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THE NAVY

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OCEANS

WHAT THEY MEAN TO US

FOR centuries the oceans of the world have provided mankind with transport and food.

Yet, until a few months ago, mankind had never more than scratched its surface.

Certainly, man has charted and recorded those parts of the ocean where his ships could go, with safety, but with ships getting larger every year, the necessity for developing new ports, this work gets more important every year.

Surveys have been carried out to discover fish resources, and as a result, catches of fish and whales have been limited.

But with populations increasing rapidly, man is, for the first time in history, by means of oceanographic surveys, endeavouring to discover the true food potential of the oceans.

It is pleasing to record that the Australian Government has recognised the value of this research, and that ships and men of the R.A.N., and scientists of the C.S.I.R.O., are keeping Australia well to the fore in this vital work.

ELECTRONIC AIDS FOR THE SURVEYOR

Commander J. H. S. Osborn, Hydrographer, R.A.N.

JUST as a new era in Hydrographic Surveying began with the introduction of the Echo Sounder in the 1930s, so is another new age beginning with the development of position fixing systems suitable for the surveyor.

Until recent years, the surveyor had to fix his position within sight of land by horizontal sextant angles to suitably placed objects on shore. His operations were very dependent on the visibility, and frequent interruptions because of rain or haze were accepted as inevitable. When out of sight of land he was forced to lay floating beacons. If near the coast, these could be fixed with reasonable accuracy, but this declined with his distance off the coast. A floating beacon could not be anchored so that it did not move relative to its mooring, and the accumulation of these errors reached undesirable figures.

Modern systems have eliminated the interruptions due to bad visibility, and have increased the accuracy of offshore surveys.

There are several electronic systems on the market for position fixing. The Royal Australian Navy Hydrographic Service has chosen a system known as "Lambda," for fitting in two of its ships. The gear consists of one unit known as the "Master," which is carried in the ship, and two units known as "Slaves," which are set up in selected positions ashore. This equipment gives the ship continuous ranges of the two shore stations, and thus the ship knows her position accurately and instantaneously. Since the range of the equipment is in excess of two hundred miles, areas with a complicated bottom topography can be investigated with ease and accuracy, even if they are far off-shore.

H.M.A.S. BARCOO is at present fitted with this equipment, and H.M.A.S. WARREGO will be fitted early in 1961. The first areas planned to be surveyed by LAMBDA include Spencer's Gulf, the south-west coast of Victoria, and part of the Great Barrier Reef. Many other areas around Australia, which have presented great difficulty to the surveyor, now become comparatively easy tasks.

In another, but not so obvious, way electronics have come to the aid of the Hydrographic Surveyor. In any survey adjacent to land the surveyor has had to fix his shore marks by triangulation. This has entailed immobilising the ship while detached parties carry out the bush work involved in establishing a series of trigonometric figures, sometimes far inland. This work is vastly reduced by the Tellurometer, a portable electronic distance measuring device. Lengths of sides of figures up to thirty miles in length can be measured with greater speed and accuracy than could be achieved by the laborious conventional methods of triangulation.

The task ahead of the Australian Hydrographic Service is formidable. Due to economic and other factors since World War I, the charting of Australian waters is not as far advanced as it should be. All New Guinea and about half Australia lies in waters where coral flourishes, and this calls for close examination by the surveyors. There is probably no nation in the world which has a larger charting task than Australia, with its wide continental shelf and its intricate waters.

To survey this vast area the R.A.N. Surveying Service has had generally the services of one major surveying ship. In contrast, it might be mentioned that Australia's sister Dominion, Canada, employs six major ships and eleven minor surveying vessels. The largest Canadian ship, BAFFIN, is only three years old, with a tonnage of 3,700 tons. In Australia, WARREGO, now almost 20 years old and in continuous commission, is a sloop of little more than one thousand tons.

With the resources that Australia has been able to afford in the past and the resources she will be able to afford in the future, it is essential that Australian Hydrographic surveys be carried out as efficiently as possible, and to achieve this, electronic aids must be fully used.

HYDROGRAPHERS CONFER

The Hydrographer of The Royal Australian Navy, Cdr. J. H. S. Osborn (right), discusses with Cdr. J. Schofield the amount of survey work which still has to be done. It is estimated that it will be at least 25 years before the Australian coastline will be well charted.

AUSTRALIA'S OCEANOGRAPHICAL SURVEYS

By G. F. HUMPHREY, M.Sc., Ph.D.,

Chief, C.S.I.R.O. Division of Fisheries and Oceanography, Cronulla.

THE C.S.I.R.O. laboratory in Cronulla was founded in 1938 to study the fisheries of Australia. It was thought that pelagic fisheries for fish such as tuna and pilchards might be started and that the production of the existing fisheries might be stabilised if scientific information were available. Fluctuations in catch and in availability of stocks are not conducive to a stable industry. It was realised from the start that it was not enough simply to examine the fish. It was also necessary to study the environment in which the fish lived. Thus oceanographical investigations were planned, but owing to the war, it was not possible to carry them out until the early 1950s, and then only in a minor way. The limiting factor was always availability of ships. It was not until 1959, when the R.A.N. refitted DIAMANTINA and GASCOYNE as oceanographical vessels that Australia was able to carry out an extensive deep-sea series of investigations.

C.S.I.R.O.'s own vessels (85-ft. WARREEN and 72-ft. DERWENT HUNTER) worked in the Coral and Tasman Seas, Bass Strait, the Great Australian Bight, and the Indian Ocean. Apart from one cruise to Noumea and one to New Zealand, the work was within a few miles of the coast. Without an oceanographical laboratory on board and with speed limited to 6 knots, the scientific work done was very limited. Nevertheless, many valuable results were obtained. For example, it was shown that barracouta congregated at the edge of the water masses moving through Bass Strait rather than at the places where fish food was found.

The Naval frigates with their well-equipped laboratories and speeds of 15 knots, have enabled C.S.I.R.O. to extend the areas of observation and the types of work done. The cruises so far carried out have been exploratory to define the interesting areas and problems so that intensive studies can be planned for future cruises.

H.M.A.S. DIAMANTINA has already made three cruises: Dm 1/59 was a run from Sydney to Perth when oceanographic gear was tested and modified for use on the ship; Dm 2/59 was a long cruise from October 11 to November 9 from Fremantle to Onslow to Cocos Island to Onslow. Then followed a series of east-west lines in the Indian Ocean. Dm 1/60 from February 2 to March 23 continued the lines of Dm 2/59 south of Fremantle, and did two lines south of the Great Australian Bight between Fremantle and Adelaide. One interesting finding on these cruises is that the euphotic zone (the area where both plants and animals live and grow) extends as far down as 80 fathoms. This is much deeper than in the Tasman Sea (50 fathoms). Another finding is that in about 500 fathoms and south-west from Perth, there are internal waves with amplitudes up to 600 ft. There were smaller waves (60-80 ft.) at about 20°s.

In the Pacific Ocean, H.M.A.S. GASCOYNE has made two cruises: G 1/60 left Sydney on February 2, travelled to the north of New Zealand, thence to Fiji, north-west towards the Solomons, south to Noumea, and returned to Sydney on March 8. Cruise G 2/60 left Sydney on March 17, travelled to Port Moresby, Manus Island, Kavieng, Rabaul, and returned to Sydney on April 21.

On these cruises it was found that the deep water in the

Coral Sea basin is supplied from the south, while that in the Planet Trench and the Solomon Sea basin comes from the central Pacific Ocean. It seems also that just near the thermocline (the depth at which a clear abrupt change in temperature may occur), there is a quantity of suspended matter, and this makes the water very turbid.

A new series of cruises is now being planned. Dm 3/60 in July-September will work as far as 95° W., and then return to examine an area of upwelling off the north-west Australian coast. Dm 4/60 will work a line of stations to 85° W., and Dm 1/61 will investigate upwelling in the Arafura-Timor area. The process of upwelling is a very interesting and important one, and is caused by wind action and the resulting movement of water from 200-300 m. to the surface layers. It usually brings nutrient salts to the surface so that phytoplankton and zooplankton (the plants and animals that form fish food) grow in good quantity. The Humboldt current along the west coast of South America, with its profusion of life, an area on the west coast of California, with its enormous catches of sardines, and another on the west coast of Africa, with its pilchard fishery, are well-known areas of upwelling. It is not yet known whether the north-west Australian area is as prolific as these, but fish have been caught there for some years.

Until the population of Australia increases very greatly, the demand for fish will not be enough to stimulate the development of a fishery so far from markets. Other countries are interested in the possibility of securing fish supplies there, because they are short of protein, and fish is an excellent source of this type of foodstuff. In order to assess the productivity of the area and to provide for the proper management of any fisheries which might develop, it is important for Australia to commence work now. On these cruises there will be studies made of the nutrient salts in the water, the amount of fish food and the movements of the water masses.

On the east coast of Australia, Cruise G 3/60 will be in November and December, and will be specially designed to develop methods for adding radioactive substances to water samples collected at about 50 fathoms, without bringing the samples to the surface. It is also planned to investigate the origin and nature of the particles causing the turbidity near the thermocline. It is hoped that G 1-2/61 (January-March) will be cruises in collaboration with France and New Zealand as part of a "Tasmapac" investigation on the oceanography of the Coral and Tasman Seas. In 1958, scientists from the Institut Francais d'Oceanic in Noumea and the New Zealand Oceanographic Institute met in Cronulla to discuss with their Australian colleagues how the three countries could co-operate to make their work more valuable. In June there will be another meeting in Wellington to decide if joint cruises by several vessels can be arranged. These joint cruises will be called "Tasmapac."

THE FUTURE

What of the future? The oceanographer sees the possibility of causing artificial upwelling by moving deeper water to the surface with the heat generated by small atomic reactions submerged in the ocean. The benefits we now get from natural upwelling would then follow in areas that we chose. Electricity has already been used experimentally for sea fishing, and the development of "fish farms," using electrical barriers, may become commonplace.

All of these advances require detailed oceanographical information if the most suitable areas are to be selected. Australian oceanographers are now accumulating this information largely through the co-operative programmes of the Royal Australian Navy and C.S.I.R.O.

NEW HYDROGRAPHER FOR ROYAL NAVY

A NEW hydrographer for the Royal Navy has been appointed. Captain Edmund Irving, O.B.E., R.N., is to succeed Rear Admiral Kenneth St. Barbe Collins, O.B.E., D.S.C., in July this year.

Captain Irving, who was born in April, 1910, has spent the greater part of his service in the Royal Navy with the Surveying Branch. The longest period he has spent away from hydrographic duties is three months, the time spent on the Senior Officers' Technical Course.

He has undertaken surveying work in all parts of the world, including the East and West Indies and the China Sea. After wartime duty off the N.W. coast of Scotland and Iceland, he went to the Red Sea in 1942 in H.M.S. ENDEAVOUR, and afterwards served with the Mediterranean survey unit preparing for the invasion of Sicily and Italy.

His first command was H.M.S. FRANKLIN in 1944, surveying captured ports from Cherbourg to Kiel, including the clearance of the Scheldt. He was awarded the O.B.E. for his services in this ship, and remained in her until 1946, when he went to Admiralty for duty in the Hydrographic department. He was twice Mentioned in Despatches for his war services.

From 1950 to November, 1952, he commanded H.M.S. DALRYMPLE on survey operations in the Persian Gulf, Zanzibar and the Mediterranean. In 1953 he became the first Commanding Officer of the new survey ship, VIDAL, and at the present is serving as Assistant Hydrographer and Superintendent of Charts.

During his time as Hydrographer of the Navy, Admiral Collins has led the inception of electronic methods of surveying, including the use of two-range Decca and the tellurometer, and also the hydrodist with the development of which he was particularly concerned. He has had great interest in the Falkland Islands survey and in the activities of the National Institute of Oceanography.

Lieut. HURST (right), Leading Seaman REESON and Snb-Lieut. PULLAR recording soundings in the chart-room of H.M.A.S. WARREGO.
—Photo courtesy "S. M. Herald"

SURVEYORS IN NEW ZEALAND

IN New Zealand, also, Navy surveyors are hard at work. How our sister dominion is progressing is described by Lieutenant E. L. Roberts, of H.M.N.Z.S. LACHLAN.

Until 1939, all hydrographic surveying in New Zealand except harbour surveys carried out by local authorities, was the responsibility of the Royal Navy. A plan for the re-charting of New Zealand was made in the middle thirties, and started by H.M. Surveying Ship, ENDEAVOUR, in 1937, but because of the outbreak of the Second World War, this was halted at an early stage.

At the end of the war, the Hydrographer was again approached, but with the backlog of work in other areas, he was unable to assist. It was, however, suggested that a New Zealand Hydrographic Service might be set up with aid from the United Kingdom and Australia, to produce charts of the New Zealand coast.

A senior surveying officer was lent by the United Kingdom hydrographer to take charge of the surveying service, and with the aid of officers loaned from both the Royal Navy and the Royal Australian Navy, a nucleus of Royal New Zealand Navy surveyors was trained. As their training was completed, the dependence on overseas officers was reduced and with the appointment of Commander W. J. L. Smith, D.S.O., to LACHLAN as commanding officer at the end of January, the service became entirely Royal New Zealand Navy.

The ships employed by the Director of Hydrography are LACHLAN, an Australian-built River-class frigate, and the two 72-foot surveying motor launches, TAKAPU and TARAPUNGA. In accordance with tradition and international agreement, these vessels are painted white over-all with buff masts and, in LACHLAN'S case, buff funnel.

LACHLAN differs from the other frigates of her class in that her armament has been removed; she has a large chart-room aft, and atop this the tall mast used to support her Two Range Decca aerial umbrella. Because of this mast she lays claim to be the only ship of the Royal New Zealand Navy with a mizzen.

She carries the two-echo-sounder equipped surveying motor boats, PENGUIN and PANDORA. Her other power boat, PUFFIN, can be fitted with a portable echo-sounder to help her larger cousins to carry out the inshore sounding. The ship herself is fitted with two echo-sounders, and her asdic is modified by a reflector plate and special recorder to enable it to be used to carry out very deep sounding.

TAKAPU and TARAPUNGA are harbour defence motor launches, sister ships of the Fishery Protection boats operating from Auckland. They are, of course, fitted with echo-sounders, and as they are commanded by surveying officers and a proportion of their crews are survey recorders, they are capable of operating with LACHLAN or undertaking separate small surveys.

The main coastal surveys of New Zealand were done by H.M. Surveying Ships ACHERON and PANDORA in the middle of the 19th century, and by H.M. Surveying Ship PENGUIN at the beginning of the present century.

With the exception of the work done by ENDEAVOUR, the coastal charts of New Zealand depended upon surveys dating from these times, with corrections to topography resulting from Lands and Survey Department surveys. LACHLAN began the work required to bring these surveys up to date in 1949. Soon after she commenced work she was joined in her long task by the two large launches.

The work has been progressing steadily. Since she began her service with the Royal New Zealand Navy, LACHLAN has been responsible for the production of nine medium scale coastal charts covering the areas from Wanganui via Wellington to Gisborne; from Banks Peninsula via Cook Strait nearly to Westport; from Bluff to Dunedin; and over 25 large scale surveys of harbours and anchorages.

In order that the ship's company might have some respite from the often severe weather conditions on the coast, it has been a policy in the past that LACHLAN should spend some six weeks of the winter in the Pacific Islands, undertaking such surveys as may be needed in New Zealand Dependencies and adjacent waters. Fiji, Samoa and Tonga have been visited for this purpose.

As well as regular surveys, there are investigations to be carried out. New Zealand's sea lanes must be searched for the vaguely reported and fixed rocks and shoals which abound

(Continued on page 26)

DIRECTOR OF NAVAL RESERVES

Captain W. B. M. Marks, C.B.E., D.S.C., R.A.N., who was recently appointed Director of Naval Reserves at Navy Office, Melbourne, after having served as Naval Representative, North America and Naval Attache at the Australian Embassy in Washington for two and a half years, has been in the Royal Australian Navy for 34 years. He is a graduate of the Royal Australian Naval College.

He had a distinguished record in the Second World War and in operations in Korean waters. As Captain of the Tribal Class Destroyer BATAAN for part of the Korean campaign he was awarded the D.S.C. by Her Majesty the Queen, and the Legion of Merit by the United States Government. He was awarded the C.B.E. for his work as chairman of the Joint Services Committee which made arrangements in Australia for the second atomic test at Monte Bello Island.

Before going to Washington in 1957 he was the Australian representative at the Commonwealth Naval Conference in England, and subsequently underwent the Senior Officers' Technical Course.

From 1954 until 1956 he was Director of Ordnance and Underwater Weapons. He has also held the appointment of Director of Training and Staff Requirements.

BIGGER SHIPS MAKE UP TO DATE SURVEYS VITAL

The new 40,000-ton liner Oriana, which, it is expected, will sail on her maiden voyage to Australia in December. Ships like the Oriana and Canberra, which will also join the Australian run in the near future, necessitate, because of their much deeper draught, that charts of the Australian coast where they will trade be kept right up to date.

AUSTRALIA'S DEBT TO THE ROYAL NAVY HYDROGRAPHIC SURVEYORS

By GEOFFREY C. INGLETON

(Author, "Charting a Continent")

THE first hydrographic surveyor from the Royal Navy to work in Australian waters was Lieutenant James Cook, who discovered the eastern coastline in 1770 and conducted a running survey of it in H.M. Barque, ENDEAVOUR.

None of Cook's work, except his nomenclature, has survived on the Admiralty charts today. In spite of great care to preserve this nomenclature, mistakes have occurred; for example: Cape Moreton was called **Morton** by Cook after the Earl of Morton. On Flinders' charts an "e" was added to the name and the mistake has existed ever since.

Cook was a hydrographic surveyor of long experience when he reached Australia, but many of his immediate successors in Australian waters were naval officers with a great zeal for discovery, but without the essential training in hydrographic surveying. The most noted of these was Matthew Flinders, whose exalted reputation depends mainly on his voyage in H.M.S. INVESTIGATOR, 1802-1803.

