Fig. 1. Admiral Panzarini addressing the Antarctic Symposium in 1959.

Fig. 2. The library of the Instituto Antartico Argentino.

Commentary

THE INSTITUTO ANTARTICO ARGENTINO

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This paper is a part of the report of the U.S. Official Representative to the Argentine Antarctic Expedition 1962-63. Since 1955 the U.S. Antarctic Projects Officer has maintained an exchange program whereby representatives of various countries involved in antarctic research may join each other's expeditions and study their methods and facilities.

I wish to thank the U.S. Antarctic Projects Officer who selected me as the U.S. Representative on the 1962-63 Argentine expedition, the Argentine Navy who was my host, and particularly Rear Admiral Rodolfo N. Panzarini and his staff at the Instituto Antartico Argentino for the assistance they gave me in the preparation of this report.

Introduction

ARGENTINA and Chile are geographically the countries closest to the antarctic land mass, particularly the Palmer Peninsula. Of the two, Argentina has shown more interest and devoted considerably more time and money to the Antarctic. This interest has been actively demonstrated for over half a century by many expeditions for exploration and by the establishment of Argentine bases.

In the political sense, this interest is very strong in Argentina and has been the topic of many heated discussions in the Republic, especially during the drafting and ratifying of the Antarctic Treaty. Her interest is manifested specifically on every map of the Argentine Republic printed in that country. The sector from the South Pole to 60° south latitude, bounded on the west by 74° west longitude and on the east by 25° west longitude, is always included under the title "Antartida Argentina".

Since 1947 there has been a yearly naval expedition to this sector of the Antarctic to carry out scientific investigations, hydrographic surveying, geographical explorations, and the resupply of the several Argentine bases and the more than 40 shelters and navigation aids located there. These expeditions involve from two to four naval vessels and accompanying Army, Navy, and Air Force detachments to man the various year-round bases. Argentina mounts the third or fourth largest Antarctic expedition every year.

In view of the number of organizations annually participating in these expeditions, the Argentine Government decided to establish one central organization to be responsible for the scientific work done by Argentina in the Antarctic. In addition, this organization was to be the common repository for information gathered on previous Argentine expeditions, as well as for that of future endeavours.

The Instituto Antartico Argentino was therefore established in Buenos Aires. It is a scientific and technical organization whose mission is to study the nature of the antarctic region. From its inception, it has steadily grown to occupy a prominent position in antarctic affairs and become the leading organization influential in all Argentine antarctic problems.

By Presidential Order the organization entitled "Instituto Antartico Argentino 'Coronel Hernan Pujato' " was established on 17 April 1951 under the administration of the Minister of Technical Affairs. The name honored Coronel Hernan Pujato, who commanded the first Argentine Army antarctic expedition. He became the Institute's first Director.

With the preparations for the International Geophysical Year underway, the Institute's activities expanded and Captain Rodolfo N. Panzarini, now a retired rear admiral, was named Director. He still retains this position and is the main driving force behind the organization (*see* Fig. 1). At the time of his nomination, the organization officially took the name "Instituto Antartico Argentino" (I.A.A.).

The Institute is an in-house polar organization, containing in one building the entire administrative staff, scientists, technicians, laboratories, shops, and equipment storage facilities necessary to carry out scientific investigations in the Antarctic.

There is an advantage in keeping under one roof the majority of persons with an active interest in antarctic work so that they can confer easily with one another, exchange data, and have easy access to a polar library. Such a closely knit organization constitutes a potentially powerful voice in antarctic affairs. This voice perhaps is not as great a consideration in the present thinking of other polar organizations as it is with the Argentines, whose interest in Antarctica, and in particular the Palmer Peninsula area, is very strong.

An organization of international as well as of national importance

The Institute is a governmental agency operating autonomously under the Secretary of the Navy. It is readily accessible as an adviser on national and international antarctic matters for the government. It also represents Argentina, one of the 12 nations signatory to the Antarctic Treaty, before the Scientific Committee on Antarctic Research (SCAR). In this capacity its potentialities are outstanding for the promotion of the international exchange of scientists and scientific and technical information on the Antarctic.

