Lighthouse

JOURNAL OF THE CANADIAN HYDROGRAPHERS' ASSOCIATION

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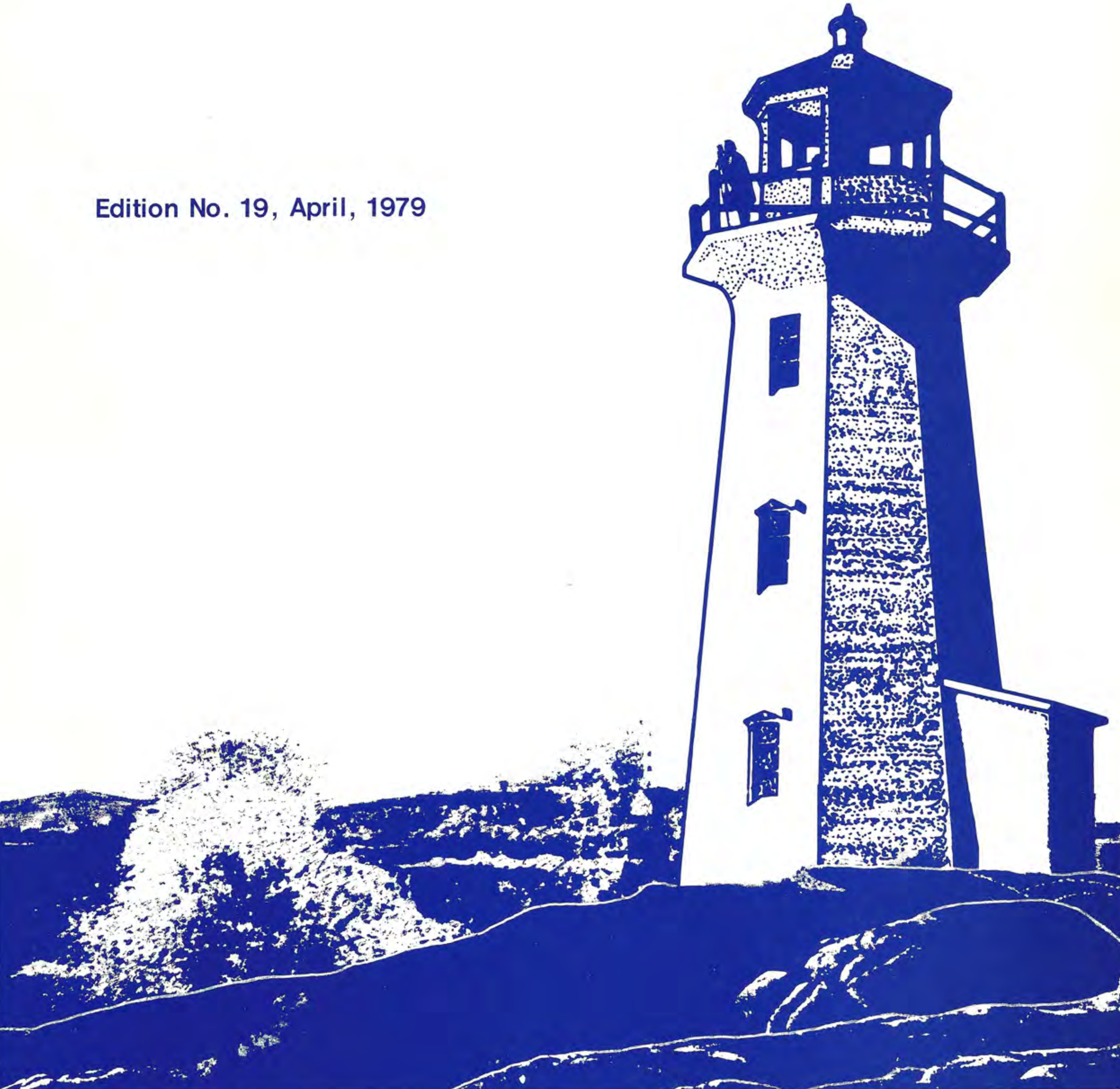

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Views expressed in articles appearing in this publication are those of the authors and not necessarily those of the Association.

Whose Name Was Writ In Water

(A Short History of the Challenger Expedition)

R. W. Sandilands

Canadian Hydrographic Service
Pacific Region

The corvette HMS *Challenger* steamed out of Portsmouth on the morning of 21 December 1872, passed through the Needles and down Channel into a smooth sea with only a light headwind. The first leg of her course was laid to Portugal.

The second day brought gales and heavy seas. A contemporary diary contains the following quote:

"A Merry Christmas and A Happy New Year" was amongst the last words I heard on leaving England. Vile mockery. Here we have been kicking our heels about for the last six days in the chops of the Channel...for we can not make good any distance towards Lisbon. South-westerly gale follows south-westerly gale...and all we can do is to lay to and let it blow on. Christmas Day was duly celebrated with roast turkeys, plum puddings and hot grog but we had to hang on to our grub pretty stiffly for everything had a tendency to make for the lee side of the place there to revel in sublime smashery and confusion. At breakfast the same day it was a perfect impossibility to keep your seat at all, and it was necessary to seize what you required from the side tables and transfer it to your mouth before it was sent flying out of your hand and our dogs kept up a delightful chorus of howls and yelps, by which they gave us to understand that they did not like it."

What was the reason that caused scientists to volunteer for such a voyage?

Since the voyage of Darwin some thirty years earlier British naturalists had become increasingly interested in the animal and plant life of the seas. Reason predicted that life in the sea was certainly confined to the upper zones. For years it was generally believed that about 300 fathoms was the depth limit for life. Below that the depths were too cold, there certainly was no light thus precluding plant life and the pressure of several tons per square inch was unbearable. But not all agreed. This was the era of telegraphic communications, of under water cables and in 1860 a cable was retreived for repair from 1,200 fathoms and was found to be heavily encrusted with corals and other animal growth clearly seen to have been alive for several years on the cable.

During the nineteenth century the Hydrographic Department of the Admiralty had become increasingly professional. Hydrographers were initially serving Officers who were seconded for limited periods but during the tenure of Rear Admiral Beaufort, they became specialists who spent their entire lives in this branch of the Navy. The accuracy of their surveys was equalled by the care with which their charts were printed for world wide circulation. Scientists were appointed to surveying vessels, frequently as surgeons, to gather information additional to that acquired by the hydrographers. Darwin sailed on the *Beagle*; Huxley was a surgeon on *Rattlesnake* in New Guinea, Hooker, the Botonist was surgeon with *Erebus* and *Terror* in the Arctic. Their journals, professional papers and reports excited the scientific community in Britain. However, it was evident that something more than the small ventures of individual researchers was required.

Dr Carpenter

Early in the summer of 1871 Dr. Carpenter of the Royal Society called on Her Majesty's government not to allow Britain's lead in marine science to go by default. News had come from the United States of a projected cruise by Agassis in the Atlantic and Pacific oceans. The Germans were planning and expedition in the Atlantic and Sweden had sent two ships to the Arctic. He pointed out that if an opportunity were not found for following up the discoveries already made it would be a blow to national prestige and unfair to the scientists whose efforts had given the country its commanding position.

As early as 1869 he had had the idea of persuading the government to send out a voyage of circumnavigation which would take the techniques and concepts developed in minor projects and put them to work in the oceans of the world.

The British Association for the Advancement of Science met in Edinburgh in August 1871 and there resolved to co-operate with the Royal Society "For the promotion of the circumnavigation expedition specially fitted out for carrying the physical and biological exploration of the deep-sea into all the great oceanic centres".

By October the Association had a letter

committing the government to "Support an expedition on receipt of a formal application from the Royal Society".

A committee consisting of among others, Carpenter, Richards, (Hydrographer of the Navy), Wyville Thomson, T.H. Huxley and Hooker, was struck and met on November 10th---specifications were drawn up, were modified and a brief submitted.

The estimates were approved in mid-December and placed before Cabinet shortly afterwards. This initial consideration was the first and last time that the expedition was discussed at the highest level and the act by which Britain led the world into the realm of oceanography received only the most cursory attention of its leaders. The Treasury approved the sum of £ 40,205 over three and a half years. If only governments could respond as quickly today. But it is clear that much of the ground work done by Carpenter was of crucial importance. Recent research has shown how he was able to use his social contacts with Gladstone and his Ministers to get the idea of the voyage accepted with the minimum of delay.

Admiral G.H. Richards RN

At the Admiralty the Hydrographer was ready. Admiral Richards, recently returned from surveys in British Columbia, as a member of the committee had had a hand in drafting the request. He had narrowed his list down to two ships, both laid up at Sheerness.

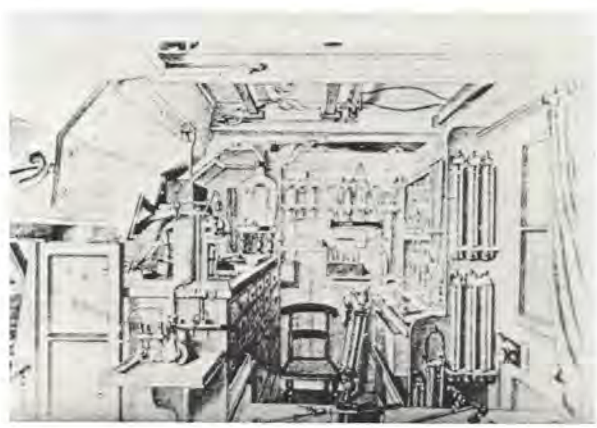
One was *Clio*, the other *Challenger*. The choice was left to the Naval Secretary and on December 18th Captain Hall suggested that *Challenger* was the more suitable vessel.