Only a small portion of Flinders' work survives on the Admiralty chart to-day and consists of some isolated lines of soundings in out-of-the-way waters, especially the Gulf of Carpentaria. Flinders' name, however, is kept before the public by the extraordinary number of place-names which were named in his honour or after members of his family. For some strange reason, almost every year, someone in Australia is inspired to name something after Matthew Flinders. The latest proposal is to name the new inner harbour at Port Kembla, the Matthew Flinders Harbour.

In 1814, following the publication of Flinders' "A Voyage to Terra Australis," the Admiralty issued a series of charts from Cape Leeuwin to Port Curtis, skilfully compiled and beautifully engraved by Aaron Arrowsmith, and based largely on Flinders' surveys. Aaron Arrowsmith was a noted cartographer, whose contribution to the charting of the Pacific has never been fully recognised in Australia.

An Australian, Lieutenant Phillip Parker King, R.N., was the next hydrographic surveyor to survey in Australian waters. His work was the most outstanding by the pioneers, and much of it still survives on the Admiralty charts, especially on the north-west coast of Australia. King also conducted a noteworthy survey along the coast of Chile, much of it in the region of the recent series of earthquakes.

Following that arduous survey, King returned to Australia to occupy in his private capacity, the position of authority on hydrographic matters in Australia. His advice was sought constantly, and some of his work was published locally in Sydney. He died, a Rear-Admiral, in 1856.

The voyages of Captain Francis Blackwood, R.N., in H.M.S. FLY, Captain John Lort Stokes, R.N., in H.M.S. BEAGLE, Captain Owen Stanley, R.N., in H.M.S. RATTLESNAKE, and Lieutenant C. B. Yule, R.N., in H.M. cutter BRAMBLE, all provided essential data, much of it exploratory surveys, which added greatly to the hydrographic knowledge of these waters. Most interesting narratives of the voyage were written by the officers and published in London, in the decade before 1850.

Following the discovery of gold in Australia, Captain H. M. Denham, R.N., arrived in H.M.S. HERALD, and proceeded to conduct a series of surveys, from 1853 to 1861, in many parts of Australia and the South-west Pacific. These surveys can be considered the beginning of scientific hydrographic surveys in Australian waters, and much of it survives on the charts to-day. With Denham were a number of young naval officers, who received an excellent training in hydrographic surveying. Many of them returned to Australia to conduct surveys for the various colonies.

Denham was instrumental in forming agreements between the Admiralty and the Australian Colonies to carry out the hydrographic survey of each colony's coastline, the expense of which to be shared by the Admiralty and the colony concerned. These important surveys commenced in the early 1860s, and continued until the 1880s. The Admiralty charts based on these surveys were used by mariners until the present day, and it is only recently that they are gradually being re-surveyed by the Royal Australian Navy Surveying Service.

From the 1880s until the beginning of World War I the Royal Navy maintained at least one, and for much of the time three, surveying ships in Australian waters. The names of the surveying ships, LARK, DART, PALUMA, MYRMIDON, FLYING FISH, EGERIA, RAMBLER, PENGUIN, WATERWITCH, FANTOME, and SEALARK, are well-known to mariners, largely because they feature in the titles of Admiralty charts and often because their name is attached to some notorious underwater danger. The work carried out in these vessels was, indeed, a notable contribution to Australia's hydrographic story.

One officer, who served for a very long period in Australia in these ships, is worthy of mention, an Australian, F. C. C. Pasco. He commenced his hydrographic surveys in Australia in 1889 as a Lieutenant in H.M.S. PALUMA. He finished them as a Captain in H.M.S. FANTOME in 1910. He then became Assistant Hydrographer, but disliking office work, he declined the opportunity of becoming Hydrographer. Unfortunately, this Australian officer of experience in hydrographic surveying was not available when the Australian Commonwealth Naval Board commenced its own Surveying Service in 1921.

China's Sub Fleet Grows

China is steadily acquiring warships and submarines, mainly from Russia. About 22 submarines were reported recently to be under the Chinese Communist flag. They have also acquired warships from Japan and even from the United States.

ROYAL NAVY SURVEYORS ARE BUSY, TOO!

The giant tankers now using the English Channel are making the Royal Navy take a second "look" at the seabed wrecks of ships of two World Wars.

BECAUSE of the increasing draughts of these large vessels, it is necessary that possible obstructions should be pinpointed on marine charts and the safety margin of water over them re-examined. A start was made in March in the Channel between Dover and Dungeness by H.M.S. SCOTT, a survey ship, commanded by Lieutenant - Commander D.E.P.D. Scott, R.N.

After the last war, Naval survey ships checked wrecks around the coast and those in important channels and likely to be a danger were afterwards depth-charged to give a clearance of at least 45 feet at low water by trawlers of the R.N. Wreck Dispersal Fleet, which was disbanded in 1958.

It is now considered, however, that there should be at least sixty feet over these wrecks in view of the size of the tankers built in recent years, and their whereabouts fixed accurately by the scientific equipment now available for this purpose.

H.M.S. SCOTT, based on Dover, is working in a busy area stretching south-westwards from the North Goodwins lightship to a point some 12 miles south of Dungeness light and including the Varne shoal. The work being undertaken by the ship is the first systematic survey of the area using modern echo sounding equipment.

There are some fifty to sixty wrecks, whose positions and depths may have changed, within the limits in which the SCOTT is being employed. Her task is likely to take some three months. The latest asdic will ensure that the wrecks are accurately fixed on future Admiralty charts, which are used by every maritime nation. By Oropesa and drift sweeping, the clearance above them will be measured and possible risks to shipping reported.

After their positions had been determined by survey vessels, hundreds of wrecks were tackled by the Wreck Dispersal Fleet after the war and effectively "buried" or broken up. Since 1958, Naval responsibility for the dispersal of dangerous wrecks has been taken over in the majority of cases by Trinity House.

Other survey ships of the Royal Navy will also have tasks this summer in the same part of the Channel. The East Coast of England Survey Unit, including the inshore survey craft ECHO, commanded by Lieutenant-Commander Richard Green, R.N., is going back to the Goodwins to finish work started there last summer. Operating out of Ramsgate, they will be concentrating on reported sand encroachment into the Gulf Stream.

EXERCISE SEALION

LARGEST SEATO EXERCISE HELD

FOUR Australian warships, including the carrier, H.M.A.S. MELBOURNE, have played an important part in the SEATO Exercise SEALION, just concluded.

The exercise was the biggest of its kind yet held by SEATO. More than 60 ships and 150 aircraft from all eight member nations took part.

MELBOURNE, with the Daring Class destroyers VENDETTA and VOYAGER, formed part of three carrier groups which protected a large convoy of supply ships moving from Manila to Singapore.

The three groups sailed from Manila on May 6, and in the South China Sea were joined on May 11 by a second smaller force of warships that had sailed from Bangkok on May 9. This second group included the Australian fast anti-submarine frigate, H.M.A.S. QUEENBOROUGH.

On the completion of the operational phase of the exercise, the ships of the combined SEALION Fleet entered Singapore Naval Base on Friday, May 13.

Command Rotates.

Rear-Admiral W. H. Harrington, C.B.E., D.S.O., Flag Officer Commanding the Australian Fleet and one of the three senior National commanders, is flying his flag in H.M.A.S. MELBOURNE. The other two are Rear-Admiral Joseph D. Black, U.S.N. (U.S.S. YORKTOWN) and the overall director, Rear-Admiral V. C. Begg, C.B., D.S.O., D.S.C., (H.M.S. ALBION). Throughout the exercise tactical command of the Force rotated among these three officers.

H.M.A.S. MELBOURNE was the only carrier in the exercise with both anti-submarine and fighter aircraft, and provided cover against submarine, surface, and air attack on the force.

Co-operation among forces reached a high peak, so it was not uncommon for an Australian Gannet to combine with U.S. Trackers and helicopters and a Pakistan destroyer in a submarine hunt. Similarly, Australian Sea Venoms were directed by a French radar destroyer to intercept attacking aircraft of the U.S. Marine Corps and the R.A.F.

R.A.N. Versatile.

VENDETTA and VOYAGER were members of the international escort screens for ALBION and MELBOURNE respectively. Their versatility was emphasised by rapid and accurate firing in both surface and anti-aircraft roles and by excellent A/S detection and attack. This ensures their active participation in most features of the exercise.

QUEENBOROUGH, a specialist fast anti-submarine frigate, was well suited to the predominantly A-S activities of Bangkok group. All three Commanding Officers of the Australian ships took their turn as screen commander of their respective screens.

After a three-day post exercise critique and relaxation period in Singapore, the R.A.N. ships sailed on Monday, May 16, to meet their various operational commitments.

Sailors from eight Seato Nations fraternised when on shore leave during "SEALION."

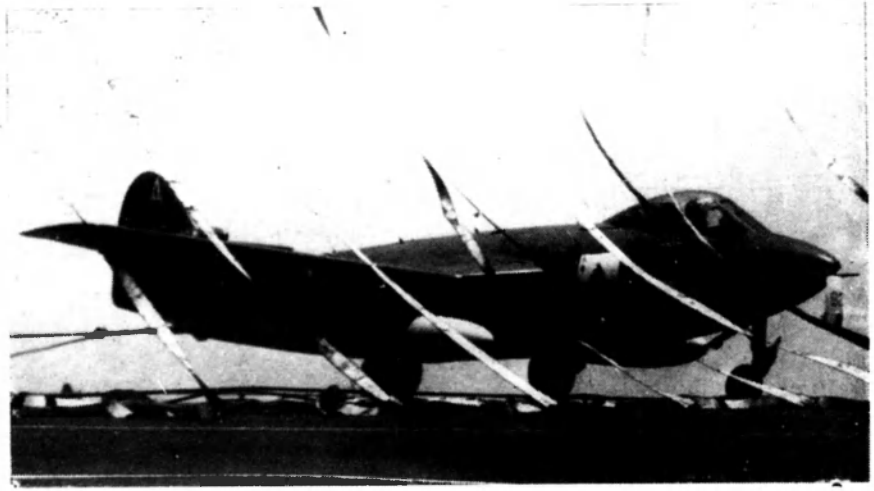
—Photo courtesy "S. M. Herald"

SPORTS DAY During Operation Sealion

In Manila Harbour an athletic meet was held on board the Royal Navy Carrier, H.M.S. ALBION. Here a husky American sailor tries his hand at "tossing the caber". The carnival honours went to the team representing H.M.A.S. MELBOURNE.

Lieut. B. ORR (right), pilot, and Lieut. R. BLOFFWITCH, whose Sea Venom crash-landed into a nylon barrier on H.M.A.S. MELBOURNE. The champagne is a present from the Flag Officer Commanding H.M.A Fleet, Rear Admiral W. H. Harrington. The flying fish, a present from the deck crew, crash-landed on the flight deck a short while before the Sea Venom.

(Blocks, courtesy "Navy News").



The Seahawk jet fighter an instant before hitting the nylon crash barrier. The broad nylon bands wrap around the wings and fuselage and as they give, with the plane's momentum, bring it to a gentle stop.

NYLON BARRIER PROVES VALUE

In April, 1959, an aircraft signalled to her carrier H.M.S. EAGLE—I am in trouble; my arrester hook has jammed.

An emergency crew set up the new "Spider Web" nylon elastic safety barrier, and the aircraft landed without injury to her pilot or damage to the plane. The first real test had been successful.

On March 16 a Sea Venom from H.M.A.S. MELBOURNE was damaged in attempting to land during night exercises. There was a long swell with intermittent rain squalls.

Piloted by Lieut. B. Orr, with Lieut. R. R. Bloffwitch as observer, the plane damaged its nose wheel on the first landing attempt, failed to engage the arrester wires and overshot.

Lieut. Orr's Venom overshot on two attempts to land. The nose wheel collapsed and the deck hook failed to function. Moreover, fuel was by this time dangerously short.

The decision was then made to rig the nylon crash barrier —this being the first time that such an emergency procedure has been adopted in the R.A.N.

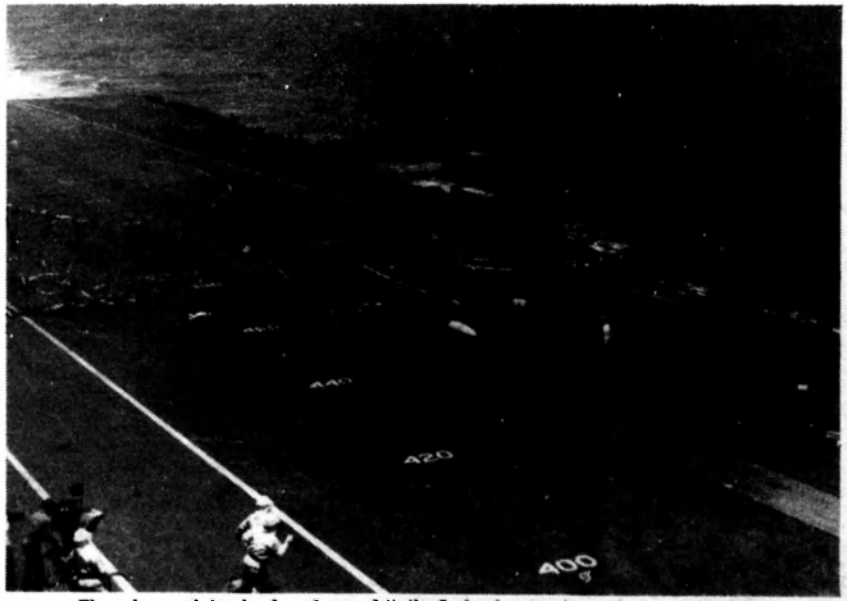
As it was realised that fuel was practically exhausted, the crew of the plane were instructed to use their ejector seats during their final approach if the barrier was not readied.

But the flight deck crew were equal to their task and the crash barrier was in full readiness. Lieut. Orr made a skilful landing and the plane came to rest enmeshed in the nylon strands with both crew members uninjured.

While this tense drama was being played out, other Sea Venoms and the Gannets carried out their normal Combat Air Patrol and Convoy Support duties.

Then, during the recent Sealion exercises a Sea Hawk, piloted by Lieutenant Maric Thomson, of Newburg, Eng., was unable to lower its flaps fully. It came in to land at speed, and was brought to a stop by the nylon barrier and the usual arrester wire. Again the plane and its pilot were uninjured.

The Nylon Barrier had again proved itself, another aid with the mirror landing sight and the angled deck to make carrier flying so much safer.



The nylon crash barrier draped around it, the Seahawk comes to a safe stop on the flight deck of H.M.S. ALBION.

U.S. Navy Makes Deep Dive

RECENTLY the U.S. Navy scientists in the Pacific made a deep dive of —— feet.

The dive was made in the TRIESTE (see picture), which was purchased by the U.S. Navy from Professor Piccard.

In the following article, which appeared in the U.S. Navy magazine, "All Hands," TRIESTE is described.

TRIESTE is a bathyscaph (derived from two Greek words "bathy" and "scaph" meaning "deep boat"), which is the underwater equivalent of a lighter-than-air craft, much like a blimp operating in reverse. Very briefly described, it consists of a 50-foot hull, 12 feet in diameter, filled with gasoline to make it buoyant, since gasoline is lighter than water. Beneath this hull is suspended a sphere 6.5 feet in diameter, which holds two men and scientific gear. It is capable of descending with reasonable safety, some three miles.

It is now operating out of San Diego, Calif., exploring the ocean depths off the Southern California coast.

The 70-ton diving craft, purchased by ONR from the Swiss scientists Auguste and Jacques Piccard, has been made available to the west coast oceanographers to conduct basic scientific research involving acoustical and biological investigations in the San Diego area.

Between June and October of 1956, Navy scientists made a series of 26 dives in the Mediterranean with TRIESTE.

TRIESTE, constructed with Italian-Swiss collaboration, is the second bathyscaph to be built and designed under the supervision of Professor Piccard. The first, known as FNRS-3, is owned and operated by the French Navy, and has been used off the coast of Japan.

ONR had four good reasons to acquire TRIESTE. It wanted to:

- Investigate the ocean environment at great depths.
- Evaluate the potentialities of the bathyscaph as a research tool.
- Encourage modification and further development of the bathyscaph or similar craft.
- Examine possible naval uses for this type of craft, such as a submarine rescue vessel or a deep-diving submarine and other devices.

Here are the ways NEL (Navy Electronics Laboratory) oceanographers will use it. They will:

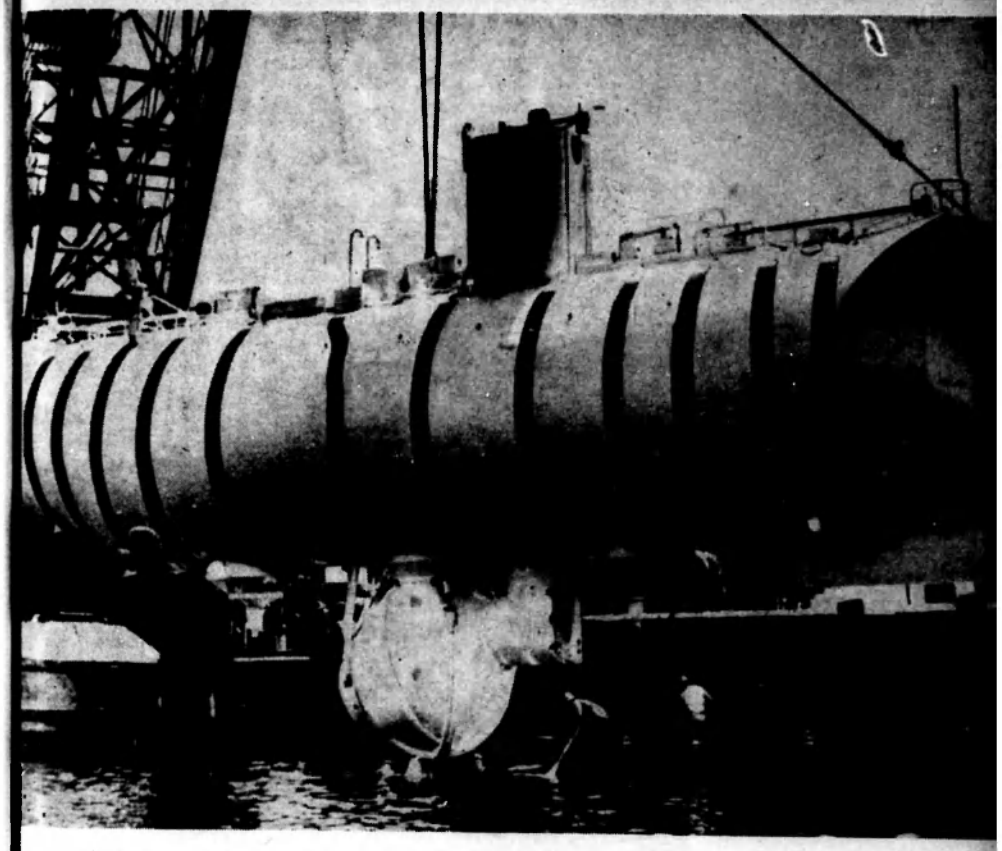
- Make direct observations of the ocean bottom, of bottom currents and organisms, and of the deep scattering layer.
- Study sound propagation and light penetration in the deep sea.
- Explore deep-sea canyons, sea mounts and other underwater features.
- Examine the orientation of sediment samplers, current meters, bottom corers and other gear lowered to the ocean floor from ships.

