rejoining the Council (Drechsel, 1917). The USA, however, became engaged in the war, and in July 1918 Hugh Smith informed Drechsel that his government now was not directly interested in the work of the Council. No future engagements or responsibilities of any kind could be assumed by USA until the war had been satisfactorily concluded (Smith, 1918).

VII. Futile post-war negotiations

When the war was over Drechsel reminded Hugh Smith about his promise to bring the matter of the USA's participation in the Council to the attention of his government (Drechsel, 1919a). The consensus of opinion in Washington was, however, that in the unsettled state of affairs it would be impracticable for the USA to participate. It would be difficult to secure from Congress the funds and authority for resumption of the relations to the Council. An important feature in this connection was the failure of Canada to participate. The feeling in Washington was that Canada would hold aloof from the Council, but be desirous of entering into more active cooperation with the USA in oceanographic work (Smith, 1919). Drechsel would not give up, however. He maintained that it would be highly to the detriment of the international investigations if the USA should now withdraw. He thought that the subscription for participation in the Council was so small that it did not count, and he pointed to the fact that the work of the Council had more and more been extended to the Atlantic and was now carried out in such vicinity of the American coasts that the adhesion of the USA and Canada to the Council ought to be justified by these facts alone (Drechsel, 1919b).

The USA was invited to send representations to the first post- war Council Meeting, held in London in March 1920. An attaché at the US London embassy, Lincoln Hutchinson, represented his country. The General Secretary stressed the importance of early information about the USA's participation in the Council. Hutchinson declared that it was his intention to urge his government to take part in the investigations, though he could give no assurance whatsoever that his endeavours would meet with success (Anon., 1920, p. 21). Shortly after the meeting the Council's President, Henry Maurice (1874-1950), met with a member of the Commercial Department of the US Embassy in London, who promised that his department would do their utmost to further the idea of American participation. In view of this Maurice thought it better to wait and see what could be done by representations in various quarters (Maurice, 1920a).

Hugh Smith again stressed that they took very much interest in the matter and that they wished to follow the work of the Council. However, in view of previous experiences and the economic situation he deemed it impossible to obtain the necessary appropriations from Congress. On the other hand, the USA would like to have a representative on the Council – not a full member, but a delegate who could follow the work and keep USA in touch with the Council. Drechsel found this standpoint peculiar. Apparently the USA and Canada wished to remain in touch with the Council and its work, but they would not pay any contribution (Drechsel, 1920a). This was the same

impression that the Danish marine biologist Johannes Schmidt (1877-1933) had gained during his visit to Washington. He was told that Hugh Smith was in favour of his country's membership, but that other US authorities were not. They would cooperate informally with the Council, but would join Canada, and they would have "working and no talking". Drechsel realized that this remark referred to the Council, and he admitted that there might be something in it, that is, that the Council had passed a number of Resolutions about hydrographic work that was "desirable" but which had not been implemented, however (Drechsel, 1920b).

Maurice was still optimistic. At a meeting of the British Association for the Advancement of Science he had met C.A. Kofoid (1865-1947) of California, who was most anxious that the USA should rejoin the Council. So Maurice did not consider the case of America's membership quite hopeless (Maurice, 1920b). Hugh Smith still felt, however, that it was futile to expect that his government would re-enter the Council. The main hindrance was again the failure of Canada and Newfoundland to join the organization. Instead these countries and USA had now entered into an arrangement for oceanographic investigations on both the Atlantic and the Pacific coast, to be coordinated by an International Committee on Sea Fisheries Investigations. At its inaugurating meeting the Committee agreed that contact should be established with the International Council. Hugh Smith wondered whether some form of limited membership of the Council might be practicable, pending the time when it might be feasible for the three countries to become regular members (Smith, 1921a).

Now Otto Pettersson gave up hope, as appears from his letter to Drechsel (Pettersson, 1921):

> "You now realize, I think, that our proposal to America is in vain, and we must content ourselves with having started universal marine research and worked out its methods." (From Swedish.)

The suggestion for limited membership was declined with the motivation that the Council was made up of delegates officially appointed by the participating countries and was working in accordance with a definite constitution. However, the Council at least pretended to keep up the illusion about an USA membership at a later date:

> "The Council has learned with pleasure from Dr. Hugh Smith's letter that he is still able to regard the eventual adhesion of the United States as a possibility and the Council will, in the meantime, be glad to maintain the most intimate relation possible with the International Committee of the United States, Canada and Newfoundland". (Anon., 1921, p. 12).

But the members of the American Committee soon changed their mind with regard to contact with ICES. At their meeting on 4 November 1921 they decided that the work of the Committee had not yet developed far enough to call for establishment of contact with the Council. At the same meeting they passed a number of resolutions about the future work of the Committee (Smith, 1921b). Drechsel passed on these resolutions to Maurice. He was not impressed:

> "If they cannot do anything better than this, I do not think we need worry much about contact with them" (Maurice, 1921).

Soon after, Hugh Smith, the main spokesman for theUSA's membership of the Council, tendered his resignation.

VIII. Interest for membership emerges in the 1930s

In spite of their actual attitude, Henry Maurice undoubtedly expected that USA and Canada some day would join the Council. It is probably to these countries he refers in an article in The Times in June 1924:

> " The Council welcomes new adherents, but does not seek them. It knows that, sooner or later, every country with an Atlantic seaboard and with fishery problems to solve will seek admission to it. Those countries which at present stand aside from it will realize in time that in the matter of marine investigations a special significance attaches to the adage 'union is strength', and that the International Council for the Exploration of the Sea is the obvious rallying point of those who foresee, if they have not already experienced, the difficulties attending the rational exploitation of the fisheries under modern conditions." (Maurice, 1924, p. 6).

About the same time Otto Pettersson approached Drechsel, asking whether he, in case it should be proposed by the Bureau, would be prepared to go to the USA for a couple of weeks to work for cooperation with the Council and for USA's participation in the investigation of the ocean. He stressed that if something should be done in the USA "it should be <u>now</u>, just now! Now or never!" In the USA, the Coast Survey, the Fishery authorities, and the learned institutions should be approached. At the same time Drechsel might, on behalf of Pettersson, receive the Agassiz medal recently awarded him. This would open the learned societies for Drechsel, and he would get introduction to the great sources of patronage (Pettersson, 1924).

Pettersson's idea does not seem to have been carried out. But the interest for cooperation with the Council on marine research did again emerge in the USA. Early in 1930 the Council received a confidential letter from Albert Eide Parr, curator of the newly established Bingham Oceanographic Laboratory. Parr pointed out that the interest of the American nation was now rapidly turning towards the problems of marine biology and oceanography. So it would seem to be an opportune moment to take up again the question of the USA joining or cooperating with the Council. Parr therefore solicited information about "the inception, organization, functions and scope of the Council, and also, if possible, a suggestion for the United States joining it". The application induced Henry Maurice to contact E. J. Allen, Director of the Plymouth Laboratory, to get some information about the merits of Parr and the Bingham Foundation. Allen estimated that the Foundation was a thing to be encouraged, but it did not represent the important oceanographic work of USA, such as the Bermuda Biological Station and Bigelow's Woods Hole Oceanographic Institution.

Information about the Council and the formalities in connection with admission to it was sent to Parr, but nothing more issued from the application. Obviously the Council considered it more important to establish connections with other American institutions. So Henry B. Bigelow, Director of the Woods Hole Oceanographic Institution (WHOI), USA, and A.G. Huntsman of the Atlantic Biological Station, Canada, were invited to the annual Council meeting at Copenhagen in 1931. Huntsman was unable to attend, but Bigelow did participate, representing the North American Council on Fisheries Investigations. He had one more reason for visiting Copenhagen in 1931, viz. to inspect the WHOI research vessel *Atlantis* which was under construction on a Copenhagen shipyard and was scheduled for delivery later in the year (Schlee, 1978, pp. 17-18). Bigelow gave an account of WHOI and of his plans for investigation of the western part

of the North Atlantic. The Council passed a resolution to the effect that it considered the moment opportune for entering into close cooperation with both WHOI and the North American Council on Fisheries Investigations. It was of the opinion, that effective cooperation could best be achieved by close personal touch between the workers, and accordingly invited representatives of both bodies to take part regularly in its deliberations. The purpose was to arrive at unity of plans and methods in the study of those fundamental problems, which were identical or similar on both sides of the Atlantic (Anon., 1931, p. 21).

During the following years guests from the USA and Canada usually attended the annual Council meetings. To further the cooperation, the Council at its meeting in 1933 established an Atlantic Committee, consisting of its North Western Area Committee and its Atlantic Slope Committee. The main purpose of this "super-committee" was to enable its two constituent Committees jointly to maintain liaison with the North American Council on Fisheries Investigations. The latter would each year send a summary on its work in the Atlantic Ocean to the Atlantic Committee for publication in the International Council's Rapport Atlantique, and the hydrographical data would be sent directly to the Council's Service Hydrographique for publication in the Bulletin Hydrographique. In return the Atlantic Committee would report to the North American Council (Anon., 1933, p. 16).

IX. After World War II: a period of negative attitude

The Second World War meant a break in most of the Council's activities and in the Annual Meetings. After the war the USA and Canada were invited to join ICES. But the reply dragged on. At the meeting of the ICES Bureau in March 1946 the President, Johan Hjort, informed the members that he had been asked by Professor Bigelow whether one of his assistants might attend the Council Meeting in Stockholm in August 1946. The ICES authorities considered, however, that it would be undesirable to see guests from USA before a reply had been received to the invitation to join the organization (Anon., 1946). Later on the authorities must have changed their mind, for as a matter of fact Mary Sears of WHOI did attend the Stockholm meeting as a guest (Anon., 1947, p. 9). In 1947 the USA declared that direct participation in the Council would not be possible (Blegvad, 1947). At many of the Council meetings in the following years, however, the USA was represented by observers, as was Canada.

In 1950 the International Commission for the Northwest Atlantic Fisheries (ICNAF) was established, with member countries from both sides of the North Atlantic. The USA and Canada concentrated their interest on the new organization, so that when the Regional Fisheries Attaché of the U. S. Embassy at Copenhagen, Andrew W. Anderson, inquired at home about the situation with regard to membership of ICES he was informed that the USA had no intention of joining it. ICES and ICNAF were considered as complementary organizations, and the existing exchange of fisheries information was felt to be adequate to meet the needs of USA. Because little US fishing was conducted in the ICES region, fisheries research should be concentrated in the ICNAF area. Also the exchange of information in the oceanographic field was considered to be adequate, and the flow was likely to increase when the data exchange mechanism of the Intergovernmental Oceanographic Commission (IOC) was more fully developed – an exchange mechanism in which the ICES data centre presumably would participate. It was

pointed out that 11 nations were members of both ICNAF and ICES and that 11 of the 16 members of ICES were also members of IOC. This should insure a continuation of cooperation and coordination and a free flow of information (Anderson, 1962).

X. The USA and Canada finally become members of ICES

In 1965, however, the US Department of State sought information about ICES (Tambs-Lyche, 1965), and early in 1966 the USA, in a letter to her embassy in Copenhagen, declared her intention to become a member of ICES. The US embassy at Ottawa was also informed. This does not mean, however, that the two countries rode in as partners. Whereas Canada became a member in 1967, the USA needed considerably more time. In 1967 the Senate had agreed on the necessary appropriation for participation, but it was deleted in "joint committee" of Senate and House (Sullivan, 1967). The situation was the same in 1968 (Sullivan, 1968) and again the following years. Only in 1973 did the USA at long last re-enter ICES.