She was a three masted, square rigged, wooden ship of 2,300 tons displacement and 226 feet overall, with a 30 foot beam. Officially described as a steam corvette she was powered by an engine of about 1200 horse power but still essentially a sailing ship. She was built at Woolwich and launched in 1858 and had served in

HMS CHALLENGER

Vera Cruz and in the Fiji Islands. She was extensively refitted for her new role. All but two of her 18 main deck 68 pounders were removed and this space along with that normally housing stores and ammunition was turned to extra accomodation and laboratory space.

Nearly the entire main deck was given over to a biological laboratory, adjacent to it was a well stocked reference library and a chemical laboratory where the sea water was analyzed. A photographic dark room and studio were fitted as well as an aquarium though the latter was not to be too successful.



The Chemical Laboratory

A large steam winch of 18 horse power was fitted on deck for dredging and sounding using the main yardarm as a boom over the same. For sounding there were 25,000 fathoms of rope, for dredging 10,000 fathoms each of 3" and 2½" line as well as 5,000 fathoms of 2" hemp.

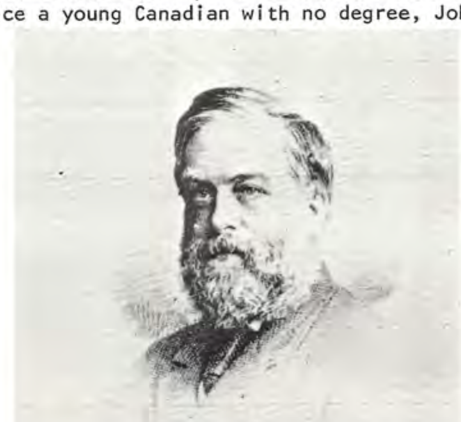
Although Kelvins wire sounding machine had been developed, hemp was still used for sounding as the wire snarled badly and was not to be trusted at times when both heavy water-sampling-bottles and thermometers were attached along with the sounding weights.

Admiral Richards then turned himself to the task of choosing a suitable commanding officer and his choice fell on Captain George Nares, an Aberdonian, and an Arctic explorer of distinction.

His second-in-command was Command MacLear and as navigating officer Lieutenant T.H. Tizard. In all there were about 20 naval officers and a crew of over 200, the total number onboard on sailing being 243.

Captain G. Nares RN

Though Dr. Carpenter of the Royal Society had been the first proponent of the cruise, by 1871 at the age of 58 he felt he was past the age to go to sea on an arduous voyage, even if his prickly personality had not stood in his way. The expeditions leadership was therefore offered to Professor Wyville Thomson, Professor of Natural History at Edinburgh University, and Carpenter's junior by 16 years. The Royal Society chose as his assistants John James Wild, a young man of Swiss nationality to act as secretary and artist. As naturalists Henry Moseley, Professor of Human and Comparative History from Oxford University, Dr. Stirling, from Edinburgh University who resigned before the expedition sailed and as third choice a young Canadian with no degree, John Murray.



Sir Wyville Thomson

Murray was born in Ontario and initially came to Edinburgh to study medicine. However, he soon became interested in the field of natural history and showed no respect for the tedious discipline of examinations and no wish to acquire the decoration of degrees but worked at any subject which interested him. He was the only naturalist who had been at sea prior to the expedition, having sailed as surgeon in the whaler *Jan Mayen* to the Arctic.

Sir John Murray

As a replacement for Stirling a young German zoologist who impressed Thomson when they met in Edinburgh in October '71, Rudolph von Willemoes-Suhm became the third naturalist. This young man was not to survive the voyage, dying of erysipelas as the *Challenger* was approaching Tahiti in September 1875.

Rudolph Von Willemoes-Suhm

To round off his team Thomson added a non-commissioned officer from the Royal Engineers to be his photographer.

These then were the men who were to write their name in history as the members of the first great oceanographic cruise.

The weather moderated after they had crossed the Bay of Biscay and once past Finisterre and into calmer seas they began to practice the strange, arduous and monotonous exercise that was to become their routine throughout the next three and a half years.

A typical day would begin at 0530. Steam was raised during the night and under steam and assisted by a spanker, the rest of the sails being furled, the ship was put head to wind. The depth was determined by sounding and as soon as the line was returned the thermometers were read, the water samples taken to the laboratory for analysis and the bottom sample collected from the tube. The ship then bore off before the wind and the trawl was lowered over the side. A beam trawl was preferred because it swept the bottom thoroughly bringing back a larger collection of fish and swimming creatures. A dredging day or drudging day as the crew preferred to call it, took from ten to twelve hours and excitement ran high when the trawl was landed onboard. Who knew what wholly new creature, what fossil or form long thought extinct would come tumbling on deck. Many strange, bizarre and grotesque animals were brought out of the depths, most of them never seen by man before.

Working the Dredge

Sub Lieutenant Lord George Campbell gave the following description of the routine after two years.

"On the average we sound something like every two hundred miles and as this old tub does not average more than one hundred miles a day, we stop every other day. Sometimes we trawl every time we sound, sometimes we skip one trawling. Sounding, taking serial temperatures to 1,500 fathoms, at every ten up to 200 fathoms, then only at every hundred, getting specimens of water at intermediate levels etc., takes about seven or eight hours. And it is no use arguing that this work is our raison d'être; we know that too well...but we should be more than mortal if after two years of this same old grind we did not---but Bah! A splendid ship, a splendid cruise, romance, how interesting etc., etc., but Hey for the *Challenger* and may we soon see the last of her!"

But there were moments of great beauty and moments of danger in this routine life. In mid-February of 1874 the first icebergs were sighted and Campbell recounts "No words of mine can describe the beauty of these huge icebergs. One which we have just sailed past had three high caverns penetrating a long way in, with the wonderful colouring of those blue caverns and white cliffs, dashed with pale sea green, stratified with thin blue lines veining the semi-transparent wall of ice 200 feet in height" and on the 16th February at about 1300 *Challenger* crossed the Antarctic Circle, the first crossing of the circle by a steamship. (The first recorded crossing being made by Captain Cook in 1773 and later, on turning north, young Vancouver ran forward to the bowsprit and claimed to have been further south than any other man).

HMS CHALLENGER meets the icebergs

Eight days later the wind approached gale force and a heavy snow squall brought decreased visibility. Suddenly a hail from the fo'castle lookout "Iceberg close under the lee bow". There was no room to steam ahead, the order was given for full astern, the lower deck was cleared, the maintopmen went aloft to loose the main topsail, the foretrysail was taken in to assist the engine reversing. The shouted commands were barely heard over the roar of the wind. The weather clew of the main topsail was set aback, headsails were taken in...and the *Challenger* slowly gathered sternway under the towering mass of the berg. Two days later there were forty bergs in sight around them and the Edinburgh naturalists may have remembered the memorable couplet in McAndrews Hymn:

> "Hail, snow and ice that praise the Lord,
> I've met them at their work, an wished we
> had another route, or they anither kirk".

The life of the seamen was a hard one. During the cruise some 61 deserted, mainly in Australia, though Thomson's photographer jumped ship at the Cape reportedly because of the Kimberley goldfields. Seven men died onboard during the three and a half years *Challenger* was away from U.K. The first was a boy called Stokes who was killed by a heavy block falling on him when a line broke due to the dredge snagging on broken ground. Two others were drowned, one killed himself with chloral hydrate, another with an excess of alcohol and two more, including von Willemoes-Suhm succumbed to illness. Two men went insane and twenty-six were hospitalized or invalided, malaria, syphilis and consumption in that order being most prevalent. Scurvy was entirely absent. Others were called home along with Captain Nares from Hong Kong to join an Arctic expedition and only 60% of the original complement stayed with the ship for the entire cruise.

Captain Thomson RN

Captain Thomson assumed command in Hong Kong when Nares went back to U.K. and the voyage continued.

For those of you who are statistically minded the *Challenger* logged 68,890 nautical miles. She spent approximately 40% of her time in port but during these visits the scientific staff were busy engaged in the surveying and in the examination of the flora and fauna of the area.

The deepest sounding recorded was 4,575 fathoms in the Marianas Trench now called Challenger Deep. The greatest depth at which she took living animals was 3,125 fathoms about 1,000 miles north of Honolulu. She spent 736 days at sea and obtained over five thousand new specimens of fish and invertebrates and conclusively proved that the deep-sea fauna was relatively recent and not merely a collection of living fossils surviving from ancient eras. Protozoa and diatoms were also abundant yielding about 5,000 species most of them new to science.

Sir John Murray later wrote "It may fairly be said that since the discoveries of Columbus, Gama and Magellan in the thirty years from 1492 to 1522 no addition to the knowledge of the surface of our planet can compare with that acquired by the *Challenger*". Never had a research project discovered so many new forms of life.

During the voyage *Challenger* occupied 362 oceanographic stations. The position of these stations having been ascertained the following data was obtained.

The exact depth was recorded, the bottom temperature was obtained and a sample of the bottom was recovered. A sample of the bottom water was taken for analysis and a fair sample of the bottom fauna obtained. At most stations the fauna of the surface and intermediate depths were sampled and temperature and sea water samples for intermediate depths recorded and analysed. In all cases meteorological and atmospheric conditions were noted, the surface current rate and direction recorded and at a few stations an attempt was made to ascertain the rate and direction of movement of water at different depths.