TRIESTE'S cabin has two portholes, one looking forward and slightly down, the other aft and upward. The ports are truncated right-angle cones of six-inch plastic, firmly forced into their metal seats by outside pressure. The two portholes give the observers a 90-degree field of vision.

Communications between TRIESTE and the surface are provided by special-purpose 15-watt battery-powered underwater telephones installed by the Navy's Underwater Sound Laboratory. This allows communication between the bathyscaph and the motor launch which always accompanies it. The telephone unit in TRIESTE is constructed in a rectangular box with a cushion on top and is used as a seat.

As a rule, communications were excellent during a descent, on the bottom, and during the ascent, but at shallower depths, with the horizontal range greater than one-half mile, communications were poor. The telephone picked up sounds of noisy fish during the dives. An unexpected dividend was that the release of the ballast could be heard on the telephone and could be checked. Otherwise, it was necessary to turn on the outside lights and watch the ballast drop from the portholes.

Generally, the bottom of the ocean area explored was surfaced with a brownish grey mud and indented with numerous holes. These appeared to be about one-quarter inch in diameter and were assumed to be inhabited by animals. On one dive, a large hole about four inches in diameter was photographed. One group of five holes arranged in the manner of a dog's paw was seen. This appeared to be the same formation noticed by observers in other bathyscaph dives. While no occupants of these holes were discovered on the deep dives, a long worm was seen to disappear into one of the holes on an earlier dive.



Among the fish seen were several which appeared to have bodies covered with white down. They had a large brown eye with a blue semi-circle behind it and a tail with a V-notch. This variety was seen to swim vigorously for a short distance, and then lie on their sides on the bottom. They appeared to be undisturbed when the ballast was dropped, sending up a cloud of mud.

Most of the bottom fish that live below the penetration of sunlight showed little concern for the strong artificial illumination of the three mercury vapour lamps that lit up the ocean for the observers, although species of isopods accumulated in the light zone by the hundreds.

The sea was filled with minute suspended particles, looking like snow. However, there seemed to be no indication of a large population of plankton which may be responsible for the deep scattering layer.

At mid-depths, the noise level differed significantly from that at higher and lower depths. It also appeared that this noise came from a horizontal rather than a vertical direction. No one has figured out an answer to this, yet.

BRITAIN Refuses BATHYSCAPE

A writer in the British magazine, "Navy", wrote recently:

It is clear that Britain is not going to plunge headlong into the exploration of outer space.

I would like to think that sound judgment and not financial anxiety is the criterion, for the fantastic possibilities of the universe have a mesmerising effect upon us.

We are inclined to think that man has discovered more about the planet in which he lives than he actually has done, forgetting that two-thirds of the earth's crust lies under the sea —the fringe only having been seen by man.

Such thoughts as these undoubtedly prompted a Member to ask the Civil Lord in the House of Commons recently why the Admiralty declined an offer of the Piccard bathyscape which probed the deepest known part of the ocean bed. The Admiralty, said the enquirer, could have the bathyscape for nothing had it been prepared to pay running and development charges.

But the bathyscape went to the American Navy.

It looks as though Britain missed an important opportunity here. The Navy's Hydrographic Service has probably contributed more than any other service of its kind to the knowledge of the oceans of the world. It located the greatest depth in the Pacific, now reached by Professor Piccard's son and an American naval officer.

(Continued on page 19)

Yet we allowed others to dive into its dark mysteries because acceptance of the Piccard offer would have involved the cost of fuel to act as ballast and the expense of transport to the area—a small price to pay for the opportunity to lead in a new and fascinating region for discovery. The wealth which the sea may one day yield to man may far outweigh the advantages of space travel.

Fortunately we are to be given a second chance. The pro-British Piccard family is anxious to build another bathyscape if Britain wants it. This opportunity must not be missed. The sea is the element of which Britain has unrivalled knowledge and experience.

NEW FIRST SEA LORD

Admiral Sir Casper John, K.C.B., has been appointed First Sea Lord. He replaces Sir Charles Lambe, who resigned because of ill-health.

Admiral Sir Casper John, K.C.B., is a son of the famous artist, Augustus John, O.M. He was born in 1903, and is an officer with exceptional knowledge of Naval aviation, especially the supply of naval aircraft.

Between the two Great Wars he served in several aircraft carriers. In 1941 he became the Director-General and subsequently Chief Naval Representative for Naval Aircraft Development and Production at the Ministry of Aircraft Production. In 1943, he left for Washington to become the Head of the British Naval Air Service Representation in the United States. He also served as Assistant Naval Attache (Air), Washington.

In October, 1944, he took command of H.M.S. PRETORIA CASTLE, which had been converted for use as an aircraft carrier, and in the following year he commanded the light fleet carrier, OCEAN, when she was first commissioned.

After World War II, he continued his association with Naval aviation. In 1948 he was appointed to command R.N. Air Station, Lossiemouth, Scotland. Then he served in the Admiralty as Deputy Chief of Naval Air Equipment, and later as Director of Air Organisation and Training.

He was promoted Rear-Admiral in January, 1951. On promotion he was appointed to the command of the Third Aircraft Carrier Squadron.

In 1952 he became Chief of Naval Air Equipment and Chief Naval Representative at the Ministry of Supply. After a reorganisation of the arrangements between the Admiralty and the Ministry of Supply he became Deputy Controller of Aircraft Production at the Ministry of Supply. He was promoted to Vice-Admiral in March, 1954, and took up the appointment of Flag Officer Air (Home) in June, 1955.

Admiral John was promoted to his present rank in January, 1957—four months before becoming a Lord Commissioner of the Admiralty and Vice Chief of the Naval Staff. He gave up that appointment in February.

AUSTRALIAN SEA CADETS IN NEW ZEALAND

Monday, 11th January, 1960:

Our Contingent came together on this day at Balmoral Naval Depot. We consisted of 2 officers and 21 cadets. One officer each from N.S.W. and Victoria. Five cadets were from N.S.W., 6 from Victoria, 3 from Queensland, 2 from S.A., 3 from Tasmania, and one each from Darwin and Canberra. We were to spend four days in Balmoral, settling in as a contingent, kitting up, sightseeing round Sydney and a little instruction. At noon on Thursday, under the glare of TV lights, His Worship, the Lord Mayor of Sydney, received the contingent in his rooms at the Town Hall, a gracious gesture much appreciated by the cadets. After this reception, cadets were granted leave until 1830—the first and only leave granted in Sydney.

Friday, 15th January:

After an early lunch, we made our farewells to the Staff at Balmoral, and thanked them for their co-operation before boarding the bus which took us to T.S.M.V. WANGANELLA, which sailed at 3 p.m. The cadets were well quartered in most comfortable cabins. The farewell was a typical Sydney liner farewell, enlivened on this occasion by 21 lusty voices booming out our AUSTRALIA war cry, followed by "Waltzing Matilda."

Saturday, 16th January-Monday, 18th Jan.:

Cadets settled in well to ship board life, helping to organise and take part in deck games, taking tricks at the wheel and, of course, Divisions, and church on Sunday. The Captain and 1st Officer and Chief Steward all were most helpful, and allowed the cadets many liberties and privileges not normally available to passengers.

Friday, 19th January:

The WANGANELLA arrived in Auckland right on time, and we were met by the Naval Baggage Officer, who looked after all our customs and entry forms, and for his help we were most grateful. At the wharf were Lieutenant-Commander Markwick, Commanding Officer of Auckland Unit, and Lieutenant-Commander Ainslee, R.N.Z.N. Staff Officer Reserves Auckland Division, who accompanied us round to Admiralty Steps to board an M.L. for Motoihi Island, the site of H.M.N.Z.S. TAMAKI, the R.N.Z.N. New Entry Training establishment. At TAMAKI we were greeted with a Haka by the N.Z. cadets (40 in number), 10 from each Division; also we met the Canadian cadets (17 in number), and Mr. Deane, Dominion Secretary of the Navy League. The cadets had the afternoon free to settle in.

Wednesday, 20th January:

The United Kingdom contingent arrived, consisting of 12 U.K. cadets commanded by Lieutenant-Commander Boulton. There were 4 N.Z. Sea Cadet Lieutenants and 1 R.C.S.C.C. Lieutenant.

At noon on this day the opening ceremony of the camp took place. Present were N.O.C.A. Commodore Burke and 2nd Naval Member R/Admiral Phipps. It was most gratifying to us to learn that R/Admiral Phipps had served for several years as a Sea Cadet Officer.

Thursday, 21st-Saturday, 30th January:

During this period the camp progressed with the cadets becoming more finely tuned day by day. The undoubted highlights of the camp were the two overnight expeditions, half of the lads going to each. TAMAKI has three sailing cutters, which lend themselves admirably to such expeditions. The first party went to Rakino Island, the second, due to weather conditions, went to Waihike—a far more hospitable site than Rakino. The first expedition was led by the U.K., Canadian, Otago and Christchurch officers. A small raiding group attacked the party during the night. Despite expansive stories of havoc wrought, their efforts were largely abortive, but, nevertheless, provided a colourful highlight. The second party was not raided. TAMAKI has only one 14-ft. dinghy, so cadet sailing was done in whalers, hence little opportunity was available for cadets to get a chance to coxswain. P.O. McGrath, of Geelong Unit, was made coxswain for Australia, and in the regatta held on Saturday, 30th, sailed to second position, but having failed to make one of the marks, all first three boats were disqualified on protest.

In the Tabloid Athletics, Zoeller, from Brisbane, did very well, getting the 2nd highest individual point score, Canada, with the highest team points, took the TAMAKI Trophy.

Sunday, 31st January:

This was the day of the closing ceremony and prize giving. Mr. Connelly, Minister of Defence, inspected Divisions, and took the salute at the March Past. We were most pleased that Sir John Collins, Australia High Commissioner, who was in Auckland to receive the Governor-General-elect, and Lady Collins, were also able to be present. The cadets of all contingents acquitted themselves well, and were greatly praised by all spectators.

Australian Sea Cadets photographed at Government House with His Excellency The Governor, Sir Eric Woodward, on their return from New Zealand. The Cadets were accompanied by Rear-Admiral H. A. Showers (Retd.) and Mr. Rodney Brown.

Monday, 1st February:

Farewells, cheers, war cries and "Waltzing Matilda" marked our farewell to TAMAKI, and a subdued reception marked our arrival in H.M.N.Z.S. BLACK PRINCE, a cruiser now in reserve, which is used as an accommodation ship. That afternoon cadets were given leave in Auckland.

Tuesday, 2nd February:

During the forenoon the cadets inspected Devonport Dockyard and then after lunch proceeded to Auckland, where they were received by the Lord Mayor at afternoon tea, after which the Auckland Division of the Navy League provided two sight-seeing buses to show us the sights of the city, followed by a dinner dance in the Navy League rooms.

Thursday, 4th February-Tuesday, 9th Feb.:

These days were spent in H.M.N.Z.S. ROTOITI and KANIERE, which ships, together with H.M.A.S. SWAN, H.M.S. ANDREW and H.M.N.Z.S. ROYALIST, were taking part in the Waitangi ceremony at Russell in the Bay of Islands. A sailing regatta during our stay at Russell was won by Canada.

Wednesday, 10th February:

All were glad to be back in BLACK PRINCE and on completion of packing, leave was granted.

Thursday, 11th February:

Embark in Navy buses at 0900 (in the rain) for Rotorua. Lunch at Hamilton with boys of Hamilton High School, and then to Rotorua by 1700 (for the tour we were to be accompanied by Lt.-Cdr. Ainslee, R.N.Z.N., and M.A.A. Thompson on the Reserve Staff of Auckland R.N.Z.N.V.R. Division). That evening we were guests of the Tourist Department at the Mineral Baths, which we found most refreshing.

Friday, 12th February:

We attended a Civic Reception in the forenoon, and visited Mokoia Island (redolent with memories of Hinemoa and Tutanekai) out in Lake Rotorua. That evening we attended a Maori concert.

Saturday, 13th February:

This day was spent on a visit to Waitomo limestone caves, and then on return cadets attended several local Rotorua dances.

Sunday, 14th February:

In the forenoon we visited Whakoa thermal region. In the afternoon we visited Lake Rotoiti and several other very scenic lakes. An impressive variety concert was put on by a Maori concert group that evening.

Monday, 15th February:

An early start, to-day, for we are to visit Geyser Valley at Wairaki. Geyser Valley was more impressive than Rotorua as far as thermal activity is concerned and, of course, it also boasts one of the world's two Geo-thermal power generating plants, where steam from the earth is fed direct to huge turbo generators. After lunching at sumptuous Wairaki hotel, we moved on, past Lake Taupo, and on to the "Desert Road," round the base of partly extinct volcanoes, Tongariro and Ruapehu, at the foot of which is the R.N.Z.N. Wireless Station, "Irirangi," and the Army Camp at Waiouru.

Tuesday, 16th February:

On to the R.A.N.Z.A.F. Station at Ohakia for lunch, and then by the Bristol freighter to Christchurch. The flight was enjoyed by some, disliked by others, for Bristols are not renowned for quiet and comfort. Once in Christchurch we were adopted by our hosts for the following week.

Wednesday, 17th-Sunday, 21st February:

Mostly billeted with local cadets or Navy League workers; all hands thoroughly enjoyed Canterbury's hospitality. The Navy League arranged a cadet dance at H.M.N.Z.S. PEGASUS, the R.N.Z.R. drill hall used also by the Sea Cadet Corps, also visits to a tyre factory, a newspaper office and the National Airlines Corp hangars and workshops at Christchurch airport. Most exciting was a jet boat display and joy ride on the Wairnak River and an M.L. trip to Ripa Island on Lyttelton Harbour, which is used as a Sea Cadet Camp by the Sumner Redcliffs sub-unit.

Monday, 22nd February:

Time for farewells to our hosts and off over the Canterbury Plains to Dunedin, where we were welcomed by our hosts for one night only. T.S. Waireka, the Dunedin Unit, arranged a film night at their fine unit building, for us that evening.

Tuesday, 23rd-Thursday, 25th February:

A Mayoral Reception at the Town Hall, followed by a visit to Museums and lunch at T.S. Waireka, filled our forenoon, and then into the buses to visit farms in Central Otago, from where we returned on Thursday afternoon. The magnificent adventures enjoyed on the farms would fill many pages, and were well worth the great distance travelled. Thursday evening, after the only bus breakdown of the tour, we returned travel-stained to our Dunedin hosts.

Friday, 26th February-3rd March:

Friday found us pushing hard to return to Christchureh to again board our Bristols for the Flight to Wellington, where we arrived at the new Rangotai Airport at 1000, and were met by our Wellington hosts, and so started another busy period, this time as guests of Wellington Navy League. Here a further dance was enjoyed at H.M.N.Z.S. OLPHERT, the R.N.Z.R. Drill Hall, while visits to the Ford factory, and meat processing works, and also a civic reception, filled in different days. Most cadets also visited the old and new headquarters of the Wellington cadets at Petone, and most felt envious of the locals for their new building. Thursday found everyone back with their best parade ground manners, for we were received by the Prime Minister, Mr. Walter Nash, at Parliament House. Mr. Nash then took the cadets on a personally conducted tour of Parliament Buildings and presided at afternoon tea.

(Continued on page 24)

H.M.A.S. TOBRUK

(Above) A cheque being presented by the ship's company to the Olympic Fund.

(Right) Recruits from Flinders Naval Depot join Tobruk for their first sea cruise—six weeks touring the Pacific Islands.

SEA CADETS' TOUR —

Continued from page 22

At 1600 the first farewells were said, for our party had then to depart, and having been with the "Canuchs" and U.K.s for so long, it was a sad parting. Even the Aussies had to split up, for our trusty Bristol was not available, and two Herons of limited capacity were all that could be made available, so 15 cadets and Lieutenant Nicholas went by plane, while the other six and I went by train.

Friday, 4th March:

This was a hectic time bringing any gifts or souvenirs which had been neglected. Surely none had, however, for every time we saw cadets, they were haunting the ever-popular souvenir shops. Anyhow, by 1400 we were all "back home" in WANGANELLA, and at 1500 Auckland Harbour echoed to our well known AUSTRALIA, and a much more wistful version of "Waltzing Matilda," for our great adventure was almost over.

Saturday, 5th-Tuesday, 8th March:

The trip home was not as calm as the one over, but all were experienced sailors by now, and only that bad weather made tricks at the wheel out of the question for 24 hours, the cadets followed the same pattern as on the way over.

Much time was spent in collecting autographs and addresses and pledging eternal friendship.

Tuesday, dawn found Manly ferries and our Bridge right ahead of us, just as proof that the show was over.

