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Vol. 30

MAY-JUNE-JULY, 1968

No 2

#### CONTENTS

roge	Page
Fast CODOG Warships for Finland 3 Periscope on Australia 5 Japanese Battleships and	Ivan Builds a Carrier
Battle-cruisers	H.M.A.S. Maneera 73
Helicopter-dostroyers for the R.A.N. 25 National Service in the U.S.S.R. 31	What's New? 7: Brooking A Ship on Purpose 8:
Sea Cadots Corpe News 35 Nautical Notes from all Compass	When Wemen Taught Sailers to Cook 87
Pointe	The Philosophy of the Modern

Plus sundry storice and photographs

The views expressed in articles appearing in this publication are those of the authors concerned They do not necessarily represent the views of the editor, the Navy League, or official opinions or policy

Published by the Navy League of Australia, 66 Clarence Street, Sydney, N.S.W., 2000; Tel.: 29-6531 Postal Address: Box 1719, O.P.O., Sydney, N.S.W., 2001

EDITOR: Dennis P. Trickett, Esq., Box C17B, Clarence Street Post Office, Sydney, N.S.W., 2000, Australia.

ADVERTISING AND PUBLICATION: PERCIVAL PUBLISHING CO. PTY. LTD.

MELBOURNE ADELAIDE RRISBANE HOBART 108 Henderson Rd. 17 Elizabeth St. Alexandria, 2015 Melbourne, 3000 17 Currie St. 546 Queen St. 53 St. George s Tce 152 Collins St Brisbone, 4000 Phone, 31, 2531 Hobert, 7000 Phone 23-732 Adelaide 5000 Perth 6000 Phone: 69-6231 Phone: 62-6411 Phone: 51-6225 Phone: 23-2031

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May-June-July, 1968

THE NAVY

Page One

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and naval architecture is always on trade protection. the lookout for the unusual. Parfence requirements.

sat up and took notice a few months ago when a perhaps overof 2.000 tons for Finland!

Warships in the plural of 2,000 the firm subsequently admitted that that displacement which have been dition of a vertical-seeking element. free from ice in the spring of 1968,

Nevertheless it appears that they of five degrees, at 18 knots. ticularly attractive is the fighting ship will be nice little ships and quite country for which it was built, the warship. They are to have comgas turbines in operation.

equipment for high-speed frigates vice. The hydro-dynamic lift on the inch turret. stabiliser fin will be adjusted by The agency stuck to its guns, but a control on the bridge console.

The true connoisseur of warships officially rated as "tykkiveneet" for The fin installation is required to stabilise the ships with a wave slope

The new ships are being built by which is out of character with the as sophisticated as many a larger the Wartsilayhtyma Oy Shipyard. Helsinki, to a specific (similar to warship which is not in keeping with bined diesel or gas (CODOG) tur- NATO) Finnish Navy requirement. a particular navy's role, or a new-bine propulsion machinery, and With a standard displacement of construction order which appears Vosper fin-stabilisation equipment 600 tons, increased to about 800 to be in excess of a nation's de- designed to operate throughout the tons at full load, they have a speed range, from the diesel cruise length of 2281 ft. and a beam of So faithful fans of warship lore condition to the full speed with 26t ft. Their armament comprise one 4-7 inch automatic dual-Rolls Royce Olympus gas turbines purpose gun forward, two single zealous public relations agency put are being fitted, and the top speed 40 mm anti-aircraft guns aft, and it out that a certain enthusiastic is expected to be substantially anti-submarine depth-charge proand enterprising British shipbuild- higher than that of steam-turbine- jectors. Rocket-flare guide-rails are ing firm had a hand in supplying powered vessels at present in ser- provided on the sides of the 4-7

The ships are flush-decked with limiting the maximum angle of a raked bow and simple lines tons when the whole Navy was incidence of the fins as speed in- affording a clean superstructure. limited by Treaty to 10,000 tons. creases, this being done by setting. The main engines were designed for developing 22,000 h.p. Vosper The equipment for these ships Thornycroft's Hydraulic Power the figure had been a misprint, will be the first for naval vessels. Division recently delivered two sets And these fast frigates turn out to to make use of the new Vosper of fin stabiliser equipment. It is be fast gunboats of the kind which electronic control system recently expected that the two ships will be it is becoming fashionable to class announced. The sensing elements completed and ready for sea trials as corvettes of only a fraction of are a roll-rate gyro with the ad- by the time the northern Baltic is



The Finnish Navy's TYKKIVENE

#### OUR COVER

H.M.A.S...Stuart, leads H.M.A. Ships Derwent and Queenborough. Queenborough is steaming under the Sydney Harbour Bridge



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#### R.A.N. SHIP WINS SHOOTING MATCH

The Daring class Destroyer VAMPIRE won the Naval gunfire support (shore bombardment) section of a naval gunnery competition against all-comers from the British. Australian and New Zealand Navies, in the Far East.

The gunnery competition is con- 979.

ducted in three sections - antiaircraft, surface and naval gunfire

#### RECRUITING STATISTICS

the end of February, 1968, were -Navy: 16,476; Army: 42,527 (26,681 Regular and 15,846 National Servicemen); Air Force: 20, Oberon class submarine H.M.A.S.

#### FIRST VISIT BY CANADIAN NATIONAL DEFENCE COLLEGE

A party of 35 from the Canadian National Defence College visited Australia during early March, in the course of a study tour of Asia and the Pacific.

The group, comprising faculty members, students and staff were led by the Commandant of the College, Major General F. S. Carpenter, A.F.C. Students are senior officers of the Canadian Armed Forces, Government Departments and civilian agencies.

The College which is located at Fort Frontenac, Kingston, Ontario, visits a number of countries each

The tours are made to obtain a better\_picture of the social, political and economic aspects of a countries foreign and defence policies.

#### R.N. Submarine returns to U.K.

After 71 years service with the R.A.N., the submarine H.M.S. Strength of the armed forces at TABARD left Australian waters on 22nd March to return to the United Kingdom. She will be replaced later this year by Australia's second OTWAY.



GREETINGS TO R.A.N. PERSONNEL FROM . . .

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#### NEW NAVY MINISTER

The recently appointed Minister for the Navy. the Honourable C. R. Kelly, made his first official visit to a ship of the R.A.N. on 8th March. He led a party of Members of Parliament and journalists aboard the G.M. destroyer H.M.A.S. HOBART.

The official R.A.N. photograph shows Mr. Kelly wearing a flying helmet, being strapped into his seat in a Navy "Tracker" aircraft before leaving for Jervis Bay where the party joined HOBART.

#### VISIT BY U.S. NATIONAL WAR COLLEGE

A party from the United States National War College visited Australia during late March in the course of a tour of the Far East,

Forty-five students and members of the faculty and staff were led by Ambassador E. Allan Lightner, Deputy Commandant of the College. The students are senior offi-



cers from the U.S. Department of State, Navy, Army and Air Force and other government agencies.

The College was established in 1946 and is controlled by the American Joint Chiefs of Staff.

It prepares students to exercise high level policy, command and staff functions.

#### BRISBANE SHOWS HER TEETH

This photograph shows the firing of an anti-submarine acoustic homing torpedo by the GM destroyer H.M.A.S. BRISBANE during her acceptance trials at the under-water tracking range in Puget Sound, Washington State. BRISBANE is working-up in U.S. waters before leaving for Australia later this year.

#### H.M.A.S. DIAMANTINA — OCEANOGRAPHIC SURVEY

The R.A.N.'s oceanographic research vessel, H.M.A.S. DIAMAN-TINA, left Bunbury, Western Australia on 20th March for a 10 day hydrographic study of the



May-June-July, 1968

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physical and chemical properties of day periods at a depth of approx. the waters of the Southern Ocean.

She carried a research team led by Dr. John Bye of the Horace Lamb Centre of Oceanographic Research at Flinders university.

#### AUSSIE TOPS SUBMARINE COURSE

Sub-Lieutenant P. D. Briggs, R.A.N. has been awarded the Admiral Max Horton prize for obtaining the highest aggregate marks in the final examination of the submarine officers training course conducted at H.M.S. DOLPHIN, the Royal Navy's submarine training school.

#### **NEW AQUANAUT CHOSEN**

Lieutenant Richard Sutton. R.A.N. (see photo below) has been selected to take part in the U.S. Navy's aquanaut programme.

He will replace Lt. Commander Michael Shotter, who was injured recently in a car accident in Key West, Florida. Lt. Cmdr. Shotter was training for Project Sea Lab III, which is to be conducted off the coast of San Clemente Island. California, later this year.

600 feet.

#### PATROL BOAT LAUNCHED

The wife of a former elected member of the Papua-New Guinea House of Assembly, Mrs Robert Tabua, launched the fourth patrol boat (H.M.A.S LADAVA) of the R.A.N.'s Papua-New Guinea Division, at Walker's yard, Maryborough, on Saturday, 11th May.

#### COAST WATCHER HERO

The ashes of the late Commander Eric A. Feldt, O.B.E., Commander of Australia's Coast Watchers of World War II. were scattered at sea, off the Coastwatchers' Memorial Light at Madang; from the patrol boat H.M.A.S. SAMARAI, on Monday, 20 May.

Commander Feldt who was supervising Intelligence Officer, Northeast Area, during the War, organised the group of men who became known as the Coast Watchers. They worked behind enemy lines, radioing information on Japanese movements to the Allies.

The Coast Watchers were credited Lt. Sutton will live with other with causing 5.414 enemy deaths, divers in an ocean habitat for 12- wounding 1,492 and capturing 74.

were killed and 40 captured.

Twenty-seven European Coast

Watchers were killed during the

War: 18 were captured and only 2

survived. Twenty native helpers

Coast Watchers also rescued 321 shot-down airmen, 280 naval personnel from sunken ships and 190

#### CHIEF OF NAVAL STAFF RETIRES

With the retirement of the Chief of Naval Staff, Vice Admiral Sir Alan McNicoll, K.B.E., C.B., G.M., on 2nd April, 1968, the R.A.N. said farewell to the man who had steered it through a period of great

The Minister for the Navy, the Honourable C. R. Kelly, M.P., further stated that "during Admiral McNicoll's service as Chief of Naval Staff, the R.A.N. introduced into service 3 guided missile destroyers. patrol boats, new aircraft and a destroyer tender, all of which add considerably to the strength of the Australian Fleet

The new equipment has made the R.A.N. more independent and self-reliant and certainly a great deal more powerful.

Sir Alan encouraged the Navy to become more Australian in character. It was he who sponsored and saw to completion the introduc-



VICE ADMIRAL V. A. SMITH

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VICE ADMIRAL SIR ALAN MONICOLL

tion of the R.A.N.'s own distinctive White Ensign.

Under his leadership the R.A.N. had gone to war without the Royal Navy for the first time, by entering the Vietnamese conflict. Australian ships have a very fine reputation with the officers and they have operated."

