

## **CENTENARY OF THE ARGENTINE NAVY HYDROGRAPHIC SERVICE**

by **Ladislao J. LAH**  
Navy Hydrographic Service

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### **INTRODUCTION**

This year marks the 100th anniversary of the founding of the Central Bureau of Hydrography (Oficina Central de Hidrografia), the basis of what has now become the Navy Hydrographic Service (Servicio de Hidrografia Naval). The following article describes the evolution, accomplishments, and current status of that Service.

### **ORIGINS OF HYDROGRAPHIC ACTIVITIES ON ARGENTINE COASTS**

The origins of hydrographic activities in Argentine waters may be traced to the epoch of the discoveries and of the first navigators who were chiefly in the service of the Spanish Crown, and who since the first quarter of the 16th Century had explored the coasts to the south of the Rio de la Plata mouth. The famous Magellan expedition which explored the coast between Cabo Santa Maria and the Magellan Strait was accompanied by a host of cosmographers and astronomers who, during and after the expedition, drew rudimentary plans and charts of the new territories. One of these charts was drawn by Antonio Pigafetta and another by Sebastian Elcano. The same happened with later expeditions, and this information represented an invaluable aid to navigators at that time. This was a slow and lengthy process, and to those first manifestations of hydrographic activities on our coasts Loayza, Nodales Olivares, Pando, Bauza, Oyarvide, among others, contributed their effort. In the last quarter of the 18th Century hydrographic activities attained a more scientific character with surveys and cartographic endeavours carried out during the expeditions of Cordoba, Malaspina, Gutierrez de la Concha, and others. The surprising precision of their work is still admired.

We then enter the period of Independence (1810), and the 19th Century began with Patagonia open to commercial shipping of all nations, thanks to the abundance of charts and other information prepared by the

Spaniards. During the period of National Emancipation and Organization (1810-1878), hydrographic problems had to be shelved in view of the numerous other problems to be solved.

During that period Argentine coasts were visited by foreign expeditions, among which excelled those led by Captains King and Fitzroy who from 1826 to 1836 with the ships *Adventure* and *Beagle* surveyed the coasts of Buenos Aires Province and from Patagonia to Cabo de Hornos. On board the *Romanche* a French expedition carried out a series of meteorological and magnetic observations in our southern regions.

But all these hydrographic activities were performed in a dispersed form and lacked the necessary coordination. It became necessary to create a specialized organization to centralize the hitherto isolated efforts.

### CREATION OF THE CENTRAL BUREAU OF HYDROGRAPHY

Thus on 6 June 1879 was created the Central Bureau of Hydrography whose functions were to produce charts of the country's coasts, rivers and ports, to organize a meteorological observatory and to compile the data necessary for Sailing Directions of Argentine coasts. To the new-born Bureau only four persons were allotted, including its first director, Lieutenant Colonel Clodomiro Urtubey. The fact that it presently employs more than one thousand persons—approximately half being Argentine Navy personnel, including 130 lighthouse keepers and 250 in ships' complements, and 40 of them having a university background—is a token of its evolution and of the great variety of tasks it is performing.

Here are some important dates in its early evolution:

- 1883 First official nautical chart - Puerto San Blas
- 1884 Inauguration of the first two maritime lights
- 1899 First important hydrographic survey, carried out by the cruiser *Almirante Brown*
- 1902 Inauguration of the magnetic and meteorological observatory on Ano Nuevo Island (Tierra del Fuego)
- 1914 Destruction by fire of the premises of the Service and a great part of the archives and various documents collected over the years
- 1916 Editing of first Sailing Directions and List of Lights
- 1920 First Tide Tables

The period 1930-1960 was marked by the introduction of new techniques and instruments, the incorporation of surveying ships and of highly skilled technical personnel, and an intensive hydrographic activity. Then in 1963 began the great survey of Rio de la Plata, and in 1974 the studies related to the construction of a deep water port near Punta Medanos were commenced.