There were those who opposed the expenditures involved in the expedition but while cruising in the regions adjacent to Java the nets of the *Challenger's* dredge collected some bits of phosphate. Murray was convinced that they had been formed on land and subsequent search for their origin under his auspices led to the discovery of the phosphate deposits on Christmas Island. The island was annexed to Britain and a company under Murray's presidency developed a highly prosperous mine. Some years before his death this company had already paid the crown more in royalties than the entire cost of the *Challenger* expedition.

In recent years we have read of the interest in manganese nodules in the ocean and the possibility of mining for them. These nodules were first found by *Challenger* between Honolulu and Tahiti in 1875 when a days dredge brought up from 2,350 fathoms more than half a ton of manganese nodules which filled two casks...the great majority were small and nearly round with a mean diameter of three quarters of an inch...incidentally among the nodules were counted 250 sharks teeth this detritus of a marine dental workshop encased forever in protective manganese.

CHALLENGER samples at the British museum

Challenger docked at Spithead on the 24th May 1876 laden with thousands of jars of pickled specimens, muds and clays and other deposits from the sea bed as much again having been forwarded from various ports of call during her cruise. She also carried records of enormous numbers of observations of temperature, weather conditions, salinities and magnetic observations.

A *Challenger* office was established in Edinburgh with Sir Wyville Thomson, who had been knighted after the return of the expedition, as Director of The Challenger Expedition Commission. With Thomson as editor, the monumental work of producing the report, eventually fifty volumes, was got under way. It was not completed till 1895 though Thomson himself died in 1882 and Murray was responsible for the final publication, partly at his own expense. Until his tragic death in an automobile accident near his home in Wardie, Edinburgh in 1914, Murray was literally the centre of world oceanography. In 1884 he established a small marine laboratory at Granton, now part of Edinburgh and eventually moved this to Millport on the Isle of Cumbrae in the Clyde. From this rose the Scottish Marine Biological Laboratory which later moved to near Oban. Today no major maritime nation is without at least one such centre of marine research.

The make-up of the oceans has changed little since *Challenger's* day but the ocean remains largely unknown with only a small percentage of the total adequately surveyed by the various disciplines engaged in oceanography. The untold wealth of the oceans resources await the nation that has the foresight to carry out these surveys. With her three ocean sciences institutes and an active marine science programme being carried out by the federal government, Canada is placing herself in the running in the ocean stakes.

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The Mini-Ranger Data Processor Automated Positioning System— A Useful Tool for Positioning Sweeps

M. V. Woods

Canadian Hydrographic Service
Pacific Region

Introduction

The possibility that Kitimat, B.C. might become an oil port led the Canadian Hydrographic Service to initiate, in 1977, their first side scan sonar sweep conducted on the West Coast. The primary purpose of the survey was to determine that the channels leading to Kitimat were indeed deep enough to accommodate large tankers (Figure 1). A basic requirement of this sweep was to accurately position the side scan towfish in order to maintain precise distance between overlapping beam patterns, thus covering the area to a predetermined depth and leaving no gaps in the sweep pattern (O'Connor, 1977 and Woods, 1977). The Motorola Mini-Ranger Data Processor, Automated Positioning System (MRDP) was selected for the job because it provides continuous steering information, an on-line plot, and X-Y position output so that the exact spacing of lines can be checked quickly (i.e. - what maximum distance apart was the fish along any two lines?).

The positioning system data processor is normally used with the Mini-Ranger III, but since C.H.S. Pacific Region had a Mini-Ranger I available for this job it was possible to lease the peripherals and modify the Mini-Ranger to provide the range - range data to the system. The positioning system and the side scan sonar were installed aboard the 20-metre survey vessel Richardson in such a way that the towfish winch controls, side scan recorder, echo sounder and positioning system were all within easy reach of one operator in the wheel house. This arrangement provided excellent communication between the hydrographers and crew at all times.

The Navigation Equipment and Function

The Mini-Ranger Data Processor Automated Position System consists of:

i) *Positioning System:* Normally the Mini-Ranger III is used here. In our case the MRS I was used to provide range - range data to position the vessel.

ii) *Mini-Ranger Data Processor:* The brains of the system, the processor, converts range - range data to X-Y co-ordinates and controls the other components of the system to provide steering information for the helmsman.

iii) *The Data Terminal:* A Texas Instruments 733 ASR terminal permits the output of time, position and depth* on paper tape and a cassette recorder.

*(The system would normally be connected to an echo sounder digitiser but during our use no digitiser was available.)

iv) *Track Plotter:* The plotter provides on-line plotting of ship's track and, optionally, a post plot of depths.

v) *Track Indicator:* This is a small package easily mounted in front of the helmsman which shows distance off line and percent of distance travelled along a line by means of bar scales. The zero of the lower scale defines the start of the line, and 50% shows that one-half of the line has been covered (Figure 2). The steering meter has 5 divisions each side of centre and can be set for fine or coarse steering where each division can equal 5, 20 or 80 units (normally metres). When getting on line the coarse scale was selected so that the unit would respond as soon as the vessel came within 5 x 80 = 400 metres of the line and, when on line, the fine scale is used for precise steering. Once the crew became used to the steering indicator, the position output along lines varied only 1 to 3 metres, with numerous fixes computed as being exactly on line.

Operating the System

Pre-Planning

Prior to the use of the MRDP positioning system the data to be entered via the terminal must be recorded in a suitable format. The parameters required are:

1. Height of transceiver above datum of survey.

2. Co-ordinates and elevations of transponders.

3. The correct codes of each transponder to be used.

4. Co-ordinates of start and end of basic survey lines to be run. Here the computing ability of the MRDP is a great time saver as many parallel offsets may be run from one defined line, so the co-ordinates of each line actually covering the work area don't have to be determined, just one line with so many parallel offsets (Figure 3).

5. Position of the vessel with regard to which side of the baseline the work area lies. This is required to solve the dual position problem where the two ranges could be plotted on either side of the baseline and is handled simply by asking the operator to specify a a right and left side for each pair of transponders. Right and left are determined by the operator being at the start of the line, looking toward the baseline.

6. Sample intervals and print ratio. These determine the amount of data the unit will record. The sample rate is set at 2 seconds which means that the system will record time,