Vice Admiral McNicoll, who of 60 years, had served for 46 years which paved the way for the formin the R.A.N.

of Naval Staff by Rear Admiral Creswell, "Father of the Royal V. A. T. Smith, C.B., C.B.E., sailors of the U.S. ships with which D.S.C., who assumed the rank of Vice Admiral on appointment.

THE NAVY

#### DEATH OF FORMER NAVY SECRETARY

Mr. George Lionel Macandie. C.B.E., who was secretary of the Australian Naval Board from 1914-46 and the first secretary of the Navy Department from 1915 until 1921 when the Department was incorporated with the Defence Department, died in Melbourne on 1st May, aged 91 years.

Born in Queensland, Mr. Macandie's first appointment was in 1895 as a clerk in the Queensland Marine Defence Office in the days of the State Navy's and Naval Brigades. He transferred to the Commonwealth Service in 1901.

Nearly 50 years later after witnessing and playing a large part in the development of the Royal Australian Navy he was to leave Navy Office Melbourne after a lifetime of service which included 2 world wars. He was awarded the C.B.E. in 1920. His service which continued beyond the normal retiring age concluded in 1946.

After his retirement he wrote. 'Genesis of the Royal Australian Navy" which placed on record the history of navies of the various States before Federation, with a glimpse of early naval history, including the Australian Naval Station when under Admiralty Command. reached the compulsory retiring age and the various colonial conferences ation of the Royal Australian Navv.

Mr. Macandie was closely associ-Sir Alan was succeeded as Chief ated with Vice Admiral Sir William Australian Navy," from 1900, and himself contributed much to its successful administration.



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# **Japanese Battleships and Battle-Cruisers**

by R. G. MELLAR

With her victory over the Russians in 1905 complete, Japan had turret of FUSO and on the stern become a nation of major naval importance in the Pacific, and it was only natural when Dreadnought-type warships became fashionable in the major navies of the world that Japan should obtain one or more was planned to fit them with a to hold this position.

this type were both completed by having to be discarded under the 1913 in Japanese yards, and they Washington Naval Treaty (finally bore the names KAWACHI and she became a target ship and was SETTSU.. They were armed with 12 twelve-inch guns and of 21,420 tons (normal), which was driven through the water by four turbine engines developing 25,000 h.p.=20 knots, only one knot slower than DREADNOUGHT.

The first Japanese vessels of in July 1918, and the SETTSU beached in July '45).

and ISE classes.

of the YAMASHIRO.

After the Battle of Midway it flight deck aft, but the idea was finally dropped, and it was to be in a gunfire and torpedo battle at Surigao Strait where they were to be eventually lost in October 1944.

The ISE and HYUGA were improved "Fuso" class ships, and also The next two classes of Dread- at completion carried the tripod noughts completed 1915-18 and mast, but they also were to lose each of two ships were the FUSO these in the early 1930's, and in 1936 the forward funnel was also The FUSO and YAMASHIRO to be removed. During the Second Britain's first Dreadnought, H.M.S. of the "Fuso" class were both com- World War they were to gain an pleted with tripod mast, but by important place in naval history These two were to be the only 1924 this had developed into a by being the only battleships to be two Japanese Dreadnoughts to be pagoda type structure, and again equipped with a flight deck, so completed and not see service in in 1933-35 they underwent refit, they could act the dual role of World War II, the KAWACHI be- the forward funnel being removed carrier-battleships. This was accoming destroyed by internal explosion and seaplanes being shipped on C plished by the removal of X and



KIRISHIMA after her first conversion

May-June-July, 1968

Page Twelve

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Battleship FUSO in 1915

Y turrets in 1943 and the placing which was to cause the cancellation ton ships of the "Kii" class of a platform in their stead, which of many of these ships. enabled twenty-two seaplanes to be carried; also one hundred and mounts were shipped. Both of U.S. planes in July 1945 at Kure.

In the last two years of the First began to lay down plans for eight new dreadnoughts and eight battlecruisers, the 8-8 programme which, with the dreadnoughts already in service, would give Japan something like the most powerful fleet would be finished in 1928

into taking steps to stop this pro- in 1942. gramme before it was completed: The final class of battleships of The "Shinano" was redesigned as

gramme were the MUTSU and Treaty, the material which had eighty five-inch rockets in six NAGATO, of 33,800 tons, mounting eight 16-inch guns, the first these ships were to see action at ships to be so armed by any nation. Leyte Gulf, finally running foul of The NAGATO was completed in 1919 and the MUTSU in 1920. and both were refitted in 1934-36 World War Japan's naval planners and subsequently saw service in World War II, the MUTSU accidently being destroyed in 1943, the NAGATO surviving the war, to be in 1937. Originally there was to destroyed by atom bomb tests in be four ships in the class, but in 1946.

The following two ships, KAGA in the world when the programme and TOSA, were to be improved "Nagato" class ships, mounting ten Abroad, especially in the United 16-inch guns, but although they States, it was believed that Japan were laid down as battleships they would have neither the money nor were never to be completed as such. the facilities to complete such a Because of the Treaty, the TOSA programme, but from time to time, was expended as a target in 1925; as information leaked out, the U.S. the KAGA became the carrier hail of U.S. bombs and torpedoes State Department was frightened KAGA which was sunk at Midway at Bonomisaki 1945 and Leyte

OWARI, KII No.-11, No.-12, which The first battleships of this pro- had to be suspended under the been gathered for the four ships being discarded.

With the cancellation of this programme many years were to elapse before Japan again strove to obtain new Dreadnoughts and although plans were drawn up in 1934 these plans were to go through twentythree stages before work commenced 1942 another one was planned, named "Yamato," "Musashi," "Shinano" and No. III, they were to be the mightiest ships in the world mounting nine 18 inch guns and having a top speed of 271 knots.

The "Yamato" and "Musashi" were completed as planned and both were to end their career's under a Gulf 1944 respectively.

hence the Washington Naval Treaty this programme were the 41,400 a carrier, being sunk in November

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Page Sixteen

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No. III was scrapped for economy

798 and 799 - 64,000 tons, 6-20 inch guns - of the 1942 programme were never ordered, being the last battleships planned for the Imperial Navy.

Japanese battlecruiser construction had actually began at Kure in 1907 with the completion of the "Ikomo" and "Tsakuba" both of 13,760 tons. mounting four-12 inch guns and the following class of two ships tons, completed 1909-10 and also consisted of more additions to the mounting, 4-12 inch guns. But these pagoda structure and the addition ships were to be reclassified as of 24 ft. to the stern, plus a cataarmoured ships so the "Kongo" class pult. "Haruna" and "Kirishima" did of 1913-15 were to be the first not have additions to their tripods Japanese battlecruisers.

class, was built in a British yard the "Kongo." but the following three were all to Imperial Navy and were an im- the London Naval Treaty she had the "Haruna" at Kure in July 1945.

world for a time.

Extensively modernised in 1930 The two improved Yamato's No. and 1936, they lost speed and gained armour which resulted in them being reclassified as high speed battleships.

> They all had tripod masts at completion and three funnels.

In the mid 1925's the "Kongo" had additions made to her tripod but by 1933 the tripod had developed into the pagoda type structure and one funnel had been removed. By 1938 the final modernisation "Ibuki" and "Kurama" of 14,600 had been completed and basicly in 1925, but from then on they The "Kongo," the first of the were refitted basicly the same as

"Hiei" was modernised in 1929

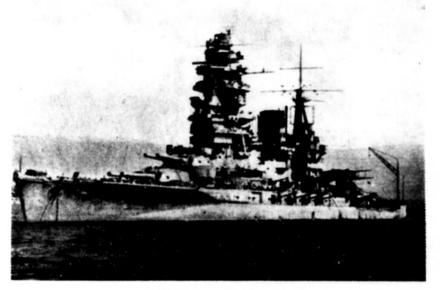
1944 by the U.S. submarine "Arche-proved version of the British Lion lost number four turret, all her fish" while on way from one yard class, which resulted in them being secondary battery, plus many boilto another to be fitted out. Hull the finest ships of their type in the ers, when she was converted to a Training ship. This conversion was not to last long and by 1939 (refit started in 1936) she had been rebuilt as the most powerful of the "Kongos,"her new pagoda structure being a test bed for the one to be fitted to the "Yamato" and her new oil fired engines giving her a speed of 304 knots.

> All four were to be active in most of the major naval engagements of the second world war, the

> "Kirishima" being sunk by the U.S.S. "Washington" (the first battleship to sink another by gunfire) on the night of the 15th November. 1942, off Savo Island.

Only the night before this, her sister ship "Hiei" had been damaged and then sunk by torpedo bombers off Savo the next day.

The remaining two ships were to see 1943 through but in the next two years both were to be lost, the be completed in Japan. They car-similar to the "Kongo," but by 1933 "Kongo" to submarine torpedoes ried 14 inch guns, the first in the when she was demilitarised under off Formosa in November 1944, and



NAGATO-Note spotter biplane of stern.

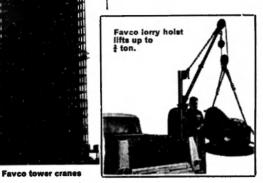
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Look up and you'll see giant Favco Tower Cranes Australia's industry and trade, the company is also exporting to other countries of the world. In fact, working on skyscrapers and helping to re-shape our when you consider it, that's quite a lot to do, for cities into new and dramatic forms. Then there are just one division of an all-Australian company the versatile Favco Deck Cranes at work on a variety of tasks that serve the shipping industry. And coming down nearer to ground level is Favco's

newest venture - the electric Lorry Hoist that Favco is a name you'll see almost anywhere where there is a lifting or hoisting job to be done. And,

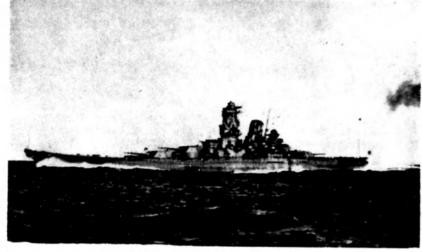
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May-June-July, 1968

The eight battlecruisers of the 8-8 30 knots. All except the "Akagi" all were to be cancelled 1921-22. programme none of which were to were cancelled, the "Akagi" as the be completed as battlecruisers were carrier "Akagi" being sunk at mid- 796 of the 13-65 class were candivided into two classes.

The "Amagi" class consisted of the "Amagi," "Akagi," "Citago" and were to have been very large ships of this class Japan never obtained "Tako" of 40,000 tons mounting mounting 8 18 inch guns on a any other battlecruisers other than 10 16-inch guns having a speed of 14,750 ton displacement but they the four "Kongo" class ships.

In 1942 two ships, hull 795 and celled, ( 32,000 tons 9-12.2 inch The 13 class Nos. 13, 14, 15, 16, 33 knots) and with the cancellation



Battleship YAMATO at 27 knots—the year, 1941

### **Australian Firm Makes World's Largest Crane**

shipped to its buyer in the United New York Authority. States.

The crane is the first of eight tower cranes to be delivered by the end of this year to the American Construction firm of Robert Koch. under a contract work \$U.S.2.5 million.

The Australian company won the order for the cranes against world competition.