The Argentine Government, through its Navy Hydrographic Service, is a member of nearly all intergovernmental and international organizations related to our activities and is a founder member of some of them—the IHB and the IOC for instance. The Service has cooperated and still

cooperates in great international projects. To name but a representative few of these efforts would be to cite its work in the International Geophysical Year (IGY), for which it installed five mareographic stations (two of them in Antarctica) and deployed its three research vessels in the Southern Atlantic, one repeating in 1957 the *Meteor* profiles I and III, another the *Discovery* profile run along the meridian 30° W between 22° and 50° S, while the icebreaker A.R.A. *General San Martin* carried out oceanographic observations in the Weddell Sea during three consecutive years. These vessels carried out in all ten expeditions, four of them in cooperation with the schooner *Vema* of the Lamont-Doherty Geological Observatory of Columbia University. Two ships and ten meteorological stations (five being in Antarctica) were integrated in the IGY national meteorological net.

For the International Year of the Quiet Sun several magnetic expeditions were undertaken in Argentine continental waters, as well as two aeromagnetic surveys, and charts of the magnetic data were published. As part of the Upper Mantle Project, geophysical and geological observations were carried out. Between 1968 and 1972 the icebreaker A.R.A. *General San Martin* participated in the International Weddell Sea Oceanographic Expeditions. Presently, the Service participates in the BATHY/ TESAC (IGOSS) and the FGGE (GARP) programmes, in the deployment of the Drifting Buoys System in the Southern Ocean, and in the International South Ocean Studies.

A national Oceanographic Data Center operates within and as part of our Service, cooperating with the World Data Centers.

The Service participates permanently in the activities of the Bureau International de l'Heure and also as part of the group of observatories which are cooperating in the definition of Coordinated Universal Time, as well as in the International Service of Polar Motion located in Misuzawa, Japan.

Argentina, through our Service, acts as Area VI Coordinator within the NAVAREA worldwide navigational warning system; it is also responsible for the operation and maintenance of the Omega Navigation System's Golfo Nuevo Argentine station, one of the eight which form the world network.

### ACTIVITIES AND CURRENT STATUS

There are two basic factors related to the activities of the Service which influence its orientation and its functions: (1) Argentina's geographical characteristics, and (2) the non-existence of other organizations to perform some of the functions which are at present the responsibility of the Service.

The country's geopolitics is dominated by the fact of its isolated and predominantly oceanic position in the southern hemisphere. This fact highlights the capital importance of its maritime routes, since they canalize the greater part of its foreign trade. Another important geographical

characteristic is the vast continental shelf bordering the country. This enormous strip of shallow water contains an incalculable potential wealth of biological, ichtiological, mineral and other natural resources, still at present little exploited.



FIG. 1. — Central buildings of the Argentine Navy Hydrographic Office.

The lack of other organizations to carry out some of the responsibilities of the Service was the reason why its activities accumulated with the years so that, although its mission does not differ substantially from that of other hydrographic services, its activities cover a wider field than in the majority of other countries. For example its tasks such as the time service, the Nautical Ephemeris, and tidal, meteorological and oceanographic studies are often assigned elsewhere than to the Hydrographic Service in other countries.

Its fundamental task consists in providing maritime safety to navigation and the aids necessary to shipping, and ranges from the production and printings of nautical charts, sailing directions, lists of lights and radio signals to providing services such as coast marking, tidal analysis and prediction, time signals, etc. Furthermore, it is responsible for the time service, oceanographic studies and surveys, and for special meteorological support for the Navy. It also provides naval ships with nautical, hydrographic, oceanographic, meteorological and other similar material.

The following is a brief description of the evolution of the different activities in this first century of the Service's existence and their current status.

## Hydrography

The construction of general charts of Argentine coasts was the first priority given to the newborn Central Bureau of Hydrography. Initially, the lack of personnel (a total of four including its director) imposed limitations, and only the most urgent problems of maritime safety could be tackled. Over the years, with new personnel and the first expeditions the necessary elements to fulfill that primordial aim were gathered.

The surveys of Martin Rivadavia commanding the gunboat *Constitucion*, then a Captain but later to become the first Minister of the Navy, and the appearance of the first official chart, that of Puerto San Blas, in 1883 were the first links of a chain uninterrupted to the present day. The last years of the century witnessed an expansion of our hydrographic surveys with the assignment to surveying of the sloop *Uruguay* which surveyed Bahia Blanca in 1888-1889, and of the cruisers *Buenos Aires* and *Patria*, and the escort vessel *Gaviota*. The first really major hydrographic survey was carried out with the cruiser *Almirante Brown*, under Lieutenant Commander Juan P. Saenz Valiente who surveyed the channels extending to the south of Tierra de Fuego, between Cabo San Pio and Bahia Lapataia (1899-1900). This campaign was darkened by the loss of the lives of a young Second Lieutenant, Juan Mackinlay, and five men of the crew. From 1904 to 1906 an important survey was conducted in the Rio de la Plata, under Admiral Juan P. Saenz Valiente, in which nearly all the minor naval embarcations participated. In 1914 commenced one of the most ambitious hydrographic surveys—that of the maritime coasts of the Province of Buenos Aires (1914-1919). A series of triangulations and traverses covered 300 km of the coast from Mar del Plata towards Rio Quequen. The *Patria* and the *Gaviota* were responsible for the bathymetry.

