

## KUNGL. SJÖKARTEVERKET (THE SWEDISH HYDROGRAPHIC SERVICE)

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The Kungl. Sjökarteverket, or Swedish Hydrographic Service, is an independent administrative unit directly under the Ministry of Defence and it has its own separate budget which is voted each year by Parliament.

The surveying season in Sweden lasts about five months, from the latter part of April to the middle of September, depending somewhat on the weather. The officers and crews of the ships are drawn almost entirely from the regular Navy, except as to about one third of the surveyors, who are civil Assistants of the Hydrographic Service serving continuously or alternately in the field during the season. The ordinary pay is supplemented by a daily allowance for subsistence, as well as by extra surveying pay during the working season, for time actually in the field, both of which are furnished from the budget of the Hydrographic Service. As the crews are conscripted it follows that nearly all of them are untrained at the commencement of the season, but there are also volunteers with previous experience who serve in the Navy for a number of years. On the other hand the military surveyors serve three or more consecutive seasons, but in all cases the amount of extra pay allowed increases with previous experience according to the following table, the amounts being in Swedish kroner:

### EXTRA SURVEYING PAY PER DAY ON BOARD.

SURVEYORS.	1st year.	2-7 years.	After 8 years.
Officers .....	1.50	3.—	5.—
Petty Officers .....	1.50	3.—	4.—
Chief Civil Assistant .....	3.—	6.—	8.—
Actuary, Cartographer .....	2.50	5.—	6.50
Assistant.....	2.50	3.50	5.50
Draughtsmen .....	2.—	3.—	5.40

The Captain is allowed 1 kr. per day in addition.

The following surveying ships are actually engaged in work during the season :

<i>Svalan</i> .....	(crew 26)
<i>Falken</i> .....	( " 37)
<i>Ejdern</i> .....	( " 17)
<i>Rabn</i> .....	( " 36)
<i>Tarnan</i> .....	( " 11)
<i>Johan Nordenanckar</i> .....	( " 36)
<i>Peter Gedda</i> .....	( " 24)

These ships are manned by ten captains and officers, 25 petty officers and 163 seamen and others. There are, in addition, 6 specially trained petty officers and 7 civilians of the Hydrographic Service serving as surveyors.

For surveying coastal waters and channels there are also generally about three camps on shore, each including from one to four surveying units, *i.e.*, one surveyor with sounding-boat and crew. This practice was initiated as a war expedient, but has been found useful and economical and is continued whenever the nature of the work makes a fixed station possible during the greater part of a season.

The methods of sounding in the Swedish Hydrographic Service have been fully described and illustrated in the *Hydrographic Review*, Vol. I, N<sup>o</sup> 2, and Vol. II, N<sup>o</sup> 2, in articles by Commodore Gustaf REINIUS, the able and energetic Swedish Hydrographer. The sounding machines, using fine gauge steel wire, are of an excellent type, and for hand-lead sounding the Swedish Service now uses American cotton cord-rope, with a flexible copper core, of the same make as that used by the U. S. Coast and Geodetic Survey. For greater depths wire deep sea lead lines are used. These lines are very serviceable and there is no shrinkage as in the ordinary braided lines. The instruments used are tested by the manufacturers at the Hydrographic Office, and also by those using them. The new type of station-pointer, designed by Commodore REINIUS, shown in fig. 4 in the article in the *Hydrographic Review*, Vol. I N<sup>o</sup> 2, is of an excellent design and has many advantages over the usual flat type.

At the end of the surveying seasons the separate working charts from each surveying party are delivered to the Hydrographic Office, each working chart being signed by the surveyor who is responsible for its execution, as well as by the captain who sees that the work is carried out according to the standards accepted in each region. As a rule each surveyor will produce 3 to 4 finished working charts in a season. These working charts are redrafted at the Hydrographic Office on rectangular sheets on the fixed scale of 1/20,000 covering the whole region, which are used as originals when preparing charts at the Hydrographic Office.

The primary geodetic land surveying is done by a special office, the State Geodetic Survey, but the Hydrographic Service supplements its triangulation work by triangulation on a scale more suitable for its working charts.