Favelle Mort Limited designed

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> The STD2700 can lift more weight over greater distances and at higher speeds than any crane of its type ever before assembled. It is an external, or lift-well climbing type, which hoists itself up to ten feet at a time, by means of powerful hydraulic jacks fitted to the base of its tower.

It is powered by two 340 horseits STD2700 crane specially for the power diesel engines and is capable tests with 50 per cent overload.

THE NAVY

The world's largest crane of its construction of the twin 1500 feet of lifting weights up to 50 tons at

The Managing Director of Favelle Mort Limited, Mr. Eric Favelle, said the Company had won the order because of the unique features of this crane. These include diesel power, which cuts the running costs up to 50 per cent compared to electric power, together with hydraulic drive for all the crane's functions, which gives unequalled delicacy of control on all motions.

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# MISSILES 'AT SEA

The British Government decision to scrap aircraft carriers in the 'Seventies leaves a gap in naval air support capability that will be hard to fill. A further complication is added by the need to deal with long-range guided weapons operated by surface ships.

The Soviet Navy is already well endowed with this type of weapon. Large cruise-type missiles are carried by KYNDA and KRESTAclass cruisers and KRUPYY-class destroyers. KILDIN-class destroyers also have surface-to-surface guided missiles

Although included in Red Square parades, the large cruise missile NATO code-name Shaddock has been concealed within a tank-like container. The only certain features are a pointed rocket nozzle and twin boosters for ramp-launching. Shaddock must have a range of at least 50 miles: terminal guidance is probably by radar.

The whole area of naval weapon development needs revision in the light of these changing circumstances. More potent ship-launched missiles must be expected in the

This class of weapon has been relatively neglected in the West where heavy reliance has been on naval air power. The HSD Sea Dart is now being developed for both surface-to-air and surface-tosurface application. The combination of rocket booster and ramjet sustainer is a useful formula and one which could be developed with profit in larger forms of shiplaunched weapon.

A wider application of the stan-





Two views of the Soviet naval cruise missile NATO, code name Styx, launched from Osa and Komar class patrol boots. Missiles of this type - under UAR command - sunk the is raeli destroyer EILAT last October.

dard Sea Dart on smaller naval which can land on any ship equiplaunched from inshore patrol boats carrier-borne strike aircraft it does class. Missile-launching boats have though its operation could be more already been supplied by Russia to the United Arab Republic, Cuba, Syria and Indonesia. Egypt has seven OSA- and five KOMAR-class, both equipped with Styx surface-tosurface missiles (see photographs). It does not need a major East-West confrontation to face this sea and coastal targets. It was retype of weapon, as the sinking by Egypt of the Israeli destroyer Ell.AT clearly demonstrated.

On the horizon is a further complication. While Britain phases out her aircraft carriers, the Soviet Union has started a carrier building programme. New air-launched missiles clearly are in the pipe-

mance V/STOL aircraft will fit into conters armed with HSD/Matra a naval role with the phasing out of aircraft carriers in the Royal Navy remains to be seen. Last ducks" to surface-to-air guided year we saw the HS Harrier getting its "sea-legs" aboard a com- ranges of 15 to 20 miles. A mando carrier and the Italian V/STOL trans-sonic strike aircraft, guided missile escort carrier AN- able to operate at low-altitude with DREA DORIA.

vessels is also possible to counter ped with a helicopter platform has the threat of cruise-type missiles its attractions. Unlike conventional of the Soviet KOMAR and OSA not have to be "navalized" allimited by bad weather conditions. though certainly no more than helicopters.

> We already have the situation where missiles are being applied to helicopters for defence against missile-firing patrol boats and other cently announced that Wasp and Wessex helicopters of the Royal Navy will be equipped with Nord AS 12 air-to-surface missiles capable of destroying enemy boats at a range of 5 to 7 miles. The new missile has been developed from the Nord \$\$.12 used on patrol boats against surface targets.

These are to be followed in the Whether of not the high-perfor- 1970s by SH-3D Sea King heli-Martel air-to-surface missiles.

But helicopters are almost "sitting missiles even assuming stand-off stand-off missiles, would be a far At first sight the concept of a better proposition in the fasttrans-sonic close support aircraft changing climate of naval warfare.

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# Helicopter-destroyers for the RAN

by R. J. HALLETT

The Royal Australian Navy has recently returned to service its seven "St. Laurent" class ships after conversion from escort destroyer (DDE) status to helicopter-destroyer (DDH) status and has undertaken the construction of four new, larger, gas-turbine powered DDH's which will be among the most advanced and versatile anti-submarine weapons affoat. Each of the new ships will carry two Sea King ASW helicopters as well as VDS (Variable Depth Sonar) and a Limbo three-barrel depth charge mortar.

ages over the normal anti-sub submarine protection and at the Until this revision is forth-coming. marine frigate. Its helicopters same time give the R.A.N. a it is essential that Australia's secenable it to maintain surveillance counter-offensive capability. over a far greater area of ocean. tions thus permitting the DDH to be used in a much wider field of military operations than the usual ASW frigate.

The DDH is particularly suited to Australian requirements for numerous reasons.

Recause of the size of the Australian continent and the dependence which Australia has on seareasons of economy, it seems unlikely that Australia will be able to procure, equip, staff and protect a second, let alone a third or the statistics of these ships might

Besides its anti-submarine role, the economic and staffing limitations to operate its ships of the next helicopter may also be used for for Australia to commission sevsearch and rescue, reconnaissance, eral DDHs, which, if suitably gunfire observation, transport and equipped, would substantially add ground support (gunship) opera- to the present anti-submarine forces and also allow a moderate counteroffensive capability.

#### No New Ships Needed

It may not be necessary to build new ships to carry out the vital role which would be performed by the DDHs.

The R.A.N. at present has five ships which may be suitable for conversion to DDH status. These borne commerce, it is imperative are H.M.A. "Battle" class destroythat the Australian Fleet should ers, TOBRUK and ANZAC, and patrol a large area of sea. For H.M.A. "Type 15" ASW frigates, Oueenborough, Ouiberon Quickmatch.

On emerging from conversion.

fourth carrier which would be read as follows:-"BATTLE" CLASS "TYPE 15" Dimensions: Length 379 358 41' 35' 8" 13' 6" 13' 6" 2 ASW Helicopters 2 ASW Helicopters Aircraft A/S Weapons Limbo mortar 1 Limbo mortar 2 4.5" Dual purpose 4 40mm AA Guns 2 40mm AA

1 Seacat launcher

Speed 31 knots It might be argued that these ships are too old to make their conversion worthwhile. The "O" class were completed in 1942 and converted to ASW frigates in 1954-57; the "Battle" class were completed in 1950-51. As the conversion of these ships to DDH would evolve a major extended refit and up-dating, these ships should remain in service until about 1980 (a similar period required of

Missiler

H.M.A.S. Melbourne after her present refit).

31 knots

I Seacat launcher

If the present rate of development continues, it is reasonable to surpose that by the mid 70s a new generation, a new concept in warships will emerge, bringing with it. a complete re-appraisal of naval strategy. Australia will then have to think about a complete revision of Naval policy. The Oberons and theDDGs are the only warships which could remain effective for ASW helicopters, it provides a

The DDH has several advant- necessary to provide adequate anti- more than ten or twelve years. urity be assured and that the Navv it may not however, be beyond should expand sufficiently in order generation. The time to plan for the eighties is now!

The interim DDH programme will not only substantially increase security, but will supply extensive "front-line" training facilities, as well as facilities for experimentation in various aspects of naval warfare which could play an creasingly important part with the development of more sophisticated weapons for each of the Armed Services

This tactical experimentation role is almost equally as important as any other to establish a DDH force. It is a proven fact that the nation with the most efficient weapons is best able to maintain peace as it is not worth an aggressor's while to provoke hostilities while at a military disadvantage.

With the British withdrawal from east of Suez. Australia must. if only for her own survival, maintain peace in south-east Asia. For obvious reasons, Australia cannot take Britain's place by stationing forces throughout the area. There are, however, two means by which she can maintain peace. These are firstly by diplomacy, and secondly, by the principle of a "Force in Being." The "Force in Being" is not meant to be a threat to neighbouring nations, but a deterrent force which will facilitate diplomatic co-operation. In order that the "Force in Being" principle should work, although this force need not be numerically large, it must be of high quality. flexibility. fighting power and have a moderate strike capability.

Here again, the DDH appears as a useful concept. If equipped with Helicopter Pilots

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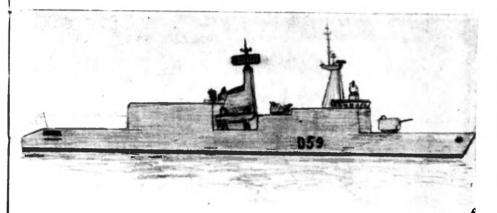
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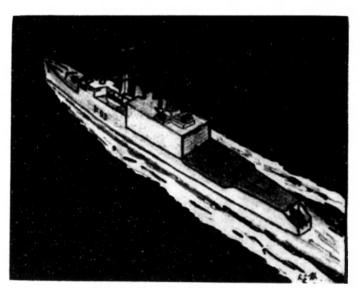
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# Helicopter-Destroyers for the RAN



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Helicopter-Destroyer (DDH) - HMAS QUIBERON

May-June-July, 1968

May-June-July, 1968

THE NAVY

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powerful deterrent to submarine destroyers, 6 ASW frigates). The attack. The DDH may, as pre- anti-submarine capability, though wiously mentioned, assume a considerable, is still comparatively counter-offensive role if equipped small and inadequate in case of with VTOL (Vertical Take-Off and emergency. Apart from the Ober-Landing) aircraft such as the Mach ons and ten small fighter-bombers, tralia and the Navy that this pro-0.98, Hawker Siddeley Kestrel, strike potential is non-existent. Ground Attack Fighter, or prefer Every unit serving with, or pro- agree? ably, the Mach 2, Mirage III U, posed for the R.A.N. is of the Strike and Reconnaissance Fighter highest quality in its own field. type which, besides being able to carry nuclear weapons against an enemy ground or sea target, may also provide reasonable anti-aircraft defence. A force to be reckoned with by an aggressor!

The use of VIOL aircraft with small ships has not yet been fully developed but the proposed DDH programme would provide a splendid opportunity for Australia to develop what would appear to be a particularly useful strategic con-

Taking an overall look at Australia's defence forces, the following facts might be noted:-

When the RAAF takes delivery of its F111 aircraft, its defence and strike capability will be second to none in this area of the world. Vietnam has demonstrated the effectiveness of the Army, and increased mobility will shortly increase this effectiveness.

The condition of the Navy is by no means as good as that of the other Services. The number of major warships in commission in 1970 will be only sixteen. (1 light carrier, 4 submarines, 3 DDG's, 2

Navy is unable to carry out completely and effectively its stated It is not supposed for one moment that the DDH programme will, like a magic wand, solve the

navy's difficulties, but it would ease them by a considerable amount.

the Australian continent and inevitable economic restrictions, the

Here, then, in summary, is a brief statement of the advantages of a DDH force developed on the lines suggested above:-

- I. Anti-submarine potential increased by 50%.
- 2. Air strike potential doubled (using VTOL aircraft).
- 3. Extensive "front-line" training facilities.
- 4. Facilities to develop tactics and associated interests.
- 5. Flexible patrol and reconnaissance force.
- 6. Maximum use of present resources; no new ships needed.
- 7. Facilities for expansion in preparation for the future.