One last moment of glory was a reception at Government House by His Excellency the Governor of N.S.W., Sir Eric Woodward, with morning tea on the verandah. From there we repaired to H.M.A.S. RUSHCUTTER to return the loan clothing. Then the farewells started: firstly, when the N.S.W. boys went their separate ways; one Tasmanian was next, then at 1920 the Brisbaneites, 2030 the Victorians and South Australians. Two Tasmanians, due to leave the following morning, and I waving from the railway platform, were all that remained. The visit to New Zealand was over. The pictures of "me and the hosts at Christchurch" and "cadets returning from the Waiheki expedition, and the postcards showing Pohutugeyser in its full glory (not sulking as on the day of our visit), and the little greenstone tikis, and the smell of the sea at Ripa Island in the paua shells, the inlaid rulers and crested teaspoons—these are the things that remain that we can see and feel, but the things that count more are the brighter eyes, the smarter step and straighter backs, for no one could make such a tour without gaining these. But what we gained that was even more important is the understanding of our British Commonwealth partners, the friendships formed with those from overseas and with the others of our own contingent. For these things and more we must, in conclusion, say a heartful "thank you" to our Kiwi cousins for having said: "You are invited to send a party of 23 to New Zealand in 1960."

GUIDED MISSILE SHIPS

The building of guided missile ships for the Royal Navy has not been neglected, and there are now four ships of this class laid down. H.M.S. DEVONSHIRE will be launched this summer. The hulls of H.M.S. LONDON and H.M.S. HAMPSHIRE are under construction and that of H.M.S. KENT was laid down in March. They are "super destroyers" with the Seaslug missile for long range and Seacat weapons for short range attacks. They will also carry a new type of homing torpedo, four fully automatic 4.5-inch guns and a helicopter for anti-submarine work.

WATSON MEMORIAL CHAPEL

Presentation of Bronze Plaques

Among the various links with Watson and other parts of the world is the strong link between Watson and H.M.S. VERNON and H.M.S. DRYAD. H.M.S. VERNON is the headquarters in England of the Torpedo Anti-Submarine School, and H.M.S. DRYAD is the headquarters of the Navigation Direction School. In one way they could be claimed to be the parents of Watson, as they supplied instructors and staff until Watson was able to provide qualified officers and staff from the Royal Australian Navy.

We have just heard that these two parent establishments are to present a bronze plaque each to the Watson Chapel. The one from VERNON will have the famous prayer written by Nelson on the eve of Trafalgar, 1805, and the one from DRYAD will contain part of the message addressed by General Eisenhower to the Allied Expeditionary Force on June 6th, 1944. Both these prayers are remarkable (see below). Nelson left to fight the battle of Trafalgar from a spot not very far distant from where H.M.S. VERNON now stands, and General Eisenhower's Supreme Headquarters were at Southwick, Hampshire, where DRYAD now stands, so there is a great deal of history bound up with this connection.

EISENHOWER'S PRAYER
Before D-Day
6th June, 1944

"Soldiers, sailors and airmen of the A.E.F., you are about to embark on the great crusade to which we have striven these many months.

"The world's eyes are upon you. The hopes and prayers of liberty-loving people everywhere march with you.

"The tide has turned. Free men of the world are marching together to victory.

"I have full confidence in your courage, devotion to duty and skill in battle. We will accept nothing less than full victory.

"Good luck, and let us all beseech the blessings of Almighty God upon this great and noble undertaking."

NELSON'S PRAYER BEFORE TRAFALGAR
Monday, October 21, 1805

"May the Great God Whom I worship grant to my Country and for the benefit of Europe in general a great and glorious victory, and may no misconduct in anyone tarnish it, and may humanity after victory be the predominant feature in the British Fleet. For myself individually I commit my life to Him Who made me, and may His blessing light upon my endeavours for serving my Country faithfully. To Him I resign myself and the just cause which is entrusted me to defend. Amen. Amen. Amen."

MINESWEEPER JOINS MALAYAN NAVY

The coastal minesweeper, DARLASTON, left Plymouth at the end of February for Singapore.

On her arrival, she was handed over to the Royal Malayan Navy under the terms of the Malayan Defence Agreement.

She has been re-named H.M.M.S. MAHAMERU.

N.Z. SURVEYORS

(From page 8)

on the old charts of her waters and those of her dependencies in the Pacific.

From ships and other sources come reports of new dangers not appearing on the existing Admiralty charts. These must be investigated and their existence or non-existence confirmed. This work can sometimes be done by the larger surveying motor launches, but in many cases LACHLAN carries out this task.

A recent example was the investigation by the ship of a shoal reported in mid-Tasman, which was carried out in June last. When a danger to navigation is confirmed, it becomes the subject of a Notice to Mariners amending the appropriate charts to show it.

Local small surveys are often undertaken for some immediate specific purpose. The two surveying motor launches and LACHLAN have just finished the re-survey of the Whangarei Heads area in connection with the investigation being carried out to find suitable sites for an oil refinery. This was followed by an investigation survey some 15 miles north of Westport in connection with the projected coal trade with Japan.

MUD COMES IN HANDY

So the bottom of the ocean is covered with mud! Who cares?

The Navy cares and, at times, is glad of it. The California Academy of Sciences, while engaged in an oceanographic survey, sponsored by the Office of Naval Research, reported that not far off the coast of California the ocean bottom was covered with large areas of thick, gooey mud. Since the ocean's depth at that point was some 500 fathoms, this appeared to be further fascinating information—to be filed.

Then some unsung genius connected this sticky fact with the problem of disposing of large quantities of radioactive waste.

Now, the waste is loaded into steel drums, carried to muddy-bottom areas, and heaved overboard. The drums sink far into the mud long before they disintegrate, and the mud absorbs the radiation. This avoids contaminating large volumes of sea water, which would happen if the drums happened to be dropped on a sand or rock bottom.

The moral? Basic research is a fine thing whenever applied.

BRITISH INTEREST
U.S. GUIDED MISSILES

During the recent visit of Mr. Wilkinson, Minister for Defence to the United States, the Air Correspondent of the London Financial Times said that he paid particular attention to the Skybolt and Polaris Missiles.

These missiles, says the correspondent, could take the place of the cancelled "Blue Streak" missile.

Skybolt missile is a two-stage, solid-fuelled ballistic missile capable of carrying a nuclear warhead over distances of between 1,000 and 1,500 miles. It is designed for launching from aircraft — the U.S. plans to use Boeing B-52Hs, but almost any large aircraft could be modified to act as a launching platform.

Total cost of the project over the next five to six years, which is the time it will take to develop Skybolt to operational status, is estimated at not much less than 1,000 million dollars. An estimated 60 million dollars is to be spent on the project in the next financial year, beginning July 1.

The big advantage in Skybolt is its mobility, due to the type of aircraft launching platforms used. The U.S. expects to form the first Skybolt B-52H squadron in 1965, with another 22 B-52H squadrons being formed thereafter.

STRATEGIC AIR COMMAND

Many of these squadrons will be based in the U.S., but some of them may be based with the outlying posts of the Strategic Air Command through the world — possibly even in the U.K.

POLARIS MISSILES

Polaris is the U.S. Navy's Fleet Ballistic Missile — again a solid-fuelled weapon — with a range of around 1,500 miles, which is intended primarily for firing from submerged submarines, although smaller versions of it could be developed for firing from mobile land-based platforms, such as trucks and trains, or from river-vessels or off-shore barges.

A U.S. nuclear submarine blasts off a guided missile.

At present, seven nuclear-powered submarines are under construction specifically for the Polaris, each capable of carrying 16 missiles. The whole cost of the Polaris programme is also put at around 1,000 million dollars, but this is expected to be increased substantially as current plans for more Polaris-carrying submarines come to fruition.

Polaris is an earlier missile than Skybolt, and it is already undergoing test firings, prior to joining the fleet later this year or early in 1961. Recently, the U.S. Navy opened a new 27 million dollar Polaris assembly depot on the Cooper River near Charleston, South Carolina.

Further developments of Polaris, extending its range capability to 2,500 miles, could be in service by 1963, according to Rear-Admiral William F. Raborn, head of the Polaris programme.

Admiralty Floating Dock No. 59

ADMIRALTY Floating Dock No. 59, which was laid down at H.M. Dockyard, Portsmouth, on 1st January, 1959, was "launched" on March 31, 1960, by Lady Carrington, wife of the First Lord of the Admiralty.

A.F.D. 59 has been constructed in a dry dock and was ready for floating out after the launching ceremony, which entailed the flooding of the dry dock. The machinery for this operation was set in motion by Lady Carrington.

The dock will be capable of lifting all existing destroyers and frigates, as well as submarines of the latest type, and will be used initially in the fitting out of the nuclear submarine DREADNOUGHT.

The Dock is 400 feet long, 77 feet wide, and 65 feet high, and is an all-welded structure containing some 4,500 tons of steel. Extensive use has been made of pre-fabrication, and the completion of the structure within fifteen months represents a considerable achievement, more particularly as the work was carried out in a dry dock which lacked many of the facilities normally associated with a building slip. Assistance in fabrication of certain fittings was given by Chatham and Rosyth dockyards.

It will be fully equipped to carry out routine maintenance and repairs of ships docked in it, and will provide accommodation and living facilities to the latest habitability standards, including air conditioning and fluorescent lighting in all cabins and messes, for about two hundred men.

A push button control system will be installed for the operation of the Dock, and the main pumps for controlling the raising and lowering of the Dock will be capable of dealing with over 200 tons of water per minute. Instruments will be fitted to record for the Dock Master's information the strains coming on the structure during the docking operation.

Four main generators and two auxiliary generators supply 1,320 kw. for the main pumping machinery, lighting, etc. This power supply is sufficient for the domestic load of a vessel in the dock and power and lighting for repairs in addition to the dock services.

The Dock will be equipped with special sliding keel blocks for the docking of submarines. A 7½ ton travelling crane is situated on, and runs the full length of, each dock wall.

IDENTIFYING WRECKS BY TV CAMERA

H.M.A. Ships, VAMPIRE and QUICKMATCH, returning from exercises recently, located a strange "object" on their ASDIC.

Located approximately 15 miles off Sydney Heads in 500 feet of water, the Navy took no chances. For several days VAMPIRE and QUICKMATCH, assisted by H.M. Submarines, ANDREW and ANCHORITE, and by Gannet A/S aircraft from the Fleet Air Arm base at Nowra, New South Wales, kept the object under surveillance.

Then, satisfied that the object was a wreck, the ships returned to Sydney.

Among the many suggestions made by the newspapers, was that TV cameras should be used to identify the object.

The use of TV for this purpose is not new—the most publicised case was, of course, when a TV camera located and identified the sunken British submarine, AFFRAY, in the English Channel.

The most recent case was in December last year when the R.N.Z.N. used this method to examine the wreck of the merchant ship, HOLMGLEN.

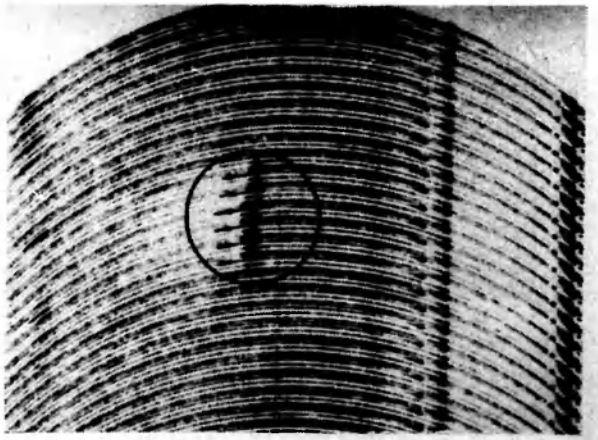
Here is how a writer from this service described the operation.

A year of unusual tasks for the New Zealand Navy was brought to an appropriate conclusion by "Operation Holmglen," an examination, at the request of the Marine Department, of the wreck of the coaster which foundered 20 miles off Timaru on the night of 24th November with all 15 of her crew.

Task Unit 329 was formed for the purpose. It was a mixed force which worked remarkably well together. The Fleet Auxiliary TUI, under her master, Captain R. W. Aylward, is civilian manned, but for this operation a number of naval ratings was added. She carried the portable decompression chamber for the divers, a medical officer, an underwater television camera, and the technical officers to operate it, and a photographer. The second ship was the diving tender MANAWANUI, commanded by Lieutenant T. H. Wickman, R.N.Z.N. She carried a team of divers who had been specially conditioned to dives down to the 220-feet in which the wreck was lying. The entire operation was under Commander J. P. S. Vallant, R.N.Z.N., executive officer of the cruiser, H.M.N.Z.S. ROYALIST.

After the divers had worked up at the Great Barrier, the unit sailed from Auckland and made a brief visit to Lyttelton. Location of the wreck was expected to be difficult; it proved to be dramatically swift. The uuit steamed 108 miles south from Lyttelton with the land totally obscured by cloud. Late on 21st December the ships neared the reported site of the wreck. TUI slowed and began a search run. Within minutes the echo sounder trace showed that she had passed over the HOLMGLEN and that, of thousands of square miles of ocean, she had found the exact small point.

The following day TUI laid a web of moorings totalling some 9,000 feet to hold herself over the wreck, and the underwater camera was lowered. After a preliminary exploration, the screens in the ship showed a litter of articles on the sea-bed—a book, a saucepan and tools. Then, with startling clarity—not to be equalled for the remainder of the operation—the wreck came clearly into view.



The "OBJECT" as shown on an Asdic Trace.

An electronic camera with a magazine holding 300 shots photographed the scene on the screens as the underwater camera, with its coupled spotlights, began the slow work of examination and identification. This examination continued through Christmas Day, broken at intervals by the painful necessity of recovering and relaying the moorings. Finally, Petty Officer F. Brady dived on the morning of Boxing Day. He found visibility limited to two feet—he could not see his diving boots—but he made an examination of areas of the hull by touch.

After this dive, television examination was continued until, by 27th December, sufficient information was obtained.

TV camera with special guard and lights which found AFFRAY.

★

How the name showed up on the TV screen.

H.M.A.S. QUADRANT UNDERGOES TILTING TEST AT GARDEN ISLAND

The angle at which she listed caused many people to ring Naval Headquarters anxiously

HIGH PURITY ZINC IS THE ANSWER

Sacrificial anodes prevent corrosion in underwater and underground installations

RECENT developments in the production of ultra high purity zinc — 99.99% — have been the significant factor in the increasing use of sacrificial zinc anodes for the prevention of corrosion in both underwater and underground installations in Australia.

The Royal Australian Navy and the Melbourne Harbour Trust have found that the use of zinc anodes has increased resistance to corrosion of their vessels, and the Gas and Fuel Corporation of Victoria has conducted successful experiments involving their use as protection against corrosion of service pipes.

Other applications include the cathodic protection of mooring chains and cables, and it is anticipated that their range will soon increase in line with developments overseas.

Recent years have brought about a steadily increasing awareness of the great losses caused by corrosion and a realisation of its gigantic cost. The cost, however, can be reduced greatly by a proper extension of those principles governing the selection of materials and their protection which are now known and practised.

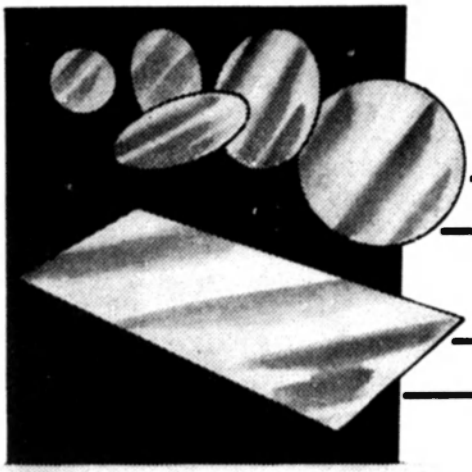
The use of zinc anodes is not new; only the modern composition of the anodes is of a revolutionary character.

They were first used in 1824 to protect copper sheathing on the hulls of British naval vessels, but in more recent years they lost some of their popularity because of inconsistencies due to lack of knowledge or attention to such factors as the need for high purity zinc, the importance of providing permanently low resistance connections, or the quantity of zinc required.

It is only comparatively recently, following intensive research, study and experiments that they have returned to favour with significant advantages over other sources of cathodic current in salt water and in some underground installations.

These advantages have been brought about primarily by the improved purity of present-day zinc anodes, because it is a fact that their effectiveness depends on the purity of the materials used.

The anodes being used by the Navy, Melbourne Harbour Trust and the Gas and Fuel Corporation of Victoria are made from 99.99% zinc and 99.99% aluminium, up to 0.5% aluminium being used. The zinc is provided by the Electrolytic Zinc Co. of Australasia Ltd., the only producer in Australia of 99.99% zinc.

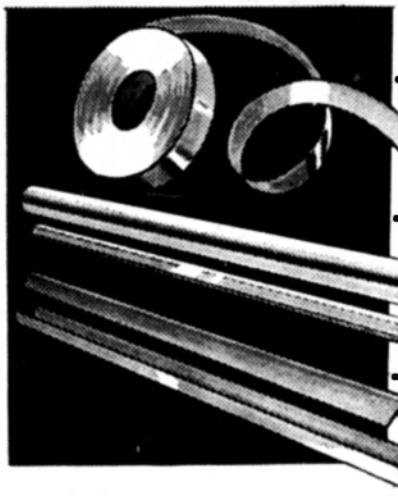


Do you require . . .