Acknowledgement. I am greatly indebted to Dr. Artur Svansson for copies of letters in Swedish archives and for constant assistance in the processing of this and other manuscripts.

References

RAC: Rigsarkivet, Copenhagen. Archive No. 10.649.

Anderson, A. W. 1962. Letter of 20 September 1962 to the General Secretary of ICES, A. Fridriksson. RAC, Box 42, File 2.A. 1956-1966.

Anonymous. 1899. Conférence internationale pour l'exploration de la mer, réunie à Stockholm 1899. Imprimerie K. L. Beckman, Stockholm.

Anonymous. 1902. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, I(A).

Anonymous. 1911. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, XIII(B).

Anonymous. 1913a. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, XV(B).

Anonymous. 1913b. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, XIX(B).

Anonymous. 1920. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, XXVI(B).

Anonymous. 1921. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, XXVII.

Anonymous. 1931. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, LXXIV.

Anonymous. 1933. Cons. perm. int. Explor. Mer, Rapports et Procès – verbaux des Réunions, LXXXV(I).

Anonymous. 1946. Protocol of the Bureau Meeting on 30 March 1946. RAC, Box 1, File 1.A.

Anonymous. 1947. Cons. perm. int. Explor. Mer, Rapports et Procès-verbaux des Réunions, CXVII, 1ère partie.
Archer, W.E. 1910a. Letter of 14 July 1910 to C.F. Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1910b. Letter of 14 October 1910 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1911. Letter of 28 January 1911 to Drechsel. RAC, Box 4.
Blegvad, H. 1947. Letter of 14 May 1947 from the General Secretary of ICES to the Danish Foreign Ministry. RAC, Box 1, File 1.A.
Danish Ministry for Foreign Affairs. 1912. Letter of 24 April 1912 to Drechsel. RAC, Box 41, File 2A: USA.
Drechsel, C.F. 1910a. Letter of 10 May 1910 to C. Moltke. RAC, Box 4.
- " -. 1910b. Letters of 23 July 1910 to C. Nagel and C.M. Bowers. RAC, Box 41, File 2A: USA.
- " -. 1910c. Letter of 12 September 1910 to Hugh Smith. RAC, Box 41, File 2A: USA.
- " -. 1911a. Letter of 28 June 1911 to Archer. RAC, Box 41, File 2A: USA.
- " -. 1911b. Letter of 30 January 1911 to Archer. RAC, Box 41, File 2A: USA.
- " -. 1911c. Letter of 24 April 1911 to the Danish Minister for Foreign Affairs. RAC, Box 41, File 2A: USA.
- " -. 1914. Letter of 5 August 1914 to Hugh Smith. RAC, Box 43, File 2B: USA.
- " -. 1915. Letter of 31 March 1915 to Hugh Smith. RAC, Box 43, File 2B: USA.
- " -. 1916a. Letter of 12 February 1916 to Hugh Smith. RAC, Box 43, File 2B: USA.
- " -. 1916b. Letter of August 1916 to M.F. Egan. RAC, Box 43, File 2B: USA.
- " -. 1917. Letter of 10 November 1917 to M.F. Egan. RAC, Box 43, File 2B: USA.
- " -. 1919a. Letter of 22 July 1919 to Hugh Smith. RAC, Box 41, File 2A: USA.
- " -. 1919b. Letter of 23 October 1919 to Hugh Smith. RAC, Box 41, File 2A: USA.
- " -. 1920a. Letter of 26 March 1920 to Henry Maurice. RAC, Box 41, File 2A: USA.
- " -. 1920b. Letter of 9 August 1920 to Otto Pettersson. Landsarkivet, Gothenburg, The Otto Pettersson Collection, Box 25:3.
Knox, P.C. 1911. Letter of 20 December 1911 to the Secretary of the Treasury. 62nd Congress, 2nd Session, House of Representatives, Foreign Intercourse, Doc. No. 341, pp. 7-8. Appended to letter of 1 February 1912 from the Danish Ministry for Foreign Affairs to Drechsel. RAC, Box 41, File 2A: USA.
Knudsen, M. 1905. The hydrographic methods used in international cooperational study of the sea. Report of the Eighth International Geographic Congress held in the United States 1904. Washington, D.C.
Krümmel, O. 1899. Bericht über die Ergebnisse der internationalen Konferenz zur Erforschung der nordeuropäischen Meere in Stockholm 15 bis 23 Juni 1899. Geheimes Staatsarchiv Preussischer Kulturbesitz (Berlin), Rep. 76–VC, Sekt. 1, Tit. 11, Nr. 11, Blatt 275–285.
Lodge, H. C. 1910. Letter of 21 June 1910 to C. Moltke. Copy appended to letter of 7 July 1910 from Drechsel to Archer. RAC, Box 41, File 2A: USA.
Maurice, H. G. 1920a. Letter of 30 April 1920 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1920b. Letter of 31 August 1920 to Drechsel. RAC, Box 43, File 2B: Gen.
- " -. 1921. Letter of 21 December 1921 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1924. Exploration of the sea. Practical investigations of the International Council. The Times Trade and Engineering Supplement, June 28, 1924.

Moltke, C. 1910a. Letter of 9 June 1910 to Drechsel. RAC, Box 4, File 1.A.4.
- " -. 1910b. Letter of 2 December 1910 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1911. Letter of 18 November 1911 to Drechsel. RAC, Box 41, File 2A: USA.
Nansen, F. 1899. Letter of 16 December 1899 to Otto Pettersson. Letter no. 279 in: Nansen: Brev, II (1961).
- " -. 1906. Memorandum addressed in August 1906 to Johan Hjort. In part quoted pp. 28-33 in: E.M. Thomasson (ed.): "Study of the Sea". Farnham, Surrey, 1981.
Pettersson, O. 1899. Letter of 10 December 1899 to Fridtjof Nansen. Norwegian National Library's Collection of Letters, File 48.
- " -. 1921. Letter of 24 June 1921 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1924. Letter of 1 April 1924 to Drechsel. RAC, Box 41, File 2A: USA.
Pettersson, O. and G. Ekman. 1915. Letter of 18 February 1915 to Drechsel. RAC, Box 1, File 1.A.1.
Schlee, S. 1978. On almost any Wind. Cornell University Press, Ithaca and London.
Smed, J. 2007. Decline of ICES during the First World War and rise after the War. Unpublished manuscript. 32 pp.
Smith, H. 1913. Letter of 17 February 1913 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1914. Letter of 19 August 1914 to Drechsel. RAC, Box 43, File 2B: USA.
- " -. 1915a. Letter of 27 February 1915 to Drechsel. RAC, Box 43, File 2B: USA.
- " -. 1915b. Letter of 7 July 1915 to Drechsel. Copy appended to letter of 7 March 1916 from Drechsel to Egan. RAC, Box 43, File 2B: USA.
- " -. 1916. Letter of 13 March 1916 to Drechsel. Copy appended to letter of 17 April 1916 from Drechsel to Egan. RAC, Box 43, File 2B: USA.
- " -. 1918. Letter of 5 July 1918 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1919. Letter of 5 September 1919 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1921a. Letter of 6 June 1921 to Drechsel. RAC, Box 41, File 2A: USA.
- " -. 1921b. Letter of 22 November 1921 to Drechsel. RAC, Box 43, File 2B:Gen.
Sullivan, W. L. 1967. Letter of 9 November 1967 to the Council's President, A. E. J. Went. RAC, Box 43, File 2A:14.
- " -. 1968. Letter of 11 September 1968 to the Council's General Secretary, H. Tambs-Lyche. RAC, Box 43, File 2A:14.
Tambs-Lyche, H. 1965. Letter of 19 November 1965 to W. L. Sullivan. RAC, Box 43, File 2A:14.

HAROLD DREYER WARBURG, TIDAL AUTHORITY

Paul Hughes
15 St. Helen's Mews
Howden, Yorkshire DN14 7GZ
United Kingdom
tides@btinternet.com
http://www.airmynyorks.co.uk

Harold Dreyer Warburg (1878-1947)**,** tidal authority, was born in Kentish Town, London, on the 1st October 1878, the son of Edward Martin Warburg, a General Merchant, and Caroline Marie Louise nee Drëyer, who both came from Denmark. On leaving his Hampstead home in 1894, Harold was one of only four Jewish midshipmen in the Royal Navy.[1] After four years as a snotty, and through sub-lieutenant, lieutenant, and lieutenant commander, he rose to acting commander by 1915.[2] Several of his senior sea-going officers noted him as trustworthy, hardworking, careful, and accurate.

H. D. Warburg as honorary M.Sc. of Liverpool University, 1938.

With his health deteriorating from 1899, he gained a posting as 4th Class surveyor on the *Research* in the English Channel. On the *Waterwitch,* he passed first to 3rd Class and later 2nd Class while in China, until invalided by appendicitis in 1906. After a course at Navigation School, he moved to the *President* for a short tour*,* transferring to the *Goldfinch,* initially on the Home Station he ventured out to the west coast of Africa, until returning once more to the *President.* On the *Research,* he became a 1st Class surveyor

[1] Archibald Day, *The Admiralty Hydrographic Service 1795-1919*, (London, 1967); Madison Clinton Peters, *Justice to the Jew,* (London, 1900), p82.
[2] Taunton, United Kingdom Hydrographic Office (UKHO), SL 110/3 Abstract of Surveyors Services.

while on the west coast of England. He held this post to the end of 1910, with his eyesight became sufficiently defective as to render him unfit for watch keeping or navigating duties.

He therefore joined the British Hydrographic Department as a naval assistant. In his spare time there, he took up a special study of tides; this allowed the Hydrographer to make him the officer 'in charge of Tidal Work' in October 1913. The formal title, Superintendent of Tidal Work, followed in 1917. He continued working on tides for the next thirty years, both formally for the Admiralty, and occasionally for himself, but increasingly in collaboration with the mathematician, Arthur T. Doodson (1890-1968) D.Sc., F.R.S., F.R.S.E.

Harold married Sara Lazarus Meherson, of Bedford Park, on 16th December 1907 at Brentford Register Office. In the summer of 1913, he requested permission to go abroad.[3] Three years later, in the middle of war, Sara was in New York for two weeks, apparently without him.[4] They had a son, Martin, in the spring of 1927.

Warburg's legacy to oceanography resides within several publications. In early 1914, the Hydrographer gave him the job of revising the Admiralty's large accumulation of tidal data.[5] As the work burden rapidly rose, Warburg gave copiously of his spare time. After war broke out, he then gained a clerk, and the help of an instruments officer. The Admiralty then expanded the number of tidal workers to a naval assistant and a second clerk in late 1917. After the conflict, the individuals carried on with their separate work until co-ordinated as the Tidal Branch in 1933. Little is known of the "green door", behind which the Branch operated.