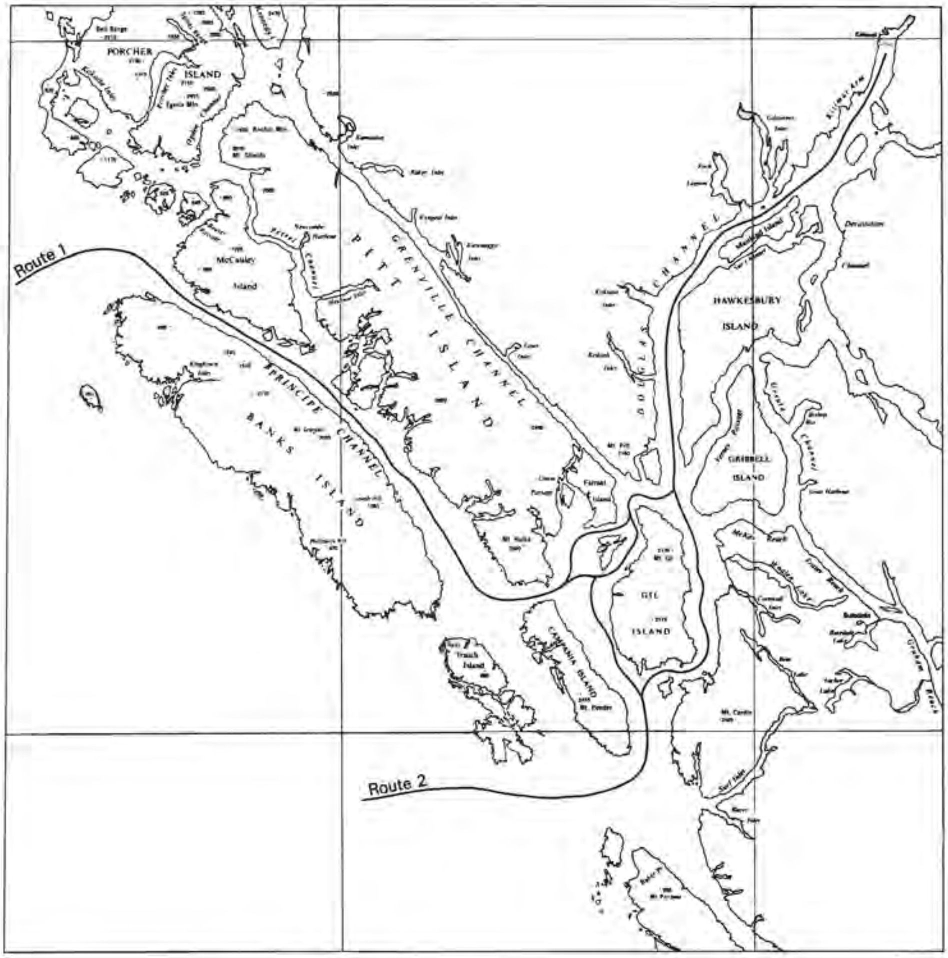

Fig. 1 Proposed Routes to Kitimat

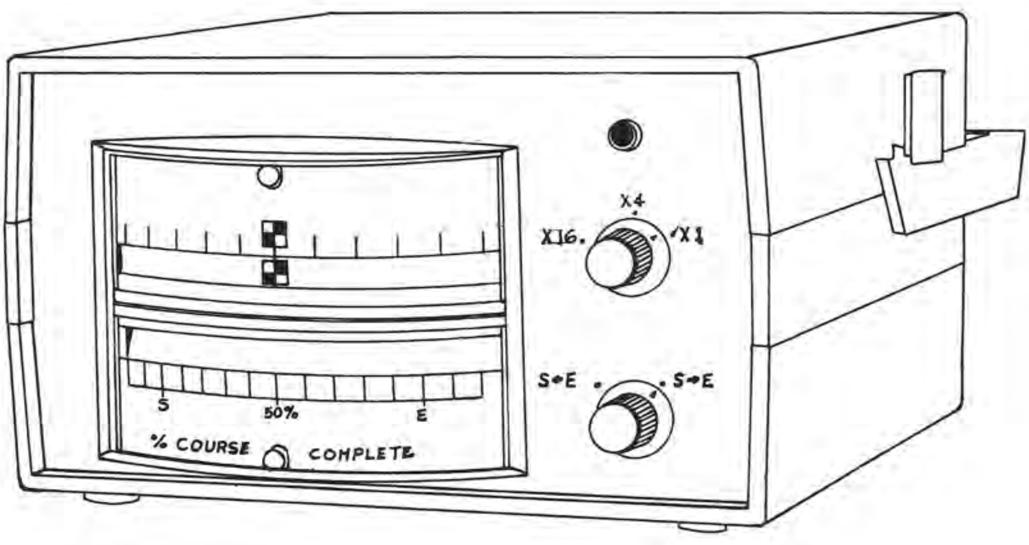

Fig. 2 Left/Right Track Indicator

position and depth once every two seconds. This rate may be changed up to a maximum of one record every 99 seconds if so desired. The Print Ratio is initially set at 1 so the terminal will list every record that is output to the recorder and can be changed to a maximum of 99. For example, if the print ratio was set to 4, the terminal would record every fourth record output to the recorder.

7. The scale to be used on the plotter. This would normally be the same scale at which the final survey data is to be portrayed. The information listed here is fed to the system via a series of input modes initiated automatically by system turn-on. Naturally, all position and elevation data must be in the same units as the ranges from the Mini-Ranger, normally metres, which makes plotting compatible with the UTM grid. The grid co-ordinate system must also be rectilinear (90^o intersections between the axes and X axis co-ordinates increase from left to right and Y axis co-ordinates increase from bottom to top), and planar, although curvature corrections can be supplied as a system option.

Running the System

To help explain the use of this system the actual set up used on a side scan sonar survey in Whale Channel (approaches to Kitimat, B.C.) is shown. Figure 3 shows the area and the survey stations used, along with lines that were run. Transponders were placed at stations HOME, WR 524 and on Cumming Point Light. Two basic lines (marked L1 and L2) were easily defined by start and finish points on even grid intersections, Line 1 along Easting 492 000 (X co-ordinate) from Northing 5 901 000 to 5 907 000 (Y co-ordinates) and Line 2, 492 000 and 5 904 000 to 486 000 and 5 910 000. To avoid bad fixes along the baseline various combinations of the transponders were selected. Offsets A, B, C, D and E were run on HOME and the light. Line 1 and offsets F and G on the light and WR 524. The south-easterly portion of offsets H, I, J and K were run on HOME and the light, and the north-westerly portion on WR 524 and the light. Line 2 and offsets L and M were run on WR 524 and the light. To switch from one pair of transponders to the next or to change direction of lines is very easily done with this system. At the start of a day all line and site data is recorded in the MRDP memory (up to 16 sites and 10 lines can be stored) so that at the end of any line, the "Escape" button is pushed on the terminal, the system enters the Pause Mode, and a new line or sites are selected in a matter of seconds. Details on these procedures are well documented in the Operation and Installation Manual supplied with the system and, after a couple of days use, the average hydrographer will rarely need to refer to the manual to manipulate the system to its fullest.

System Efficiency

All hydrographers can easily recognise that being able to run straight lines rather than arcs is probably the greatest advantage of this system. There is no need to consider transponder placement so that lines cross contours, and arcs that intersect the shore line at acute angles (which increase turn around time) can be avoided. As long as the transponders give good coverage of an area the lines may be run in any suitable direction, as was the case in the "old" days of parallel lines fixed by sextant angles. In one area of Caamãno Sound it was determined that 17 straight lines gave the same coverage as 23 arcs, cutting down turn around time by about 20 percent. Office time is also greatly reduced, even if fixes are plotted manually, as plotting of simple X - Y values is certainly easier than range - range intersections. The handiest feature in this regard is that output may be selected as chainage and offset, which gives distance from the defined origin of the line and distance off the lines, (usually not plottable with a good Coxswain!).

System Accuracy

The absolute accuracy of the system is dependent on the two ranges received from the transponders and the computed position of the ship will not be geographically correct if the ranges are in error. This error is normally minimised by regular system calibration and is accounted for by determining the "diamond of error" and plotting accuracy lobes for each transponder baseline.

The relative accuracy is excellent for the job of sweeping, where precise line spacing is called for within a given swept area. On the sweep of Caamãno Sound most of the lines we ran were set at 500 metres apart, and a few simple calculations show how this spacing is maintained, even though some error may exist in each range.

In Caamãno Sound transponders were positioned at station BRIT, N. 5 865 706, E. 458 859 and DUPO, N. 5 865 352, E 470 573, baseline length of 11719.35 metres, and two lines were run due east and west along northings 5 862 000 and 5 862 500 respectively.

Supposing the worst fix accepted was with an angle of 20^o between the stations, as shown in Figure 4, the ranges would have been 6933 from BRIT and 17 890 from DUPO, which gives a position of 5 862 000 and 453 000. Now assume the worst case and say that one reading was short by 10 metres and one long by 10 metres, 6 923 from BRIT and 17 900 gives a position of 5 862 050 and 452 980 (50 metres north and 20 metres west of the plotted position). On the next line due north of this point, readings of 6 679 and 17 803 give a position of 5 862 500 and 453 000, but adding and subtracting 10 metres results in 6 669 and 17 813, giving a position of 5 862 556 and 452 981, again 56 metres north and 19 metres west of the plotted position. Thus, the spacing between lines at this point was 506 metres - good relative accuracy, but the absolute accuracy of position has deteriorated drastically.

A similar calculation taken along the same two lines, but in the centre of the pattern where range intersections are 90^o shows that line spacing would have been 501 metres, with the same errors applied: -

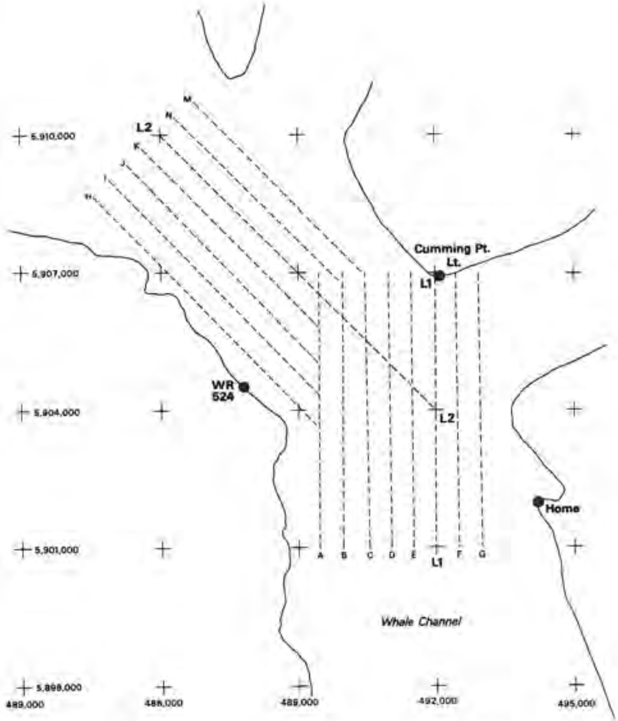

Fig. 3 Configuration of Sounding Lines

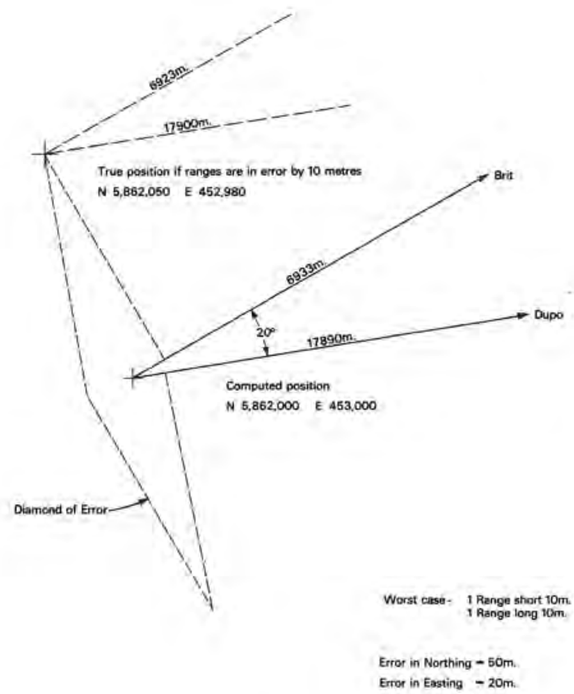

Fig. 4 Effect of Range Error on Position

RANGES			POSITION	
BRIT	DUPO			
3 878	11 092	give	N 5 862 000	E 460 000
3 868	11 102	give	N 5 862 006	E 459 987
3 402	10 951	give	N 5 862 500	E 460 000
3 392	10 961	give	N 5 862 507	E 459 988.