CIRCLES

SHEET*

COPPER · BRASS · ALUMINIUM



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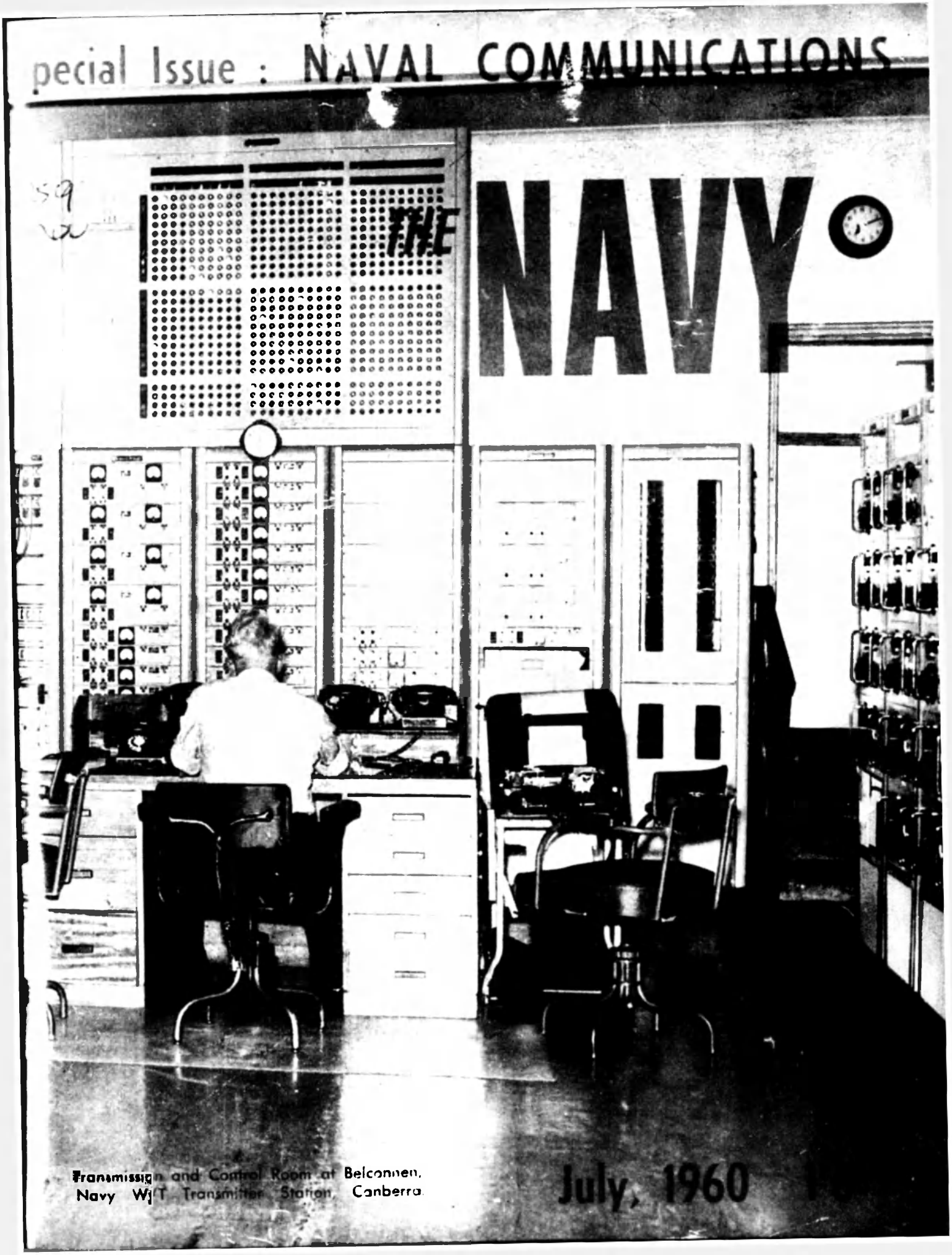

Transmission and Control Room at Belconnen, Navy W/T Transmitter Station, Canberra.

July, 1960

THE NAVY

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Naval Communications Win Battles

BATTLES have been lost for want of a horseshoe nail, but many more have been lost through lack of communications or because of faults or breakdowns in this important part of our organisation.

In 1942, for example, our communications won a battle for us. The outlook was grim enough for the worst of pessimists. France out of it, Italy and Japan against us, the latter having proved to be a well-organised, capable and ruthless enemy. They had captured half a world, including our impregnable fortress at Singapore. They had dealt the U.S.A. a crippling blow and had sunk our best ships — PRINCE OF WALES and REPULSE, PERTH and HOUSTON, YARRA and VAMPIRE, and dozens more. The New World in the U.S.A. was not yet strong enough to save the Old, but it was willing to try. So here they were, with seventy ships and thousands of men, assisted by H.M.A. Ships AUSTRALIA, CANBERRA and HOBART to re-capture the capital of the British Solomon Islands and Guadalcanal. This latter was important because the Japanese had almost completed an airstrip there, from which they could have successfully bombed the East Coast of Australia. With the ports of Newcastle and Kembla out of action, Australia's war effort might be practically finished. The invading armada had succeeded in landing the Marines, together with their warlike stores and equipment. The pace was a furious one, for we knew that far away to the North, at Rabaul, were many more Japanese in ships, submarines and aircraft, who would probably take exception to our temerity and doubtless would attempt to put a spoke in our wheel, or perhaps try to knock a few out.

Our gallant little Force of Coast Watchers, hiding on these islands in close proximity to, and hunted by, the Japanese, never staying in one spot more than a few hours, now come into the picture.

They did not know of our operations, of course, but one of them, Paul Mason, Esq., heard what he considered to be about forty heavy bombers pass close to him, heading south. He, therefore, called up a certain call sign and made the following message: "FORTY HEAVY BOMBERS FLYING SOUTH 1030 MASON," which was safely received on the mainland of Australia. The message was then passed to Brisbane, from where it was relayed to Sydney. From here it was relayed to Canberra Naval Radio Station, who transmitted it to Pearl Harbour, in mid-Pacific. Pearl Harbour transmitted it on the ship broadcast, and we received it in H.M.A.S. AUSTRALIA at 1057. That message, which took twenty-seven minutes to reach us was a very valuable one. We knew how far North Mason was, and we knew roughly the speed of heavy bombers. We, therefore, knew the Japanese would arrive overhead at about midday.

We set about making preparations to greet them, and hoped they'd bring their own lunch since we hadn't very much. We stopped the unloading of the convoy, got it under way in a compact little fleet, with the warships in a tight circle about it, and had them going at full speed and zig-zagging.

When the Japanese arrived we were ready for them, and no ship was hit by a bomb, though several were damaged by torpedoes and one by a suicide pilot.

However, without that message from Mr. Mason we might have had such serious casualties as to cause our withdrawal from the venture. Hence, you may see the importance of the efficient Communications Organisation. Now, the way the Communication Organisation works is as follows:—

Admiralty, in London, has what are called "FIXED SERVICES" with each of the Naval Commands. Each Command has Fixed Services with WHITEHALL, and with the neighbouring Commands: and so we in Australia are in touch with:

LONDON
SINGAPORE
WELLINGTON (N.Z.)
PEARL HARBOUR.

If we want to pass a message to, say, MALTA, we pass it via CANBERRA and LONDON. One for WASHINGTON could go via PEARL, while a message for a ship at sea on the Far East Station would go via SINGAPORE.

Each Naval Command has its own internal organisation. Australia's nerve centre is at CANBERRA NAVAL RADIO STATION in H.M.A.S. HARMAN. This station is connected by a Teleprinter Network to Sydney and Melbourne, as well as to the R.A.A.F. and Army Network. HARMAN is a Major

NAVAL COMMUNICATIONS (Cont.)

Tape Relay Station, as well as our Main Radio Station. Sydney and Melbourne are Minor Tape Relay Stations, and they each have many tributaries running off to outlying stations. For example, Sydney serves The Flag Officer-in-Charge, East Australia, the R.A.N. Air Station and the Australian Joint Anti-Submarine School at NOWRA, H.M.A.S. PENGUIN, H.M.A.S. WATSON, The DOCKYARD, and many other Naval Establishments. Each of these is connected by teletype or some other means to Sydney Signal Centre, but if a ship has sailed, she must be reached by radio—close to the port she would be reached on the local coastal frequency, but if proceeding far from port she will have set watch on the Area Broadcast and will receive her messages via CANBERRA NAVAL RADIO. Each message is numbered and the ship makes sure her numerical sequence is complete so that no messages are missed. She must ask for the missing ones.

Radio Messages go by Automatic Teletype

The messages passing between LONDON and CANBERRA are usually by Radio Automatic Teletype (RATT), and many of the ships are fitted to receive RATT as well. This is automation entering into the game, for it is not read by a man using a pencil or typewriter. A teletype operator types the message out by teletype perforator, which makes a tape somewhat after the fashion of the old pianola roll. The perforated tape, when put in a transmitter head, passes the message out over the air by means of radio signals, which, as they are picked up in the receiving ships, works the teletype there to give a replica of what was originally typed.

Ships in harbour obtain their messages via Sydney Signal Centre. Urgent signals are passed at once, either by visual signalling, by telephone or by radio. Non-urgent messages are usually collected twice daily by the orderly or postman. On receipt, the messages are copied and delivered to the necessary officers or offices, and are filed in the correct logs so that they may easily be traced or referred to.

Confidential or secret messages are, of course, never made in plain language. These must be dealt with by the cryptographic team, who are skilled in the art of encrypting and decrypting messages. So skilled are they that sometimes nobody at all can unravel what they have done!

The Communications Department is the eyes and ears of Her Majesty's Fleet, and they are never closed. For twenty-four hours every day, and for 366 days in 1960 they watch and listen, and they provide the means whereby the Admiral may receive information and pass his orders to the ships and authorities under his command.

Mercury was the Messenger of the Gods, and the Royal Navy's Signal School is called H.M.S. MERCURY because we communicators are the messengers of the admirals and we will put a girdle round the earth (by radio) in about a fifteenth part of a second.

C. H. NICHOLLS.

W.R.A.N. Margaret Lumsden checking tape relay.

H.M.A.S. Vampire — on Service in the Far East

Ships like H.M.A.S. VAMPIRE and QUIBERON, at present serving with the Strategic Reserve, are in constant wireless communication with Australian Naval authorities.

H.M.A.S. HARMAN

AT an Imperial Conference held in London in 1926, discussions on Empire Defence took in a long range plan of Empire Communications. The then relatively new technique of long range communications using short wave was to be exploited fully and a chain of wireless stations was to be established throughout the Empire to ensure satisfactory defence communications.

The Australian Commonwealth Naval Board decided to have its major Shore Wireless Station nearby and under its direct control. Even in the 1930's it was planned to have the Headquarters of the three Defence Services in Canberra. Accordingly suitable transmitting and receiving sites were selected in the districts of Belconnen and Woden in the Australian Capital Territory.

Work commenced in constructing "HARMAN" in 1938. The first message was received from Singapore Radio on 19th December, 1939. Before that date, however, telegraphists spent many hours digging holes for trees and shrubs at both stations from which have grown magnificent wind breaks. The present occupants are grateful for this forethought.

H.M.A.S. "HARMAN" was named after the Director of Naval Communications and assistant of the time, Commander E. H. Harvey. R.N. and Commander J. B. Newman, R.A.N.

There was a first "unofficial" message received "out of the blue" from a Walrus amphibian aircraft from H.M.A.S. "ALBATROSS". The aircraft was flown from Jervis Bay to look at the station from the air and dropped a good luck message as it flew across. With "HARMAN" going on the air a considerable load dropped from Garden Island and Flinders Naval Depot Wireless Stations which up to this time had taken the brunt of Naval Communications since the outbreak of war.

WRANS first appeared in the form of 12 girls who were part of a private (but publicly-minded) organisation called the Women's Emergency Corp. These girls had been trained in morse code by a Mrs. McKenzie of Sydney who had been far-sighted enough to realise the value of such operators. Her trained girls, when offered to the Navy, were sent to "HARMAN" "on approval", where they proved themselves rapidly. They subsequently merged into the WRANS. From the outbreak of the Japanese War there was a steady build-up in personnel and equipment to a peak of 600 in 1943/44.

The station represented quite a mixed bag of men and women RAN, RN, and USN with the Army providing guards for security purposes.

On 15th May, 1946, in addition to Naval Communications, "HARMAN" provided broadcast facilities for Merchant Ships in the Australian Area. This was part of a world-wide scheme sponsored by the Admiralty to provide safe and efficient communications for British Commonwealth Ships.

It is not generally known that all long-distance radio telegrams to and from merchant ships in and out of Australia pass through "HARMAN" in some form. This work is carried out by the Navy, free of charge.

Following the run down of WRANS after the war, the girls re-appeared in 1951 and have been growing in numbers ever since. A modernisation programme has been progressing steadily with the result that there has been a complete change-over in equipment.

Of the original transmitters, only 4 remain. Three are due for very early replacement. The fourth is still the most powerful transmitter in the Southern Hemisphere and will complete a 20-month refit in October. Not only will naval and merchant ships be glad to have it available again, but so will organisations such as the University of Sydney, the National Observatory at Mount Stromlo and the Sydney Water Board.

The modernisation programme has resulted in "HARMAN" being one of the most modern Shore Wireless Stations in the British Commonwealth, if it is not the most modern. There is little morse used now. Radio Teletype is the normal method of communication, even the fleet receives its messages on a teleprinter. The receiver and transmitter buildiugs are masterpieces of radio engineering.

The comfort of the sailors and WRANS has not been forgotten. The WRANS are already living in modern, centrally heated quarters which were officially opened by H.R.H. Princess Alexandra, on 23rd Sept., 1959. Construction of new bachelor quarters for the sailors has commenced at "HARMAN" and "BELCONNEN" and will be ready for occupation early in 1961.

"HARMAN" is the only non-stop operational "ship" in the RAN, working 24 hours per day, throughout the year. This has been the case since the first morse code in London, the ship's motto of NE CEDE could be well twisted into "We never close."

INTERNATIONAL CO-ORDINATION OF TIME AND FREQUENCY SERVICES.

It has been agreed, by the authorities concerned, that the time and frequency transmissions of the United States and the United Kingdom shall be co-ordinated.

The purpose of this synchronisation is to provide a uniform system of time and frequency transmissions, which is needed in the solution of many scientific and technical problems in such fields as radio communications, geodesy and the tracking of artificial satellites.

Participating in the project are the Royal Greenwich Observatory, the National Physical Laboratory, the Post Office Engineering Dept. of the United Kingdom, and, in the United States, the U.S. Naval Observatory, the Naval Research Laboratory and the National Bureau of Standards.

It is anticipated that, with the completion of modernisation of the 200 Kilowatt power output transmitter at H.M.A.S. HARMAN, Australia will also join in this programme of transmissions.

The transmission stations which are at present included in the co-ordination plan are GBR and MSF at Rugby, England; NBA, Canal Zone; WWV, Beltsville, Marvland; and WWVH, Hawaii.

Co-ordination began in January. It is expected that by the end of 1960 the time signals from all participating stations will be emitted in synchronism to the thousandth of a second. Such accuracy has been needed for some time in tracking artificial satellites on a world-wide basis.

Checking Equipment in Transmitter Control Room

The complex nature of modern radio communication equipment requires the services of skilled technicians to ensure that the equipment is always efficient. Officers and men of the R.A.N. are often sent to the factories of the firms supplying the equipment to obtain first-hand knowledge of how it is made.

R.A.N. W/T STATION H.M.A.S. HARMAN

DURING the period since 1955, Standard Telephones and Cables Pty. Ltd. have been engaged in the modernisation and enlargement of the facilities at the Naval Wireless Station, H.M.A.S. HARMAN.

H.M.A.S. HARMAN includes an administrative centre and signals centre at Harman, and receiving and transmitting stations at Bonshaw and Belconnen respectively.

All point-to-point communication, that is, communication between shore establishments of the R.A.N., and with shore stations of the Royal Navy, the Royal New Zealand Navy, the United States Navy, etc., is carried out by means of automatic printing telegraphic equipment. Automatic telegraphy is also being adopted for communication with ships at sea, although manual Morse Code is also used, and will continue to be used for this purpose.

The majority of R.A.N. communications pass through the Signals Centre at Harman, which serves as a central exchange. Thus all communications with remote R.A.N. stations and with overseas organisations, and with ships are sent from the originating stations by radio or by landline to Harman, where they are automatically received and then relayed over the appropriate radio circuits. Likewise, incoming signals are fed to Harman, whence they are relayed to the addressee stations.

All traffic passing through Harman is handled in the form of punched paper tapes through the central exchange, the Tape Relay Centre. These tapes are automatically punched by telegraphic receiving equipment, and after manual transfer from receiving bays to the appropriate transmitting bays, the messages are automatically retransmitted. The only departure from this automatic routine is in the case of communication with ships not fitted with automatic telegraphic equipment, in which case messages manually received are transcribed by operators on to punched tape, and outgoing messages are sent in Morse Code either manually or by means of electronic code converters.

Associated with the sending equipment in the Tape Relay Centre is automatic Dating, Timing and Numbering equipment, which adds that information to each outgoing signal prior to transmission.

Also associated with the Tape Relay Centre is the Control Room, where the engineering control of the communication circuits takes place, and, for example, frequency (wavelength) changes for the radio circuits are originated to conform with changes in transmission conditions, and the quality of the circuits is supervised. The Control Room also contains the channelling equipment which permits the transmission and reception of several channels of traffic simultaneously on one radio circuit. Likewise, all the outgoing radio traffic to the transmitting station, 10 miles distant, is stacked by means of similar channelling equipment on to a very short wave bearer group and sent to Belconnen through highly directional aerials. At Belconnen the many channels of signals are sorted out automatically and fed to the appropriate radio transmitters.

The Belconnen Transmitting Station contains a Very Low Frequency transmitter of 200 kilowatts power output, operating at 44 kilocycles per second (a wavelength of almost five miles), four 40 kilowatt short wave transmitters for the most important overseas fixed services, 23 5 kilowatt transmitters for fixed services, broadcasts to ships and ship communication, and three 20 kilowatt transmitters for ship communication.

W.R.A.N. Robyn Nielsen, a tape relay operator at H.M.A.S. Harman.

The 200 kW transmitter, which was originally built 20 years ago, has now been overhauled and modernised, and is believed to be the most powerful radio transmitter in the Southern Hemisphere. It is particularly valuable because its great wavelength and power permit communication with ships to be maintained even during solar disturbances and magnetic storms which disturb short wave communication.