Edward Roberts (1845-1933) F.R.A.S., I.SO., J.P. was the instruments officer; with whom Warburg compiled additional and special tidal information for His Majesty's ships in *Fleet Notices to Mariners*.[6] Then from August 1914 they issued these in handbook form for the North Sea every six months, supplemented with another for the European Arctic as war with Russia expanded.[7]

The Great War brought a philosophical clash to those tidal predicters congregating around London in Teddington, Eltham, and Whitehall. While the set of predictions for Home Waters were of a high quality, the method employed was only empirical. In contrast, the prediction sets for abroad were of a much lesser quality, yet they did bask in the rigour of a theoretical method. During the war, the Hydrographer published those two different types of predictions together in one volume. In between, the Admiralty had published a comprehensive list of simple data for the ports of the world since 1910 in a second volume.[8] In their wartime desperation, the formative branch, with

[3] UKHO, *Index to Minute Book 1908 to 1914,* year 1913 page 730.
[4] List or Manifest of Alien Passengers for the United States of America.
[5] UKHO, *Index to Minute Books 1908 to 1914,* C.E.919 1913.
[6] Paul Hughes, *Edward Roberts 1845-1933,* Oxford Dictionary of National Biography, (2004-7).
[7] [Edward Roberts & Harold D. Warburg], *North Sea Handbook*, (London, 1914-17); [Edward Roberts & Harold D. Warburg], *European Arctic Handbook*, (London, 1916-17); [Edward Roberts & Harold D. Warburg], *North Sea and European Arctic Handbook*, (London, 1918-20).
[8] T. H. Tizard, *Local and Greenwich time of high water on full and change days with the rise of the tide at springs and neaps, for the principal ports of the world*, (London, 1910): High Water Full & Change (HWF&C).

the aid of both Roberts and his son, Herbert William Thomson Roberts (d. 1930), they revised that barely useful information under Warburg's direction.[9]

The clash and inter-mixing of predictions of a different nature also had its political aspect. The proto-branch produced the Home Water predictions in-house, by an understood method, and hence they were available to the Hydrographer's direct scrutiny. Those from abroad were not nearly so. While the scrutiny of British Empire predictions was nominally available to the Hydrographer, their method of production was much more advanced than that of a navigator's normal mathematical remit. Those predictions from foreign coasts he had to take at face-value. From then on, both the Hydrographer's and Tidal Branch's grip on the science under them became less than total.

After the Armistice, leading Liverpool shipowners took up their patronage of the Liverpool Tidal Institute out of obvious self-interest. This expanding centre of oceanography immediately attracted the young Arthur Doodson. Then, the old age, premature death, and ill-health of three family members wrought an end to Roberts's successful computing company. Doodson's great admiration of Roberts's mechanical tide predicters, led to his eventual adoption of these analogue computers. Warburg's work among tides was initially only on a temporary basis, so that on war-end he took the formal opportunity to retire (for the first time). However, still only forty, he remained active in the subject. His recreation ran to the place of tides in history, and despite early retirement he continued with Admiralty work on an ad-hoc basis.[10] From out of this situation came forth Warburg's second collaboration, this time with Doodson, which gave an even greater yield than his former work with Roberts.

Initially, in addition to revision, their Lordships also gave Warburg the task of compiling tidal instruction suitable for midshipmen.[11] Warburg did not achieve the direct result of this until 1922, by which time it is amply apparent that he was deeply involved with the proto-tidal branch on publication of a much higher level.[12] Warburg knew of the difficulties connected with prediction from his own labours.[13] The fifty year old theoretical method needed a full research programme of empirical adjustment to work satisfactorily. Under an Admiralty committee the Tidal Institute were in the business of implementing this.[14] Doodson & Warburg's substantial revision of 1927 transformed and fixed the Admiralty's involvement from the empirical to and into the theoretical.[15] With one more edition, progress was slow; but a prize from the Royal Society of Arts for a new

---

[9] London, The National Archives (TNA), ADM 12/1588A digest for 1917; *The Admiralty Tide Tables Part II containing The time of high water on full and change days with the rise of the tide at springs and at neaps for the principal ports, etc., of the world*, (London, 1918-1919); UKHO, The war work of the Hydrographic Office (1914-18).

[10] H. D. Warburg, 'The Admiralty tide tables and North Sea tidal predictions*', The Geographical Journal*, **Vol LIII Jan-Jun**, (1919), 308-330; H. D. Warburg, 'Ceaser's first expedition to Britain'*, The English Historical Review*, **XXXIVVV (CL)**, (1923), 226-240.

[11] TNA, ADM 12/1528 *Admiralty digest 1914*.

[12] H. D. Warburg, *Tides and Tidal Streams – a manual compiled for the use of seamen,* (Cambridge, 1922); *The Admiralty Tide Tables Part II. Third Edition, containing Tide Constants and Tidal Differences for the Principal Ports, etc. of the World*, (London, 1920).

[13] H. D. Warburg, *Instructions for reducing and analysing tidal stream observations,* (London, 1929).

[14] TNA, ADM 1/8666/154.

[15] *The Admiralty Tide Tables Part II. Fourth Edition, containing Non-Harmonic Tidal Constants, Tidal Differences and Harmonic Tidal Constants for the Principal Ports, etc., of the World*, (London, 1927).

method of approximately predicting tides and tidal streams provided encouragement.[16] They improved on the prize essay with a new volume. This formed an actual instructional manual, and became the basis of the still on-going *Admiralty Harmonic Method*.[17] Together, they did not object to the Admiralty making public their second edition of this manual in the war-year of 1941, as it remained at an intermediate level. In contrast they did express surprise at their Lordships publishing their more substantial and then definitive version of the manual at that time of conflict.[18] In contrast, Joseph Proudman, head of the Tidal Institute condemned the manual as elementary. Despite that opinion, reprinted several times down to 1980, this manual demonstrates its own worth with sales continuing into the twenty-first century.

Still considering himself retired as war beckoned again, the Hydrographer knew Warburg as the only man in England capable of meeting the Admiralty's looming new tidal needs. Warburg did not finally revert to the Retired List until November 1945. Yet despite formal retirement he carried on with revision work at home for the Tidal Branch.[19] The Royal Astronomical Society made Warburg a fellow; and Liverpool University awarded him an M.Sc. *honoris causa*.[20]

While resident at 44 Shirehall Park, Hendon, Sara witnessed Commander Warburg's death from a heart attack on 7th May 1947in a Bournemouth hospital.

---

[16] *The Admiralty Tide Tables Part II. Standard Edition, 1932 containing Non-Harmonic Tidal Constants, Tidal Differences and Harmonic Tidal Constants for the Principal Ports etc., of the World,* (London, 1932); *Journal of the Royal Society of Arts*, **Vol LXXXIII February**, (1935), p306: Thomas Gray Memorial Trust, Award of Prize offered for the Improvement and Encouragement of Navigation, Prize for Inventions, £25 to Commander H. D. Warburg R.N., and A. T. Doodson DSc., FRS.

[17] A. T. Doodson & H. D. Warburg, *The Admiralty Tide Tables Part III containing Instructions for Predicting Tides and Tidal Streams and for Analysing Observations and Tables to assist Prediction and Analysis*, (London, 1938).

[18] A. T. Doodson & H. D. Warburg, *The Admiralty Manual of Tides,* (London, 1941).

[19] H. D. Warburg, *Tidal Streams of the waters surrounding the British Islands,* (London, 1946).

[20] *Monthly Notices of the Royal Astronomical Society*, **Vol 75**, (1915), p505: elected May 14th 1915; Liverpool, Congregation of Liverpool University, 2nd July 1938.

IOAN BORCEA AND THE FIRST ROMANIAN MARINE ZOOLOGICAL STATION AT AGIGEA (1926)

Alexandru S. Bologa[1], Adela F. Bologa[2], Roger H. Charlier[3]

[1]"Grigore Antipa" National Institute for Marine Research and Development,
RO-900581 Constanța 3, Romania
abologa@alpha.rmri.ro
[2]Museal Complex for Natural Sciences, RO-900581 Constanța 3, Romania
E-mail: delfinariu@cjc.ro
[3]Free University of Brussels, B-1050 Brussels, Belgium
rocharli@vub.ac.be

Ioan Borcea belongs to the outstanding Romanian pioneers of marine biology. His most remarkable achievement is certainly the creation of the first Romanian marine biological research organization, the Marine Zoological Station, at Agigea, in 1926; it became a major component of the Romanian Marine Research Institute (1970–1999), today the "Grigore Antipa" National Institute for Marine Research and Development (NIMRD) located in Constantza. Various major scientific, didactic and public performances round off Borcea's prolific career: a lively personality, he contributed to zoology, marine hydrobiology, ecology, and general biology. Besides organizing scientific research, he introduced general biology into university curricula and is founder, member, honourary member and president of different national and foreign professional organizations and editor of learned journals. This paper is dedicated to Borcea; it was intended as homage to him on the occasion of the 125th anniversary of his birth.

BIOGRAPHICAL DATA

Ioan Borcea (Figure 1) was born in Buhoci, a village in the Bacău county (in the historical province of Moldavia), Romania, on January 13, 1879. After spending his hildhood in the villages of Letea Veche and Racova (near Buhuşi), he graduated from the "Costache Negruzzi" national high school in Iaşi and studied at the University of Iaşi, or the "Alexandru Ioan Cuza" University, Iaşi as of October 26, 1860. He acknowledged during his entire life his distinguished professors P. Poni, P. Bujor, A. Popovici, I. Simionescu, A. Obregia.

In 1900 he graduated in natural sciences from the "Al. I. Cuza" University, Iaşi, and, one year later, became a "*preparator*"[1] at Professor Paul Bujor's Chair of Zoomorphology. His evident vocation led him to receive a "*Vasile Adamachi*"[2] scholarship and went to Paris where he studied at the Sorbonne, got a diploma in Sciences (1903) and a doctorate in natural sciences (1905). His doctoral thesis *Recherches sur le système uro-génital des Elasmobranches,* was

[1]Person who, in European universities, sets up equipment on the professor's teaching desk for the upcoming lecture.

[2]Prestigious Moldavian scientific and cultural Foundation.

directed by the prominent biologists Yves Delage and Edouard Hérouard. He graduated with the mention "*très honorable"*. Y. Delage mentioned in his official report: *"par un travail acharné, qui a duré quatre ans sans répit, Jean Borcea est arrivé à donner une solution qui paraît être définitive, à la plupart des problèmes posés dans la thèse qu'il s'est proposée ..."*.

His initiation to marine sciences took place at the Marine Biological stations of Roscoff and Banyuls-sur-Mer in France and at the Naples Zoological Station in Italy; he always kept, as other prestigious Romanian scientists did, the imprint of both Romanian and French schools.

Fig. 1. – Prof. Ioan Borcea (1879–1936).

Back in Iaşi he became an associate professor (1906), then a lecturer (1909) and full professor (1912) of the Chair of Zoology at his *alma mater* the "Al. I. Cuza" University in Iaşi.

As scientist, I. Borcea asserted himself in various fields of the biological sciences, namely fish anatomy and embryology, crustaceans, applied entomology and, mainly, marine biology. He has his place in the history of science as an important Black Sea fauna specialist.

Besides his major merit as the founder of the first Romanian marine biological research station, I. Borcea was also Dean of the Faculty of Natural Sciences of the "Al. I. Cuza" University, Iaşi, director of the Museum of Natural History of Iaşi, and in the public life a member of the [political] Rural Party (1919) and subsequently minister of Cults and Public Instruction in the Vaida Voievod cabinet between 1919 and 1920 (Minerva, 1929). I. Borcea was a founding member and editor of the scientific journal "*V. Adamachi*", also editor of "*Annales scientifiques de l'Université de Iassy*". He belonged to several learned societies: he was a corresponding member of the Romanian Academy, founding member of the Academy of Sciences of Romania, corresponding member of the famed "Museums" of Natural Sciences in Paris and New York, member and honourary president of the Zoological Society of France, *doctor honoris causa* of the University of Montpellier (France), honourary member of various national and foreign scientific societies. The French Government made I. Borcea knight of the "Légion d'honneur". As an invited speaker he participated in marine biology conferences in France (Paris, Lyon, Marseille, Grenoble, Dijon) in 1935.