When in the same year the lighthouse tender *Alferez Mackinlay* was assigned to hydrographic surveying, this permitted further campaigns to be carried out, among them a continuation of the survey of the Province of Buenos Aires coastline to its junction with Bahia Blanca at Punta Asuncion.

The northern coast of Golfo San Jorge was surveyed with the *Patria* in 1925. In that year, for the first time, air photography was used for cartographic purposes.

By 1926 a total of 27 750 square miles had been surveyed. The use in 1928 of the oceanographic vessels *Bahia Blanca* and *Madryn*, and the active campaign carried out by the transport vessel *Primero de Mayo* after conversion to a survey ship, gave an impulse to hydrographic surveys and permitted cover of nearly the totality of Argentine coasts before the end of the forties.

In the period 1931-1951 approximately 70 charts were published; hydrographic surveys were extended to the Antarctic sector resulting in the appearance in 1957 of a provisional set of Antarctic charts, Nos. 121 to 139, which have now been replaced by definitive editions.

Between 1943 and 1948 triangulation was carried out between Rio

Negro and Belen light, and land and hydrographic surveys made of the Gulf of San Jorge, the area between San Julian and Cabo Virgenes, and the Le Maire Strait and its western approaches.

In 1948 was created the Photogrammetric Division, endowed with the best equipment then available. The Service has never been assigned its own airplanes for photogrammetry, but has had the full cooperation of the Naval Air Force, so that in the period 1951-1966 air surveys could be carried out in Argentine's Antarctic sector, resulting in 100 000 km<sup>2</sup> of terrain charted from the material obtained.

The precision standards of modern photogrammetry induced the Service to renew its equipment totally since 1968. An analogic rectification instrument RA II OMI, two Zeiss RMK A 15/23 cameras, two photogram rectification instruments Zeiss SEG V and SEG VI, and a first order Wild A 10 autograph with peripheral equipment for data registering were acquired. This is fundamentally the equipment presently used in the Service, enabling all photogrammetric tasks related to cartography to be carried out.

The period 1952-1962 saw extensive hydrographic activities from one end to the other of our coasts and in Antarctic waters. A major survey was carried out from May 1956 to December 1957 between Quequen and Punta Asuncion employing two hydrographic vessels; another lasted five years and included 7 surveys in the Golfo San Jorge. By then the Service was equipped with Raydist and Tellurometers. The great survey of the Rio de la Plata area (CLIAP) began in 1963 and demanded an important effort up until 1967 (see *International Hydrographic Review*, Vol. XLII, No. 2, 1965). In 1974 studies were initiated to determine the possibility of constructing a deep draught port near Punta Medanos. Numerous hydrographic and oceanographic tasks for this project have been undertaken which have absorbed a considerable part of our operational capabilities.

Presently, with the coastal areas of the country satisfactorily surveyed, our hydrographic efforts are oriented towards critical areas and port entrances in Rio de la Plata, Mar del Plata, Quequen and Bahia Blanca, where the changing hydrographic conditions demand periodic check surveys.

### **Maritime safety**

Maritime safety has been, and continues to be, the fundamental aim of the Service. In 1900 were published the first Sailing Directions for Argentine coasts (Derrotero de las costas argentinas), a simple translation of the corresponding part of the British Admiralty South America Pilot, Part I (ed. 1893), augmented by some new local information; this edition remained in force until 1916 when our version of Sailing Directions and the first official List of Lights appeared. Other nautical publications were edited one after the other until they total at present 18 books.

It is to be noted that the surveying and marking of interior rivers is the responsibility of the Secretaria de Intereses Maritimos, and our Service is only required to publish Sailing Directions and to cooperate in printing river sketches (Croquis de los rios).