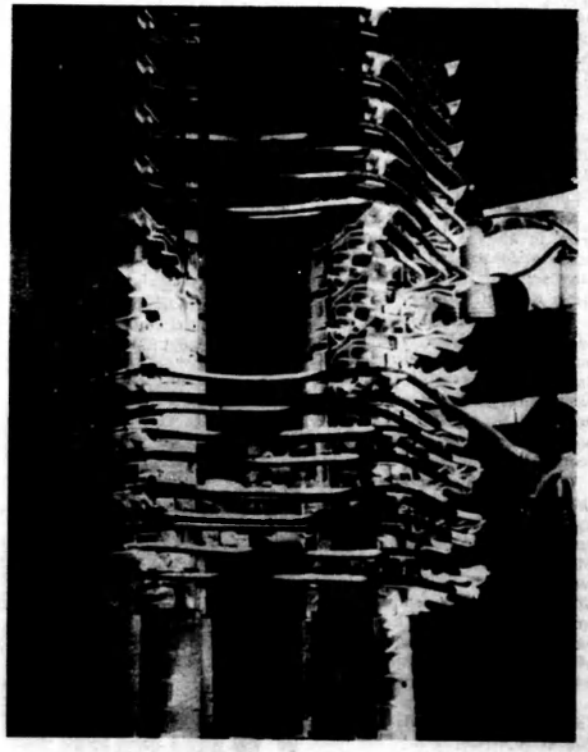
Associated with the transmitters at Belconnen is the necessary control and monitoring equipment, directional and broadcast aerial systems, and aerial exchanges which allow any transmitter to be connected to almost any aerial.

The Bonshaw Receiving Station likewise has a comprehensive system of directional and non-directional aerials which permit reception from any direction with a minimum of interference, and aerial exchange systems, which allow any receiver to be connected to any desired aerial. The exchanges feed the fixed service receivers, which operate without attention, and are connected directly with tape perforators at the Tap Relay Centre, and also the ship-shore receiving positions, which are manned by telegraphists.

The communication system at H.M.A.S. HARMAN is one of the most modern in the world and it probably the largest shore wireless station in the British Commonwealth.

Harman's activities are supplemented and backed up by the other major R.A.N. station, Coonawarra (Darwin), which is similar but on a smaller scale, and which has also been completely modernised by Standard Telephones and Cables.

COIL OF 200 kW TRANSMITTER



A technician from S.T.C. checks the transmitter coil. The coil is housed in a sealed, air-conditioned room. Anyone entering the room during transmission would be killed instantly, but, should entry be necessary, a special safety device cuts off the power.

W.R.A.N.S. Vital Part in Naval Communications

Today, many young women, from all over Australia, are taking their stand alongside men of the Navy in maintaining vital communications with ships and naval establishments of the British Commonwealth.

Typical of these young women is W.R.A.N. P.O. Barbara Coberoft, of Bega, New South Wales, who has served at the Naval W/T Stations at Canberra and Darwin.

During the five years she has been in the W.R.A.N.S., Barbara estimates that she would have sent, or received, over the air, a million words.

England, United States, Canada, South Africa, India, are but a few of the countries she has talked to, while ships in Singapore, Hong Kong, Honolulu and the Antarctic are but a few who have been glad to record her words.

Barbara makes no secret of the fact that she enjoys working at H.M.A.S. HARMAN, the largest self-contained W/T Station in the British Commonwealth, which, although built in 1939, was not commissioned until 1943. It was here that, early in the last war, the first W.R.A.N. Telegraphists came to serve. Here for 365 days a year, 24 hours a day, they built up a tradition, which the W.R.A.N.S. today, not only the Telegraphists, but their support train of Supply Assistants, Sick Berth Attendants, Writers, Cooks and Stewards, are very proud to continue.

NAVY APPRENTICES PASS OUT

Before a large gathering, which included the First, Second and Third Naval Members, the 38 apprentices who have completed their training passed out officially at a ceremony in H.M.A.S. "NIRIMBA" on Wednesday, June 15.

The original intake of 50 youths began their training on July 1, 1956, and Commodore F. L. George, at that time Captain of H.M.A.S. "NIBIMBA", was present at the graduation ceremony.

THE 38 young men are the first of a steady flow of highly skilled tradesmen who will do much to meet the technical needs of the Service. To date 395 apprentices have been entered, and from now on there will be a six-monthly output of apprentices.

Three of the apprentices already entered were selected during their course for training as Cadet Midshipmen at the Royal Australian Naval College.

The impressive ceremony was attended by many of the parents of the apprentices and by representatives of the N.S.W. Dept. of Technical Education, the Apprenticeship Commissioner, the Department of Supply and various organisations and firms, all of whom assisted materially in the development of the Apprentice Training Scheme.

Vice Admiral Sir Henry Burrell inspecting the Apprentice Guard.

Visual Signalling is Not a Modern Art

By Lieutenant Commander C. H. NICHOLLS, R.A.N.

VISUAL Signalling is by no means a modern art. It may be said that it is the development of a natural instinct.

Long before coherent speech began, primitive man had felt the want of some method of communicating with his fellows in those circumstances which precluded the use of the voice, such as the proximity of the enemy or game in the hunting field, or great distance.

The well-known beckoning gesture, meaning "come on," the waving back motion, meaning "go back," and the placing of the fingers on the lips to enjoin silence, are all primitive signals which persist even unto the present day.

The nature of visual signalling varies considerably and is as widely divergent as the races of the earth.

The smoke signal is almost universal, but this art was developed to its highest degree of efficiency by the North American Red Indian.

Today, in Central Africa, the signal drum is widely used, and passes intelligible messages over vast distances with astonishing rapidity and accuracy.

Julius Caesar, when crossing the English Channel to the conquest of Britain, marshalled his ships by means of trumpet calls, and it is thought possible that these calls were identical with those used in manoeuvring his army ashore.

William of Normandy used drums for the same purpose in similar circumstances.

THE EARLIEST FLAG SIGNALS.

Turning to the Naval side of signalling, we find that Blake, in his instructions to his captains, ordered: "If I hoist a bucket at my mainyard arm, close and I will speak with you."

From such a simple beginning sprang the elaborate and efficient system of visual signalling as used in Her Majesty's Fleet at the present time.

Naturally, this was not done in one stride, but is the result of a gradual building up through the centuries.

One of the earliest flag signals, which was used to the end of World War II in a slightly altered form, was the "Enemy" flag.

In its original form it was the French ensign, and hoisted at the Main by any ship indicated "Enemy in sight."

Hoisted at the foremast by the Admiral it meant "chase the enemy." If, however, the Admiral wished the chase discontinued, he hoisted this flag at the mizzen mast. This is now flag T (for Tango).

THE CODE OF LORD HOWE.

The oldest Signal Flag in the world is the British Church Pennant, and it is still used for its original purpose, that is, to denote that the ship's company is at Divine Service.

It originated when the British and Dutch were enemies, and both sides being Roman Catholic, it was decided that a truce should be observed whenever the Mass was being celebrated by either side.

The ensigns of the two countries were sewn together, and the Flag of Britain, a red St. George's Cross on a white field, occupies the part of the Pennant next to the Mast, while the Dutch Colours, red and white and blue horizontal bars, is at the "Fly" or part farthest from the mast.

Flag signalling developed but slowly, until the middle of the 18th century, when several codes were designed, notably by Kempenfeldt and Lord Howe. It was the latter's system of signalling which was used so successfully by our beloved Nelson.

This code included a small English dictionary, where each word was allotted a combination of figures; a phrase section, where each of the various orders in common use, such as "Make sail," "Tack together," etc., were also indicated by groups of figures, and a Geographical section whereby names of places could be signalled in the same manner.

Lord Howe's code consisted of only 12 flags, which represented the numbers one to nought and two substitutes, so naturally enough it was not very comprehensive.

As an illustration of the evolution of flag signalling, it may here be mentioned that the British Naval code in use to the end of the last World War consisted of no fewer than 80 flags, each having its own several meanings in different circumstances, and yet again different meanings when used in conjunction with one another.

In fact, it may be said that learning of flag signalling is as complex as the learning of a foreign language. This is the main system of visual signalling from a "war" point of view, and the speed at which orders can be issued by an Admiral by this means is really amazing.

At the present time all N.A.T.O. nations use the same Code of flags which has been reduced to 70 all told.

VALUE OF HELIOGRAPH.

Flag signals are hoisted at the masthead of a flagship, certain ships repeating the signals, the remaining ships merely answering.

When the Admiral wishes his order to be executed, the signal is hauled down, although, in some cases, flag signals are obeyed on sight.

It must not be presumed, however, that flag signalling is the only method of conveying orders. When the distance is great, or visibility poor, the signalling projector (or searchlight) is brought into use, the Morse Code being employed.

Other systems in use are semaphore for short distances, flag waving for longer distances and siren or whistle for signalling in a fog.

At night, communication is effected by means of flashing lanterns. The heliograph is an ingenious arrangement of mirrors whereby the light of the sun is utilised for flashing the Morse Code over immense distances under favourable conditions.

The greatest distance to which the heliograph has transmitted messages is something like 120 miles.

This system is used only by signalmen in a landing party, the reason being that the movement of a ship prevents the accuracy required in directing the rays of the sun to a distant station.

EYES OF THE FLEET.

The importance of efficient and precise signalling cannot be too greatly stressed, as the following story from Greek Mythology amply proves:

Theseus, a legendary hero of Attica, was determined to slay the Minotaur, a monster with the head of a bull and the body of a man, who lived in the Cretan Labyrinth, where he devoured the Athenian youths and maidens sent as a tribute every nine years.

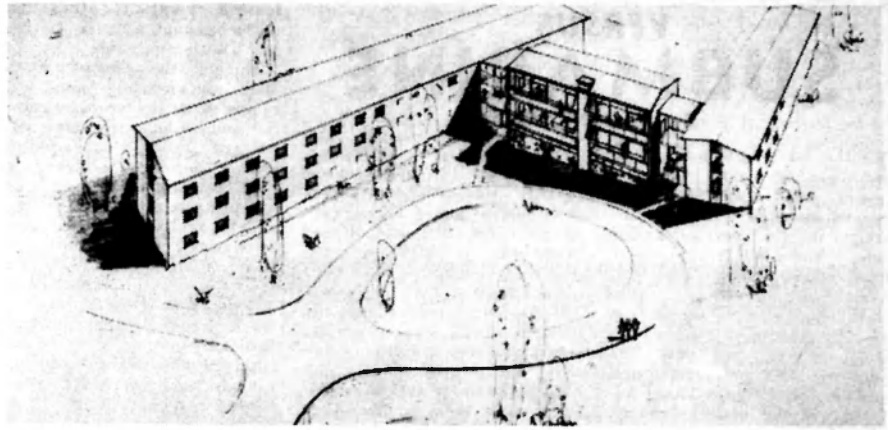
Before sailing away in his black-sailed ship, Theseus told his father, Aegeus, that, should the ship return bearing white sails instead of black, it would indicate that the mission had been successful.

With the aid of Ariadne and a reel of cotton, Theseus slew the Minotaur. Unfortunately, the ship's company were so elated that they omitted to change the sails. Aegeus, standing on the cliffs of Attica, sighted the black sail returning, and forthwith cast himself into the sea in despair.

Thus was named the Aegean Sea, and thus is proven the necessity for attention to detail in signalling, as Aegeus never fully recovered from the result of this error.

The Signalmen are the eyes of the Fleet, and they never cease watching, although "Automation" in the form of radar gives more timely warning of the approach of objects which may prove to belong to the enemy.

NEW RATINGS' BLOCK AT HARMAN



The Minister for Works, Mr. Freeth, has released details of the new accommodation blocks for ratings to be built at H.M.A.S. "HARMAN". —Courtesy Daily Telegraph.

Costing nearly £200,000, construction has just begun on the new quarters which will consist of three interconnected blocks of modern design. A three-storey block will house ratings, catering for the new living scale conditions . . . four men share each large room, with private stowage for clothes and personal gear for each occupant.

A two-storeyed block will house Chief and Petty Officers in single berth cabins. The central two-storied block will contain all communal facilities — galleys, dining halls, reading and recreation rooms, toilets, bathrooms and laundries.

Heating will be provided throughout the new quarters, which will be of brick, faced externally with face-brick. The walls will carry the load, eliminating supporting internal pillars. For added fire protection, floors will be of concrete, and an automatic fire sprinkler system will be installed.

The new accommodation will house 174 Chief and Petty Officers and ratings.

The new quarters, together with the new "Wrannery," opened in September last, will make HARMAN the most comfortable and up-to-date shore establishment in Australia.

With the bright colourful cottages nestling around the new buildings and its natural setting in undulating plains with the backdrop of the near-by hills, HARMAN will, indeed, make an attractive sight by the spring of 1961.

SUBMARINE *VERSUS* SUBMARINE

By "DORMOUSE"

IN the Navy to-day the overwhelming weight of manpower, ships and aircraft is concentrated, directly or indirectly, in the anti-submarine role. Some 60 frigates have been converted or built expressly to cope with this aspect of defence, and the whole face of the sea-going Navy has changed over the past two decades. The most logical, and potentially the most lethal adversary to the modern submarine is only now coming to the fore. This weapon? Another submarine—the anti-submarine submarine. A brief historical survey of the development of this facet of submarine warfare will help to underline the point.

The Submarine Branch is only just over 50 years old. During this time most people have thought of the submarine as an exclusively "anti-surface ship" device. There does not appear to have been any attempt to use it in the A/S role until 1917.

At this crucial stage of World War I, the Germans began unrestricted U-Boat warfare, and our own submarines were stationed at focal points and in patrol areas where they could expect to encounter enemy submarines. They sank 14 U-Boats in the next 18 months, and a grand total of 17 during the war. These were not, however, A/S submarine engagements in the modern sense. Detection and attacks were carried out on surfaced targets and certainly required the target submarine to be visible.

The final stages of the war, however, saw the production of the "R" class—the first purely A/S submarines. These were unique little craft, and 10 had been built by 1919, so great was the urgency. They displaced a mere 500 tons, were 163 ft. long, and had a complement of 22. Their surface speed was only nine knots, but once submerged, their "K" class main motor and large batteries gave them an incredible 14 knots on their single propeller.

Here were the perfect vessels to combat the U-Boats on surface transit. Their low silhouette gave them the first sighting at night, and by day they could rely on their superior speed to reach an attacking position. Moreover, they had six 18-inch bow tubes—a large salvo for such a small boat. They had come too late to have any effect on the war, however, and after a brief period of peace-time training they vanished altogether, the last being sold in 1924.

Meanwhile, developments in asdics and experiments in new types of submarines to fulfil new, and sometimes fantastic roles, displaced the scarcely fledged concept of an A/S submarine from strategical thought in the inter-war years. The submarine in general was considered an unmasked bogey; a single submarine on patrol was "Like a tethered goat — you get a devil of a butt if you get too close, but otherwise they are harmless." (This from a lecture at the Imperial Defence College in 1935.) Similar lectures of this period make no mention of an A/S side to submarine operations, other than an occasional allusion to this as "another possible role."

During the Second World War surface ships were still regarded as the proper targets for our submarines, and 300 out of 782 U-Boat sinkings were, therefore, achieved by R.N. surface escorts and co-operating aircraft. It is not widely realised that 39 Axis submarines were credited to their Allied counterparts. For their part the German and Italian submariners accounted for seven Allied boats discounting Russian ones. The 35 British sinkings were carried out by a branch which at no stage exceeded three per cent. of the uniformed Navy.

The Axis submarines were sunk on the surface by torpedo, gunfire, or even by ramming in all but one significant case. This single attack marks the beginning of the present concept of a submarine A/S attack, for on 4th February, 1945, Lieutenant J. S. Launders in VENTURER sank U864—130TH submarines being dived throughout.

VENTURER, on patrol to the north of Bergen, had received intelligence reports of an approaching U-Boat the previous day. Her asdics detected the "hydrophone effect" of a vessel unlike the customary fishing boats, but though the bearing was carefully watched, nothing could be seen. Then the Officer of the Watch caught a brief glimpse of a mast or periscope. It seemed likely that this was the submarine, but course, speeds, even range, were unknown. Suddenly the Captain sighted two periscopes too close to ensure the arming of his own torpedoes. He gave chase and, after an exciting pursuit, gained an attacking position, turned and fired four torpedoes, the last of which sent the homecoming submarine to the bottom. Contact had been maintained, and course and speed estimated, during an action of two hours' duration with only the "hydrophone effect" bearings as a guide, for no further sighting was obtained.

This brilliant action translated into practice the vaguely formed theory of fixing the target by "bearings only." Much depended on the skill of the asdic operator, whose cool judgment of the volume and bearing of the target's "hydrophone effect" won him in this instance a D.S.M.

Submarines now entered a new phase in their development. Over the intervening 15 years the fascinating technique of attacking a totally invisible target from a submerged submarine has been practised and perfected in countless N.A.T.O. exercises. This new role has coincided with the adoption of the snort and with longer range asdics; so that the modern submarine, with a vast submerged range and enhanced listening capabilities, is, indeed, a formidable anti-submarine weapon.

The history of submarine operations, as of any other

(Continued on page 25)

Sydney Harbour Bridge (stop ger-nashing yer teeth, Melbournites!) as seen by the submariners in H.M. Submarine "ANCHORITE." This picture was taken through the main periscope of the submarine.
—Courtesy S.M.H.

WRANS in the News

W.R.A.N.S. at Flinders Depot prepare to come alongside in a work boat. Front: Wran Std. G. J. Spragg of Bundaberg (Bowman). Rear: Wran Std. R. S. Brown of Tumbellup, W.A. (Stern-sheetman), Cabin: Wran Cook O. E. McCann of Bayswater, W.A.

Lieutenant B. Dunn points out features of a Gannet anti-submarine aircraft to W.R.A.N. officers and ratings from the aircraft carrier Melbourne, in Darwin recently.

—Courtesy S.M. Herald.

Lieut. Commander Clark-Smith swears in 8 new members of the W.R.A.N.S. at H.M.A.S. "RUSHCUTTER". The girls are from various parts of N.S.W, and will now begin their initial training at Flinders Naval Depot It is intended that in a future issue we will publish a picture of the same girls in the same line up but wearing their uniforms. Left to right: M. D. Felton (Newcastle), M. J. Haragan (Newcastle), L. C. Dickson (Campsie), D. H. Macintyre (Hornsby), M. A. Magill (East Hills), E. A. McFadden (Manly), D. Honey (Stanwell Park), M. D. McTiernan (Orange).