Sadly Professor I. Borcea passed away at the height of his creative power, victim of a septicemia he developed at Agigea, on July 30, 1936, and was buried in Racova, in his family's vault.

Many testimonies of his coworkers and disciples recall with admiration, devotion and emotion the exceptional qualities of I. Borcea as a scientist, teacher and patriot (*e.g.*, Cărăuşu, 1959; Macarovici, 1966; Mustaţă *et al.,* 1969): two quotations about the founder and the Marine Zoological Station from its "Golden Book" come to mind: "*J'ai trouvé, à la Station Zoologique Maritime d'Agigea, dirigée par le professeur Ioan Borcea avec un admirable esprit d'organisation, une atmosphère de rare cordialité, imprégnée d'un sentiment de solidarité, que j'ai rarement rencontrée ailleurs. Grâce au professeur Borcea, à ses collaborateurs et aux jeunes chercheurs que j'ai rencontrés à la Station, je suis arrivé à compléter mes connaissances de cytologie, à amasser un matériel fort utile, qui facilitera mes travaux sur le fonctionnement du neurone ...*" (Professor Gheorghe Marinescu[3], le 25 août 1935), and "*Il me semble que ce soit une station zoologique extrêmement réussie et, certes, elle accomplit sa mission de station dirigeante dans les Balkans*" (Homer A. Jack, M.S.[4], le 5 décembre 1938).

A memorial house in Racova (Bacău county) was dedicated to I. Borcea in 1966 and several schools in Romania bear his name nowadays.

THE MARINE ZOOLOGICAL STATION AT AGIGEA 1926–1956

The first scientific, organizational and patriotic merit of I. Borcea is doubtlessly the creation on the Romanian Black Sea coast (Figure 2) of the Marine Biological Station "King Ferdinand I" by High Royal Decree No. 810 of March 1, 1926, the first such kind of institution in Romania, at Agigea, about 15 km south of Constanta. He became and remained until his death its first director. At the 30th anniversary of the Station (1956) and upon Professor Radu Codreanu's suggestion, the founder's name was attributed to the Station (Marine Zoological Station "Prof. Ioan Borcea"), which belonged for a while to the Romanian Marine Research Institute (RMRI) in Constanta (1970–1999); today the Marine Biological Station "Ioan Borcea" is again administered by the "Al. I. Cuza"

University Iasi (Figure 3).

[3] The most important Romanian neurologist (1863–1938), member of the Romanian Academy and of many foreign medical academies and societies.

[4] Cornell University, Ithaca N.Y., USA, delegate of the Science Education Department for the Study of European maritime stations

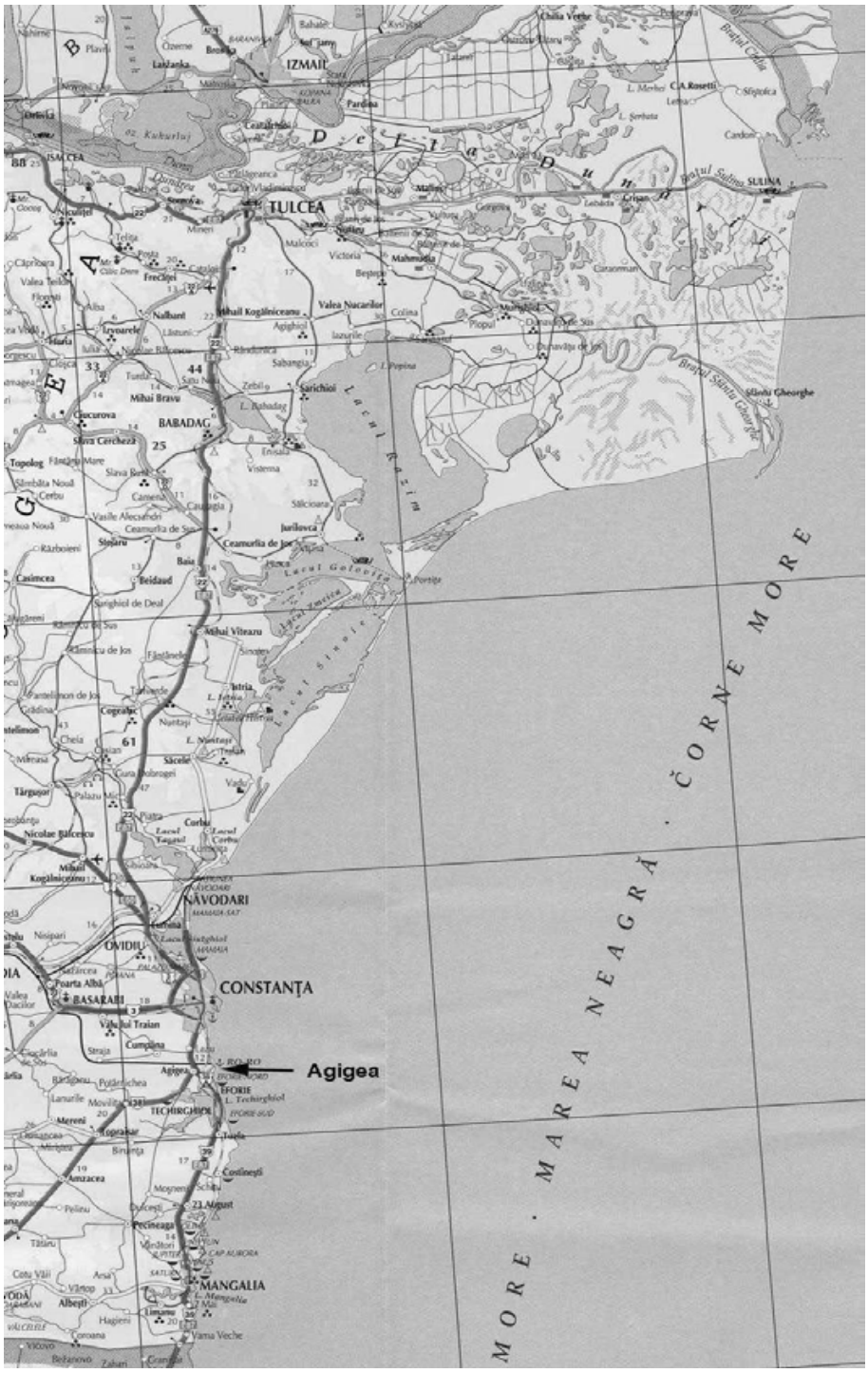


Figure 2. – Location map of Constanța and Agigea along the Romanian Black Sea coast.

Figure 3. – The "Prof. Ioan Borcea" Marine Zoological Station, Agigea.

The founder commented during the first congress of naturalists in Romania (1929), on the importance given to the marine fauna along the Romanian Black Sea coast, which generated the founding of the Station that had encountered many difficulties: "*Nous rappelons aussi le fait que la mer Noire et le delta du Danube sont les endroits de prédilection pour les esturgeons, si rares en Europe occidentale et si importants du point de vue économique; il en est de même pour*
d'autres espèces de poissons migrateurs, tels que les Caspialoses, les harengs, les anchois, les maquereaux, les saurels, les pélamides, etc. qui nous intéressent particulièrement au point de vue économique; nous rappelons, également, qu'en dehors des moules fixées sur les rochers, la mer Noire contient d'immenses bancs de moules qui vivent à de plus grandes profondeurs (20 mètres) et représentent des formations spécifiques à la mer Noire. Notons, aussi, la possibilité de faire de l'ostréiculture. Toutes ces considérations m'ont déterminé à rechercher un emplacement convenable pour l'établissement d'un institut de recherche scientifique sur la faune de la mer Noire, qui vit en face de notre littoral. L'endroit que j'ai choisi a été Agigea; il y avait un cap avancé dans la mer et une installation de pêche au talian."

The 30th anniversary celebration of the Station's founding coincided with the commemoration of 20 years of the founder's death.

The most significant achievements of the Station were summarized in the "balance sheet" of these first 30 years of activity (cf. Cărăuşu, 1959):

a) development of scientific research in various fields and under several aspects, such as: physical and chemical oceanography; qualitative composition of marine flora and fauna along the Romanian littoral; main biological characteristics of economically valuable marine fish; comparative animal morphology and anatomy; animal physiology and eco-physiology; taxonomic revisions of some zoological groups; capitalization of marine fisheries; marine microbiology; study of littoral (para-marine) lakes; observations on geology, pedology, terrestrial flora and fauna (insects, birds, mammals) in the Station's vicinity; nature protection; natural reserve of maritime dunes (with *Ephedra distachya*) declared as "monument of nature" (*Journal of Ministries Council* No. 142 / 1939);

b) improvement of endowments (crafts and ships – initially the small boat *Posidonia*, followed, after 1940, by the larger *Sagitta* and *Noctiluca*, and lastly by the R/V *Gilortul* – Figure 4), sampling equipment, laboratory instruments, fishing gear, furniture);

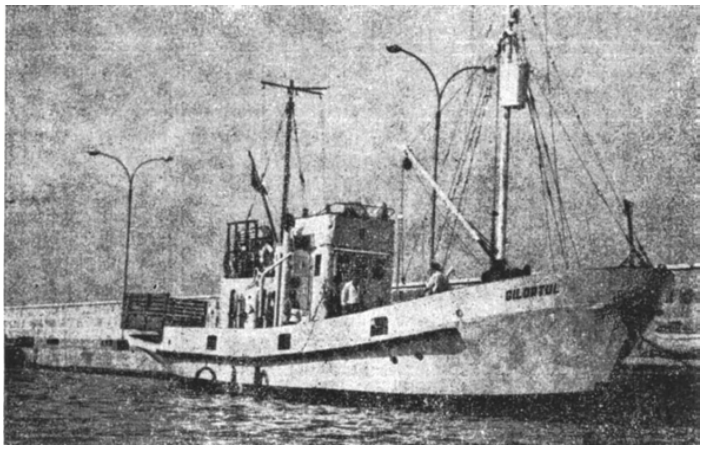


Figure 4. – R/V *Gilortul*.

c) laboratory diversification, photographic workshop, library[5];

d) first specialists in different fields of marine hydrobiology;

e) scientific co-operation at local (Marine Research Station Constanța – Tăbăcărie, later Marine Fishery Station "Dr. Grigore Antipa", part of the RMRI between 1970 and 1999), national (Universities of Iaşi, Bucharest, Cluj-Napoca) and international level (Academies of Science of the former USSR and Bulgaria);

f) participation in scientific events (*e.g.,* sessions at the "Al. I. Cuza" University, Iaşi);

g) publication of scientific papers in Romania and abroad (in *Lucrările Stațiunii Zoologice Marine "Prof. Ioan Borcea" Agigea* (edited by Prof. Constantin Motaş since 1938)*, Analele Ştiințifice ale Universității Iaşi, Studii şi Cercetări ale Academiei R.P.R., Buletinul Institutului de Cercetări Piscicole, Natura, Revista Ştiințifică "V. Adamachi", Buletinul Institutului Politehnic "G. Asachi", Bulletin du Muséum d'Histoire Naturelle Paris, Bulletin de l'Institut Océanographique de Monaco, Zoologischer Anzeiger*);

h) ensuring of accommodation for indigenous[6] and foreign research personnel (*e.g.*, from the former USSR, Bulgaria, Yugoslavia, Hungary, former Czechoslovakia, Poland, France, Germany, Sweden and USA);

i) teaching activities (courses, summer student training for all Romanian universities for in-depth studies of Black Sea life, training courses in museology for high school teachers of natural sciences, marine plants and animal collections for schools, universities, museums);

j) public awareness nurturing (Station's museum, conferences, brochures, pamphlets).