The field work includes also observations of terrestrial magnetism, rough observations of declination being made frequently during the coast-line work



Coastlining  
Mark

Erection d'un signal  
de topographie côtière



Sketching in the  
Coastline

Le croquis du  
contour de la côte



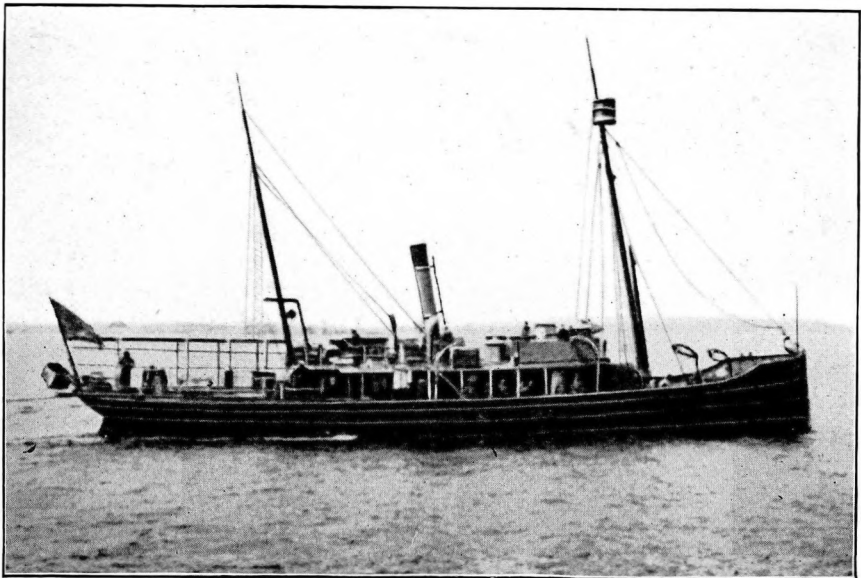
Fixing Coast-lining  
Stations

Station de topographie



Sounding Motor Boat

Canot automobile pour sondages



Surveying Vessel

" SVALAN "

Navire Hydrographe

by every surveyor. The more refined and complete observations and computations are carried out by a Chief Civil Assistant in charge of the magnetic survey, with a motor sloop to transport his party.

The Office work of the Hydrographic Service is divided into the usual sections, *viz.* chart making, correcting and reprinting; Notices to Mariners; compilation and correction of Sailing Directions; geodetic work and library; and chart issue and sale of publications. There are 62 sales agents for such publications in Sweden and 19 abroad. The Section of military charts for the Navy, not for issue or sale to other countries, is an important one which Sweden has never neglected.

The Swedish Hydrographic Office has also a very interesting and efficient installation for the galvano-plastic treatment of copper plates, which process is fully described in an article in the *Hydrographic Review*, Vol. III, N<sup>o</sup> 2. *Notices to Mariners* are issued weekly and these Notices are also issued to all Swedish Consulates throughout the world, while important Wireless *Notices to Mariners* are sent out the day of their receipt. Copper plates are kept in a fire-proof chart room, and the usual sets of books are kept, in which are noted all corrections to copper plates, standard charts and charts on hand. The charts on hand are kept corrected up to date by hand.

There is also an important and somewhat unusual section, charged with the governmental verification and testing of ships compasses, side lights, masthead lights and navigational instruments. Such examination is required by law at the time of original purchase and before use, and in addition all compasses must be tested at stated intervals to verify their correct working. There are branch offices in Goteborg, Malmo, Kalmar, and Sundsvall. It is stated that few foreign ships' running lights would pass the rigid inspection except in countries where similar inspection is compulsory. The strict testing of a compass takes only a couple of hours and is an insurance against certain avoidable causes of stranding.

There is also a Section for Terrestrial Magnetism, charged with the working out of charts and papers based on the magnetic surveys.

The Service has recently issued a book with charts of various channels of approach to the port of Stockholm, in which accurate alignment bearings are given for the purpose of compass correction while underway or entering and leaving port. This work will probably be continued for certain other of the principal Swedish ports.

Recently there has been issued also a new chart from Tistlarna to Varberg in the Kattegat, and an attempt has been made in this to establish a standard type for the new series of charts on the scale of 1/50,000, which will, in course of time, cover the greater part of the Swedish coastal waters. Extensive use has been made in this chart of new symbols adopted through the International Hydrographic Bureau and the London Conference. Care has been taken to give also the essentials of the title and explanation in English in order to make the chart readable to Mariners of all nations.

The Office has recently issued also two charts showing the coloured light sectors for the entrance channels to various ports, and also an excellent revised Manual of Hydrographic Surveying, which has been gotten out by

Commodore REINIUS and his staff of able Assistants. This book is well worth translating into other languages for the benefit of Hydrographic Offices, embodying as it does the practice and experience of the Swedish Hydrographic Service.