Commodore F. L. Georgr, A.D.C., R.A.N., and First Officer E. Ekert, W.R.A.N.S., cut the Birthday cake at the party given by the W.R.A.N.S. at Flinders Naval Depot to mark the nineteenth anniversary of the formation of their Service.

W.R.A.N. (M.T.D.) Wendy Thurley A/P.O. "Simon", and Naval Airman Ralph Turner of H.M.A.S. "ALBATROSS", captain of the Navy's Australian Rules Football team in the Charity Carnival.

Latest Developments in Soviet Naval Policy

By J. MEISTER

SOVIET Naval Policy has changed sharply once again, the fifth time in the history of the 42-year-old Soviet Navy. For some years Western observers have noted that work on the hulls of several of the "Sverdlov" class cruisers had stopped, and it was obvious from many Soviet statements that they did not know to what use to put these new cruisers except for training and for carrying V.I.P.s abroad. Nobody, however, expected such complete condemnation as Khrushchev pronounced during his trip to the United States when he remarked casually that 90 per cent. of Russia's cruisers would be scrapped in the near future. This would leave her with about three or four, probably one for each of her main fleets in the Baltic, Arctic, Black Sea and Pacific; and these survivors are to be employed for training and probably as peacetime flagships only.

Among vessels to be built under the "new look" programme, submarines are to receive top priority, followed by minesweepers, motor torpedo boats, patrol craft and large destroyers. This trend was confirmed in Khrushchev's speech to the Soviet Assembly in January, 1960. As the Russians had been building from 50 to 80 submarines a year, besides many cruisers and numerous other warships, tankers and miscellaneous merchant vessels, this concentration on submarines and small craft will no doubt enable them to launch even more submarines and some of them nuclear-powered.

The Western navies have also come to the conclusion that battleships, and perhaps even cruisers, have no raison d'etre in the nuclear age; although it is hard to see why the aircraft carrier, for instance, should have a better chance of surviving an attack by missiles with nuclear warheads. At the same time neither the British nor the U.S. Navies would take such radical steps as the Russians and scrap cruisers only a few years old. In peacetime and in limited war, cruisers may still play an important role, and it is surprising that the Russians do not seem to contemplate converting some of their cruisers into missile-launching vessels or light aircraft carriers. They intend to rearm their modern destroyers with missiles as soon as possible (most of these vessels carry at present conventional armament which is weak and obsolescent); but a cruiser hull can obviously carry more and heavier missiles than a destroyer while offering at least some armoured protection, better sea-going qualities, and wider cruising range. For these and many other reasons the Soviet decision seems revolutionary — putting all its eggs into one basket so far as the Soviet Navy is concerned. In a few years the Russian Navy will resemble that of Germany in 1944-45—with many submarines and some coastal forces, but no surface ships which might tie up superior N.A.T.O. forces.

The disappearance of the Soviet cruisers will ease the task of the N.A.T.O. Navies which may now concentrate almost exclusively on Soviet submarines and mines, and on countering amphibious assaults over somewhat short distances. For the time being, however, the said cruisers are still quite active and towards the end of 1959 the ADMIRAL SENJAVIN, belonging to the Pacific Fleet, paid a visit to Indonesia. This beautiful vessel and her escort of two heavy destroyers certainly did more to impress the Indonesians than a whole flotilla of Soviet submarines. It is tempting to conclude that if the Russians really scrap their cruisers and concentrate even more on submarines than they have done so far, they contemplate either total war or total peace, but certainly not limited war. For the latter their Navy, composed exclusively of submarines and coastal forces, would be quite unsuited, especially if the war were to be waged far from the Russian coasts. As for total peace, to build a submarine fleet of 720 craft, nearly 500 of them already in existence, hardly seems to be the best solution. Unfortunately, there are other indications, too, that the Soviet Navy is trying to secure new bases abroad, both in the Mediterranean and in the Persian Gulf, and to develop its influence in the Pacific. Hand in hand with this goes a worldwide increase in underwater research work and spying in coastal areas.

"SCIENTIFIC" ACTIVITIES

While it seems that Russia is concentrating her ambitions at present on the Near East and Africa, it should not be forgotten that Soviet research and surveying vessels as well as submarines are still very active all over the world. Surveying goes on on a tremendous scale in the Pacific and Atlantic probably in connection with the trials of long-range missiles. Sightings of Soviet submarines are reported from Canada, the Caribbean Sea, along the coasts of Argentine, Brazil and Chile (in some cases surface vessels of these countries have reported depth-charging unknown submarines!) and many other places, and some of these reports are almost certainly correct. Soviet "scientific" activities in the Antarctic, and even more in the Arctic, are designed ultimately for military purposes as well as peaceful ones, and in this field the Russians deploy more means and obtain more results than the Free World.

Altogether, the situation may be summed up as follows: While the Soviet is increasing the numerical strength of her navy, acquiring new bases and testing improved weapons, the Western navies decrease in strength, close down more and more bases, and are also declining in manpower. As long as this situation continues, Soviet Russia will hold the political initiative and by one means or another secure still more friends, while the Free World loses them. We have already lost so many that we cannot afford to lose many more!

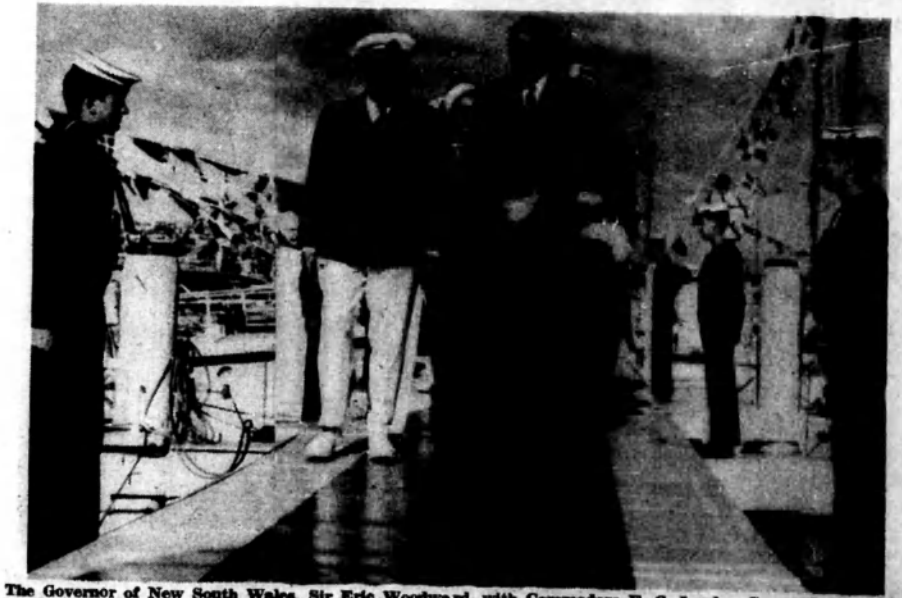
SEA CADETS in DARWIN

Captain Marks, Director Naval Reserves, visited Darwin recently to inspect the Northern Territory Division of the Sea Cadets, whose ship is T.S. "WARRAMUNGA". They were very seamenlike in their drill, and after the inspection he presented the cadets with a framed picture of H.M.A.S. "WARRAMUNGA" at speed.

These same cadets received congratulations from the former Governor-General, Sir William Slim, when he visited Darwin last year. They paraded a guard for him at the Darwin Show and His Excellency commented very favourable on the appearance and bearing.

Sea Cadets in the News

(Above): R.A.N.R. ratings prepare to take H.M.A.S. WAGGA to sea for a cruise to the Barrier Reef. Left to right: Frank Vaibusa of Balmain, Jeff Pugh of Epping, Barry Brown of Belfields, Robert Auld of Belfields, Tony Hughes of Newcastle, and Lloyd Cropper of Blacktown.



The Governor of New South Wales, Sir Eric Woodward, with Commodore F. G. Lender, Commodore of the Royal Motor Yacht Club at Point Piper, inspect the new marinamooring dock on the occasion of the official opening of the dock. The Guard was provided by the Sea Cadets.

ROYAL CANADIAN NAVY

The Royal Canadian Navy is celebrating its 50th anniversary. Canada's Navy officially came into being when, on 4th May, 1910, Royal assent was granted to the Naval Service Act. That same year two protected cruisers, the NIOBE and RAINBOW, were acquired from the Royal Navy.

Ships of the Royal Canadian Navy have served in three wars. During the First World War the Canadian naval contribution was about 9,600 officers and men and 100 ships.

During the Second World War the Royal Canadian Navy expanded to 392 armed ships and 95,000 officers, men and Wrens. Canada's major naval effort being devoted to the Battle of the Atlantic.

Canadian destroyers served in the Far East throughout the Korean War.

This 50th anniversary year 1960, finds the Royal Canadian Navy at its greatest peacetime strength, with 62 warships in commission and with 20,604 officers, men and Wrens on full-time duty, and 3,550 in the active Royal Canadian Naval Reserve. Some 49 per cent. of the Royal Canadian Navy personnel are at present serving on board ship.

R.C.N. JETS TESTED.

Six Banshee jet-fighters of the Royal Canadian Navy, armed with Sidewinder missiles, convincingly demonstrated their destructive power by shooting down five target-aircraft in an exercise designed to test the effectiveness of the Banshee-Sidewinder combination.

The firings took place over the sea on the missile range of the Royal Aircraft Establishment at Aberporth, Wales. The targets were Firefly VIII aircraft, flown by remote control. Six missiles were fired at as many targets and five of the drone aircraft were splashed.

The operation was carried out by aircraft of Fighter Squadron 870.

The Governor-General, Lord Dunrossil, and Lady Dunrossil, with Acting/Leading Seaman Brian Boad of H.M.A.S. VAMPIRE, and Chief E.R.A. Charles Cunningham of H.M.A.S. MELBOURNE and Mrs. Cunningham at an Investiture for R.A.N. men at Government House, Canberra.

QUEEN'S BIRTHDAY HONOURS

Her Majesty the Queen has been graciously pleased to approve the following awards:—

Knight Commander of

The Order of the British Empire

Vice-Admiral Henry Mackay Burrell, C.B., C.B.E.

Commander of

The Order of the British Empire

Rear-Admiral Kenneth McKenzie Urquhart.

Officer of

The Order of the British Empire

Captain Stanley Darling, D.S.C. and two bars, V.R.D., R.A.N.R.

Member of

The Order of the British Empire

Lieut. Ronald Mervyn Titcombe, R.A.N.

British Empire Medal

Chief E.R.A. Thomas William James Cunningham.

Vice-Admiral Sir Henry Burrell, K.B.E., C.B.

The circumstances surrounding the award to Lieut. Titcombe were:

On April 21, 1959, a chopper operating from Portland (England) ditched about 9 miles south-east of the Shambles Light Vessel, in a depth of 170 feet.

To determine the cause of the crash it was essential to recover the helicopter, but the strong tides prevented the recovery by wire sweeps and standard divers.

Lieutenant Titcombe, then in charge of the Clearance Diving team at H.M. Underwater Detection Establishment, was consulted on the use of clearance divers. In such depths, with further complications caused by the swift tides, operating time for the divers below would be very short.

Still further, the ascent must be a matter of no more than 5 minutes, making decompression in a special chamber a matter of urgent necessity.

The necessary equipment including special inflatable dinghies capable of operating in rough weather were available, and so Clearance Diving history was made.

It was the first operational occasion that Clearance Divers had performed at such great depths and that surface decompression had been used, and the team effort was the main factor in the successful recovery of the chopper.

The success of the operation was largely due to the intelligent appreciation of the situation, the leadership and the fine personal efforts of Lieutenant Titcombe.

NEW RATE FOR R.N.

Among the points that Mr. Orr-Ewing, Civil Lord of the Admiralty, recently discussed in the House of Commons was the suggestion that a Master rate, above that of Chief Petty Officer, be introduced in the Royal Navy.

This rate would bring the Navy in line with the status and pay of Warrant Officers in the other services.

Mr. Orr-Ewing said that the problem is now under consideration.

NEW TYPE SONAR

Significant Advance in Submarine Detection

A new type of Sonar, known as V.D.S. (variable depth sonar) is being manufactured in Canada for the Royal Canadian Navy.

THE new system will enable warships to lower sonar gear through the ocean's thermal layers, thereby overcoming the ability of submarines to escape detection in or below these temperature strata.

Variable depth sonar is the result of more than 10 years' research and development by Defence Research Board scientists of the Naval Research Establishment at Halifax, Nova Scotia.

The need for a layer-probing sonar first became apparent when German submarines, both by accident and design, made tactical use of thermal layers during the Second World War.

The upper levels of oceans usually contain layers of varying temperature which form a horizontally uniform pattern many miles in extent. These layers may refract or completely resist penetration by sonar transmissions from hull-mounted sets.

The problem was of particular concern to the Royal Canadian Navy because of the presence of such layers off the coasts of Canada.

Defence Research Board scientists and anti-submarine specialists of the Royal Canadian Navy, Working on the project together, discovered that the problem could be substantially overcome by placing transducers in or below the layers of varying temperatures.

Applied research and development followed, and the result was an equipment consisting essentially of a transducer enclosed in a streamlined body which can be towed at varying depths. The towing cable houses a core of electrical conductors. These transmit signals to the towing ship's sonar displays and also carry electrical power from the ship to the transducer.

The concept which led to the development of variable depth sonar was initiated almost simultaneously in Canada and the United States. Close liaison was maintained with the Royal Navy and the United States Navy, who also sought improved detection methods along similar lines. Information was shared throughout by the associated countries, with Canada concentrating on specified possible methods as the other countries explored different but allied techniques.

H.M.C.S. "NEW LISKEARD", originally an "Algerine" class ocean minesweeper subsequently reclassified as a coastal escort, and now again re-rated as a survey ship for bathythermeographic duties, was the first ship to be used for experimental trials. Repeated testing and modification resulted in improvement in the performance of the equipment, and a more sophisticated version of variable depth sonar, built by Canadian firms, was installed in H.M.C.S. "CRUSADER," a former British destroyer now rated as a destroyer escort. Intensive evaluation produced effective results and the equipment was accepted for service in the Royal Canadian Navy.

SUB. VERSUS SUB.

(Continued from page 15)

form of warfare, has been a succession of temporary advances on each side of the battle. Now, however, the nuclear submarine has temporarily outstripped all conventional forms of surface and air A/S methods, leaving only another submarine (preferably nuclear) as its logical opponent.

What advantages does a submarine hold over its surface and air colleagues? By its choice of depth it can penetrate the density layers which are the under-water equivalent of the smoke screen or rain storm to shelter a hunted submarine. It can chase its quarry under the polar icefloes. Its invisibility, even in these days, gives it a good chance of operating in enemy held waters, and particularly in the approaches to submarine bases—the most fruitful hunting ground of all. Such areas, with their inevitable enemy air superiority, are unsuitable, to say the least, for patrol by frigate groups or slow A/S aircraft. As well as having the ability to remain unseen, the submarine can stay on patrol for weeks or even months, maintaining complete silence, and making the best use of intelligence reports covering a large area. Finally, rough weather effectively "quenches" the asdics of surface ships and reduces their speed superiority over a conventional submarine. The chances of detection and chase against a 20-knot nuclear vessel are still decidedly slender, even using a combination of air and surface forces. Another nuclear submarine, equipped with homing torpedoes and modern asdics, has both the speed and the detection equipment to deal with its transiting opponent.

Russian Submarines

The U.S.S.R. is quietly but surely distributing her new medium-sized seagoing patrol submarines of the "W" class all over the world, either based in fellow travellers' countries or actually incorporated in, leased or loaned to foreign navies with communist sympathies.

No fewer than 30 "W" class submarines of the Soviet Navy have been deployed in this way.

A whole squadron of eight units are now based in Albania.

Eight of the nine former Russian seagoing types of submarines now incorporated into the Egyptian Navy are reported to be of the "W" class.

It is not generally known that two Russian submarines of the "W" class have been allocated to the new Indonesian Navy.

Of the 24 ex-Russian submarines now incorporated into the Chinese Communist Navy twelve are new vessels of the "W" class. These are all operational, and another nine are under construction. Also, "W" type submarines are being or are schedulued to be built at Shanghai and Wuchang dockyards at the rate of about six to eight each year.

The modern Russian "W" class submarines in Indonesia and China alone more than offset the two meagre British submarine squadrons based on Singapore and Sydney, and rival the number of American submarines based on Pearl Harbour, and in emergency or all out war would require hundreds of anti - submarine frigates in the China and Java Seas to counter them.

There are also 35 ex-Russian submarines of other classes now in the navies of Bulgaria, China, East Germany, North Korea, Poland, Roumania and Syria.

THE W.R.N.S. COMES OF AGE

The Women's Royal Naval Service is 21 years old. It was in the uneasy summer of 1939 that the organization, which was to attain a distinctive niche in naval history, was formed.

Although pioneered in the First World War it is from the date that the Service was reformed by the late Dame Vera Laughton Matthews that it is officially recognized.

11th April was the date, and functions to mark the occasion will take place at home and abroad throughout this year. In London, H.R.H. the Duchess of Kent, the Chief Commandant of the W.R.N.S., was present at a reception in St. James's Palace on 16th May with several hundred serving and retired officers.

A comparative handful of young — or not so young — women of 21 years ago, wearing soft brimmed hats with non-committal "H.M.S." bands, grew by 1944 to a peak strength of 75,000.

To-day, members of the W.R.N.S. serve in 25 categories in Britain, Gibraltar, Malta and Oslo. With uniforms of the latest materials and attractive quarters to live in, they are worlds apart from the volunteers of World War I in heavy serge skirts, nine inches from the ground, and stout boots. They accepted bully beef and plum duff but were linked by loyalty as closely to the Royal Navy as all who have served since.

After 21 years the W.R.N.S. has become an integral part of the Royal Navy, as essential as any of its branches.

U.S. ATOM CARRIER.