The chronicle of the jubilee scientific session dedicated to the first three decades of the Station (Motaş, 1959) has been published as a *Festschrift*, with the help of the

Ministry of Education, under the auspices of the *Scientific Annals of the "Al. I. Cuza" University, Iaşi*.

[5] The Prof. I. Borcea book donation, owing to Dr. Lucia Leon-Borcea, which represented the initial fund, included 3,000 volumes.

[6] Some of the Some of the most prestigious Romanian scientists *, i.e.* Profs. G. Bratescu (geology), I. Simionescu (paleontology), C. Caluga reanu (physiology), G. Marinescu (neurology), I. Scriban and I. Ciurea (ichthyopathology) and P. Bujor (Tekirghiol Lake), were hosted; they substantially contributed to the work at the Station.

1956–1966

Ten years later, another scientific session, organized by the Faculty of Biology and Geography of the "Al. I. Cuza" University, Iaşi at Agigea, held on November 1 and 2, 1966, celebrated 40 years of the founding and commemorated 30 years of the decease of its founder; among the numerous papers presented at this session, those dealing with Black Sea biota, evolution of the Station and the flora and fauna of Dobruja were published in an "anniversary volume".

The main scientific and didactic results achieved by the Station were reviewed for the period 1956–1966 by Andriescu (1966): completion of facilities (building / accommodation capabilities, technical installations, vehicles, research boats, library); increase of scientific personnel (46 members); development of scientific research (physical-chemical oceanography, marine biology and zoology, marine-animal physiology, marine radiobiology, others); 39 scientific publications; national (Iaşi, Bucharest, Cluj-Napoca, Timişoara, Galaţi) and international co-operation (Belgium, Germany, Denmark); didactic activities (student practice, training courses for high school teachers, museum collections); fostering of public awareness.

Thus the prior sound efforts devoted to this multidisciplinary research and teaching organization, pursued after the founder's disappearance, made possible the successful continuation of its traditional activities and perennity in spite of all human and historical vicissitudes. The work was shouldered by C. Motaş, I. G. Botez, S. Cărăuşu, P. Borcea, I. Suciu, N. Gavrilescu and I. Andriescu.

1969, 1970, 2001

1969 is a benchmark for the history of the Station: the organization of a first international course on the Black Sea's brackish waters by Prof. E.A. Pora in collaboration with the Mediterranean Association of Marine Biology and Oceanography (MAMBO), followed by publication of the lectures in the twovolume *Biologie des eaux saumâtres de la Mer Noire* (Pora and Bacescu, 1977).

In 1970[7] the Station was incorporated, together with other preexisting marine research units along the Romanian Black Sea coast, into the RMRI (Bologa, 1995, 1999, 2003, Bologa *et al.,* 1994), and transformed in 1999 into the present National Institute for Marine Research and Development (NIMRD) "Grigore Antipa" Constantza (Figure 5).

Fortunately, on June 28, 1990, after 20 years, the Station was reattributed to the "Al. I. Cuza" University Iaşi (Mustaţă, 1996) except for some hectares of the adjacent

natural reserve (lost to the Danube-Black Sea canal inaugurated on May 28, 1984). The station's "marine" library remained in possession of the NIMRD.

Credit is due Professor Gheorghe Mustață, the "Al. I. Cuza" University, Iaşi, the Faculty of Biology and its recovered Station, together with the NIMRD and the "Ovidius" University, Constanța, the Faculty of Natural Sciences, for the 70th anniversary of the Station, at which he organized the scientific session "The Black Sea in balance", at Agigea, between October 18 to 20, 1996 (Mustață, 1996).

[7] The first author spent himself 10 years (1970–1980) of activity at Agigea, meeting, experiencing and guiding distinguished scientists at the Station, to the beach and around the natural reserve: Dr. Lecturer Maria Celan (1898–1989), Professor Eugen A. Pora (Cluj-Napoca) (1909–1981), Professors Petre T. Frangopol and Ioana Pana (Bucharest), Professor Roger H. Charlier (Northeastern Illinois University and Free University of Brussels), Dr. Robert Ward (UK), and others since 1990: Dr. David G. Aubrey (USA), Dr. Allan Walton (Canada).

Figure 5. – Main building of the Romanian Marine Research Institute / the "Grigore Antipa" National Institute for Marine Research and Development.

The session included six sections (Plant diversity, morpho-anatomy and physiology, Animal morpho-anatomy and physiology, Animal bio-diversity, Aquatic biology, Ecology and sustainable development, Genetics, Microbiology and Biochemistry) and a poster session.

The event (Bologa, 2002), attended by about 180 people from various universities, research institutes and musea, from Romania and the Republic of Moldova, included the bestowing of a honourary diploma and a jubilee medal to former and present scientists who contributed to the achievements, prestige and recognition of the Station.

The essential contributions of the Station to the development of Romanian biology and oceanology were often evoked at various national and international jubilee events (*e.g.*, Cărăuşu, 1957, 1959, 1966; Andriescu, 1966; Mustață, 1996; Băcescu and Meşter, 1996; Bologa, 2003).

THE NATURAL HISTORY MUSEUM OF IAŞI

The Natural History Museum founded by Dr. Iacob Czihac (1800–1888), was created in Iaşi, through the initiative of the members of the Society of Physicians and Naturalists, on February 4, 1834. As a cultural institution, the main purpose of the museum consisted in the presentation to the public of exhibits of underground resources, flora and fauna from Moldavia and other parts of the world (Mândru, 1996).

To an initial period of blossoming (until 1860), an evident decline (that lasted some 50 years) set in until the leadership of the museum was taken over by I. Borcea in 1912.

The appointment as the director of the museum, the same year that he became Professor, was due to the report of Grigore Antipa, director of the Natural History Museum of Bucharest (which, on its centennial celebration, on King Carol II's recommendation, would be given his name on May 23, 1933), after his visit in Iaşi in 1902. The alarming situation, encompassing a deficient organization and the unsatisfactory state of the collections, had been transmitted to the Ministry of Cults and Public Instruction (MCPI). Consequently, at its request, the Society of Physicians and Naturalists proposed, by its Decision No. 11 from February, 1912, that as an appropriate specialist, I. Borcea, be appointed director on April 11, 1912. In this quality, too, he gained a real reputation as a museologist; his erudition and dynamism contributed decisively to the recovery and ensuing progress of the museum.

The revival of the museum under the leadership of I. Borcea was made possible by his successful fund raising from the MCPI for acquisition of new exhibits (from Romania and the Wilhelm Schlüter House from Halle, Germany), creation of a restoration workshop, hiring of a full time specialist and of assistants from the Chair of Zoology for identification and labeling of collections, which when adequately organized, could then be shown to the public. Since 1926, the Marine Zoological Station Agigea, founded by the manager himself, helped to enrich the collections with valuable exhibits of Black Sea fauna. Ample reconstruction works of the museum building were finalized in 1932 in preparation for the centennial celebration of the Society's founding (1933).

SUMMARY OF SCIENTIFIC AND DIDACTIC CONTRIBUTIONS

The personality and professional achievements of I. Borcea were the subject of studies by various Romanian researchers (cf. Cărăuşu *et al.,* 1966, Mustaţă *et al.,* 1996), but – to the first author's knowledge – only one related paper was published abroad, *viz.* in the former *Bulletin* of the Commission Internationale pour l'Exploration Scientifique de la Mer Méditerranée – CIESM (Cărăuşu, 1957).

The scientific and didactic results, synthesized on the occasions of the 40th and 70th anniversaries of the Marine Zoological Station (Cărăuşu *et al.,* 1966; Mustaţă *et al.,* 1996), may be summarized as follows:

- pioneer of Romanian marine biology (together with E. Racovitza and G. Antipa);
- valuable scientific contributions in different fields of zoology: faunal systematics / taxonomy, entomology, general biology, marine hydrobiology, marine ecology, zoogeography, history of biology, philosophy of science;

- promoter of the theory of evolution in biology;
- zoology courses, marine biology training and introduction of general biology in Romanian High Education;
- organiser of scientific research;
- creator of a scientific school in marine biology;
- methodological contributions (biological combat of noxious insects);
- humanist and *animateur* of the young generation;
- important role in increasing and accelerating social progress in Romania.

Nearly complete compilations of I. Borcea's publications were made by S. Cărăuşu (1959), S. Ghiță (1961), S. Cărăuşu *et al.* (1966), P. N. Laking (1974), and, more recently, F. Porumb (1999–2000).

Romania has produced several distinguished marine biologists and has gained its laurels in this domain, and naturally particularly in regard of the Black Sea. The means have always been rather modest, yet the contributions to the science have been significant. Among the names that have illustrated those achievements, that of I. Borcea deserves to be highlighted.

References

Andriescu I., 1966, Dix ans d'activité de recherche et d'enseignement à la Station de Biologie Marine "Prof. Ioan Borcea" d'Agigea (1957–1966). *Lucr. ses. şt. St. Cerc. Mar. "Prof. Ioan Borcea" Agigea (1–2 noiembrie 1966)*, 1–49.

Anonymous, 1929, *Minerva. Enciclopedia Română.* Ed. Comit. de red. al Enciclop. Române Minerva, Cluj, 974 p.

Băcescu M.C., Meşter L.E., 1996, La Station Zoologique Marine "Prof. Dr. Ioan Borcea" d'Agigea revenue dans son ancien territoire. *Marea Neagră în cumpănă*, Univ. "Al. I. Cuza" Iaşi, Lucr. ses. şt., Agigea–Constanța, 18–20 oct., 41–45.

Bologa A.S., 1995, 25 years from the founding of the Romanian Marine Research Institute. Jubilee Symposium RMRI, Constanța, September 15, 1–11.

Bologa A.S., 1999, Marine research and fight against pollution. *Constanța, What, Where, When*, 1, 2, 5.

Bologa A.S., 2002, History of the marine science in Romania. *History of Oceanography*, IUHPS, Newsletter Comm. Oceanogr., 14, September, 18.

Bologa A.S., 2003, Developments of marine biological institutions around the Black Sea: An overview. In *Ocean sources bridging the millennia – A spectrum of historical accounts*, ICHO VI Proceedings, UNESCO, Paris, 53–64.

Bologa A.S., Cociasu A., Diaconu V., Mihnea R., Nicolaev S., Panin G., Tiganus V., 1994, Romanian involvement in Black Sea research. In *Black Sea Research. Country Profiles,* UNESCO / IOC, 3, Paris, 45–79.

Cărăuşu S., 1957, La Station Zoologique Maritime d'Agigea. *Bull.de Liaison des Labor. Commiss. Int. Explor. Sci. Mer Médit.,* 8, Banyuls-sur-Mer.