Here, because the diamond of error has been reduced by a solid geometric fix, the absolute accuracy is much improved. This good relative accuracy and the excellent manner in which the ship is kept on line with the steering indicator provides the desired overlap of sweep beam patterns generated by side scan sonar towfish.

Conclusions

The MRDP and MINI RANGER SYSTEM is well worth considering on any job requiring straight, accurate lines to be run. Although it was used in its simplest form, that is plotting fixes manually and recording soundings manually, it was still a great time saver. The positions on all our printouts averaged about ±2 metres of being on the line, and the crew were very impressed by the quality of the steering indicator. The terminal input and output is very good. Simple commands are used and one does not have to be a computer expert to run the system.

References

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Acknowledgements

I wish to thank Meiric Preece, hydrographer; Captain M. Wheeler and the crew of C.S.S. Richardson, who assisted so well on the Kitimat project; Garth Weedon, Motorola Canada; and, Larry Fox and Ron Matthews, Motorola Arizona, who supplied and maintained the MRDP equipment.

Cushy Shore Jobs

Editor's Note: The following article is reprinted by permission from THE NAUTICAL MAGAZINE, April, 1978. The philosophy expressed is familiar to field hydrographers, I'm sure.

In the middle of a West Indian hurricane, China Sea typhoon, Indian Ocean cyclone or just plain ordinary North Sea winter 'blow', every seafarer has thought longingly, since time immemorial, of a nice quiet, comfortable job ashore. Out in the morning, home in the evening and a soft and steady bed every night. It is the same after three days of steaming in fog with the siren going. And the same when nosing out of a port with one's wife and loved ones left behind for months. Always the shore job is visualised as a cushy number -- from mid-ocean viewpoints it is never, but never, anything else. After having been ashore a year or two myself I know very differently, though -- despite my seagoing friends 'rudely'-expressed opinions.

I was thinking only today about a certain Imperial Oil engineer officer. He had a chief's ticket, was serving on board in a junior position and thought he could accomplish more ashore. So he applied for and got the job of supervisor of maintenance and repair in the Imperial Oil Fleet. Name of Art McKenzie if you happen to know him?

In two years ashore he has circled the world twice and has spent 300 nights in various hotel bedrooms. Overall he has been away some three months more than if he had been in a seagoing ship. 'There have been times,' he says, 'when I've come into the office in the morning, been told of a situation that requires my presence, phoned home and asked my wife to pack a bag and been on my way within minutes. On one occasion the ship was on her way to the Persian Gulf from California. I flew to Singapore and a helicopter transferred me to *IMPERIAL OTTAWA* at sea.' Art is a happy man in spite (or because) of it all.

Although that particular story was about one man and one shipping company, it is equally applicable to thousands of others in all kinds of industry. To make good money, feel worthwhile inside one's self and to forge a meaningful career, one has to be prepared to work all the hours that God sends and to travel anywhere at the drop of a hat. That's a real old-fashioned, corny philosophy. A ghastly, boring, repellant (to some) philosophy. But it is the only true one.

A 'comfortable', lowly-paid (and there are no others for unqualified young people) 9-to-5 job rots the soul, frustrates the spirit and leads through an unhappy life of non-achievement to an equally unhappy old age with no single memory of a great event tackled and overcome. Just an unfulfilled lifestyle as useful, interesting and memorable as that of a cabbage.

Municipal Place Names and Hydrographers

David Monahan

Geoscience Mapping & GEBCO
Canadian Hydrographic Service
Ottawa

During the opening ceremonies of the CHA Conference at Patricia Bay last year, the Mayor of Sidney, B.C. presented a plaque to Mike Bolton and his staff welcoming them to their new home in Sidney. His Worship mentioned that Sidney was named after a hydrographer and that Sidney is the only town in Canada whose coat of arms honours a hydrographer, in that it contains a picture of a surveying vessel. His comments got me to thinking about how many municipalities in Canada were named after hydrographers.

A great number of Canada's place names come from the early hydrographers, most of whom were the first explorers to enter a region. Usually they named islands or water masses; municipalities were built so much later, after the hydrographers had done their work and departed, that it would have been impossible for the hydrographers to actually name the communities. The names hydrographers did assign could be categorized into several groups, the first being ship names. Most names around Canada like "Endeavour", "Intrepid", or other names implying manliness in the face of adversity come from early hydrographic ships. Fortunately the early hydrographers did not name features after their launches; can you imagine for instance the "Bright, Brave, Bold, Brisk Bay"? Sometimes, place names reflect the state of mind of the hydrographers on arriving there; surely the most evocative of these is the "Bay of God's Mercy". Another category of names used by hydrographers was what one might call the names of patrons; kings, lords of the admiralty, sponsors or important dignitaries. Ships' captains, as opposed to hydrographers on the ships, seemed to have received a fair share but hydrographers themselves have received fewer names and the number of municipalities named after hydrographers is probably quite small.

All this leads to the point of this short note. Now, how many Canadian municipal place names with a hydrographic origin can you come up with? To get you started, British Columbia has Sidney and Vancouver, Ontario has Bayfield Inlet, La Belle Province has Cartierville and Newfoundland has Cook's Harbour. If you can think of any other municipal place names draw up a list and mail it to the Editor of LIGHTHOUSE. A prize of $25.00 will be awarded to the person compiling the longest list. The contest is open to all members of the Canadian Hydrographers' Association and all subscribers to LIGHTHOUSE. Judging for authenticity will be carried out by an independent panel of experts. All entries must be received at the office of the Editor no later than September 30th, 1979.

Book Review

Round the Horn or Through Magellan An Extreme Case of Voyage Planning

The Netherlands Maritime Institute

When a ship's Master gets his sailing orders, he sets in motion a chain of events which is affected to a great extent by the work of hydrographers. So it was with the ill-fated voyage of the *V.L.C.C. METULA* which ran aground in the Straits of Magellan on 9 August, 1974.

As a result of the inquiry into the *METULA* grounding, the Netherlands Maritime Institute was commissioned by the Directorate of Shipping to prepare a report discussing the planning of a voyage by a V.L.C.C. through relatively unknown waters.

In this report the authors have tried to document what is involved in such planning on the part of the ship's fleet management and the Master although they have emphasized planning required by the former.

Of clear interest to Hydrographers are the conclusions reached by the authors concerning the number of publications which must be consulted to obtain information required for effective voyage planning. This points up the importance of Hydrographers collecting and documenting information for inclusion in Sailing Directions.

Another recommendation is made to present information such as port of entry procedures, routing schemes, search and rescue information, distance tables and frequencies and broadcast times of radio stations, in chart format. This is presently being done by J. D. Potter Ltd., U.K. for the North Sea area.

The value of this publication to the Hydrographer lies in its documentation of what the authors believe is the information required by the Mariner to safely conduct his voyages. The special needs of the Master of a 300 m V.L.C.C. drawing in excess of 18 m have to be met as well as those of a 50 m coaster.

Available from: - Public Relations Dept.
Netherlands Maritime Institute
19, Hofplein, P.O. Box 1555
3000 BN, Rotterdam
The Netherlands

Cost: Dfl 60 U.S. $20.00 U.K. 15

R. A. Marshall
Canadian Hydrographic Service
Central Region
Burlington, Ontario

Notes

Standards of Competence for Hydrographic Surveyors

Hydrographic Surveyors may have heard, during the last seven years, of the work of the Federation International de Géométres (FIG) or of the International Hydrographic Organization (IHO) in developing international standards of competence for hydrographic surveyors. This work has been reported on previously by McCulloch in this journal and Ingham at the 16th Annual Canadian Hydrographic Conference at Burlington.

The work reached a level of fruition in August, 1978 with the publication of the 1st Edition of Standards of Competence for Hydrographic Surveyors. This work was finalized by the International Advisory Board on the Education of Hydrographic Surveyors under the chairmanship of Rear Admiral D.C. Kapoor. Other members of the Board are J. Bourgoin (France), W.J.C. Burki (Netherlands), A.E. Ingham (U.K.), A. J. Kerr (Canada) and T. Uchino (Japan).

The Standards of Competence are intended to provide a guide to hydrographic organizations and educational institutions in the preparation of their own standards. It is hoped that this will have particular application in the developing countries where there is, in many cases, an urgent need to develop a competence in hydrographic surveying.

Further information may be obtained from the Office of the Dominion Hydrographer, 615 Booth St., Ottawa or from A. J. Kerr, 8th Floor, 240 Sparks St., Ottawa.

Symposium 1980 - Position Fixing at Sea

Call for Papers

The Hydrographic Society and the Canadian Hydrographers' Association invite authors to submit papers for the 3rd Symposium which will be held at the University of Southampton, England on April 15th, 16th, 17th, 1980, inclusive.

Earlier symposia organised by the Hydrographic Society have attracted delegates from many countries, from Government as well as commercial companies.

Papers are invited from: users, manufacturers, research establishments, Government departments and individuals.

The papers will be presented in English, and since delegates will receive their papers in advance, authors will be invited to give highlights of their papers to attract as much discussion as possible from the audience.