I think that for the good of Ausgramme is worthwhile; don't you

The Editor invites Readers to respond to Mr. Hallett's article. but simply because of the size of Suitable letters will be published.



A model of the proposed Canadian Destroyer Helicopter Carriers. It is understood that their construction commenced earlier in 1967. Designed as anti-submarine ships, they will be fitted as leaders, having variable-depth and conventional sonar, landing deck equipped with double hauldown and beartrap. Flume type anti-rolling tanks to stabilise the ship at law speed, pre-wetting system to counter radio-active fallout, enclosed citadel, bridge control of machinery and automatic combustion control in boilers. Provision is also being made for the fitting of a short-range anti-aircraft missile.

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### NATIONAL SERVICE IN THE USSR

by ANDREI GRECHKO

Under a new law approved by the Supreme Court on October 12, 1967, the period of national service in the Soviet Union has been reduced by one year. At the same time there has been a 15% increase in the defence budget voted by the Supreme Soviet for 1968. The speech summarised below, in which the new Minister of Defence announced the new law, shows that these two measures are by no means contradictory, but should be seen as an attempt to reconcile rising costs for new weapons with the Soviet Union's growing commitments.

years, and naval ratings and petty limit for call-up is fixed at 27. officers would serve three years. A a higher education.

-18 being the age at which most young people finish their studies at secondary schools.

The call-up will be carried out twice a year, in May-June and November-December, Marshal Grechko explained that this procedure would create more favourable conditions for maintaining the combat preparedness of the armed forces at the proper level. Transfer to the 19 and 40 t reserve will also be made twice a

A system of initial military trainmen of call-up age and vounger. This preliminary military training will be carried out at ordinary schools beginning with the ninth form, and also at specialised secondary and vocational schools. Young people who are not studying full-time at educational establishments will do their military training alities. at special centres.

The need for this preliminary training was explained by Marshal Grechko as being due to the inperiod of national service.

Full-time students of higher edu- our attention," he said.

Outlining the main provisions of cational establishments will have

one-year period of national service under the new law the service age- of warfare." was being retained for persons with limit for officers would be raised. being established instead of 18 or are transferred to the reserve at a forces. 19 as has been the case previously comparatively young, working age," he said.

women who have medical or other today from what they were in special training to perform military 1939," he said. "A present-day duties. In peacetime their names motorised rifle division, for instwill be placed on a military register. ance, as compared with a motorised They will take part in training ses-rifle division of 1939, has 16 times sions at military camps and will also as many tanks, 37 times as many be admitted to voluntary active armoured personnel carriers and military service between the ages of armoured vehicles, 13 times as

vicemen enjoyed all the rights and facilities, and is incomparably had the same duties as all Soviet superior as regards the quality of ing is being introduced for all young citizens under the Constitution of this equipment. the USSR.

would have their housing reserved enhanced its combat potentialities. for them, while those transferred Thus one artillery mortar salvo to the reserve must be given jobs of a division of 1939 weighed within a month of their application 1,700 kilograms, whereas that of for employment, duly taking into account their experience and speci- 53,000 kilograms. These figures

universal military service will accord greater in power. Thus, the power with the changes that have taken available to an army division has place and will be in keeping with grown from three horsepower per creased demands made on service- the spirit of the party's demands capita in 1939 to 30 hp per capita men and to the reduction of the that the problems of the country's today. defence be always in the centre of

"The colossal growth of socialist the new law, which goes into force their call-up deferred, and the cate-industry and structural changes in on 1st January 1968 and replaces gory of persons eligible for defer- its development have made it posa law adopted in September 1939, ment for family reasons will be sible to supply our Army and Navy the Defence Minister explained that extended. There will be no defer- with the most up-to-date military privates and NCOs of the Army ment for students of evening and equipment — nuclear weapons, misand the Air Force would serve two correspondence institutes. The age siles for various purposes, supersonic aircraft, new tanks, nuclear Marshal Grechko explained that submarines and other modern means

Marshal Grechko stressed the "This is being done in order to cut higher technical level and combat A uniform call-up age, 18, is down the number of officers who capacity of the Soviet armed

> "In their technical equipment and combat possibilities the Soviet The law also makes provision for Army and Navy differ considerably many automatic weapons and five Marshal Grechko said that ser- times the radio communication

> "The division's increased tech-Servicemen on active service nical equipment has considerably present-day division weighs do not take into account nuclear "The adoption of the new law on weapons, several hundreds of times

> > "This is true of each one of the arms and each one of the fight-

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ing services," the Defence Min- depth of its dive five times, and reme Soviet that "the Communist 'has taken a leap during these years from piston-engined planes to modern jets with a speed of 2.500 to 3,000 kilometres per hour (1,500 to 1,850 mph). The bombing strikes of the jets are five times more powerful than those of the military planes of 1939.

"The Air Force now has aircraft capable of inter-continental flights in any weather and of inflicting crushing blows on an enemy with missiles carrying nuclear warheads.

"Furthermore, our Navy has acquired a qualitatively new featurenuclear submarines have become. its main force.

submarine is almost 100 times, the

ister continued. "The Air Force its speed when submerged three to Party and the Soviet Government four times greater than in the case are taking all the necessary steps of a pre-war submarine.

"The submarines, armed with ballistic missiles, are capable of destroying ships from a distance of hundreds of kilometres and of delivering blows from under water against enemy strategic targets thousands of kilometres away.

Aircraft Defence, which are equipped with the latest, first-class and most complex military equipment is colossal and their combat cap-"The powering of an up-to-date acity is in general incomparable."

Marshal Grechko told the Sup- sory military service.

for the further strengthening of the country's defence potential."

He said that the Soviet people "will continue to show every concern for strengthening the defence capacity of our country and our armed forces. It is only growing "As for the younger arms of the military might brought to the highservice - the Stategic Rocket est level that can cool the bellicose Forces and the country's Anti- ardour of aggressors and guarantee our country from possible eventu-

During the discussion in the Supand weapons - as far as they are reme Soviet, it was announced concerned, their fighting strength that the legislative proposals committees of both chambers had approved the draft law on compul-



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### SEA CADET CORPS NEWS

#### SEA CADET INTERNATIONAL RIFLE SHOOTING COMPETITION 1967

The Royal Canadian Sea Cadet Corps CRESCENT of Hanna, Alof the Navy League's International Small Bore Rifle Shooting competition for Sea Cadets in 1967.

This Corps has won the Navy church, New Zealand. League of Canada's DUKE OF

PLACABLE of Southend on Sea. berta, has been declared the winner Essex, England, placed second and Malmo, Sweden. will receive The Navy League of Great Britain's trophy which was placed Fourth in 1967. held last year by the Sea Cadet Corps T.S. STEADFAST of Christ-shared by A/C R. K. HOFFMAN,

EDINBURGH SHIPS BELL trophy, emblematic of third place, berta, and L/C S. T. ROBINSON, TROPHY, signifying the top award, will be sent to Sea Cadet Corps of T.S. TALISMAN, Nelson, New for the second consecutive year. T.S. TALISMAN of Nelson, New Zealand, who posted perfect scores,

The Sea Cadet Corps T. S. IM- Zealand, by last year's winner, the Sea Cadet Corp, LIMHAMN of

The Malmo, Sweden, Corps

Top individual honors were PO2 E. J. BUCHFINK, both of The Navy League of Australia's RCSCC CRECSENT, Hanna, Al-

#### EFFICIENCY TROPHY TO NEW SOUTH WALES DIVISION

At Admiralty House, Kirribilli, at the same time learning to be re-organisation of the Sea Cadet on 20th April, the Governor- General, Lord Casey, presented the Navy League Efficiency Shield to the training ship "TOBRUK,"

The unit, situated in Newcastle, was adjudged by the Naval Board to be the most efficient unit in Australia in 1967.

Presenting the shield, Lord Casey said:-

"This is a great achievement and one of which the C.O., Lt. Williams, his officers, instructors and cadets can well be proud."

The ceremony took place on the lawns at Admiralty House and the entire N.S.W. division, some 350 strong, marched from nearby Bradfield Park to Admiralty House.

The contingent, in full uniform, and including an armed guard, was led by the band from the East Australian Area.

Lord Casey, after reviewing the cadets, congratulated all upon their bearing and appearance.

Addressing them he said:-

"It is good to see so many of you young men showing an interest in the history, spirit and traditions of the sea service.

What is also so very important is that by being a member of the Sea Cadet Corps you are helping to develop your own character and

good citizens in the widest sense.

of the officers and instructors who stration of the Naval Board. voluntarily give so willingly of their time to the Sea Cadet Corps. They are to be commended for the part they play in moulding the Cadets we see before us, and I trust that you Cadets will do the as Naval Reserve Cadets will, like same when you are older.

change from the present organis- the opportunity of joining a worthation is proposed and I refer to the while organisation."

Corps, by which it is intended to I realise also the untiring efforts bring you fully under the admini-

When that time comes I am sure the Navy League will continue to support you in every possible way and I am confident that you your Army and Air Force Cadet counterparts, continue to flourish I believe you all know that a and to offer the youth of Australia



The Royal Solute — the official R.A.N. photographer snapped the guard provided by the winning unit T. S. Tabruk.

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THE NAVY

May-June-July, 1968



The Governor-General, His Excellency the Right Honourable the Lord Cassy. Patron of the Navy League of Australia addresses the Codets prior to the presentation of the Efficiency Shield. On the Governor-General's right is Rear Admiral H. A. Showers, the Federal President of the Navy League of Australia; and to his left Lieutenant Commander L. Mackay-Cruise, R.A.N.R., Senior Officer, N.S.W. Division, A.S.C.C.



The Presentation — to Lieutenant V. C. Williams, A.S.C.C. Commanding
Officer of the winning unit.



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### SEA CADET CORPS NEWS

**NEW SOUTH WALES DIVISION** 

#### Report of Activities and Training Undertaken by the New South Wales Division of the Quarter Ending March 31, 1968

Naval Establishments:-

2/1/1968 to 12/1/68 (10 days) 12/1/68 (10 days) H.M.A.S. PENdays) Jervis Bay Air Strip.

mitted to undertake a training period of 10 days as in view of the increasing shortage of billets the Naval Board has recently decreed that the maximum time for any form of continuous training for Cadets will be limited to 7 days. By adopting this limitation it is hoped to provide postings for many more Cadets than has been possible in past years. There is no doubt that the Jervis Bay air strip is an ideal location for Cadet training particularly when coupled with the boat work facilities available at H.M.A.S. CRESWELL. With the addition of a few extra essential amenities this area could well provide an ideal permanent training camp for Cadets. This is the subject of a separate submission which has already gone forward.