Cărăuşu S., 1959, Trente années depuis la fondation de la Station Zoologique Maritime d'Agigea et vingt années depuis la mort de son fondateur, le professeur Ioan Borcea. *Lucr. ses. Şt. St. Zool. Mar. "Prof. Ioan Borcea" (15–17 septembrie),* I–XXXIX.

Cărăuşu S., 1966, Rol' Biologicheskoj Morskoj Stantsii Agigea v razvitii gidrobiologii v S. R. Rumyniya (K sorokoletiv deyatel'nosti stantsii). *Lucr. ses. şt. St. Cerc. Mar. "Prof. Ioan Borcea" Agigea (1–2 noiembrie 1966)*, V, 75–82.

Cărăuşu S., Cărăuşu D., Ghenciu V., 1966 – Contributions à l'histoire de la science en Roumanie: L'oeuvre du biologiste Ioan Borcea. *Lucr. ses. st. St. Cerc. Mar. "Prof. Ioan Borcea" Agigea (1–2 noiembrie 1966)*, 51–74.

Ghiță S., 1961, Din istoria biologiei generale în România. In *Din istoria biologiei generale*, N. Botnariuc, Ed. Ştiințifică București, 757 p.

Laking P.N., 1974, *The Black Sea. Its Geology, Chemistry, Biology. A Bibliography,* WHOI, Woods Hole, Massachusetts, 368 p. 174 Noesis 12

Macarovici N., 1966, Cum l-am cunoscut pe Profesorul Ioan Borcea (Evocările unui fost elev). *Lucr. ses. şt. St. Cerc. Mar. "Prof. Ioan Borcea" Agigea (1–2 noiembrie 1966)*, 321–324.

Mândru C., 1966, Activitatea Prof. I. Borcea ca director al Muzeului de Istorie Naturală din Iaşi, *Lucr. ses. şt. St. Cerc. Mar. "Prof. Ioan Borcea" Agigea (1–2 noiembrie 1966)*, 83–86.

Motaş C., 1959, Cronica sesiunii ştiințifice de la Stațiunea Zoologică Marină de la Agigea. *Lucr. ses. şt. St. Zool. Mar. "Prof. Ioan Borcea" (15–17 septembrie)*, 601–607.

Mustață G., 1996, The "Ioan Borcea" Station of Biological Marine Research of Agigea. Past, perspectives and future perspectives, *Marea Neagră în cumpănă*, Univ. "Al. I. Cuza", Iaşi, Lucr.ses.st., Agigea–Constanta, 18–20 oct., 23–39.

Mustață G., Mustață M., Andriescu I., 1996, Ioan Borcea. *Marea Neagră in cumpănă*, Univ. "Al. I. Cuza", Iaşi, Lucr. ses. şt., Agigea–Constanta, 18–20 oct., 279–288.

Pora E.A., Băcescu M.C. (Eds.), 1977, *Biologie des eaux saumâtres de la mer Noire*, IRCM Constanța, vol. 1+2, 347 p.

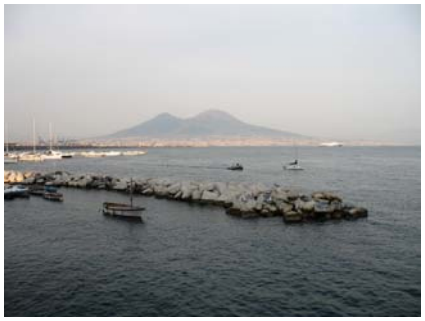
Porumb F., 1999–2000, L'histoire des recherches marines roumaines en mer Noire. *Cercetari marine – Recherches marines*, 32–33, 372 p.

ICHO-VIII – A PHOTO-ESSAY BY ERIC MILLS

The Eighth International Congress of the History of Oceanography (ICHO-VIII) was held in Naples from June 26 to 29. Using the facilities of the historic Stazione Zoologica di Napoli and for one day the beautiful Villa Doria D'Angri, it was hosted by the Stazione, The Associazione Italiana di Oceanologia e Limnologia, the Università degli Studi di Napoli Parthenope, and the Commission of the History of Oceanography.

The programme centered on the history of oceanography in the Mediterranean. Overall the papers were wide-ranging, interesting, and of high quality. As with all such meetings, discussion within and outside the sessions was lively and constructive also fun. Plans are afoot within the Stazione Zoologica to publish the proceedings. A field trip took place on the last day to the ancient Graeco-Roman settlement of Cumae and the nearby fumarole of Solfatara.

The pictures that follow are intended to give some glimpses of the Congress, its participants, and the environment in which it took place.



Vesuvius dominates Naples. It was a brooding presence in the haze throughout the hot days when the Congress was in progress.

The opening buffet on the first night. In the foreground, Julia Lajus (Russia), and in the background, L to R, Anita McConnell (UK) and Deborah Day (USA).

The historic Fresco Room of the Stazione, being described by Christiane Groeben (Italy, Stazione Zoologica), to whom, along with her colleagues, we are indebted for the fine organization of the Congress. Some others, L to R, Johan van Bennekom (Netherlands), Juan Peréz –Rubín (Spain), Selim Morcos (USA and Egypt), Deborah Day (USA) and Maria Cristina Gambi (Italy – with guitar).

Deep interest in the Fresco Room: L to R, Deborah Day (USA), Johan van Bennekom (Netherlands), Walter Lenz (Germany), Alexandru Bologa and Mme Bologa (Romania), Christiane Groeben (Italy, Stazione Zoologica), Anita McConnell (UK), and Maria Cristina Gambi (Italy).

Anita McConnell (UK) talking about J.Y. Buchanan; Deborah Day (USA) and Keith Benson (Canada – President of the Commission) in the chair.

Deborah Day (USA) talking about Charles A. Kofoid's travel to the marine stations of Europe in 1909.

Intense concentration and conversations: Selim Morcos (USA and Egypt), Sergei Fokin (Russia), Julia Nikiforova (Russia), and Johan van Bennekom (Netherlands).

The Congress dinner, June 27, on the Naples waterfront – and featuring the best of Neapolitan food and wines. Facing the camera, from L to R, Alexandre Thys (Belgium), Mme Bologa and Alexandru Bologa (Romania), and Roger Charlier (Belgium).

More of the dinner. Clockwise, L to R, Kelly Hamilton (USA), Walter Lenz (Germany), Julia Lajus (Russia), Sergei Fokin (Russia), and with backs to the camera, Julia Nikiforova (Russia) and Artur Svansson (Sweden).

Another group at the dinner: from L to R, Christiane Groeben (Italy), Keith Benson (Canada), Anita McConnell (UK), Selim Morcos (USA and Egypt), Johan van Bennekom (Netherlands), and Deborah Day (USA).

Where it all happens – discussing the Congress at lunch, June 28. L to R, Alexandre Thys (Belgium), Anne Mills (Canada), Johan van Bennekom (Netherlands), Anita McConnell (UK), and Christiane Groeben (Italy).

At Cumae, June 29. The Cumaean Sibyl was silent, at least on that occasion, although the participants were not.

Travelling to Naples gave some of the participants the chance to visit some lovely Italian coastline - here the Amalfi Coast south of the city. The first is above the delightful village of Praiano, with Positano in the background. The second shows Positano from a café in the mountain village of Nocelle, which three of us recklessly reached on foot in 35ºC temperatures.

(With thanks to Anne Mills for the technical composition of this article)

NEWS AND EVENTS

BLOG ON SCIENCE, HISTORY AND EXPLORATION. Michael Robinson (mtroy_mrob@yahoo.com), author of the recently published *The Coldest Crucible. Arctic Exploration and American Culture* (University of Chicago Press, 2006), announces a blog about science, history and exploration named "Time to Eat the Dogs." As he says, "I post stories about exploration of all sorts, usually told from an informal, if scholarly, perspective. I welcome announcements and submissions from the history of oceanography community." See the blog at http://timetoeatthedogs.com/ .

HISTORY OF OCEANOGRAPHY IN ROMANIA. Alexandru Bologa reports that the annual symposium of the Constantza Subcommittee of the Romanian Committee of the History of Science and Technology (CRIFST) was held on June 7 in Constantza. There were two papers on prestigious predecessors in Romanian marine science, one on Ioan Borcea by Alexandru Bologa (later presented at ICHO-VIII in Naples), and the second on Dr Mihai Bacescu by T. Onciu and C. Samoila.

BOOK REVIEWS AND NOTICES

Reidy, Michael S. 2008. *Tides of History: Ocean Science and Her Majesty's Navy.* Chicago: University of Chicago Press. xiv + 389pp. ISBN-10: 0-226-70932-9. US$ 40.

University of Chicago Press describes this important new book as follows. "In the first half of the nineteenth century, the British sought to master the physical properties of the oceans; in the second half, they lorded over large proportions of the oceans' outer rim. The dominance of Her Majesty's navy was due in no small part to collaboration between the British Admiralty, the maritime community, and the scientific elite. Together, they transformed the vast emptiness of the ocean into an ordered and bounded grid. In the process, the modern scientist emerged. Science itself expanded from a limited and local undertaking receiving parsimonious state support to worldwide and relatively well financed research involving a hierarchy of practitioners.

Analyzing the economic, political, social, and scientific changes in with the British sailed to power, *Tides of History* shows how the British Admiralty collaborated closely not only with scholars, such as William Whewell, but also with the Maritime community - sailors, local tide table makers, dockyard officials, and harbormasters – in order to systematize knowledge of the world's oceans, coasts, ports and estuaries. As Michael S. Reidy points out, Britain's security and prosperity as a maritime nation depended on its ability to maneuver through the oceans and dominate coasts and channels. The practice of science and the rise of the scientist became inextricably linked to the process of European expansion."

Rozwadowski, Helen M. 2008. *Fathoming the Ocean. The Discovery and Exploration of the Deep Sea.* Cambridge, MA: Harvard University Press. 276pp. ISBN 978-0-674-02756-5. US$ 19.95, paper.

This well-received study of the change of sensibility that led to the exploration of the deep sea in the nineteenth century, originally published in hard covers in 2005, is now available in paperback, making it more accessible to classes and the general reader. In November 2008 Dr Rozwadowski received the Watson Davis and Helen Miles Davis Prize of the History of Science Society for this important book.

Mills, Eric L. 2009. *The Fluid Envelope of Our Planet. How the Study of Ocean Currents Became a Science.* Toronto: University of Toronto Press (in press).

Advance notice of this work on the history of physical oceanography which shows how the qualitative interest in and study of ocean currents became a quantitative geophysical science beginning late in the nineteenth century.

ANNUAL BIBLIOGRAPHY AND BIOGRAPHIES 2008

Prepared by Deborah Day, Scripps Institution of Oceanography Archives

BIBLIOGRAPHY

Anderson, Katherine. 2006. Does history count? *Endeavour* 30: 150-155.

Anderson, Thomas R. and Tony Rice. 2006. Deserts on the sea floor: Edward Forbes and his azoic hypothesis for a lifeless deep ocean. *Endeavour* 30: 131-137.

Belanger, Dian Oleson. 2006. *Deep Freeze: The United States, the International Geophysical Year, and the Origins of Antarctica's Age of Science*. Boulder: University Press of Colorado, 494 pages.

Benson, Keith R. and Helen M. Rozwadowsi, eds. 2007. *Extremes: Oceanography's Adventures at the Poles*. Sagamore Beach, Mass.: Science History Publications/USA, xiv, 393 pages.