Some years ago the Service introduced an important innovation with a view to improving maritime safety. This consists of maintaining a permanent rotating guard for Radionavigational Warnings. Three or four retired seafaring Masters and the same number of Leading Seamen specialized in hydrography perform this duty which is particularly important since, on 1 January 1977, our Naval Hydrographic Service began to propagate NAVAREA VI radio navigational warnings.

The Omega System station, Golfo Nuevo, whose operation and maintenance are the responsibility of our Service, was inaugurated on 1 April 1977.

### Coast marking

One of the first attempts of the Argentine Government to solve problems of maritime safety, before the Service was created, consisted of the installation in 1845 of the first light-pontoon at Punta Indio, landfall point to the Rio de la Plata. During a period of 35 years maritime traffic was such that light-pontoons were extended to other crucial points. The year 1884 marks the beginning of land marking, with the construction of the first lighthouses: Martin Garcia in the access to the Parana and Uruguay rivers, and San Juan de Salvamento on the eastern end of Isla de los Estados which was a notorious danger to sailing vessels intending to round Cape Horn. In the following thirty years the most important lights were established, while the light-pontoons still remained active. The year 1915 opened the modern age of lighted coast marks. European techniques improved the use of acetylene in the flash apparatus, permitting automatic signals with solar valves, an innovation which we adopted immediately. When other technical advances made it possible, the first radiobeacon was established in 1934 on Punta Mogotes, and it was followed by ten others—later renewed—covering all the Argentine coastline.

The construction of lighted signals continued, particularly after the lighthouse tender *Alferez Mackinlay* was assigned for these operations in 1924, so that by 1926, 1,117 miles of our coasts were illuminated, leaving only 823 miles unlighted. In 1942 the Primero de Mayo light was established on the Melchior Archipelago in Antarctica, and was followed later by numerous lights and beacons. Lighthouse personnel are military, and besides their specific tasks they make local tidal and meteorological observations. Presently, the aids to navigation in operation total 68 lights (13 are guarded), 190 light beacons and 190 beacons, 77 buoys and 11 radiobeacons.

### Oceanography

Since almost the first hydrographic surveys, oceanographic and magnetic observations have been included in the survey programmes. At the turn of the century our tidal studies began, leading to the appearance of the first Tide Tables in 1920; initially for six ports, they include currently 48 Argentine and 11 foreign standard ports. The computation and printing are now carried out by computers.

In 1926 the first oceanographic problem was tackled in its numerous facets, and two years later the oceanographic vessels *San Luis* and *San Juan*—later to be rebaptized *Bahia Blanca* and *Madryn*—were assigned to the Service. A series of oceanographic cruises began in 1938. An Oceanographic Division, under the Hydrographic Department, had however been active for some years, its laboratories carrying out basic analyses and other specific tasks. In 1944 the first tidal station of the Argentine naval network was established at Puerto Madryn, and over the years the stations multiplied till the current number of eleven was reached, two being in Antarctica. Formerly tidal determinations had been made with data obtained from the stations of the Ministry of Public Works.

In 1953, the Oceanographic Division became a Department, assuming part of the functions performed up till then by the Hydrographic Department. In 1960 its laboratories occupied new premises with an area of 228 m<sup>2</sup>, and the modern equipment then provided and that acquired in the years that followed enable them to perform a great variety of chemical, biological and geological analyses and determinations.

The international cooperation that Argentine Naval Oceanography has contributed and still offers to the scientific community of the world has already been mentioned.

The first oceanographic cruises began in 1938, and by 1951 nine had been carried out; after the creation of the Oceanographic Department the cruises followed in rapid succession until they now total more than 120. The fact that the Service has assigned to it two full-time oceanographic vessels, with a third joining them on a part-time basis, augurs a promising future.

The field of activities covered ranges from physical oceanography, with bathythermographic, sound, descriptive, tidal, coastal dynamics and numerical models sections; marine geophysics, comprising bathymetric, gravimetric, magnetic and seismic studies and observations; submarine geology, endowed with a sedimentological laboratory; marine chemistry, with a specialized well-equipped laboratory and another dedicated to marine contamination; to marine biology, with a modern well-equipped laboratory.

### **Naval Observatory**

Created in 1881 and equipped with instruments brought from France, the Observatory was finished just in time to take part in the world project of the 1882 Transit of Venus. In all of its existence, no efforts have been spared to endow it with the best instruments, either acquired overseas or produced in the Observatory.