The year 1960 will be notable for the U.S. Navy as well as the Royal Navy. Across the Atlantic, I am told, preparations are now being speeded up for the launching of the first nuclear-powered aircraft carrier, ENTERPRISE.

This ship will be of 85,000 tons displacement and will probably cost upwards of £50,000,000. She will be able to operate aircraft with speeds in the 1,300 to 1,500 m.p.h. range.

Although the ENTERPRISE will be similar in many respects to the big carriers of the FORRESTAL class her eight pressurised water-cooled reactors will give her far greater endurance. She will be able to circle the globe several times without re-fuelling. As she will not have to carry heavy oil which conventional carriers need for their main boilers.

MERCHANT SHIPPING

Liverpool Steamship Owners' Association discuss Nuclear Power

THE Liverpool Steamship Owners' annual report contained some very interesting facts and figures on British Merchant Shipping.

The following condensation is from the "Navy":

The Annual Report of the Liverpool Steam Ship Owners' Association covers, as usual, much the same ground as does the Report of the Chamber of Shipping, though it is taken from the liner operators' angle. Flag discrimination, the problems of taxation and replacement, and the world surplus of tonnage (which is allied to the question of flags of convenience) are difficulties common to all ship owners and are discussed at length. Peculiar to the Association is the useful table which shows the tonnage employed in the export and import trade of the United Kingdom, and the percentage of this which wears the red ensign. The percentage of British tonnage is falling steadily, and the figures for 1959, 51.1 per cent. in the import trade, and 61 per cent. outward bound, are appreciably lower than those for 1958. This trend goes hand in hand with the equally marked drop in the share of British tonnage in world shipping; and both are bound to continue so long as the depredations of the tax-gatherer impede the proper provision for the upkeep of fleets.

NUCLEAR PROPULSION.

The Association discusses at some length the proposals set out in the draft convention dealing with the liability of owners of nuclear ships which was prepared by the Comite Maritime International at its meeting in September, 1959. In this draft it is proposed to settle all liability for nuclear damage on the operator of the nuclear ship, regardless of where responsibility may lie for the fault which has resulted in such damage, **unless** the fault can be proved to have been committed **with intent**. This, as the Association points out, is a novel legal doctrine, but one which is essential if there is to be any future for the nuclear ship, since ordinary considerations of blame would entail a risk falling on the owner of a non-nuclear ship which would be quite beyond the bounds of normal third party insurance. The operator of a nuclear ship will be under compulsion to carry insurance sufficient to cover probable claims. The draft convention will now go to the Diplomatic Conference for consideration by Governments.

The Committee on Safety in Nuclear-Powered Merchant Ships set up by Her Majesty's Government has also reported, with various recommendations which will be put forward to the International Safety at Sea Conference to take place later this year. Since the U.S. SAVANNAH should proceed to her sea trials some time during the second half of this year, and may come into service thereafter as a combined passenger and cargo ship, it is important that decisions be taken without too much delay on the conditions under which she and her successors shall go about their business. Major shipping disasters are mercifully rare, but the ANDREA DORIA and STOCKHOLM collision is a nasty reminder of what can happen. Presumably the shielding would protect the reactor in most cases of damage; but this is not one of the engineering problems which are best tested by experience.

Experience with a nuclear-powered ship at sea has, however, been recommended from two quarters as the best way for Britain to make progress towards an economic unit. Lloyd's Register of Shipping, in their annual report for 1959, repeat the opinion expressed a year ago, that Britain's lack of actual operating experience of a reactor under marine conditions may well handicap her in future commercial developments. The building of the first British nuclear ship would be an important step in the process of technical advance, which was always associated with cost reduction. Also on record in favour of getting a ship to sea is Dr. T. W. F. Brown, director of the Pametrada Research Station at Wallsend, who pointed out recently to the Institution of Naval Architects that the problems associated with economic nuclear propulsion were now largely engineering ones. Capital cost could only be brought down by good engineering improving on an installation already constructed, and no amount of paper work or studies in committee would replace this. Actual construction was essential, as otherwise the necessary techniques and craft skills would not be learned, and the country would become dependent on others who had

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R.A.N. SEARCH for AIRCRAFT WRECKAGE

The Royal Australian Navy recently played a vital but unenviable part in the search for the wreckage of a Fokker Friendship aircraft which crashed into the sea off Mackay on the Queensland coast on the 10th June.

H.M.A.S. "WARREGO" which had just arrived at Townsville was immediately ordered to the scene of the crash and having located and buoyed the wreckage used her divers, who were joined by the Clearance diving team from H.M.A.S. "RUSHCUTTER," in Sydney, to obtain most of the vital wreckage which would assist the investigation committee to ascertain the cause of the accident.

Because it was feared that some of the wreckage might be too heavy for the gear in "WARREGO", H.M.A.S. "KIMBLA," who was refitting in Sydney, with most of her crew on leave, was also ordered to assist.

Salvage was delayed for many days because of bad weather and the operation was not completed until the 26th June.

Officers and men from the "WARREGO" played their last part in this sad accident in which 29 persons were killed when on Sunday June 26th they took part in the Guard of Honour at the unveiling of a memorial on the mainland near where the plane crashed

Heavy lifting tackle being fitted to H.M.A.S. "KIMBLA" for lifting the large portions of the crashed Fokker Friendship. L/E. M. Clayton (centre), L/Sea A. True (left) and L/Sea P. Rowe.

SEACAT MISSILES FOR R.N. SHIPS

A substantial order for the Seacat surface-to-air guided missiles, which will replace short range anti-aircraft guns, is, it is reported from London, shortly to be placed with Messrs. Short Bros. of Belfast.

At first the Seacat will become part of the armament of the four County Class G.M. destroyers now building and of some of the more advanced frigates.

The test vehicle of the Seacat was first shown at the Farnborough Air Show in 1957. Since then there have been many predictions as to the lethal qualities of the missile even at wave top height.

The primary purpose of the Seacat will be to strike attacking aircraft which may evade the outer defences of the fleet—fighters and long range guided missiles.

REAR-ADMIRAL HARRIES RETIRES

Rear Admiral D. H. Harries, C.B.E., Flag Officer in Charge, East Australian Navy who retired on 17th June, had over 43 years service in the Royal Australian Navy. The Admiral entered the College in 1917, becoming a midshipman in January, 1921, Sub-Lieutenant in 1923, Lieutenant in 1924, Lieut.-Commander in 1932, Commander in 1938, Captain in June, 1945, and Rear-Admiral in July, 1954.

His first ship was H.M.S. "CONQUEROR", from which he went to H.M.S. "WARSPITE." At the outbreak of World War II he was in command of H.M.S. "SEAGULL" and for a brief period in 1940 he was Senior Officer, 4th Minesweeping Flotilla, in H.M.S. "NIGER."

Late in 1941, he was Naval Attache to Washington and then became Executive Officer of H.M.A.S. "SHROPSHIRE." Then he became, in 1944, the Deputy Chief of Naval Staff and in April, 1946, he took command of H.M.A.S. "HOBART."

In later years he had command of H.M.A.S. "SYDNEY" and subsequently was head of the Australian Joint Services Staff in Washington.

Admiral Harries on his return to Australia became Flag Officer Commanding the Australian Fleet in 1956 and in 1958 Flag Officer in Charge East Australia Area.

He has been succeeded by Rear-Admiral G. C. Oldham, D.S.O., whose last appointment was Captain, H.M.A.S. "WATSON", the Navigational Direction and T.A.S. Training Establishment in Sydney.

ADMIRAL ROWED ASHORE

Rear-Admiral D. H. Harries is rowed ashore to his official residence, Tresco. The whaler's crew were five of his senior Captains (left to right,) Captain G. D. Tancred, D. S. C., Captain B. W. Mussared, Captain T. K Morrison, O.B.E., D.S.C., Captain C. C. Stevens, R.N.Z.N., and Captain W. F. Cook, M.V.O.

—Courtesy S.M.H.

New "Super-Tanker" to be Built at Whyalla

THE keel for Ampol's new "super tanker" was laid at the B.H.P. shipyards at Whyalla, South Australia, on Wednesday, April 27.

"This marked the birth of the biggest ship and the first oil tanker ever to be constructed in Australia," said the Managing Director of Ampol Petroleum Ltd., Mr. W. G. Walkley.

"Of 32,250 tons deadweight, the tanker will cost an estimated £4 million, and is due to be ready for sea trials in July-August, 1962.

"The new tanker will be 670 ft. long and 87 ft. across the beam.

"She will be Australia's first 'super' tanker. We call them 'super' tankers when they are over 30,000 tons.

"The Broken Hill Proprietary Co. Ltd. will build the new tanker for Ampol."

Mr. Walkley emphasised that wherever possible, Australian materials and equipment would be used.

Construction of the tanker will provide employment for hundreds of skilled craftsmen, shipyard workmen and others.

The tanker will exceed by more than 13,000 tons the biggest ship so far built in Australia.

Much preparatory work has been required to adapt the Whyalla shipyard to the construction of this monster ship, and more than 1,000 tons of plate-work have already been prepared for the laying of the keel.

The tanker will be driven by a Parson's Steam Turbine, supplied with super-heated steam from two oil-fired, selectable superheat boilers made by Babcock and Wilcox of Australia Pty. Ltd., at Regents Park, Sydney.

The first piece of ship's equipment delivered to the shipyard was the huge propeller.

Of 21 ft. diameter, it weighs 21 tons, and is made from special cunial bronze to give it added strength and efficiency and freedom from corrosion.

When completed, the tanker will join Ampol's existing fleet of four tankers, carrying crude oil to the Australian Oil Refinery at Kurnell, Botany Bay.

She will carry approximately 30,000 tons of crude oil cargo.

Ampol already owns Australia's biggest ship—the "LESLIE J. THOMPSON," a 25,000 ton tanker, named after the company's Chairman of Directors.

C.M.A. QUEENSLAND FACTORY COMMENCES PRODUCTION

A new £250.000 copper cable manufacturing factory established at Strathpine (Queensland) by Cable Makers (Australia) Pty. Ltd., is now in production. In its initial stages the plant will employ a staff of about 50.

The new factory represents a combined venture, as Cable Makers' electric cable manufacturing plant and a wire drawing and stranding factory of Metal Manufactures (Queensland) Pty. Ltd. have been established in conjunction.

At a function to celebrate commencement of production, Mr. M. Dillon, general manager of Cable Makers (Australia) Pty. Ltd., said that the new factory would be staffed and operated by Queenslanders; would use copper from Queensland mines; and, as far as possible, would draw all its materials and services from Queensland sources.

Mr. Dillon further stated that the buildings and equipment at Strathpine are more than adequate to produce sufficient electric cable and wire to meet the full requirements of the Queensland market.

"The venture," he stated, "has been undertaken in conjunction with our associated company, Metal Manufactures (Q'land) Pty. Ltd., and also with Cable Makers' distributors throughout the State. There will, therefore, be a very effective liaison between copper supplies, electric cable manufacture, selling and distribution, which will prove very beneficial to the user of our product and enable us to give the ultimate in service to our customers."

Mr. Dillon said that the new buildings at Strathpine, where the two companies had acquired 25 acres of land, had been specially designed and erected to give the most effective and efficient layout of plant and equipment.

The plant, which had been installed, was composed of the most modern automatic machines available in the world. Although the new plant is not large compared with our Liverpool, N.S.W., factory, it is the most modern plant operating in Australia today for the production of electric wires and cables.

(Continued from page 27)

in fact proceeded to build. He recalled that knowledge derived from actual construction had by now enabled Babcock & Wilcox to offer a marine reactor with 2.5 times the output of the reactor in SAVANNAH, but which would require only 20 per cent. more space in a ship. He also spoke of the need for service experience with such matters as fuelling and de-fuelling, disposal of waste (potentially one of the greatest safety problems), and the effects of rolling and pitching on the reactor.

The ball is now at the Government's feet. Perhaps it may be of some little encouragement that the Minister of Transport said recently at the annual dinner of the Institute of Marine Engineers that he was certain our first nuclear powered ship would not be economic, but we must go on trying until we got an economic unit.

SHIPBUILDING.

With the concurrence of both sides of the industry, a special sub-committee is to be set up by the Minister of Transport to consider the future of the shipbuilding industry. Shipbuilding has been under fire recently from Lord Hailsham for not spending enough, in his opinion, on research and development of new techniques; and in the House of Commons for its demarcation troubles. It is pleasant, therefore, to find a Norwegian shipowner, Mr. Nerdrum, now settled in London, on record that British yards can compete on price and delivery with any in the world. Mr. Nerdrum suggests that one of their great difficulties is that they cannot offer the same extended credit terms as some of their competitors. Fifty per cent. down and five years to pay off the balance is much less attractive than 20 per cent. down and eight to 10 years to pay. These figures, quoted by Mr. Nerdrum, depend, of course, on government subsidies in the countries concerned.

The last month has seen the launch of the CANBERRA, which with her running mate, ORIANA, is designed for the P. & O./Orient combined service to Australia, with its new extension across the Pacific. Both vessels show a considerable increase in size and speed over anything which has been employed in this service in the past, being of 45,000 and 40,000 tons respectively, with a service speed of 27½ knots. Their draught, fully loaded, will be well within the limits for use of the Suez Canal and their speed will cut the voyage from this country to Sydney by nearly a week.

In both ships extensive use is being made of aluminium, about 1,000 tons going into the superstructures of each. Plastics are also being used very largely for facing surfaces, so eliminating the need for interior painting and reducing maintenance costs. They will also be the first two major liners to be fitted with a bow propeller for manoeuvring when berthing, though the machinery has been fitted in a number of ferries built during the past few years.

FRENCH SHIP VISITS SYDNEY

The French ship, LA CAPRICIEUSE, visited Sydney from the 13th to the 27th June, for the purpose of docking and overhaul.

She has a length of 258 feet, a breadth of 28 feet, and a draft of 11 feet, with a complement of 8 officers and 85 men.

She is propelled by 2 Diesel Sulzer engines, 2,000 h.p. each, giving 18 knots as a maximum speed.

She was built in France in 1939, and belongs to the pre-war class "Aviso de 800 tonnes," which revealed itself, during the war as a useful class of escort and patrol vessel.

LA CAPRICIEUSE, not entirely completed in 1940, lay un-armed in Great Britain until the end of the war. Re-armed by the French Navy in 1945, she made a very good job as a patrol vessel throughout the Indo-China war. She joined the French "Forces Maritimes du Pacifique" in October, 1959, coming from Dakar through Panama and Tahiti.

Still armed as a small anti-submarine escort vessel, she replaced, in the Pacific, the French frigate, LA CONFIANCE, which is going back to France.

Main duty of LA CAPRICIEUSE, is to visit all French Territories of the South Pacific, and give assistance to the populations of these islands. On these tours, she is based either on Noumea or Papeete. She has already sailed more than 19,000 miles around the South Pacific islands.

In addition, LA CAPRICIEUSE takes part in hydrographic work in the South Pacific.

CRITICISM OF DARING DESTROYERS

THE Minister for the Navy, Senator J. G. Gorton, recently replied to criticism of Australia's Daring Class destroyers.

H.M.A.S. VOYAGER, he said, had recently blown a boiler, and had to be repaired in a Hong Kong dockyard.

This was the fourth time that either one or the other boilers had given trouble.

Mr. Gorton said that the cost of repairing the boilers in Hong Kong was significantly less than in Australia, even though tubes had had to be air freighted to Singapore.

Two of the Daring Class destroyers had also had trouble with their turbo generators, which were complicated machinery.

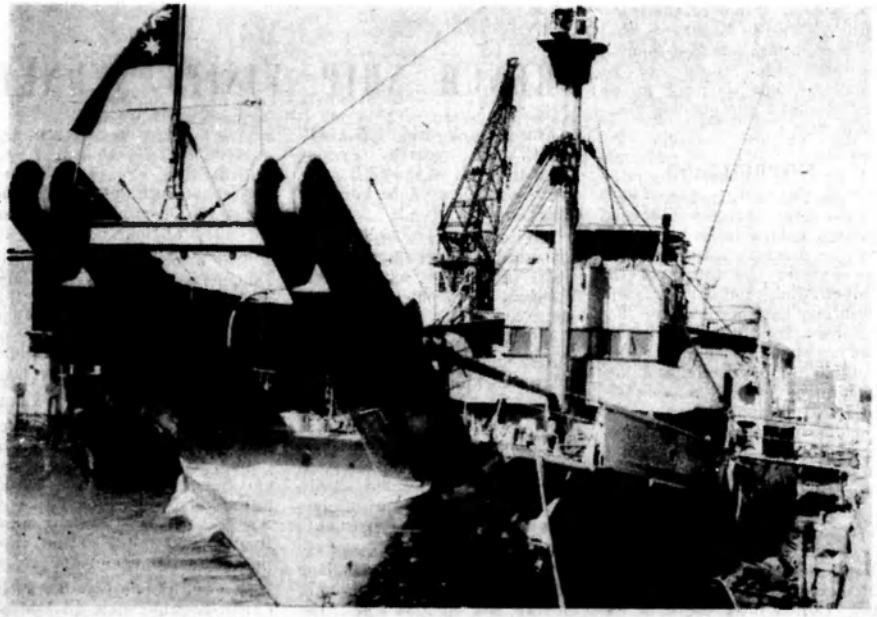
Senator Gorton said the bringing together of these troubles, which occurred in a period of almost three years, into one set of allegations was designed to make things look bad.

The reports said that the three Darings had been built in Australia at a cost of £9 million each, when they could have been built in the U.K. for about £3 million each.

Senator Gorton said this was untrue. The average cost of the three destroyers had been £6.75 million each, and at the time that they were built they could not have been bought in England.

It was also true, said Senator Gorton, that the Royal Navy had put its Daring Class destroyers into reserve.

Of the Royal Navy's eight Daring Class destroyers, four were in service with the fleet and four were undergoing modifications, some of which had been incorporated into the Australian Darings when they were built.



H.M.A.S. "KIMBLA," a Boom Depot ship who assisted H.M.A.S. "WARREGO" in salvaging the wreckage of the Fokker Friendship aircraft which crashed into the ocean off the Queensland coast.

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