Bologa, Alexandru S., Adela F. Bologa, and Roger H. Charlier. Ioan Borcea and the first Romanian Marine Zoological Station at Agigea (1926). *Noesis* 29: 163-174.

Bouvet, Jaochim. 2005. *Journal des Voyages*, edited by Claudia von collani. Taipei: Taipei Ricci Institute, iv, 374 pages.

Budd, G.M. 2007. Australian exploration of Heard Island, 1947-1971. *Polar Record* 43, no. 225: 97-123.

Capocci, Mauro and Gilberto Corbellini. 2002. Adriano Buzzati-Traverso and the foundation of the International Laboratory of Genetics and Biophysics in Naples (1962-1969). *Studies in the History and Philosophy of Science*. Part C: *Studies in History and Philosophy of Biological and Biomedical Sciences* 33: 489-513.

Cartwright, Julyan H.E. and Hisami Nakamura. 2008. Tsunami: a history of the term and of scientific understanding of the phenomenon in Japanese and Western culture. *Notes and Records of the Royal Society* 62, no. 2: 151–166

Chambers, Neil. 2006. *Joseph Banks and the British Museum: The World of Collecting, 1770-1830*. London: Pickering and Chatto, xiv, 195 pages.

Clarke, Allyn. 2008. International and intergovernmental organizations in ocean science. *Scientific Committee on Ocean Research (SCOR). Canadian Ocean Science Newsletter* No. 36 (May 15, 2008), 3 pages (available online at www.cncscor.ca).

Cloud, John. 2007. George Davidson and the Point of the Beginning: 'Once seen, it will never be forgotten.' *California Coast and Ocean* 23, no. 2: 20-27.

Cloud, John. 2006. The long arc of the pathfinder. *Imago Mundi* 58: 220-226.

Colnett, James. 2003. *A Voyage to the Northwest Side of America: The Journals of James Colnett, 1786-89*, edited by Robert Galois. Vancouver, B.C.: University of British Columbia Press, 448 pages.

Cookson, Gillian. 2006. Submarine cables: novelty and innovation, 1850-1870. *Transactions of the Newcomen Society* 76: 207-219.

Cyranoski, David. 2007. Ocean drilling: in the zone. *Nature* 449: 278-280.

Darrigol, Olivier. 2005. *Worlds of Flow: A History of Hydrodynamics from the Bernoullis to Prandtl*. Oxford: Oxford University Press, 376 pages.

David, Daniel. 2006. The suit behind the door: Alexandre Bideau and his diving suit (1816). *Historical Diving Times* 34: 24-26.

DiMento, John Mark. 2007. *Beyond the Water's Edge: United States National Security and the Ocean Environment*. Tufts University, Ph.D. Dissertation, 589 pages.

Doel, Ronald E. and Thomas Söderqvist, eds. 2006. *The Historiography of Contemporary Science, Technology and Medicine: Writing Recent Science*. New York: Routledge, *Routledge Studies in the History of Science, Technology and Medicine*, xv, 312 pages.

Domingues, Francisco Contente. 2006. Science and technology in Portuguese navigation: the idea of experience in the Sixteenth Century. Translated by Neil Safier. In: *Portuguese Oceanic Expansion, 1400-1800*, edited by Francisco Bethencourt and Diogo Ramada Curto. New York: Cambridge University Press, 460-479.

Dreyer, Edward L. 2007. *Zheng He: China and the Oceans in the Early Ming Dynasty, 1405-1433*. New York: Pearson Longman, xiv, 238 pages.

Duffin, Christopher J. 2007. Louis Agassiz (1807-1873): a passion for fishes. *Geology Today* 23, no. 4: 132-142.

Edenborn, Harry M. 2001. American Petroleum Institute Project 43 and the origin of modern petroleum microbiology. *Oil Industry History* 2: 21-27.

Erlingsson, Steindór J. 2008. The Plymouth Laboratory and the institutionalization of experimental zoology in Britain in the 1920s. *Journal of the History of Biology* 41: [Published in *Online First* July 2008, print publication forthcoming.]

Erlingsson, Steindór J. 2005. *The Rise of Experimental Zoology in Britain: Hogben, Huxley, Crew and the Society for Experimental Biology*. Unpublished PhD thesis, University of Manchester.

Ferreiro, Larrie D. 2007. *Ships and Science: The Birth of Naval Architecture in the Scientific Revolution, 1600-1800*. Cambridge, Massachusetts: MIT Press, 441 pages.

Fleming, James Rodger. 2007. The Callendar Effect: The Life and Times of Guy Stewart Callendar (1898-1964), the Scientist who Established the Carbon Dioxide Theory of Climate Change. Boston, Mass.: American Meteorological Society, xv, 155 pages.

Fokin, Sergei and Christiane Groeben (editors). 2008. *Russian Scientists at the Naples Zoological Station 1874-1934*. Napoli: Publicazioni della Stazione Zoologica Anton Dohrn, 242 pages.

Gascoigne, John. 2007. *Captain Cook: Voyager between Two Worlds*. London: Hambledon Continuum, 288 pages.

Grindle, Nick. "No Other Sign or Note than the Very Order': Francis Willughby, John Ray and the importance of collecting pictures. *Journal of the History of Collections* 17: 15-22.

Gass, Gillian Linda. 2007. *Managing Marine Life: Scientific and Practical Work at Two British Marine Stations, 1884-1902*. University of Toronto, Ph.D. Dissertation, 353 pages.

Greene, Mott T. 2007. Writing scientific biography. *Journal of the History of Biology* 40: 727–759.

Gulbina, A.A., A.N. Malyutin and Yu. D. Chugunov. Undated. History of foundation of the first marine reserve in Russia. *Bulletin of the Far Eastern Branch, Russian Academy of Sciences* 3: 3-13. [In Russian. Istoriya sozdaniya pervogo v Rossii morskogo zapovednika. *Vestnik Dal'nevostochnogo otdeleniya RAN*]

Hamblin, Jacob Darwin. 2007. 'A dispassionate and objective effort': negotiating the first study on the biological effects of atomic radiation. *Journal of the History of Biology* 40: 147-177.

Hamblin, Jacob Darwin. 2008. *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of the Nuclear Age*. Rutgers, New Jersey: Rutgers University Press, 352 pages.

Hannesson, Rögnvaldur. 2004. *The Privatization of the Oceans*. Cambridge, Massachusetts: MIT Press, 202 pages.

Harrison, W.G. 2006. Biological oceanography in Canada (with special reference to Federal Government science.) *Proceedings of the Nova Scotian Institute of Science* 43, no. 2: 129-158.

Hempel, Gotthilf. 2007. Antarctic marine biology – two centuries of research. *Antarctic Science* 19, no 2: 195-203.

Hempel, Gotthilf. 2008. Der Fluss der Deutschen Polarforschung/History of German polar research in brief. *Meer und Museum* 20: 35-47, 182-183. [Abstract in English.]

Hoheisel-Huxmann, R. 2007. *Die Deutsche Atlantische Expedition 1925-27. Planung und Verlauf.* Bremerhaven: Deutsches Schiffahrtsmuseum & Hamburg: Convent Verlag GmbH. 125pages.

Istoriia Rossiiskoyo Vodolaznogo dela/The History of Russian Diving. St. Petersburg: 6 issues, 2002-2007.
[Parallel Russian text and English translation. Includes bibliographical references]

Holthuis, Lipke B. and Theodore W. Pietsch. 2006. *Les Planches Inédites de Poissons et autres Animaux Marins de l'Indo-Ouest Pacifique d'Isaac Johanes Lamotius/Isaac Johannes Lamotius (1646-c. 1718) and His Paintings of Indo-West Pacific Fishes and other Marine Animals*. Paris: Publications Scientifiques du Muséum, 290 pages.

Koslow, J. Anthony. 2007. *The Silent Deep: The Discovery, Ecology and Conservation of the Deep Sea*. Chicago : University of Chicago Press, 270 pages.

Kracke, Michael. 2008. History of the Kerguelen Islands. *Meer und Museum* 20: 57-74, 184.

Lafuente, Antonia and Leoncio Lopez-Ocon. 2006. Scientific traditions and Enlightenment expeditions in eighteenth-century Hispanic America. In: *Science in Latin America*, by Juan Jose Saldana. Austin, Texas: University of Texas Press, pp. 123-150.
[Translated from the Spanish. Originally published as *Historia Social de las Ciencias en America Latina* in 1996.]

Liebersohn, Harry. 2005. *The Travelers' World: Europe to the Pacific*. Cambridge, Mass; London: Harvard University Press, xiii, 380 pages.

Longworth, H. R. and H. L. Bryden. 2007. Discovery and quantification of the Atlantic meridional overturning circulation: the importance of 25ºN. In: A Schmittner, J. C. H. Chiang and S. R. Hemming (editors), *Ocean Circulation: Mechanisms and Impacts. Past and Future Changes of Meridional Overturning.* Geophysical Monograph 173. Washington, DC: American Geophysical Union, pages 5-18.

Lovell, Lawrence L. 2003. The Scripps Institution of Oceanography benthic invertebrate collection: a centennial history and report on its mollusk holdings. *Festivus* 35, no. 10: 119-123.

Lyons, Sherrie. 2006. Swimming at the edges of scientific respectability: sea serpents in the Victorian era. In: *Repositioning Victorian Science: Shifting Centers in Nineteenth Century Scientific Thinking*, edited by David Clifford, *et al.* London: Anthem Press, pp. 17-30.

Maienschein, Jane and George Smith. 2008. What difference does history of science make, anyway? *Isis* 99:318-321.

Matthäus, W. 2006. The investigation of salt water inflows and their effects on the Baltic ecosystem – a historical survey. *Historisch-meereskundliches Jahrbuch* 12: 7-44.

Matthäus, W. 2007. Die Atlantikreise des Forschungsschiffes "Professor Albrecht Penck" im Jahre 1964 zur Untersuchung des Äquatorialen Unterstroms im östlichen Atlantik. *Historisch-meereskundliches Jahrbuch* 13: 63-94.

Mezzano, Michael. 2005. The Progressive origins of eugenics critics: Raymond Pearl, Herbert S. Jennings, and the defense of scientific inquiry. *Journal of the Guilded Age and Progressive Era* 4: 83-98.

Ming, Wan. 2004. Reflections on the study of Zheng He's expeditions. *Ming Studies*, no. 49: 17-33.

Ming, Wan. 2004. Zheng He's voyages to the western oceans. *Ming Studies*, Nos. 51-52: 31-42.

Mohr, Barbara A.R. and Annette Vogt. 2003. Berliner Geowissenschaftlerinnen an der Friedrich-Wilhelms-Universität von 1906 bis 1945, eine Fallstudie/ Berlin Women geoscientists from 1906-1946, a case study. *Mitteilungen aus dem Museum für Naturkunde in Berlin. Geowissenschaftliche Reihe* 6: 53-69.

Moore, P. G. 2008. The Marine Station at Millport: the "troubled years" between 1897-1907 and their continuing relevance. *The Linnean* 24, no. 1: 21-36.

Moore, P. G. 2008. The short-lived Marine Station substitute facility on the Isle of Bute (1914-1922). *The Linnean* 24, no. 4: 25-39.

Munk, Walter with Deborah Day. 2008. Glimpses of oceanography 8in the postwar period. *Oceanography* 21, no. 3, 14-21.