Time determination commenced with a repeating theodolite and meridian and equatorial telescopes brought by the Observatory's first director, the French scientist Beuf. In 1921 a Bamberg visual transit instrument was acquired, which rendered service for exactly half a century, complemented since 1959 by a star passage telescope (*Askania AP 70*). In 1968 was inaugurated the zenithal passage station Punta Indio, where a photo-





FIG. 2. — The Naval Observatory.

graphic zenithal tube leased from the U.S. Naval Observatory, Washington, D.C. was installed. This instrument permits precise latitude and time determinations. The station forms a link in the southern part of the world chain necessary to study polar motion and the Earth's rotational speed variations, and to verify the existence of the continental drift. In time to come, the tube will replace astronomic observations made with the transit instrument, leading to a fivefold increase in precision.

Timekeeping was initiated with three astronomical pendulum clocks. At present the Observatory is equipped with six quartz crystal clocks, and in 1967 the first caesium atomic clock was obtained, later to be complemented by a second clock of the same type and a rubidium atomic clock.

Time signals were given by visual means almost from the very beginning of the Observatory in order to indicate the time to naval vessels anchored in the Buenos Aires roads. In 1912 manual radiotelegraphic signals began to be given and as from 1927 automatic radiotelegraphic signals have been transmitted. A personal telephone time service was also made available, and this was automatized in 1937 by means of a time transmitting clock. Since 1934 time signals have also been transmitted by several broadcasting stations.

From 1962 onwards the Observatory has participated in a worldwide plan for coordination of time signal emissions to the millisecond, based on atomic frequency and time.

At the end of 1978 a Danjon astrolabe was inaugurated in Rio Grande (Tierra del Fuego), on transfer from Besançon University, France. By providing precision time determinations in this part of the southern hemisphere, this instrument will help resolve important geodesic and geophysical problems on a worldwide basis.

### Meteorology and Antarctic activities

Although some meteorological activities had been carried out since 1881, the Meteorologic Service, responsible to the Hydrographic Service, was not established until 1945. It then went through a period of organization lasting until about 1961, during which time the worst obstacle to its progress was the lack of adequate communications among the components of its extensive observational network. An ambitious acquisitions plan was thus drawn up which when implemented permitted establishment of an efficient system of meteorological communications.

At the end of 1966 an APT satellite reception station was established, and from 1969 nocturnal infrared images began to be received.

There are presently 19 fixed surface meteorological stations, 3 fixed and 2 shipborne upper air observations stations, 3 storm radars, and 3 satellite information reception stations. Received information is processed in seven fixed and two shipborne meteorological centres. General and special meteorological forecasts for Argentine coasts and rivers are broadcast, as well as wave forecasts, Naval Airforce routeing forecasts, and other specialised services.

Until the creation of the Antarctic Department in 1952, the Meteorologic Service was directly responsible for the installation and subsequent administration of the Antarctic Naval Detachments. The Naval Detachments Melchior (1947), Decepcion (1948) and Almirante Brown (1951) were already established, and the Islas Orcadas Detachment changed dependence and was put under Naval administration. Their contribution to meteorological observations, which continues to be one of their main tasks, has been important.

With the new Antarctic Department the activities in the Argentine Antarctic sector received an impulse which manifested itself in the installation of new detachments, some of them occupied on a permanent basis, others only during the seasonal Antarctic campaigns. The new detachments are similar to the already existing Teniente Camara and Petrel detachments. In 1977, a further detachment, the Corbeta Uruguay, was set up on Morrell Island, Islas Sandwich del Sur.

In order to cooperate in providing for the safety of human life in the Antarctic, within the aims of the Antarctic Treaty, the Service has built and now operates thirteen naval refuge huts on various islands in the Argentine Antarctic sector.

### Surveying vessels

In 1924 the first vessel was assigned to the Service. This was the lighthouse tender A.R.A. *Alferez Mackinlay*, 700 tons, built in 1914, which performed specific tasks and occasional hydrographic surveys up until 1942. But before that date other Naval ships, although not attached to our Service permanently, had been assigned to carry out hydrographic surveys—the sloop *Uruguay*, the cruisers *Almirante Brown*, *Buenos Aires* and *Patria*, and the escort vessel *Gaviota*. Also rendering valuable services

were our hydrographic-oceanographic vessels *Bahia Blanca* (1927-63), *Madrin* (1929-58), *Sanaviron* (1949-55), *Chiriguano* (1951-61), *Capitan Canepa* (1956-72), *Comodoro Lasserre* (1963-69), *Comandante General Zapiola* (1962-76) and the lighthouse tender *Ushuaia* (1952-73).