If you wish to submit a paper please reply as soon as possible to: R. Britton, Functions Organiser, Hydrographic Society, Department of Land Surveying, North East London Polytechnic, Forest Road, London E17 4JB.

Hydrographic Society Appointment

The Hydrographic Society announces the appointment of Mr. George Edney as Executive Secretary.

A former General Manager of the Port of Bristol Authority and previously with the Port of London Authority, Mr. Edney was a part-time member of the Milford Haven Conservancy Board for a number of years. He was also formerly Chairman on the Executive Committee of the Dock and Harbour Authorities Association, as well as being a Director of the International Ports and Harbours Association.

Mr. Edney's appointment coincides with the increasing national and international activities of The Hydrographic Society, whose administrative headquarters are based in London. He will be responsible for developing the Society's planned growth, as well as co-ordinating its principal executive functions.

Mr. Edney assumes his appointment on 1 January 1979.

New Staff Appointment at the Bureau

In response to Circular Letter 16/1978 there were 14 applications for the post of Professional Assistant (Editorial) at the IHB which became vacant on 23 June 1978. The duties of this post were extended to include technical projects arising from decisions of the Organization. By specifying 10 years' hydrographic experience as one of the qualifications, the Directing Committee hoped to strengthen the technical capability within the Bureau.

A number of the candidates were highly qualified and, after a very careful study of their records of service and qualifications, the Directing Committee is pleased to announce the selection of Commander N.N. SATHAYE.

Commander SATHAYE, who is 48 years of age, has had long experience in hydrography since he joined the Hooghly River Survey in 1950. In addition to passing various departmental examinations, he obtained a Certificate of Merit from the Coast and Geodetic Survey after a period of training in the U.S.A. during 1958.

SATHAYE was sent to Singapore in 1970 as an Expert in Hydrography under the Colombo Plan. Except for a short break in 1973 when the Colombo Plan contract terminated, he has remained as Singapore's first Hydrographer to the present date. He takes up his duties at the Bureau on 12 February 1979.

During the period of vacancy of this post, the editorial duties have been carried out most competently by Mme M.-R. BRESSET, of the Bureau's staff.

Geometronics '79

A series of four seminars organized and directed by Humber College of Applied Arts and Technology in cooperation with the:

Canadian Institute of Surveyors
Canadian Hydrographic Service
Canadian Hydrographers' Association
and the Ontario Land Surveyors

I. HYDROGRAPHY
May 7 - 11, 1979
Toronto (Canada)

II. SONAR WORKSHOP
May 7 - 10, 1979
Toronto (Canada)

III. LAW OF THE SEA
May 14, 1979
Ottawa (Canada)

IV. CONTROL SURVEYS (MANOR PROGRAM)
May 28 - June 1
Toronto (Canada)

For further information, contact:

Conference & Seminar Services
Humber College of Applied Arts & Technology
P.O. Box 1900
Rexdale, Ontario M9W 5L7

(416) 675-3111

Letters to the Editor

Sir, --- Internav have a full-page ad for their Loran-C Coordinate Converter in last November's LIGHTHOUSE which rather gives the impression that the Coordinate Converter does away with the need for a chart.

These coordinate converters, including the Nav. Boxes we use in hydrography, are extremely useful in steering cross-pattern lines, and a great convenience in calculating positions instead of plotting continuously. However, they do conceal some traps that the operator must be aware of.

First, they do not show up bad fix geometry. Taking an example from the extended Pacific Coast Loran-C chain, which will shortly have a Z secondary at Port Hardy, Vancouver I.: a mariner bound from Vancouver to Prince Rupert could easily set up his coordinate converter on TD(Y) and TD(Z) at Vancouver, and use it to round the dangerous Triangle I. at the north end of Vancouver I., oblivious of the fact that he had no fix there because he was on the M-Y baseline extension.

Second, coordinate converters generally do not show cycle skips, which can be detected by regular plotting.

Third, they cannot account for changes in navaid errors, such as the overland error (ASF) of Loran-C. I have just worked out a cautionary case of a fisherman using the future Loran-C chain on the Atlantic Coast, which will have Caribou as Master and Nantucket and C. Race as secondaries. He adjusts his coordinate converter to give the correct Lat., Long. at Country Harbour, near Canso, N.S., and sets off for Sydney, 100 miles up the coast. It happens that along this track the overland path from Nantucket increases from being all over-water, to travelling the full length of Nova Scotia, while at the same time the proportion of land on the path from the Master decreases. The net effect is to increase the ASF by 2 1/2 µs by the time the fisherman approaches Flint I. on the way in to Sydney. The lattice on the charts will be warped to allow for this ASF change (using the results of our recent calibration), but the coordinate converter doesn't know about it. Since the effect of the 2 1/2 µs error is to move the position line 1000 m to seaward, the coordinate converter will calculate a position 5 cables further offshore than the true position, and if he is cutting it fine and isn't watching his radar the fisherman could easily run aground on Flint I.

I welcome Internav's advertising in LIGHTHOUSE. I know that their Coordinate Converter is a very useful piece of equipment, and I expect that their users' manual explains the precautions to be taken. I just want to stress that the user should always be aware of what lies behind those confident-looking figures on the nixies of a Nav. Box.

R. M. Eaton
Canadian Hydrographic Service
Atlantic Region
Dartmouth, N.S.

Sir--- I think we all agree with Mike Eaton that the user of <u>any</u> box should always be aware of what hides behind its display numbers; and this is, of course, the reason our CC-2 Internavigator Operators Manual has 41 pages in it, compared to the single page of our Lighthouse advertisement which, incidentally, we are running again in this issue. But Mike raises several points, and I will deal with each in turn.

First, I would like to state categorically that Internav does not feel that the Internavigator does away with the need for charts. What we do say is that with such a device, the lack of an appropriately scaled, latticed, chart in an operational area need no longer be the limitation it once was.

There's an important difference here and, in fact, no one would be more pleased than I if Canada and U.S. waters, and for that matter the rest of the world, were charted to the N^{th} degree. Unfortunately, the sad truth is that the present lack of latticed charts is severely hampering the use and acceptance of Loran C for fishermen and other commercial users for whom the system is primarily intended.

What the CC-2 permits is operation in an area serviced only by a standard nautical navigation chart showing just latitude and longitude lines. In such an area, a conventional receiver would be thoroughly unusable but at the same time - due to its overall sophistication and cost - the vast majority of our users will not purchase a CC-2.

Therefore, we feel quite strongly that latticed charts are still highly important. Actually, it is my feeling that any announced operational dates for Loran C chains are largely meaningless unless latticed charts are available to users on that date. I hope this underlines the fact that we, at Internav, are not attempting to do away with charts. We are merely providing a means for using the system when latticed charts are not available.

Now let me address first the problem of bad fix geometry. It is stated that an operator sailing from Vancouver to Prince Rupert would be oblivious to the fact that fixes in the vicinity of Triangle Island would be unusable because he was on the MY base line extension. This is theoretically correct. All Loran C receivers, however, have standard deviations on the order of 20 to 100 nanoseconds depending upon various factors. Internav's are no exception. This standard deviation reflects itself immediately as a standard deviation in latitude and longitude. When in good coverage, a standard deviation of latitude, for example, would be on the order of two to ten seconds of arc or 20 to 100 feet, but in the vicinity of base line extensions, the same receiver errors would cause latitude variations measured in miles, not feet. It will appear to the operator that his position fixing capability has dramatically deteriorated.

I do concur with Mike that co-ordinate converters do not show cycle slips - these can only be detected by regular plotting. I would like to add, however, that on many occasions Loran C receivers do not show cycle slips either. It is the regular plotting which can show up the cycle slips under worse case conditions. But one can plot a latitude/longitude output just as readily as a time difference output. It doesn't matter whether the operator is plotting Loran C time differences, latitude and longitude generated from Loran C time differences, lanes from a Decca receiver, latitude and longitude generated by a satellite navigation system, or lanes provided by an Omega system. It is the decision to plot that counts and it is the deviation of the ships path on the plot due to an abnormality which provides the warning. I might further add that when cycle slips occur within specified Loran C coverage, they generally result in warning indications on the receivers. In our case, these are also transmitted to the CC-2, and cause a warning light to be illuminated on its front panel.

I do concur with Mike's caution about using the system in new areas, and the CC-2 has the capability for putting in corrections for local anomalies of the type described. Our operators handbook describes the requirements for these corrections and the types of errors that can result. But I feel that Loran C ASF correction is an area where Government and industry can come together.

The co-ordinate converter is a new piece of equipment for the fisherman, which provides many functions he would not otherwise have, such as the ability to punch in a number of waypoints and get steering and distance information. But we need to be able to tell him the value of the corrections for the various local areas, and these will probably be available from the data taken during chain calibrations. I would hope that in the future this information could be provided to fishermen who use co-ordinate converters. One day it should be possible to include the corrections within the memory of the computer.

My feeling is that at Internav, we are definitely breaking new ground with this device. In the past, there have been problems when we moved from one system to another, such as from Loran A to Loran C or from Decca to Loran C. Some day, there will be a difficult transition from Loran C to whatever, perhaps satellite navigation.

However, I am convinced that all future navigation systems will have latitude and longitude as their primary output rather than time difference numbers or lanes and parts of lanes, because of the dramatic price breakthroughs coming with very large scale integration (VLSI).