Harbour and weekend training was conducted in the following ships and establishments:---

> H.M.A.S PENGUIN 16 to 18 February.

> H.M.A.S. OUEENBOROUGH 16 to 18 February.

H.M.A.S. CRESWELL 23 to 25 February.

H.M.A.S. OUEENBOROUGH 15 to 17 March.

It was regrettable that both Sydney Grammar School and Scots College found it necessary to cancel their weekend training resulting

May-June-July, 1968

mittments.

An Indoctrination Course of 7 H.M.A.S NIRIMBA. 2/1/1968 to days for Officers was organised by days for Officers was organised by GUIN, 2/1/1968 to 12/1/68 (10 this Division for personnel from A.C.T. Queensland and New South Wales. The course was conducted In future Cadets will not be per- in H.M.A.S. PENGUIN.

> The annual swimming carnival was held in H.M.A.S. PENGUIN on Saturday 17th February 1968 and it was pleasing to observe such strong contingents of Naval Reserve Cadets participating from St. Ives High School and Scots College. The trophies were presented to winning Cadets and Units by the President of the Navy League of Australia, N.S.W. Division, Rear Admiral H. A. Showers, C.B.E. (Ret'd).

The annual inspection of T.S. CONDAMINE (Manly Unit) and

Periods of continuous training from insufficient Cadets being avail- T.S. SYDNEY (Refer photos) were were carried out in the following able due to School sporting com- carried out on 9th March 1968 and 23rd March 1968 respectively by the representative of the Flag Officer-in-charge, East Australia Area. Commander D. J. Beckley, D.S.O., D.S.C., R.A.N.

> As a result of discussions held with the Mayor of Manly and the Council Engineer a most suitable alternative site for T.S. CONDA-MINE (Manly Unit) has been determined and the Navy League has now been requested to complete and finalise the negotiations that have taken place. During the past three years a considerable amount of time and energy has been spent trying to find a suitable location to resite the Manly Unit and it is to be sincerely hoped that the matter is now resolved.

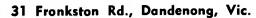
> > L. MACKAY-CRUISE Lieut-Commander R.A.N.R. Senior Officer



Commander D. J. Beckley, D. S. O., DSC, R.A.N., Ihe representative of the Flag Officer-incharge, East Austrelen Area, accempanied by Lt. Commander L. Mackey-Craise, R.A.N.R. Senier Officer, A.S.C.C., N.S.W. Divislan, board T.S. SYDNEY (Snapper Island) for the Annual Inspection.

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May-June-July, 1968

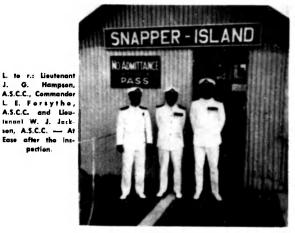


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ANNUAL CHURCH PARADE

The annual Church Parade of the New South Wales Division of the Corps was held in Her Maiesty's Australian Dockvard Church. Garden Island, on Sunday, 28 April,

Approximately 300 Cadets paraded and were inspected by the Flag Officer-in-charge, East Australia Area, Rear Admiral D. C. Wells.

The service was conducted by the Base Chaplain, Archdeacon L. W. Long, R.A.N., the evangelicai message being expounded by Fleet Chaplain A. W. Rosier, R.A.N. The Division's Colours were laid up in the Sanctuary during the service. Music was provided by the band of the East Australia Area. conducted by Lt. N. G. Gullick. L.R.A.M. R.A.N.

The service concluded with the Naval hymn "Eternal Father Strong to Save" and the Naval Prayer,

The Division then, led by the E.A.A. band, "Marched Past," outside the Church, Admiral Wells taking the salute.

The Editor is always pleased to receive news and photographs concerning the activities of Divisions of the Corps.



May-June-July, 1968

pection.

THE NAVY

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The aim of the Australian Sea Cadet Corps is to provide for the spiritual, social and educational welfare of boys and to develop in them character, a sense of patriotism, self-reliance, citizenship and discipline.

Uniforms are supplied free of

noons and certain Units hold an undertake training at sea in ships additional parade one night a week. of the Royal Australian Navv.

covers a wide sphere and includes the Royal Australian Navy, the seamanship, handling of boats Mercantile Marine or the Royal under sail and power, navigation. Australian Naval Reserve, but there physical training, rifle shooting, sig- is no compulsion to join these Sernalling, splicing of wire and ropes, vices.

for Sea Cadets in Naval Establishments, and they are also given Parades are held on Saturday after- opportunities, whenever possible, to

Cadets, if considering a sea career, The interesting syllabus of training are given every assistance to join

For further information please contact the Divisional Senior Officer in your State, using the Form provided below.

Senior Officers, Australian Sea Cadet Corps

NEW SOUTH WALES: "El Abrigo". 4 Rangers Ave., VICTORIA: C/- Room 8, 8th Floor, 528 Collins St., Cremorne, 2090.

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Melbourne, 3000. WESTERN AUSTRALIA: C/- 182 Coode St., Como,

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TO: The Senior Officer, Australian Sea Cadet Corps

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May-June-July, 1968

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### A DAY AT CHATEAU TAHBILK

#### - BY LADY BURRELL

Melbourne justifiably has a reputation for unpredictable weather League Ball scheduled for 3rd in February. After months of century and near century readings, it October next, the proceeds of should have been easy to predict a scorching temperature of 105 deg. which go to the A.S.C.C. and other with a North wind blowing half a gale, on Sunday 25th February when causes which the League supports. some 120 guests had bought tickets for a picnic lunch at Chateau Tahbilk plus a tour of the cellars.

With such a frightful day we all day dispensing delicious white

course knows that, if you promise table cloths and dispense food. children an outing on a certain day at a certain time, you take them rain or shine - it is by far the lesser of two evils.

Everyone enjoyed themselves, and not the least attraction was seeing Top Brass ex Naval types in action. Rear Admiral Beecher looked after the bar by the river and stood up

were agreeably surprised when and red wine from the "House of everyone turned up. It was a family Tahbilk", to the continuously thirsty day and those who had children guests. Vice Admiral Burrell sold brought them along and many raffle tickets for a case of wine swam in the river which flows and also organised groups and through this lovely historic Vine- tickets for the cellar visits. Commodore Plunkett-Cole battled with Anyone who is a parent of the hot north wind to tack down

> Victorian President, Geoff Evans. and Secretary Pat Shorrocks, with their guests, arrived looking distinctly jaded, but revived under the ministrations of Admiral Beecher.

defray the expenses of the Navy able!"

An Italian, visiting England for the first time, was talking at a cocktail party given in his honour. 'Yes," he said, "I'm very happily married, except we have no children. My wife is unable to have babies. She is what you say in England - impregnable." z

This caused a burst of laughter which confused him. Hurriedly he added. "What I meant was - she is inconceivable."

This only added to the merriment and further puzzled him. However, the house was down by It was all in a good cause—to his final attempt "She is unhear-

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# **Nautical Notes from all Compass Points**

...... By SONAR ......

#### CANADA

#### Another 'Tribal' Class

Information has been received from Canadian Forces Headquarters that the Minister of Defence for Canada has approved the following names for the DDH 280-class destrovers scheduled for construction in the near future:

Name Hull Number H.M.C.S. IROQUOIS 280 H.M.C.S. HURON 281 H.M.C.S. ATHABASKAN 282 H.M.C.S. ALGONOUIN 283

Three of these names were, of course, identified with the previous Canadian 'Tribal' class, namely ATHABASKAN, HURON and IROQUOIS, but the fourth, AL-GONOUIN, although also a previous Canadian DDE name, was borne by the former British destrover VALENTINE transferred from the United Kingdom on completion in 1944 and fully converted into a fast anti-submarine escort.

The projected new ALGON-QUIN, DDH 283, however, has found her right niche in warship class nomenclature, for the Algonquins were the most prominent of the three aboriginal races (the other two being the Hurons and the Iroquois) which occupied the great basin of the St. Lawrence at the beginning of the 17th century.

#### **NEW CANADIAN COAST GUARD SUPPLY SHIPS**

Maine Industries Ltd., of Sorel, Ouc., has been awarded a Federal \$8,402,303 contract for the construction of two 189 ft. inshore supply vessels for the Canadian Coast Guard.

The welded-steel ships, which will carry 37-man crews, are to be completed in 1969.

They will be used on the East

The twin-screw ships will be powered by diesel engines and will be used for buoy tending, light- about 50 feet long, with a beam obstacle survey was carried out in

cue duty.

They will have an 11-knot cruising speed and a range of 3300 nautical miles.

#### PEOPLE'S REPUBLIC OF CHINA Red China May Be **Building SSBMS**

Communist China's two largest submarines, one now in commission and the other nearing completion at Dairen, have been equipped with three tubes for launching ballistic missiles, according to U.S. Navv sources. Solid evidence is adduced in Washington that these tubes are compatible with missiles with a range of 380 miles - the range attributed to the nuclear missile which China claimed to have tested successfully on 27th October, 1966.

The two Chinese submarines are modelled on the Soviet G-2 class. Conventionally powered, they are no match for nuclear submarines in speed or range.

#### FRANCE

#### New Minesweepers

The French Navy is to build a fleet of eight ultra-modern wood and plastic minesweepers equipped with a top-secret mine-destroying system.

#### JAPAN Research Submersible

The keel of the first underwater survey vessel of its kind to be built in Japan was laid recently at the Kobe vard of Kawasaki Dockyard Company. Japan's Maritime Safety Agency ordered the craft. which is being built under an appropriation from the Science and Technology Agency. All governmental agencies concerned will Coast to replace two other vessels. share the vessel, according to their

The underwater boat will be house supply and search and res- of about 18 feet and a submerged February off the Dutch Coast in

THE NAVY

displacement of about 85 tons. It will operate at depths up to some 2.000 feet, manoeuvring at a speed of about 3.5 knots. The vessel will carry a crew of four, including two researchers, and will be equipped to perform a variety of underwater research and survey pro-

Kawasaki was the first Japanese shipyard to build a submarine. Pre-war construction totalled 61 submarines, and the survey vessel is the yard's fifth postwar submersible. It is scheduled for completion late 1968, with delivery set for March 1969.

#### WEST GERMANY

#### Cuts In New Construction

Bundesmarine Inspector Gert Jeschonnek, outlining the future of the Navy to the Bundestag Defence Committee in January, stated that, owing to reduction in defence expenditure, the originally planned ten AA corvettes, armed with the Tartar missile, would not now be built. In their place four 'Fregatten 70' AA frigates would be laid down.

These vessels are of some 3,000 tons and will have the U.S. SM-1A missile (improved Tartar) and a 76-mm. rapid-fire gun for antiaircraft and ship targets.

#### LIBYA

#### Another Order For F.P.B's

Recently Vosper - Thornveroft launched the second of their 96 ft. fast patrol boats and also received a further order for four more 100 ft. F.P.B.'s. The latter are to be steel-hulled and powered by diesels,

#### NATO Operations off the Dutch Coast

### A preliminary underwater-

preparation for a major minecountermeasures operation to be carried out in May by Belgian, British, French, Netherlands and Norwegian forces.