It must be recognized that with the ratification of the Antarctic Treaty, a significant precedent in international diplomacy has been set. Twelve

nations, including the Union of Soviet Socialist Republics, have agreed to collaborate by permitting exchange observers and scientists on their antarctic expeditions and at their antarctic stations. They have agreed to work together peaceably without detonating nuclear devices in the Antarctic, an area larger than the continental United States.

With the foundation already laid by diplomacy, it largely rests on the international community of polar scientists to build and strengthen the treaty provisions and objectives. Practically, this can best be done on a working level between the polar organizations of the various countries, if the organizations have the direct support of the parent governments. The I.A.A. recognizes the value of international exchange of both men and ideas and its policy has been regularly to send some of its men to the polar institutions of other countries, at the same time encouraging men from foreign institutions to work in Argentina. The Institute is generally represented at international polar and general scientific symposia and conferences and has also been the host to such meetings in Argentina.

The aims of the Institute

The principal purposes of the Institute are to organize or sponsor scientific expeditions and research projects in the Antarctic and to maintain a group of scientists and technicians specializing in polar work. The Institute serves as a repository for all information, data, specimens, and samples obtained on Argentine antarctic expeditions and maintains a polar library and museum, which are accessible to the public.

The Institute wishes to encourage scientists, both Argentine and foreign, to take advantages of its facilities to carry out their own research. It provides the transportation necessary to get them to and from the operational area, food, clothing, and general polar equipment. The Institute itself contains modestly equipped laboratories for geology, glaciology, and biology. In addition, the support facilities of darkroom, shop, and drafting section are available. For Argentine students who wish to prepare doctoral theses in some field pertaining to Antarctica, the Institute makes the necessary arrangements with Argentine universities.

Organization

The I.A.A. is an organization with more than 70 employees (*see* Table 1 and Chart). In its large, three-story building in downtown Buenos Aires are housed the scientific offices, business offices, laboratories, and most of the facilities necessary for the organizing and carrying out of antarctic expeditions. This proximity of the various sections aids immeasurably in the accomplishment of the goals of the Institute. It is most important in a business as unorthodox as the conduct of polar expeditions for all the personnel concerned with its ultimate success to be fully cognizant of the many and varied problems raised by this work. This can only be accomplished by continued and intimate association of all those persons working directly with these problems.

All this was recognized at the outset, and keeping in mind the very modest budget that it would have to work with, the Institute was constituted in the following manner: (a) Director, (b) General Secretariat, (c) Scientific Department, (d) Technical Department, (e) Accounting Division.

The Scientific Department is the heart of the Institute and its *raison d'etre*. It is directed by Dr. Otto Schneider, a geophysicist, who is in charge of the administration of the entire scientific effort of the Institute. The geology, geophysics, and biology sections and all collections of data, samples, and maps are in this department. There are at present ten men on the permanent scientific staff, working on a variety of problems. Several of them alternate between fieldwork and data reduction and preparation of reports at the Institute. Others remain permanently at the Institute engaged in studies of data and specimens returned by various field parties. In general, the programs in progress at the Institute at any one time depend on the interests of the resident workers. Accordingly, the emphasis varies from year to year.

Table 1. Number of personnel of the Instituto Antartico Argentino.

	1957	*1958*	*1959*	*1960*	*1961*	*1962*	*February 1963*
Executive	1	2	5	5	5	7	7
Scientific	15	16	12	14	9	10	10
Technical	14	21	17	25	23	24	24
Administrative	18	11	7	9	16	21	21
Maintenance	—	—	3	5	6	6	6
Service	12	12	7	6	10	11	9
Total	60	62	51	64	69	79	77
Honorary	—	1	1	1	1	1	1
Temporary	16	23	—	—	14	15	11

An average of 30 additional persons per year were used to operate Ellsworth Station during the years 1959 to 1962.