I can still remember an airborne version of our CC-2 I helped design 14 years ago. Then, it cost $70,000: today the CC-2 costs $4,500. Tomorrow, a precision latitude/longitude system will probably be available to even small lobster boats.

If mariners in general switch to the latitude and longitude grid system now the future transition to the next navigation system will be far easier.

John M. Currie
President
Internav
Sydney, N.S.

Guess the Location

This rather imposing looking tide gauge tower was installed in the year 1940 to determine whether differences in tidal levels existed between a sheltered harbour location and an offshore location outside the harbour. Is there anyone out there who knows the location? Clue: north of 50^{o}. Answer on page 23.

News from C.H.S.

Departmental Name Change

The Canadian Hydrographic Service has had many departmental homes during its long and distinguished existence, and has just moved to a new one. Sections of the Government Organization Act 1979 were proclaimed April 2, 1979 establishing the Department of Fisheries and Oceans, of which the Canadian Hydrographic Service will form part. The Honourable Romeo LeBlanc has been sworn in as first Minister of the new department and Mr. D. D. Tansley appointed as Deputy Minister.

1979 Training

The classroom portion of Hydrography I this year ran from Jan. 23 to Mar. 29 in Ottawa. Taking the course were: Bill Van Duin (Pacific); Phil Elliott, Jon Biggar and Lorne Perkins (Central); Dave Stewart (DOT, Halifax); Christian Idigo (Nigeria); and Cliff Chaulk (DND, Ottawa).

The field portion of Hydrography I will be held in April, May and June using the Patricia Bay facilities of Pacific Region as a base of operations.

A drafting course held Feb. 19 to Mar. 16 in Ottawa was attended by Al Gris and Hermo Nepomuceno of Central Region to complete Cartography I requirements.

PRANS Evaluation

Intended to assist large vessels in moving safely and efficiently through confined channels the Precise Radar Navigation System (PRANS) is built by Associated Controls and Communications Incorporated, Lynn, Mass. System accuracy is attained by using a highly accurate clock and a unique pulse detection technique. The system can be interfaced to existing radar systems and uses passive reflectors as shore stations.

The Dominion Marine Association is interested in the potential of the system to improve production, capacity and safety of operations on the St. Lawrence Seaway, and have awarded a contract to ACCI for the production of one system to be evaluated on the Seaway this summer.

Also involved in the evaluation will be Transport Canada; the St. Lawrence Seaway Authority; the National Research Council, and the Canadian Hydrographic Service, Central Region. Horizontal control for the on-shore reflectors was established by Central Region, C.H.S. in April, 1979. C.H.S. will also be involved in the accuracy tests in July and August.

Initial testing will involve the Dominion Marine Association vessel "*ROSEMARY*" and, later in the summer, a lake carrier.

TATS Units Installed in Permanent Gauging Stations

The Tidal Acquisition and Telemetry System (TATS) is a microprocessor-controlled data logger designed by the Tidal Instrument Development Section of C.H.S. in Burlington specifically for permanent gauging in both tidal and non-tidal waters, and is manufactured by Canadian Applied Technology in Buttonville, Ontario.

Five TATS units have been installed in Central Region gauging stations for approximately 6 months on test and, except for some minor software and hardware problems, have performed well. These units have now replaced existing instrumentation which stored data on punched paper tape and transmitted the stored data on command via Telex terminals. Whereas the existing units could transmit the data only once and only to a central location, the TATS units will transmit data over telephone lines to any user having a data terminal, an acoustic coupler and the proper access commands.

Central Region, C.H.S. will have an additional ten units installed this summer at stations on the Great Lakes and St. Lawrence River. Atlantic Region and Pacific Region will each have 3 units installed soon, and Pacific Region is also using TATS in a tsunami warning application.

Semi-Automatic Scaler Large Success

The prototype of the Semi-automatic Chart Scaler developed in the Atlantic Region underwent tests during the past survey season. The results were excellent. It was found that one man operating the scaler was able to do as much work as two men scaling by hand. Additional time was saved because tidal reductions were applied directly.

The scaler has a cursor which is manually set on the graphed sea-bottom. By pressing the 'Fix' foot pedal the depth is recorded as a sounding at the fix. By pressing the 'READ' foot pedal a sounding is indicated between fixes. A keyboard is used to indicate missed soundings, buoy fixes and circle fixes. The keyboard also has facilities for setting the transmission mark and editing. The scale is presently set up for the EDO 9040 sounder, incorporating all of its phase changes and meter/decimeter modes.

The semi-automatic scaler is interfaced with an HP 9815A calculator. The calculator supplies software for scaling, editing, listing, correcting for bar check and applying tidal reductions. All depths are stored on a tape cartridge. Accessing the files produces a paper tape listing of the data.

Field personnel were extremely pleased with the capabilities of the machine but also suggested a few changes. The hydrographic development staff have been busy this winter incorporating these improvements. One scaler has had all corrections made and it is presently undergoing tests. Three others will be ready for the '79 season.

Thinking Pays

The Federal Government Suggestion Award Program recently paid off handsomely for Mike Woods of Pacific Region. Last field season he solved the age-old problem of efficiently plotting range-bearing soundings during collection so that no time has to be spent plotting after the days' work. The idea is simple enough - a protractor with a single, moveable arm, with holes spaced every 5 mm along the moveable arm and the main body of the protractor cut away to allow plotting within the circumference of the protractor.

In the field, the operator tapes the protractor, centred over the main station and zeroed through a reference station, to a boat. As each angle is taken the arm is set on the angle and the pencil placed through the appropriate range hole marking the boat board. This will make range bearing sounding as simple as sextant sounding where at the end of the day all fixes are plotted and reading off the roll can commence immediately. A good hydrographer could even read off the number of soundings between fixes during the day. Pacific Region is having some of these plotters manufactured and hopes to distribute some to other Regions to try out.

Canadian Hydrographic Conference Proceedings

Copies of the Proceedings of 1977 and 1978 Annual Canadian Hydrographic Conference are still available. The 1977 proceedings may be obtained by writing to:

The Editor
LIGHTHOUSE
c/o Canadian Hydrographers' Association
P.O. Box 5050
867 Lakeshore Rd.
Burlington, Ontario L7R 4A6

The 1978 proceedings are available from:

R. W. Sandilands
Chairman, Publications Committee
17th Annual Canadian Hydrographic Conference
Institute of Ocean Sciences
Patricia Bay
P.O. Box 6000
9860 West Saanich Road
Sidney, British Columbia V8L 4B2

The price is $10.00 Canadian, postage paid. ($6.00 to members of the Canadian Hydrographers' Association.) Payment by cheque or money order should be made to the Canadian Hydrographers' Association.

News from Industry

M. S. E. Opens Maritime Office

M.S.E. Engineering Systems Ltd. have announced the opening of a Maritime Regional Office effective December 23, 1978. The address of the new office is:

M.S.E. Engineering Systems Ltd.
59 Riverside Drive
Lower Sackville, Nova Scotia
B4C 1C2
Telephone: (902)865-9310

M.S.E. also have announced the appointment of Mr. Ted Corbett as Manager, Maritime Region. Mr. Corbett brings with him a background in managing instrumentation and operations at the Atlantic Geoscience Centre, high power transmission and ionospherics with the U.S. Defence Communications Agency, and military electronics with the Canadian Armed Forces.

Klein Side Scan Successful at over 6,000 Foot Depths

For over two years the U.S. Navy's Submarine Development Group I, San Diego, California, has been successfully operating KLEIN SIDE SCAN SONARS on various missions to over 6,000-foot depths.

On separate operations, Klein's Side Scan Sonar Towfish were towed up to:

6,800 feet to locate various targets including an aircraft and other debris,

5,000 feet to locate an old sunken submarine.

5,000 feet to locate special targets (actually found at 1,800 feet).

Some of the located targets were 1 to 2 feet in span.

Various weights from 500 to 1,000 pounds were used to help depress the tow cable. Cable lengths ranging from 8,000 feet to 15,000 feet were used on separate missions.

Klein's standard Side Scan Sonar Towfish are rated to 7,500-foot depths and are often used in deep operations as noted above. Special towfish rated to 20,000 feet have recently been tested and are available on special order.

CHA Personal Notes

Atlantic Branch

Joining the cartography unit this year were *Alex Hantzis*, transferred from Ottawa, *Jim Ross* and *Charles Legasse* (who recently completed Cartography I); *Charles O'Reilly* is a new addition to the Tidal Section; *Gunther Schutzenmeier* was seconded to Ottawa for training on Step I; *Mike Eaton* and *the navigation staff* co-ordinated a 3 day introductory Loran-C/SATNAV course for 80 people from B.I.O., local fisheries, DND and MOT; *Steve Forbes* has won a position as CS-2 with Hydrograpic Development.

Ottawa Branch

John Cooper, who retired from his position as Maritime Boundaries Officer last December, is being employed on contract to provide continuity until his successor is named; *John O'Shea* returned to the Planning Unit on Jan. 1 after a one year assignment as Acting Regional Hydrographer in Quebec Region; *E. Belec* left C.H.S. at the end of March for a position with Geodetic Survey of Canada; *Don Vachon* joins C.H.S. in May filling the vacant engineering position; *Elizabeth Levey* joined C.H.S. in Feb. replacing *Danielle D'Aoust* who was promoted to 240 Sparks St.