The object of the operation is to create safer and better routes for merchant shipping.

#### **SWEDEN**

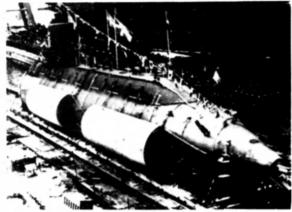
#### Laser Rangefinder

This laser rangefinder (see photo below), developed for the Swedish Navy by the L. M. Ericsson Telephone Company of Sweden, has a range of 12 miles with an accuracy of + 5 metres. It contains a ruby crystal laser with a rotatine prism. emitting high intensity pulses of ultra-short duration. Range is determined by an electronic counter. with values being transferred to a direct-reading presentation.

#### Ship-to-Ship Missile

After the recent furore caused by the Egyptians sinking the Israel destroyer ELATH with a Russian ship-to-ship missile, comes the news that SAAB of Sweden have developed a similar weapon.

fitted in two destroyers and in to radar homing.



mobile defence batteries for use on the coast

The missile is same 19 feet and is launched by a rocket booster. which separates, and the missile is then propelled by turbojets. No speed is given, except that it is subsonic and the range is stated to he several times that of conventional guns'. No details as to its guidance are given beyond that it is 'radio-controlled', which might The Swedish missile is apparently mean anything from beam riding

#### The First Five

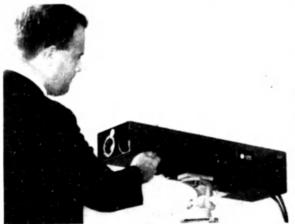
The submarine SJOORMEN (see photo above), is the first of five being built in Sweden for their Navy. The SJOORMEN is conventionally powered, displaces 1 100 tons, and has a length of just under 175 feet. A highly streamlined shape and a large, flowly rotating propeller makes the craft fast and silent when submerged. She will be armed with a new type of guided torpedo and mines; advanced electronic systems have reduced manning to 23 crewmen.

#### UNITED KINGDOM

#### Vosper Patrol Boat

Vospers are reported to be developing a new high-speed patrol boat mounting a French (Nord Aviation) surface-to-surface missile. The vessel will be capable of 50 knots and will carry eight SS12 wire-guided missiles which have a range of 3.7 miles.

This type of hoat should be ideal for small navies, as its missiles will give it the equivalent firepower of much larger conventional ships, though the range is nothing like as good as the Styx missile fitted in the Russian KOMAR class which is reputed to carry as far as 12 to 15 miles.



#### Glass Fibre In British Submarines

The Royal Navy has, for a period of several years, been evaluating the use of Cellohond polyester resin and glass fibre in a prototype G.R.P. ship section and in the construction of the foredeck, fin and outer structures of submarines.

Trials, and subsequent use have established that British Resin Products' Cellohond polyester resins meet the tough requirements of submarines, and the majority of "Oberon"-class submarines now incorporates many tons of this resin and glass fibre in their outer struc-

Others within this class will change construction to plastics as they are due for refit. The moulding of the structures is carried out by dockvard personnel.

Royal Naval Constructors and personnel of the Admiralty Materials Departments have found that the polyester resin and glass fibre offers a structural material which facilitates construction of the outer unpressurised sections of the submarine, and is resistant to cor-

It also has the added advantage of weighing only one-seventh of the equivalent amount of steel. The life expectation for the metals previously used, prior to a major overhaul, was around the three-year mark, but this period is now "considerably extended" by the new material

#### Hovercraft For R.A.N.

British Hovercraft BH-7, the 45ton vehicle which has a speed of 75 kt., and — in civil version will have a capacity for 140 passengers or 70 passengers plus eight vehicles, is to be ordered by the UK Government for use as a naval patrol vessel, according to a reported statement by Technology Minister John Stonehouse on 4th April. Stonehouse also said that the Government intended to increase its civil vote for hovercraft research and development at Cowes by BHC on a Ministry of Technology grant for evaluation by the Inter-Services Hovercraft Unit and the Royal Navv.

#### Sea Dart Production

First production order for the HSD Sea Dart has been placed by the Ministry of Defence for the Royal Navy. The weapon will arm the Type 82 Destroyer, now under construction. It will also be fitted to a new class of cruiser providing command and control for future naval forces and to a new class of destroyer, scaled down from the Type 82.

Effective both in surface-to-air and surface-to-surface roles. Sea Dart will defend against air attack at all levels and can be used in support of coastal operations at long range. It could also deal most effectively with missile firing ships and homing missiles of the type that sank the Israeli destroyer ELATH last October, Continuous propulsion is provided by a Bristol Siddeley Odin ramiet which ensures excellent manoeuverability under all flight conditions

Other leading contractors working with Hawker Siddeley Dynamics are Sperry Gyroscope, EMI, AEI, GEC, Ferranti and Vickers.

#### U.S.A.

#### All-Purpose Boat For Naval Air Stations

The Navy has recently accented the first of ten new 40-foot aircraft personnel and rescue boats some 35 miles of deep-draft chan-

from the Grafton Boat Company. The heavy-duty all-nurpose craft (refer photo below) is a refinement of the 40-foot utility hoat now used by the Navy and Coast Guard. Diesel-powered, she has a speed of over 23 knots. The hull is steel and the superstructure is aluminium.

#### Sea Based Anti-Missile

A sea-based anti-ballistic missile intercept system (SABMIS) is being studied by Hughes Aircraft Company under a six month \$700,000 US Navy contract. Designed to intercent missiles during the ascent phase of the trajectory, the primary effort is being directed toward the application of anti-ballistic missiles aboard surface ships. If approved, the system would take five years to develop. State Department interest is reported on the grounds that SABMIS might also protect other nations of the Western Alliance.

#### Hazardous Oceanography

U.S. Navy divers and civilian scientists recently carried out a most hazardous oceanographic environment study of the Long Tau shipping channel from Phu An, north of Saigon, to Can Gio where the Long Tau enters the South China Sea. It was a survey of



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nel, conducted under combat conditions with the men in constant danger from Viet Cong sniper-fire and mines.

During the survey, the team tested the water for temperature, salinity, conductivity, currents and sound velocity at some 65 different observation points. At each point, the divers obtained bottom core samples of the river bed and made other underwater measurements. such as visibility and bottom hardhardness.

Included in the 1968-69 U.S.

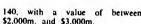
#### **Defence Budget**

Defence budget, totalling SUS77,000,000,000, sent to Congress by President Johnson on 29 January is \$500,000,000 for converting Polaris submarines for the latest Poseidon missiles. Provision is also made for further "hardening" of Minuteman ICBM sites to make their destruction more difficult, a decision which postpones the building of a new generation of ICBM's beyond Minuteman 3, which slips from 1969 to 1970. Missile provisioning in general. however, rises from \$2,600,000,000 in 1967-68 to \$3,600,000,000 in 1968-69, a trend reputedly due to U.S. decision that aircraft-launched missiles hold greater promise for precision targeting in limited war. Aircraft procurement (\$8,700,000,000 for fiscal 1969) is based on the Defence Department assumption that Vietnam needs are flattening out, after peaking at \$9,700,000,000 in 1966-67, with \$8,500,000,000 provided in 1967-68. Peak year for missiles was 1962-63 when nearly \$4,000,000,000 was budgeted for various types.

#### The VSX Programme

The U.S. Navy has obtained approval for the development of a new anti-submarine aircraft, to be called the VSX. Now comes the news that five ASW carriers are envisaged.

Each carrier would probably be capable of carrying up to 20 airtotal number of VSX's expected to be ordered is in the region of ships against cruise missiles (such low the surface.



U.S. naval officers, whilst delighted that the controversy of land-based versus carrier-based ASW aircraft has been settled in their favour, feel that the number of carriers ordered is insufficient for anti-submarine groups to be de- be effective both against air-toployed in the Pacific, Atlantic and Mediterranean. A figure of nine, they say, would have been more realistic and with five probably only the Pacific could be recovered. the remaining areas having to rely on the Orion shore-based ASW aircraft.

#### New 5-incher

The Navy's new 5-inch 54-calibre gun is test fired (see photo above) at the U.S. Naval Weapons Laboratory. The lightweight, fully automatic gun, can fire projectiles of more than 50 pounds for over 20,000 yards.

#### Phoenix Missile

U.S.N. is developing the Hughesbuilt Phoenix missile - designed initially for F-111B use against craft and, with spares, etc., the high-flying, missile-carrying supersonic bombers - for defence of Operating depth is 2,000 feet be-

140, with a value of between as the Soviet-supplied Styx missile which Egypt used to sink the Israeli destroyer ELATH last October). Senate Armed Services Committee was told recently by Navy Secretary Paul R. Ignatius that analysis of recent tests suggest that the Phoenix missile system will surface and surface-to-air missiles. He expects basic performance characteristics of the Phoenix to be satisfactorily demonstrated by mid-1968, and the R & D programme is scheduled for completion in January. 1969. U.S. intelligence has reported locating what appear to be two Styx sites in North Vietnam.

#### Grumman/Piccard Craft

The PX-15 research submarine (see photo of model over page) is scheduled to make a six-week submerged survey of the Gulf Stream about June, manned by Jacques Piccard and five others. The craft, now under construction, will have 29 viewports, television, flood lights and photographic equipment for conducting acoustical and environment experiments. The 130 ton vehicle has a pressure hull 48 feet long with a 10-foot diameter.

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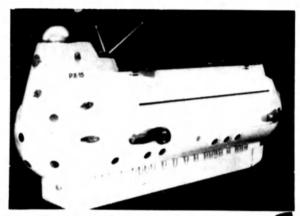
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May-June-July, 1968



Navy Develops ASR Rescue Ships

The U.S. Navy's new class of submarine rescue ships (ASR) will he unique in capabilities and design. These ships will serve as:

(1) Surface support ships for the Navy's new rescue submersibles.

(2) Submarine rescue ships emploving the existing McCann Diving Chamber.

(3) The Fleet's major deep-sea diving support ships.

(4) Operational control ships for salvage operations.

These new ships have twin, catamaran hulls. This design will provide a large, deck area, to facilitate the raising and lowering of submersibles and underwater equipment, and to give the ship improved stability when operating equipment at depth.

Each hull of the ASR will be 251 feet long and have a beam of 26 feet. The well between the hulls will be 34 feet, giving the ASR a maximum beam of 86 feet. The ship's draft will be 19 feet with a full load displacement of 3.411 tons. Propulsion for the ASR will be provided by four diesel engines, producing a maximum of 6,000 s.h.p. to two propeller shafts. The ship will have a sustained durance of 10,000 miles at 13

the bow of each hull to enable the ship to maintain position while stopped or at slow speed. For selfdefence, the ship will be armed with two 3-inch 50-calibre dualpurpose guns and four 50-calibre machine guns.

Accommodations will be provided for a ship's complement of 6 officers and 109 enlisted men, a unit commander staff of 4 officers and 10 enlisted men to operate the submersibles of a Salvage Operational Control Centre.