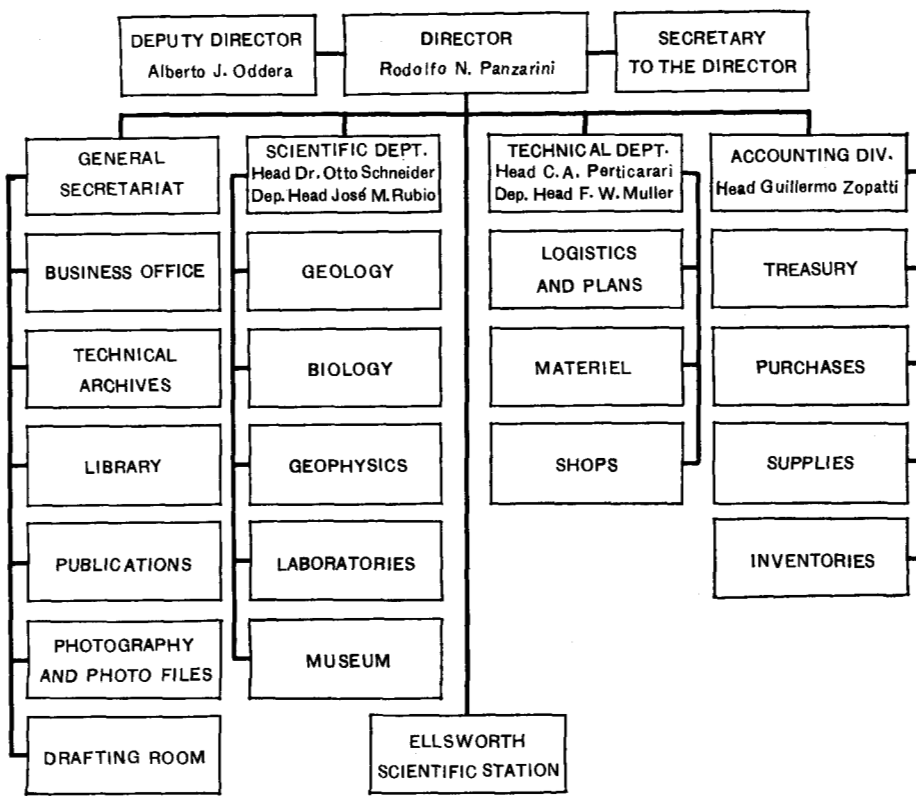
Each summer, several field parties, generally composed of geologists and biologists, join the ships of the antarctic task force and are taken either to one of the permanent stations or to temporary field camps and are picked up at the end of the summer. Some investigators, or whole crews as at Ellsworth Station, remain at permanent stations for a year, and are picked up the following summer. Often these field men are university students who collect data for principal investigators at the I.A.A. or universities. The Scientific Department has prepared very comprehensive field manuals in many disciplines for use by field parties.

The Technical Department is charged with the responsibility of providing logistic support for all scientific programs. Under the direction of Captain Carlos Perticarari, several efficient, time-saving, cost-cutting methods have been instituted, which have been tailored specifically for the solution of problems unique to polar logistics.

Of exceptionally great value are the "Kardex" control boards. (Fig. 3), which provide ready determination of the condition of all supplies and equipment needed by each team, station, or expedition.

Each year about April, plans are made for the expedition of the following summer (November-February). The Navy's antarctic task force *(Grupo Naval Antartico)* can send its ships to the Antarctic only during the summer, so that both the summer scientific parties and those parties that are to winter must be ready with all their equipment at the time designated by the task force. The general field season plan is referred to as CAVIAA or *Campana Antartica de Verano del Instituto Antartico Argentino.* This plan covers all the summer scientific field parties who will be left at various stations or *"refugios"* (small camps or shelters). The persons or crews who will be wintering at the permanent stations, as well as all the winter field activities, fall under the plan referred to as CINIAA, or *Campana Antartica de Invierno del Instituto Antartico Argentino.*

ORGANIZATION CHART



All the requirements for a given field season (CAVIAA or CINIAA) are divided into four groups:— (1) Food, (2) Clothing and Equipment, (3) Field Supplies, and (4) Camp Supplies. Each of these groups in turn is subdivided and catalogued by reference codes. A special card is prepared for each item and this card contains a history of all the operations performed