Olson, Storrs L. and Judith N. Lund. 2007. Whalers and woggins: a new vocabulary for interpreting some early accounts of the Great Auk and penguin. *Archives of Natural History* 34: 69-78.

Oreskes, Naomi, Erik M. Conway and Matthew Shindell. 2008. From Chicken Little to Dr. Pangloss: William Nierenberg, global warming, and the social deconstruction of scientific knowledge. *Historical Studies in the Natural Sciences,* 38, Number 1, pps. 109 -152.

Oreskes, Naomi. 2006. Most scientists agree that global warming is a human-caused problem, in *Global Warming*, edited by Cynthia A. Bily. San Diego : Greenhaven Press, 37-40.

Otis, Laura. 2007. *Muller's Lab*. Oxford, New York: Oxford University Press, xix, 316 pages.

Paine, Stuart D.L. and M.L. Paine. 2007. *Footsteps on the Ice: The Antarctic Diaries of Stuart D. Paine, Second Byrd Expedition*. Columbia: University of Missouri Press, xxx, 368 pages.

Paulin, Chris D. 2007. Perspectives of Maori fishing history and techniques. *Tuhinga* (Wellington) 18: 11-47.

Pauly, Daniel. 2004. *Darwin's Fishes: An Encyclopedia of Ichthyology, Ecology and Evolution.* New York: Cambridge University Press, xxv, 340 pages.

Postnikov, Aleksey V. 2000. The Russian Navy as chartmaker in the Eighteenth Century. *Imago Mundi* 52: 79-95.

Reidy, Michael S. 2007. *Tides of history: Ocean Science and Her Majesty's Navy*. Chicago: University of Chicago Press, 392 pages.

Robinson, Michael F. 2006. *The Coldest Crucible: Arctic Exploration and American Culture*. Chicago: University of Chicago Press, xii, 206 pages.

Rüger, H.-J. 2007. Marine bacteriology – the first 125 years. *Historisch-meereskundliches Jahrbuch* 13: 7-62.

Sachs, Aaron. 2006. *The Humboldt Current: Nineteenth Century Exploration and the Roots of American Environmentalism*. New York: Viking, xii, 496 pages.

Smed, J. 2006. The relations between Otto Krümmel and Martin Knudsen during the foundation and early years of ICES. *Historisch-meereskundliches Jahrbuch* 12: 103-124.

Smed, J. 2007. A note on Gerhard Schott's relations to Scandinavian colleagues and ICES. *Historisch-meereskundliches Jahrbuch* 13: 95-102.

Smed, J. 2008. Hydrographic work of the *Ingolf* expedition (1895 and 1896) to Icelandic and West Greenland waters. *Earth Sciences History* 27, no. 2: 151-163.

Strelnikova, N.I. 2007. History of diatom research in Russia. *International Journal on Algae* 9, no. 1: 89-104.

Sündermann, J. and W. Lenz. 2006. 50 Jahre Institut für Meereskunde der Universität Hamburg. *Historisch-meereskundliches Jahrbuch* 12: 45-64.

Szabo, Vicki Ellen. 2005. Bad to the bone? The unnatural history of monstrous medieval whales. *Heroic Age: A Journal of Early Medieval Northwestern Europe*, 8.

Thomas, Parrish. 2004. *The Submarine: A History*. New York: Viking, x, 576 pages.

Ulrich, J. and G. Kortum. 2006. Der Forschungskutter Herman Wattenberg (ex Südfall): Basis der Forschung und Lehre des Instituts für Meereskunde in Kiel 1946-76. *Historisch-meereskundliches Jahrbuch* 12: 65-80.

Van Cleempoel, K. 2005. *Astrolabes at Greenwich: A Catalogue of the Astrolabes in the National Maritime Museum, Greenwich*. New York: Oxford University Press, 339 pages.

Veradarijan, Lotika, ed. 2004. *The Rahmani of M.P. Kunkikunhi Malmi of Kavaratti: A Sailing Manual of Lakshadweep*. New Delhi: Manohar, xiv, 284 pages.

Voultsiadou, Eneni and Dimitris Vafidia. 2007. Marine invertebrate diversity in Aristotle's zoology. *Contributions to Zoology* 76, no. 2: 103-120.

Wallace, C.C. and H. Zahir. 2007. The 'Xarifa' Expedition and the atolls of the Maldives, 50 Years on. *Coral Reefs* 26, no. 1: 3-5.

Weart, Spencer R. 2007. Money for Keeling: monitoring CO_2 levels. *Historical Studies in the Physical and Biological Sciences* 37, No. 2: 435–452.

Williams, Gary C. 2007. History of invertebrate zoology at the California Academy of Sciences. *Proceedings of the California Academy of Sciences* 58, no. 1-12, pp: 197-239.

Wolff, Torben. 2006. Thai-Danish collaboration in marine research. *Natural History Bulletin of the Siam Society* 54, no. 1: 3-2.

Wolff, T. 2008. The first Danish deep-sea expedition on the *Ingolf*: 1895 and 1896. *Earth Sciences History* 27, no. 2: 164-187.

Wöppelmann, Guy, Susanna Zerbini and Marta Marcos. 2008. Tide gauges and geodesy: a secular synergy illustrated by three present-day case studies. *Comptes Rendues Geoscience* 338: 980–991.

Zorlu, Tuncay. 2005. The Ottoman Experience with Copper Sheathing of Warships. *Archives Internationales d'Histoire des Sciences* 55, Diffusion of Science and Technology; Ottoman Empire and National States issue: 459-466.

BIOGRAPHIES

Allen, Kenneth Radway (II.16.1911-2008, Sydney, Australia)

Pitcher, Tony J. 2008. Stream out of Eden: K. Radway Allen, 1911-2008, Obituary. *Fish and Fisheries* 9, no. 2: 119-120.

Altukhov, Yurii Petrovich (X.11.1936, Voronezskoi, USSR – X.27.2006)
Carvalho, Gary. 2007. Yurii Petrovich Altukhov 1936-2006. *Journal of Fish Biology* (London) 70, no. 2: 331-333.

Beebe, Charles William (VII.29.1877, Brooklyn, New York-VI.4.1962, Trinidad)
Gould, Carol Grant. (2004). *The Remarkable Life of William Beebe*. Washington: Island Press/Shearwater Books, xv, 447 pages.

Behrendt, John C.
Behrendt, John C. 2005. *The Ninth Circle: A Memoir of Life and Death in Antarctica*, *1960-1962*. Albuquerque: University of New Mexico Press, xiv, 240 pages.

Carr, Archie Fairly, Jr. (VI.16.1909, Mobile, Alabama, USA –V.21.1987, Micanopy, Florida)
Carr, Marjorie Harris. 1994. *A Naturalist in Florida: A Celebration of Eden*. New Haven: Yale University Press, 264 pages.

Davis, Frederick R. 2007. *The Man Who Saved Sea Turtles: Archie Carr and the Origins of Conservation Biology*. Oxford, New York: Oxford University Press, xv, 312 pages.

Denton, Sir Eric (IX.30.1923, Bentley, Yorkshire- I.2.2007, St. Just, Cornwall)
Blaxter, J. H. 2007. Professor Sir Eric Denton, FRS. *Scottish Association for Marine Science Newsletter* 33: 5.

Brownlee, Colin. 2007. Professor Sir Eric Denton. *The Independent,* 27 January 2007.

Discombe, Reece (1919, Cambridge, New Zealand-1970)
Gordon, Keith (2008). Reece Discombe 1919-2007. *Historical Diving Times* 44: 33-34. [Discombe is the Vanatu diver who discovered the lost ships of La Perouse's expedition.]

Gardiner, John Stanley (I.24.1872, Belfast, Ireland-II.28.1946)
Brown, Barbara E. 2007. The legacy of Professor John Stanley Gardiner FRS to reef science. *Notes & Records of the Royal Society* 61, no. 2: 207-17.

Gunnerus, Johan Ernst (1718, Christiania-25.XI.1773, Kristiansund, Norway)
Jørgensen, P. M. 2007. The importance of Bishop Gunnerus for Linnaeus. *The Linnean* 23, no. 4: 35-40.

Haeckel, Ernst Heinrich Phillipp August (16.II.1834, Potsdam-9.VII.1919, Jena)
Richards, R.J. 2008. *The Tragic Sense of Life. Ernst Haeckel and the Struggle over Evolutionary Thought.* Chicago: University of Chicago Press, xx, 551 pages.

Irving, Laurence (1895-1979)
Dawson, William R. 2007. Laurence Irving: an appreciation. *Physiological and Biochemical Zoology* 80, no. 1: 9-24

Martin, Richard Aidan (X.7.1965-II.13.2007)
Mackinlay, D.D. 2007. Shark researcher: Richard Aidan Martin. *Fisheries* 32, no. 3: 144.

Mitrofanov, Valery Petrovich (III.1.1932-III.5.2001)
Dukravets, G.M.; Sidorova, A.F.; Gavrilov, E.I. In Memorial of Valery Petrovich Mitrofanov (03.01.1932-03.05.2001). Voprosy Ikhtiologii 42, no. 3: 429-432. [In Russian]

Myers, Ransom Aldrich (VI.13.1952, Lula, Mississippi, USA–III.27.2007, Halifax, Nova Scotia, Canada)
Hutchins, Jeffrey A. 2008. Random Aldrich Myers 1952-2007: In Memoriam. *Canadian Journal of Fisheries and Aquatic Sciences* 65: 7-12.

Pauly, Daniel. Obituary: Ransom Aldrich Myers (1952–2007). *Nature* 447 no.160.

Ray, Dixy Lee (3.XI.1914, Tacoma, Washington-2.I.1994, Fox Island, Washington)
Ellis, Erik. 2006. *Dixy Lee Ray, Marine Biology and the Public Understanding of Science in the United States, 1930-1970*. Oregon State University, Ph.D. Dissertation, 269 pages.

Ricker, William Edwin (1908, Waterdown, ON-2001, Nanaimo, BC)
Noakes, D. L. G. (editor). 2006. *Bill Ricker: An Appreciation*. Developments in Environmental Biology of Fishes 24. Dordrecht: Springer, 151 pages (reprinted from *Environmental Biology of Fishes*, 75, no. 1, 2006),

Schäffer, Jacob Christian (V.30.1718, Querfurt, near Halle in Thuringia, Germany-I.5.1790,Regensburg)
Fryer, Geoffrey. 2008. Jacob Christian Schäffer FRS, a versatile eighteenth-century naturalist, and his remarkable pioneering researches on microscopic crustaceans. *Notes & Records of the Royal Society* 62, no. 2: 167-185.

Southward, Alan J. (1928, Liverpool, England-2007)
Dando, Paul R. 2008. Obituary: Alan J. Southward (1928-2007). *Nature* 551, no. 7174: 28.

Voigt, Klaus (1.V.1934, Plauen, Germany-23.IV.1995)
Brosin, H.-J. 2006. Klaus Voigt (1934-1995)–Ozeanograph und Wissenschaftorganisator. *Historisch-meereskundliches Jahrbuch* 12: 81-102.

Wangersky, Peter John (26.VIII.1928,Woonsocket, RI, USA-7.I.2007,Victoria, BC)
Sharp, J. *et al.* 2007. Peter John Wangersky (1928-2007). *Proceedings of the Nova Scotian Institute of Science* 44, no. 1: 97-98.