Aboard the submarine rescue ship, the DSRV's will be carried in cradles on the ship's main deck. They will be lowered into the water on a two-section elevator through an opening in the main deck between the two hulls. The DSRV is lowered into the water and the forward and after elevator sections swing up and away, allowing the submersible to operate freely.

To receive the DSRV, the submarine rescue ship maintains a heading at zero speed and lowers for the DSRV. Further, the DSRV two "capturing cables". The submersible locates these cables with its television cameras and sonar. moves between the cables, and engages them with small "capturing arms" The DRSV, with a slight speed of 15 knots with an en- negative buoyancy, then uses its ducted thrusters to move up toward the submarine rescue ship, Space and weight are being re- being guided by the capturing sional sonar tracking system which served in the ASR for future in- cables. When about eight feet be- will show the position of the

engaged by "positioning arms" from the ASR which will raise the submersible to the surface. There the elevators will swing down and engage the DSRV.

The DSRV is then lifted to the ASR's main deck where the elevator cradle is disengaged from the elevator and the DSRV is transferred to a wheeled dolly. The dolly, which runs on athwartships tracks in the main deck, can then move the cradle with the RSDV to a position over decompression chambers built into the ship (if the rescued submariners require decompression) or to a storage area on the deck. This DSRV handling system is designed to launch and recover the rescue submersible in seas up to Sea State 3 and without the ship being moored.

As a secondary mode of recovery, there will also be provision for the ASR to recover a DSRV on the surface during calm sea conditions. In this operation the DSRV will approach from the stern, between the two hulls, and engage the capturing cables, held in position by twin booms. The DSRV is then towed between the hulls, engaged by the positioning arms, and raised by the elevator.

Additionally, the submarine rescue ship will carry the McCann rescue chamber. This device, developed in the 1930's, is a twochambered diving bell which can be lowered by a cable attached to the disabled submarine. The McCann chamber can only be used to a depth of approximately 850 feet and the ASR must be moored precisely over the stricken submarine. In contrast, the DSRV is a free operating submersible which can operate to 3,500 feet (and eventually greater depths). The McCann chamber can carry 6 passengers per trip compared to 24 can operate under ice and without concern for surface sea states or weather when supported by a "mother" submarine.

The submarine rescue ship's rescue control centre (RCC) will be the command post during a rescue operation. This compartment will have displays for a three-dimenstallation of a ducted thruster in low the ASR, the DSRV will be DSRV's in relation to the ASR

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during the rescue. The RCC will also have displays for the ship's detection and tracking sonar, underwater telephones for communication with the disabled submarine. DSRV's, and "mother" submarines (if being used); and radios for communication with other ships, aircraft, and shore activities. The ship's radar and other equipment normally found in a Combat Information Centre will also be located in the RCC.

During deep-sea salvage operation, the new submarine rescue ship will serve as the primary diver support ship and operational command ship. For the former role, each ASR will have a Mark II Deep Diving System. This consists of two Deck Decompression Chambers, one in each hull, and two Personnel Transfer Capsules with related equipment such as the handling gear, winches, gases, cables, and control equipment required to operate the PTC's and DDC's.

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concepts for the Navy.

#### Navy's Omega Navigation Approved

Four stations for the Navydeveloped Omega navigation system have been approved for operational use to facilitate operational evalua-

The stations, located in Bratland, Norway: Port of Spain, Trinidad; Haiku, Hawaii; and Forestport, N.Y., will provide navigation coverage to an area of more than one-fourth of the world.

Omega, which has been under development by the Navy for some time, is an all-weather, general purpose navigational aid. The system provides navigation for aircraft. ships, and submerged submarines. The system continuously provides a position to a navigator in any weather. The operation of the receiver is quick, simple, and reliable. The transmitting stations transmit signals on 10.2, 11.3, and 13.5 kilohertzes (kilocycles). The lowest frequency and the one most generally used in Omega is 10.2 kilohertzes.

Omega has a potential of pro-Feasibility of installing a cluster viding continuous world-wide posiof 81-mm, mortars in the belly of tion information, accurate to one a Lockheed P-3 patrol aircraft mile during the daytime and two specially outfitted for night attack miles at night, and will be evaluamissions in Vietnam is being studied ted together with other existing by Lockheed-California Company navigation systems as well as those under the Navy's Trim Programme in an advanced state of develop-The mortar cluster would be ment in connection with the foraimed downward from the aircraft. mulation of a National Navigation Lockheed has been conducting ex- Plan. The responsibility for the detensive studies and tests of Trim velopment of this plans was assigned to the Department of Trans- MOSCOW and LENINGRAD and

portation by Vice President Hubert Humphrey at the 13 July meeting of the National Council for Marine Resources and Engineering Development. The Department of Defence will participate in the development of the plan.

#### U.S.S.R. New Missile T-5-30

At the last Red Square Parade commemorating the 50th Anniversary of the Bolshevik Revolution in November, was a new missile (see photo below), solid-fuelled, about 45 ft. long, and bore the designation T-5-30. This has been variously described as a "submarine ballistic rocket" and a Fleet missile for coastal bombardment. Much larger than U.S. Polaris-type missiles, the range would obviously exceed 2,000 miles with a hefty nuclear punch. An indication that the missile is two-staged is given by the external conduit which runs almost the full length of the constant-diameter body with a break almost two-thirds up from the base. The warhead re-entry body, if this represents definitive hardware, is curiously bull-nosed.

#### Helicopter Carriers

Further information has now come to light regarding the Russian assault-helicopter carriers. Two carriers have so far been built and one of them is reputed to be carrying out trials in the Black Sea.

The ships have been named



Floot ballistic missile emplaying solid-grapellant. It he serial number

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THE NAVY

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are about 25,000 tons displacement. They carry 30 to 35 heliconters each, but cannot operate fixed wing aircraft. Construction of a third similar ship is believed to be about to start.

#### Russian Strength in the Mediterranean

The latest figures on the number of Russian ships in the Mediterranean are: one 20,000-ton cruiser, five guided-weapon destroyers, four fast gunboats, six submarines (some probably nuclear), three armoured landing craft. There are also a number of supply ships.

The landing craft are reputed to have Marine Commandos on board whose role would appear to be very similar to Royal Marine Commandos.

The Americans assert that the Russian fleet would be no match for their Sixth Fleet, because the latter have got carriers and the Russians have not.

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# THE BISMARCK CHASE

By David Paton, formerly Instructor Lieutenant-Commander, Royal Navy, and Plotting Officer in H.M.S.

the gap to as little as 50 miles.

For months we had been sailing this strip of water, reporting continuously on the state and position of the ice edge. At times wide splits would stretch across the bows as the great ship nosed her way along. At others the surface of the freezing water was covered with a jelly-like film of ice, which had the strange effect of eliminating all bow and stern waves.

By this time the crew had become accustomed to working under sequently became legendary. The conditions of unbelievable hardship. enemy ships were moving fast in a Heavy seas, piercing winds, blinding south-westerly direction roughly sleet, and freezing spray all made parallel to our own. a nightmare of long hours on watch. Yet inside the ship life proceeded much as usual. Four hours on duty and four hours off did not allow much time for relaxation.

making history. The 10,000 ton not always possible to tell at a chase that followed. cruiser was once again on patrol in glance the importance of each, and the Denmark Strait, between the what action, if any, should be taken. north-west tip of Iceland and Green- Reports would come in too from enemy ships with her radar. We land. The Strait is about 200 miles the recently fitted radar set. Radar could tell by the tremendous vibrawide but, because of the ice which was then in its infancy, and the tion that she was putting all her borders the coast of Greenland, the SUFFOLK was one of the first reserves into the chase. I had width of water in winter is roughly ships to test the new equipment. It never seen the needle touch 30 knots 100 miles. In summer, southerly was largely due to this device that before, and it was difficult to use movement of the ice may narrow contact with the BISMARCK was the ruler on the plotting table, maintained for so long.

> squall between the SUFFOLK and the ice. There could be no mistaking the vastness of the battleship at the point blank range of inappropriate remark of a midshipman - "HOOD and PRINCE OF WALES, I suppose" - sub-Action Stations.

This was the culminating moment of all those weary months of training and waiting. "Action stations" was immediately piped, full speed In the plotting office there was al- rung down to the engine-room, and stomach it. Throughout the time ways work to be done. Besides a sharp alteration of course made we were sending out a succession keeping a moment-to-moment re- away into the enveloping mist of messages, reporting the enemy's cord of the ship's position, a steady Every second was vital. In a flash position, course, and speed,

Aboard H.M.S. SUFFOLK the flow of naval messages would be the first of a long stream of sighting dawn of 23rd May, 1941, gave no received. These ranged from the reports was sent out; that stream hint that the day was destined for emergency to the trivial, and it was which set in motion the elaborate

Meanwhile the SUFFOLK had increased speed and located the Every moment we expected the Suddenly, at 7.22 in the evening, BISMARCK to open fire. At this one of the lookouts sighted the stage, however, it was more import-BISMARCK and the cruiser PRINZ ant that we should maintain con-EUGEN emerging from a snow tact than force an action and be annihilated.

About an hour later H.M.S. NORFOLK, which had been due to relieve us on patrol, joined us seven miles, though the somewhat and began to shadow too. So the pursuit continued at high speed throughout the night, moving roughly parallel to the coast of Greenland. I remember losing all sense of time. especially as in that latitude there is no true night but merely a kind of pallid twilight. Bully beef and hot cocoa were brought round from the galley. I have memories of the hot syrupy liquid spilling and sloshing over the deck. Perhaps that is the reason I can no longer



The German battleship BISMARCK.

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May-June-July, 1968

At home, the intelligence services turrents was out of action, and tions, of course, and also laid intentions, and as a result H.M.S. HOOD and H.M.S. PRINCE OF WALES had hastily put to sea shortly after midnight on 21st/22nd they received our sighting report and had set course to intercept the enemy on the morning of the 24th.

come patchy and the weather was deteriorating. Just after midnight the SUFFOLK lost the enemy for the British cruisers a time, and it was feared they might have doubled back to return the way they had come. But contact was regained at 2.47 in the morning: we all knew that action was imminent and was only a question of time and place.

Early Disaster.