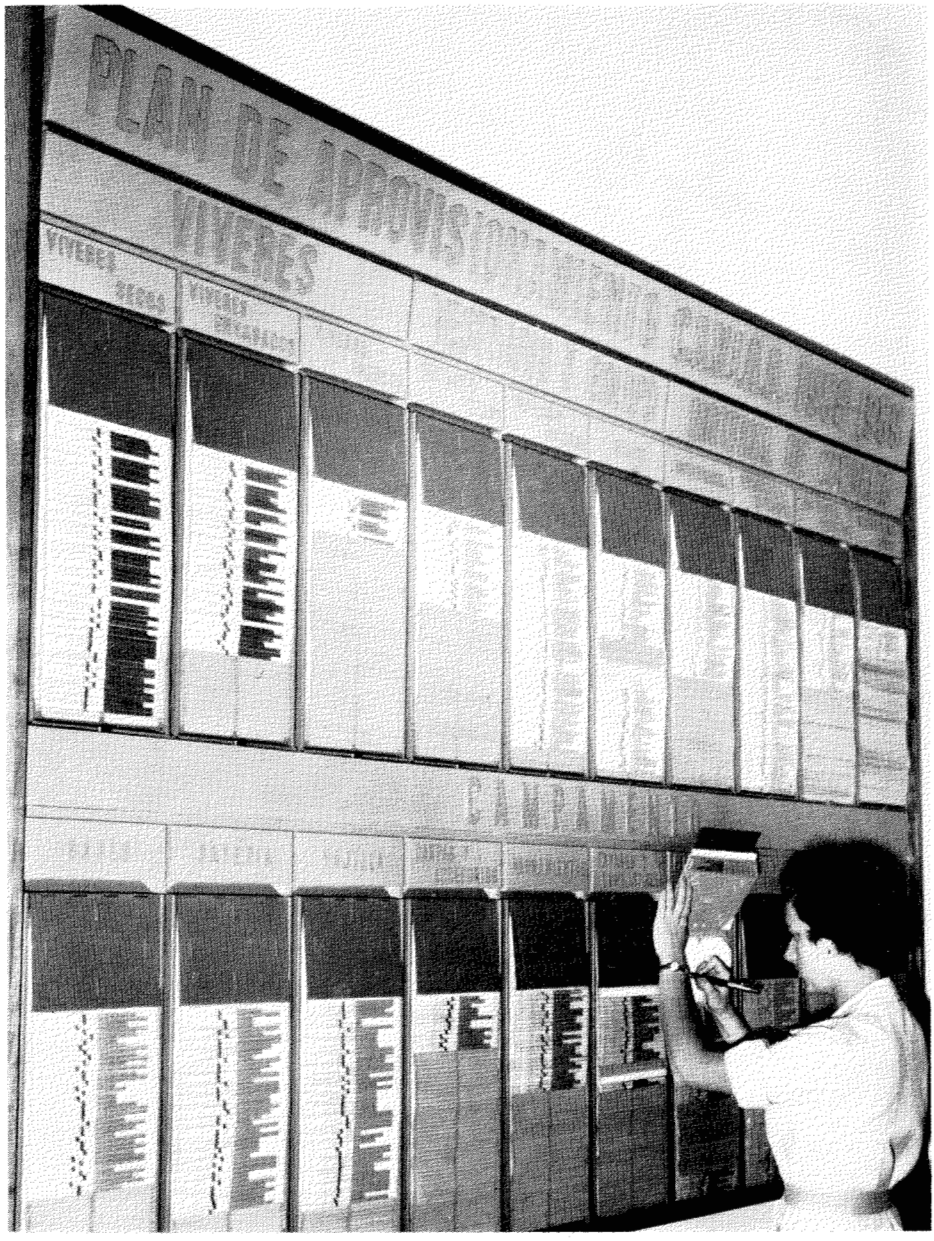


Fig. 3. "Kardex" control board, divided into four groups: Food; Clothing and Equipment; Field Supplies; and Camp Supplies.

on the item from the time it is first requested to the final step of packing it for shipment to the Antarctic. Coloured plastic markers, which slide along the card face, indicate the condition of the item. Since all these cards are

displayed on a large supply-plan board at one time, it is possible to determine quickly the state of readiness for each expedition.