Currently the ships of the Hydrographic Service are:

The oceanographic vessel A.R.A. *Goyena*, built at the dockyards of the Pendleton Ship Co. New Orleans, U.S.A. Transformed to an oceanographic vessel in 1967/68. Endowed with a satellite navigator.

The hydrographic vessel A.R.A. *Thompson*, sister ship of the *Goyena*, built in 1944. 1,863 tons. Modified in 1974/75 and equipped with oceanographic instruments so that she is now used both as a hydrographic vessel and for coast marking as well as to perform standard oceanographic tasks.

The research vessel A.R.A. *Islas Orcadas* (ex *Eltanin*), incorporated into the Argentine Navy in 1974 by virtue of a five year lease from the U.S. Navy and a cooperation agreement with the U.S. National Science Foundation. Built in 1957, and with an ice-strengthened hull, she was adapted for research work in 1962. Displacing 3,886 tons fully charged, equipped with a satellite navigator, her laboratories permit all types of marine investigations.

The hydrographic vessel A.R.A. *Comodoro Rivadavia*, 816 tons was incorporated into the Navy in 1976 and attached to the Hydrographic Service in 1978 (see *International Hydrographic Review*, Vol. LVI, No. 1).

The oceanographic vessel A.R.A. *Puerto Deseado*, 2,200 tons (approx.) built at the Argentine dockyard Astarsa and fitted with the most advanced equipment. A brief description of this ship, whose use will be shared, is to be found in the present issue of the *International Hydrographic Review*.

The coastal survey launch A.R.A. *Cormoran*. Built in 1963, she is 25.2 m long, displaces 102 tons and has a 2 m draught. Equipped with a main Raydist station and basic surveying equipment.

The oceanographic and coastal survey launch A.R.A. *Petrel*. Built in 1965, and fitted with the same type of surveying equipment as the *Cormoran*, a small oceanographic laboratory is also included.

The icebreaker A.R.A. *General San Martin*. Although this ship is not permanently attached to this Service, the fact that every year she carries out special nautical, hydrographic and oceanographic tasks in Antarctica to satisfy our requirements justifies her inclusion in this brief summary. Built at the A.G. Weserseebeck in Germany, she was included in the Argentine Navy in 1954. Displacement 5,300 tons, Overall length 85 m; two electric engines driven by four diesel generators; twin screws; maximum speed 16 knots. (For further details see *International Hydrographic Review*, Vol. XXXIII, No. 1, May 1956.)

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This has been a review of the activities and achievements of our Service in the first 100 years of its existence, and is a humble homage to its servants who by their efforts contributed to its progress, as well as

to those who in fulfilling their duties gave their lives in the unsheltering regions and dangerous waters of our country.

#### **Postscript by the Director, Argentine Navy Hydrographic Service**

At the end of this historical review of the first century of existence of the Argentine Navy Hydrographic Service, prepared by a member of its staff who has lived with it for almost one third of that period, I do not wish to miss the opportunity to acknowledge with appreciation the many services rendered to our Service in the past by both the successive Directing Committees of the International Hydrographic Bureau and the many Hydrographic Offices of the world. This is a cooperation reciprocated continuously by our Service, whose sense of international responsibility has been reflected during the whole of its existence in a series of important undertakings often of considerable magnitude, since we are conscious that only by such cooperation among nations will the world accelerate and enlarge its knowledge of the oceans, and at the same time improve the safety of human life at sea.

#### **THE NEED TO LOOK AHEAD**

Quite apart from the particular British hydrographic problems, a 1977 international conference in New York concluded its Report abstract with words of sound and pointed general advice to governments everywhere: 'Those responsible at the highest level in government should recognise that in the marine environment there can be no exploitation of resources without exploration, and there can be no exploration without hydrography.' The trouble is that such advice needs to be given very emphatically about once a year at very least. Of course governments throughout the world differ as much in constitution as different ships used to have different long-splices. But on the whole, governments are so beset with the solution of immediate problems that they can hardly ever spare time or effort to look ahead.

From "A Nautical Miscellany" by J.W. HOGARTH in *The Nautical Magazine*, Vol. 221, No. 1, January 1979. Brown, Son & Ferguson, Ltd., Glasgow.