The general character of the budget of the Swedish Hydrographic Office may be judged by the estimate for the financial year 1924-1925 as follows :

1. Salaries (civil personnel)*.....		165,420 kr.
2. General expenditure :		
Surveys.....	162,000	
Ships equipment.....	112,000	
Instruments and sounding boats .....	14,500	
Printing Office.....	57,500	
Building and inventory .....	3,000	
Expenses .....	8,000	
	357,000	357,000
3. Control of navigational lights and terrestrial magnetism sections		15,000
4. Notices to Mariners .....		31,000
5. International Hydrographic Bureau .....		8,500
		<u>576,920 kr.</u>

The salaries paid to the personnel are as follows :

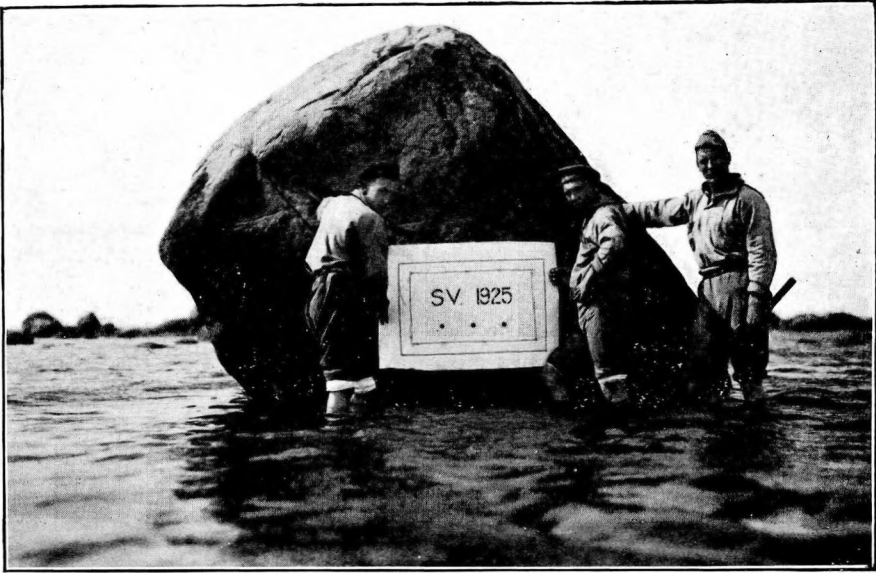
PERSONNEL	Salary (*) kr.	Pension * kr.	Retiring with pension	
			at age	after... years of service.
Chief Civil Assistant.....	7,668 — 9,060	5,076	65	35
Actuary.....	6,816 — 8,124	4,476	"	"
Cartographers.....	6,420 — 7,668	4,200	"	"
Draughtsmen & Engravers.....	4,350 — 5,676	3,036	"	"
Paymaster .....	4,350 — 5,676	3,036	67	"
Draughtswomen .....	2,574 — 3,018	1,704	60	30
Women clerks .....	2,160 — 2,574	1,440	"	"
Porter .....	2,520 — 3,144	1,644	67	35

Roughly the office personnel is about 60, and the surveying or field personnel 205. The Kungl. Sjökarteverket is a vigorous and growing Institution, which is developing along very up to date lines under the able direction of Commodore REINIUS and his staff of Assistants, to whom the Bureau wishes to express its hearty thanks for the information given and the reception extended to the writer.

(\*) 1. When the Hydrographer is not a Commodore on active service his salary is augmented by 2,520 kr.

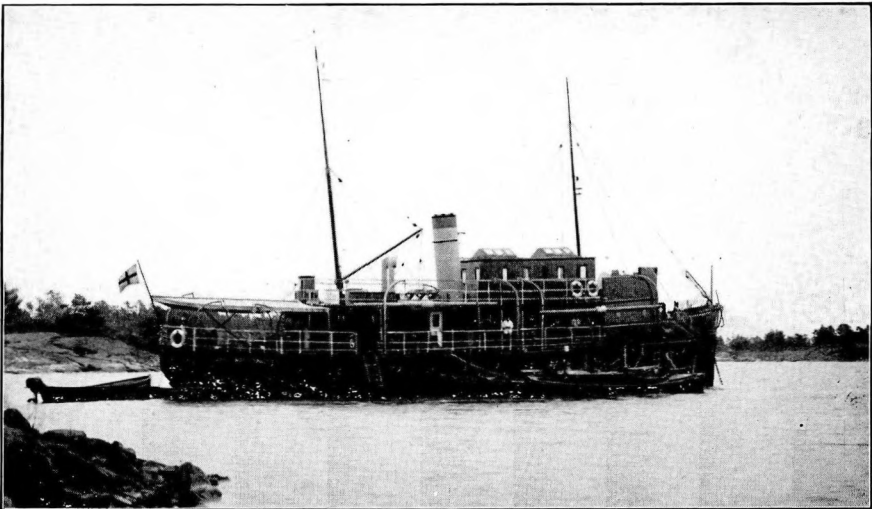
2. The salaries of the naval personnel are paid by the Navy.

3. At present augmented 19 %.



Bench Mark

Marque de Repère



Surveying Vessel

“JOHAN NORDENANCKAR”

Navire Hydrographe