The supplies are all packed in specially constructed, numbered, wooden boxes designed for polar conditions. When fully packed each box weighs less than 50 kg., and has strong rope handles, which can be grasped by heavily gloved hands. Thus, the boxes can easily be managed by two men. The boxes are returned when the expedition is completed. There is a special control board indicating the state of these boxes of supplies, i.e., packed, inspected, or already shipped.

To insure the fullest cooperation between the Institute and the *Grupo Naval Antartico* and to obtain the maximum possibility for all equipment and supplies to reach the desired destination, the head of the Logistics and Plans Section joins one of the expedition's ships as the Institute's special representative. He remains with the ship during the entire field season.

The Technical Department contains 13 men, five of whom are employed in the shop and two in the equipment storage areas.

The General Secretariat and *the Accounting Division* contain those administrative, service, and business offices required to run and support the Institute. Several of the important facilities of the Institute are contained within the General Secretariat and will be discussed under "Facilities".

Facilities

The Institute has on its premises many of the scientific and technical facilities that are necessary for the performance of its mission. These facilities are discussed more fully below.

A. *Library* — The Library (*see* Fig. 2), located on the ground floor of the Institute, comprises the library proper and the librarian's office. It is maintained by a librarian and an assistant. Contained in the library are between 8000 and 9000 volumes, in all languages, on polar subjects, as well as scientific and technical papers and books of a general nature. There are many rare editions of the journals of the early polar explorers.

The library regularly receives the magazines, journals, and other publications of other polar institutes and of several non-polar scientific organizations as well. It is interesting to note that Russia sends the Institute far more publications than does any other country.

In addition to the books and other publications, there is a substantial library of individual reprints on many polar subjects and allied fields. Furthermore, recognizing the difficulty in obtaining many very rare or expensive works, a microfilm library is being built up, and currently holds 40 films.

The polar library is exceptionally well catalogued and cross-referenced. Each work is catalogued by author, title, subject, general theme, and number. The catalogue numbers conform to the "Universal Decimal Classification . . . British 1000 A."

The library is open to the public and books may be borrowed for periods up to 15 days. Between 1200 and 1300 people take advantage of this service annually.

B. *The Publications Office* — This office works very closely with the library and takes charge of publishing and distributing the various papers and journals of the Institute. The office has a list of some 600 organizations throughout the world with which it exchanges publications.

The publications office is in charge of preparing the following:

1. "Publicaciones del Instituto Antartico Argentino". Monograph-length works involving antarctic scientific investigations.
2. "Contribuciones del Instituto Antartico Argentino". Scientific and general papers on antarctic work.
3. *Boletin del Instituto Antartico Argentino.* The semi-annual publication of the Institute containing general interest material on antarctic operations.
4. *SCAR Bulletin* (Spanish Edition).

C. *Photography Section* — The photography section contains a well-equipped darkroom with an Omega D-2 enlarger. There is a wide assortment of cameras, both still and motion picture, to take care of the needs of the Institute. All photographic work is well catalogued in a photo-library containing negatives, slides, and contact prints, so that it is an easy matter to locate quickly any photograph in the collection.

D. *The Drafting Section* — The drafting section provides the Institute with the professional drafting, copying, and map-making services necessary in the preparation of material for reports and publications.

E. *Map Library and Scientific Collections* — This office contains a catalogued file of some 500 different maps. In addition, all the samples and artifacts recovered from the various expeditions are catalogued here. Many specimens such as birds, eggs, and lichens are stored in this office, preserved in well-marked drawers or cabinets. Other collections, such as rocks and preserved biological specimens, are stored in the laboratories in which they will be used.

F. *Laboratories* —

1. Biology Laboratory — The biology laboratory (*see* Fig. 4) has a large quantity of preserved antarctic specimens including plants, birds, fish, and other animals; ample work space; and all the general laboratory tools and reagents. The heart of the laboratory is a special air-conditioned room at present used for the microscopic study of fungi, of which there is a large and important collection.