Central Branch

Reg Lewis has returned to Burlington after a one year assignment in Ottawa and will head the St. Lawrence survey in the Gananoque area this summer; *Pete Richards* left Burlington early this year to take up the position of Chief Training Officer in Ottawa; *Don Knudsen* has also left C.H.S., heading for greener pastures with the Canada Centre for Remote Sensing in Ottawa; the deep sounding Central Region string band of *Ray Chapeskie*, *George Macdonald*, *Rob Tripe* and *Brian Tait* may be heard at the IHTC and CIS conferences this May - give those boys a big hand.

Pacific Branch

Kal Czotter, *Dale Wood* and *Rainer Shoenrank* successfully completed the Hydrography II course last fall; *Reg Pierce* and *Peter Morton* returned from Ottawa after passing their Cartography I course; *Bill van Duin* is currently on Hydrography I course; *Stan Huggett* and *Bill Crawford (*Tides and Currents*)* returned recently from the PARIZEAU oceanographic FGGE cruise on the equator with fine tans having missed what passes for winter in Victoria; new staff in the Region are *Dave Harrison*, Supervisor of Chart Corrections and *Susan Huggett*, Technical Records; Pacific Region assignments for the 1979 field season will see *Barry Lusk* in charge of a survey party working in Laredo Sound and Harrison Lake; *Graeme Richardson* going to Seymour and Belize Inlets and Pitt Lake; *Jim Vosburg* will be back in the Queen Charlotte Islands at Masset Inlet onboard C.S.S. RICHARDSON and *Vern Crowley* on the Mackenzie River with the charter vessel RADIUM EXPRESS; *Tony Mortimer* will be continuing Loran-C calibrations and latticing; *Tony O'Connor* will be on the course faculty for the Humber College Sonar Workshop in Toronto in May.

The Great Football Caper

Every November, rain, snow, frost, or sun, Pacific Region hosts the Challenge Bowl, the "touch" football game between traditional rivals, the Electronics Technicians and the Hydrographers. In 1978 superior training and organization on the part of the Technicians paid off in a defensive battle which saw them triumph 2-0. Some say they cheated - bringing in ringers etc., but it was their uniforms that did it. The photo shows offensive captain of the Hydrographers Tony "sore-foot" O'Connor presenting the Challenge Bowl to Bill "the lout" Hinds defensive captain of the Technicians, at a luncheon held in December.

Pacific Branch Luncheons

Sandy Sandilands was guest speaker at a C.H.A. sponsored luncheon in December. An excellent turn out of about 40 were treated to a fascinating dissertation on hydrographers past. The theme of Sandy's talk gave us all a brief look at some of the research he has been doing on the History of Hydrography in Canada.

Former Hydrographer and now instructor at the B.C. Institute of Technology, Don Jarvos, was the honoured guest at a C.H.A. Luncheon held in February. Don's topic, "Survey Education - Back-sights and Foresights", was very well received and very enlightening. The survey community of the western provinces has seen the need to set up a survey engineering degree program and Don's talk presented a good insight into how the education system will likely set up such a program and the effect it will have on producing the right balance of engineering and technologists required by industry in future.

R. C. Melanson Retires

R. C. (Russ) Melanson, Regional Hydrographer, Atlantic Region, retired on December 28th of last year after a long and colourful career with the Canadian Hydrographic Service.

Russ joined CHS in April, 1948 taking part in surveys of the Atlantic Provinces, Sub-Arctic, High Arctic and the west coast for 16 consecutive seasons. Many of the establishments with which he served are long gone - either retired, sold or sunk. Some of these were the C.H.S. Kapuskasing, C.H.S. Acadia, C.H.S. Henry Hudson, M.V. Terra Nova, C.H.S. Cartier and the M.V. Theron.

His first assignment as HIC was on the C.H.L. Anderson in 1953. Following this assignment he was given charge of the C.H.S. Cartier, M.V. Arctic Sealer, C.S.S. Baffin and the C.H.S. William J. Stewart.

In 1963 Russ transferred from Ottawa to the Atlantic Region. He was appointed Regional Hydrographer, Atlantic Region in 1964. He held this position until his retirement last year.

Prior to his leaving Russ was honoured at a C.H.A. party. He is shown on the right below receiving from Steve MacPhee one of the many gifts presented to him - a Canadian Hydrographic Service Crest.

The memory of Russ Melanson will remain forever with all those associated with him. His was a time of change within the hydrographic service. The pioneering efforts of Russ and his contemporaries are and always will be an inspiration to the younger hydrographers of today.

> *"A fair breeze blew, the white foam flew,*
> *The furrow followed free*
> *We were the FIRST that ever burst,*
> *Into that silent sea."*
>
> *The Ancient Mariner,*
> *S.T. Coleridge*

We are on the Map!

The "B" event was won by Barry Little's rink.

H_2O Bonspiel

(From left) Marg Chapeskie, Geoff Thompson, Peggy Sinclair, and Barry Little.

Local curlers gathered at the Humber Highland Curling Club on Jan. 20, 1979 to participate in the 8th Annual H_2O Bonspiel sponsored by the Central Branch of the Canadian Hydrographers' Association.

At the banquet following the bonspiel, Ray Chapeskie, CHA Vice-President for Central Region, presented the winning teams with trophies and prizes.

After an afternoon of highly competitive curling, the rink skipped by Guy Paquette emerged as winners of the "A" event.

(From left) Paul Warren, Carla Covey, Brian Power, and Guy Paquette.

Donations for the bonspiel were gratefully received from the following companies:

- Canadian Applied Technology, Buttonville, Ont.
- W.T. Chatham Associates Ltd., Hamilton, Ont.
- C-Tech Ltd., Cornwall, Ont.
- J.H. French & Co. Ltd., Hamilton, Ont.
- Marinav Corporation, Ottawa, Ont.
- Marshall Macklin Monaghan Ltd., Don Mills, Ont.
- Motorola Military and Aerospace Electronics, Willowdale, Ont.
- Port Weller Dry Docks Ltd., St. Catherines, Ont.
- Rapid Blue Print Ltd., Hamilton, Ont.
- Wild Leitz Canada Ltd., Ottawa, Ont.

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Correction

In the November, 1978 issue of LIGHTHOUSE, on page 13 (yes, page 13), the name of the Town of Sidney was incorrectly spelled as Sydney in the title for R. W. Sandilands' article. The editor's apologies go out both to Mr. Sandilands and to the people of Sidney for this error.

Guess the Location

A tidal survey was carried out in 1940 to determine whether the permanent gauge located in Churchill Harbour recorded tidal times and heights that were significantly different from those outside the harbour in Hudson Bay. The structure shown in the picture on page 17 was erected outside the harbour at Sandy Bay, 1.5 miles (0.5 km) south-east of Cape Perry. It operated from July 28 to September 1st when, presumably, it was destroyed. The data obtained did not resolve the mystery and the question is debated to this day.

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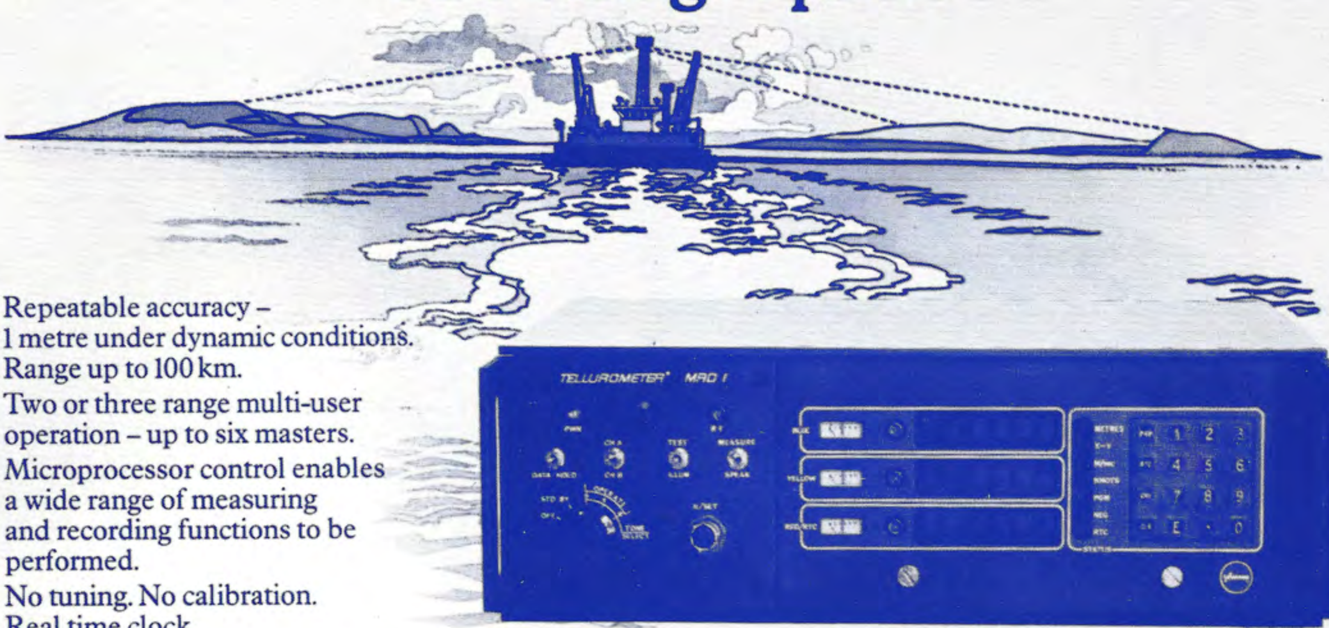

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