2. Chemistry Laboratory — There is a modestly equipped chemistry laboratory with an Obertling balance, having a sensitivity of 0.2 mgm., a centrifuge, small ovens, distilling equipment, a Bausch and Lomb spectroscope, and a Fischer electro-analyzer.

3. Geology Laboratory — The geology laboratory contains equipment for grinding and making thin sections, a diamond rock- and crystal-cutting machine, a mechanical separator for sizing sediments, a Bausch and Lomb LC-4 petrographic microscope with universal stage, and a Bausch and Lomb

refractometer. There is a large rock and fossil collection representing much of the geology of the "Argentine" sector of the Antarctic.

4. Cold Room — The cold room can be adjusted to a minimum of —22°C. and is used principally for glaciological studies.

G. *The Museum* — The museum contains artifacts of general antarctic interest and is open to the public.

The Institute — now and in the future

Argentina's long-term interest in antarctic science and political affairs has been much intensified in recent years particularly during the International Geophysical Year. Since its inception, the I.A.A. has served to provide the main support and focal point of this interest. At the present time the Institute is rapidly firming up the plans for Argentina's contribution to the International Quiet Sun Year.

Fig. 4. The biology laboratory of the Instituto Antartico Argentino.

By having both the I.A.A. and the task force, which provides the logistic support in the same organization, a closer spirit of co-operation has been developed than would be likely if the two were in different agencies. They have realized that, although it should make no difference who sponsors research as long as some group has been committed to its support, in practice the chances of successful operations are enhanced if both research and logistic support are provided by the same organization, here the Navy.

As an autonomous organization, the I.A.A. receives its own budget apart from other Navy funds and is reasonably free to make its own policy decisions (*see* Table 2).

Under the very forceful direction of Rear Admiral Panzarini, an oceanographer, as well as an able administrator, the Institute has shown a steady growth during the last six years. This growth is all the more remarkable when viewed against the background of unstable political and fluctuating economic conditions of Argentina. Through all this, the Institute has maintained its character as a scientific research organization and has allowed the widest freedom to its competent investigators.

Although the Institute has a highly capable executive staff, it is faced with the problem familiar to many research organizations, and particularly polar organizations, namely, that of finding and keeping competent investigators. This problem is complicated by the shortage of science graduates in the country and the low salaries which the Institute is able to pay them. How this will ultimately affect the Institute is difficult to say at this time.

Table 2. Budget for the Instituto Antartico Argentino since 1956.

	1956	1957	1958	1959	1960	1961	1962	1963
Personnel salaries	85,307 2,729,835	68,246 2,729,835	44,725 3,131,991	87,215 7,267,916	89,184 7,432,016	121,768 10,147,300	87,316 12,224,200	88,096 11,892,920
Consumable goods and services	69,764 2,232,460	54,865 2,194,584	31,339 2,194,584	38,335 3,194,584	82,651 6,887,584	102,475 8,539,600	60,997 8,539,600	43,756 5,907,080
Capital equipment	25,781 825,000	21,572 862,876	12,322 862,876	12,050 1,000,000	14,400 1,200,000	14,400 1,200,000	8,568 1,200,000	7,407 1,000,000
Total budget	180,853 5,787,295	144,682 5,787,295	88,385 6,189,451	137,550 11,462,500	186,246 15,520,500	238,643 19,886,900	156,884 21,963,800	139,259 18,800,000

Argentine fiscal year: November 1 to October 31; lower figures in Argentine Pesos, upper in $ U.S.

The Antarctic Treaty, by its very nature of dealing with exploration and investigation in vast, remote areas, can probably serve as a basis for outer space treaties of the future. If it is to be used as a model for international scientific co-operation, its provisions must be implemented. The world's polar institutes can provide an excellent means for the exchange of ideas and information among countries, which, after all, is one of the main goals of the Treaty. The scientist, and in particular the polar scientist, must first become aware of the opportunities to work with the polar expeditions and institutes of other countries, and recognize the value of exchanging data and ideas before this goal of the Treaty will be fulfilled. It is felt that the Instituto Antarctico Argentino is among the first organizations to realize what its potential role could be, both as a polar scientific institution and as an instrument of the Antarctic Treaty.