With the pale light of morning. the HOOD and PRINCE OF WALES intercepted the enemy and the British ships opened fire at about six o'clock. The orange flashes on the horizon showed that the enemy had replied. Almost at once the HOOD was hit, and a great column of flame shot into the air, followed by an immense pall of black smoke. The shells must have penetrated her magazine. In an instant the stately ship and all but three of her gallant crew of over 1,400 had perished. Apart from the magnitude of the disaster, a to engulf us all

had already anticipated the enemy on the bridge all except the cap- smoke in order to escape the tain had been killed or wounded. She had only recently been commissioned and, owing to defects, was still carrying civilian work-May. On Friday 23rd they were men. But the enemy had not essouth of Iceland. In the evening caped entirely, and her speed had been reduced. She also left telltale patches of oil on the sea. So the chase continued with the Meanwhile the visibility had be- enemy ships heading for the safety of the ocean ahead, followed closely by the PRINCE OF WALES and

After mid-day the enemy altered course to south. At the same time the weather got still worse, and patches of mist and rain got thicker and more frequent. We decided to close the range so as to mantain contact. As each successive storm hid the German ships, it became crucially important to proceed warily. At about half past six in the evening the enemy entered a particularly thick squall. An uncanny sense must have warned our captain to beware of an ambush. Suddenly the great battleship loomed through the mist about ten miles off. Immediately we altered course and at the same time opened fire with the main armament. The noise was deafening. The Bismarck, too, was firing, and after what appeared to be an interminable wait the great fountains of water rose into the air nearby. dazed feeling of incredulity seemed From the comparative safety of the plotting office exploding shells The PRINCE OF WALES, too, sounded like extra loud machine had sustained damage. One of her gun fire. We made violent altera-

THE NAVY

enemy's fire. The PRINCE OF WALES had come to our assistance but the enemy once again turned to the south and tried to elude the British ships at high speed.

By this time the ship's company had been at action stations for 24 hours, and tiredness was inevitable. We tried to snatch an hour's rest in turn if opportunity allowed. Outside, the sea was rising and the visibility getting worse. We were no longer in the Arctic circle, and darkness was now adding to other difficulties

From the reports coming into the plotting office it became apparent that H.M.S. KING GEORGE V and H.M.S. VICTORIOUS would soon be in the vicinity Late in the evening a great cheer went up when we heard that torpedo-carrying aircraft from the VICTORIOUS had made an attack and secured one hit. These attacks had been carried out with great gallantry from a carrier newly commissioned and not properly operational.

Conditions became worse than ever, and in blinding rain and mist we lost contact at about 3.6 a.m. on May 25. The enemy ships must have made a sudden turn. and for the time being had eluded their pursuers. (We did not know at the time that the PRINZ EUGEN had been detached about nine hours previously.) This was a serious setback to the operation. We continued to search with the NORFOLK to the south-west, but only after another 24 hours, when the BISMARCK had been located heading for the safety of Brest. was any relaxation possible. By this time all I wanted was sleep. Men were sleeping on their feet and carrying out duties as if in a dream.

#### **EPILOGUE**

The subsequent events are now well known. The BISMARCK was located by a Catalina aircraft at 10.30 a.m. on the 26th, apparently making for Brest. At this time the Commander-in-Chief in H.M.S. KING GEORGE V was steaming in the same direction, but about 130 miles behind. He could not hope to force an action unless the enemy's speed was reduced. In the evening of that day the BIS-



The BISMARCK in action against HMS HOOD and HMS PRINCE OF WALES. This photograph was taken from the PRINZ EUGEN.

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HMS HOOD blows up

MARCK was attacked by Swordfish destroyers under the command of from the carrier ARK ROYAL. Captain Vian, she was at last and a hit was obtained which brought to action at about 8.45 damaged her rudder and propeller. a.m. on May 27. She was silenced From then on she was doomed by gunfire from the KING

After being harried all night by GEORGE V and RODNEY, but maintiendrons".

she had been so skilfully designed that in spite of a terrifying pounding she refused to sink. With colours still flying she was finally sent to the bottom by a torpedo from H.M.S. DORSETSHIRE. So ended her first and last voyage and, though unknown at the time. so ended the enemy's final attempt to cut the Atlantic shipping lines with surface ships.

Of the memories I recall, the most vivid is the tragic end of H.M.S. HOOD and the desolate feeling which followed. But there are others in more cheerful vein. The splendid sight of the first lieutenant - a veteran of the Battle of Jutland - who calmly knitted socks during lulls in the action. The chaplain, who had a roving commission on these occasions, and who always brought a word of cheer to his parish'. And, finally, the iron-nerved captain, whose magnificent skill and judgment brought new battle honours to the ship, whose motto was "Nous



Page Sixty-three

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# IVAN BUILDS A CARRIER

The U.S. Government has revealed that the Soviet Navy is building one and possibly two aircraft carriers to operate helicopters. Reportedly, the first carrier underwent initial sea trials in the Black Sea this past fall and the second ship is on the building ways at Odessa.

The estimated length of these new carriers is 650 ft. over all, full-load displacement 23,000-25,000 tons. They are reported to have rather large island structure forward, including A.A. guns, bridge and anti-submarine weapons.

Thus, the Soviet Union joins all other major sea powers of this century in building (or, in the case of Italy, converting) aircraft carriers. U.S. sources have not revealed whether intelligence indicates the Soviet carriers will have anti-submarine helicopters or operate as commando ships with troop-carrying helicopters embarked. The former role appears more likely at this time because of Soviet concern for U.S. and British nuclear-powered submarines, especially those armed with Polaris ballistic missiles. Although the Soviets have a large shore-based naval air arm, they are not believed to have a large number of A/S patrol aircraft similar to the British Shaekleton or the American P-3 Orion. Helicopter carriers would enable the Soviets to extend the combat radius of A/S helicopters. The most likely candididate for the flattops is the Kamov Ka-20 (NATO code name 'Harn'). a turbine powered, tandemrotor helicopter. Of course, the ships easily could be converted to the commando ship role should Soviet Naval requirements call for such a capability.

Looking further into the future. the Soviet Union is developing fixed-wing vertical take-off and landing (VTOL) combat and transport aircraft. Such planes could operate from helicopter carriers.

Could this be the beginning of a large carrier-building programme? John Slinkman, the editor of the

#### The story of Russian seaborne air

#### By NORMAN POLMAR

Washington Correspondent to "Navy"

Navy Times newspaper, has observed: "That the Soviets are building a smaller carrier does not mean they think the big attack carrier is outmoded. Starting from scratch they can get the smaller ones much faster than they can develop and build the U.S. type of attack carrier."

Periodically there have been imaginative and intelligent Soviet naval planners. Indications are that the current Soviet naval leadership is of a high calibre.

Several times in the past the Soviets have attempted to build aircraft carriers; indeed, one aircraft carrier has even flown the hammer-and-sickle ensign.

Czarist Russia developed a large naval air arm prior to World War I. Russian naval aviators flew a variety of aircraft in the War, including the wold's first four-engine bombers: others - among them air-power intellect Alexander P. de Seversky - test-fired rockets and an 82-millimetre cannon from aircraft; and Russian Navy fighters were equipped with 37-millimetre cannon in adition to the lighter machine-guns common to other aircraft of the War.

The War, Revolutions, Civil Wars, and Allied intervention in Russia destroyed this naval air arm. However, its rebirth was rapid and by 1925 Soviet naval air strength reached some 300 to 400 seaplanes in addition to a few landplanes. New land-based aircraft became available to the Red Navy and by the outbreak of the Germano-Soviet War in June 1941 the Soviet naval air arm is believed to ship hoped to concentrate on light have had as many as 1,000 air- naval forces, they were forced tocraft, most of them land-based defend their own right to build fighters and bombers; by war's end major warships.

Soviet naval aviation numbered some 2,500 aircraft.

Despite this development of naval aviation under both the Czars and Commissars, there wasno serious effort at aircraft-carrier development by the Russians. From the Revolution of 1917 until 1927 the insecure Soviet leadership could not afford the time or money to undertake warship construction. The situation was explained by Naval Commissar V. Zof at the Soviet Naval War College in 1925 when he declared: "You speak of aircraft carriers and of the construction of new typesof ships , , at the same time completely ignoring the economic situation of our country and the corresponding condition of our technical means, completely ignoring the fact that perhaps tomorrow or the day after we will be called to fight. And with what ships shall we fight? We will fight with those ships and personnel that we have already."

The first post-revolution naval construction in Russia was begun in 1927, just as the German parliament began public discussion on the proposed construction of armoured ships (popularly known as POCKET BATTLESHIPS). The first Soviet-built naval vessels were submarines, part of a new Soviet maritime strategy of 'offensive defensive' whereby submarines and light surface warships, working. with aircraft, would be capable of undisputed control of Soviet coastal waters. Thus, destroyers, torpedo boats, submarines, and naval aircraft became the principal weapons of the Red Navv.

But this concept was not compatible with external influences: other nations, even within treaty limitations, were operating and building large warships; Japan, a major naval power, was pushing against Soviet interests in the Far East. Although the Soviet leaderMembers! Visit . . .

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THE NAVY

May-June-July, 1968

In 1934 the Soviets began the construction of 2,900-ton (light) the Soviets began their new cruisers, 8,500-ton ships armed with 7.1 inch guns. (Those completed were slightly heavier and were armed with nine main guns.) By 1937 the Soviets were asking the United States for battleship plans and were inquiring into the possibilities of such ships being constructed in U.S. shipvards.

Premier Joseph Stalin told the Supreme Soviet in January of 1938: "The powerful Soviet State must have a sea-going and oceangoing fleet consistent with its interests, worthy of our great task." (But that same year a Stalinist purge executed the older naval commanders who had big-ship experience).

The construction of aircraft carriers was inevitable under such a programme and in 1939 the keel was laid down for a 12,000-ton aircraft carrier as were the keels for two 35,000-ton battleships. The carrier was purported by some sources to be named STALIN and by others to be christened KRAS-NOYE ZNAMYA. Francis E. McMurtrie, warship authority and editor of Jane's Fighting Ships during the period, reported that the 12,000-ton carrier KRASNOYE ZNAMYA was laid down at Leningrad in 1939; a second ship of the same type, to be named VOROSHILOV, was later reported to have been laid down that same year. Each carrier was to operate 40 aircraft.

Mr. McMurtrie did list another aircraft carrier to be named STALIN, describing her as a 9.000-ton ship laid down as a cruiser in 1914. Originally named ADMIRAL KORNILOV, her construction was said to have been suspended until 1929 when she was re-designated as an aircraft carrier. This STALIN was credited with a 22-plane capacity and was expected to be finished in 1939. Regardless declared that cruisers were only of the facts, none of these aircraft carriers survived the war; not even on visits and firing their guns on their bones remained as the Soviets salutes. Still, in the mid-1950s, War II.

Technically an aircraft carrier large destroyers. The first ships destroyer leaders and a year later sign. The scuttled German carrier GRAF ZEPPELIN was captured by the Soviets at the end of World War II and, after being refloated and loaded with booty, she was taken in tow across the Baltic Sea. In rough water - and possibly a storm - her heavy load caused her to sink. Popular accounts to the contrary, she was not salvaged, but lies in the Baltic depths as mute testimony of the Soviet's lack of knowledge about aircraft carriers construction and centres of gravity.

> Soviet naval policy for the postwar years was announced on 28th July, 1945, when Stalin declared: "The Soviet people wish to see their fleet grow still stronger and more powerful. Our people are constructing new battleships and bases for the fleet . . .

But there was no evidence of warships larger than cruisers being laid down during the Stalin era. Late in the 1940s the Soviets began laying the keels for a large to defeat the enemy naval forces, number of light cruisers, comparable in size with earlier heavies (15,450-tons light, armed with 12 tion of rocket-carrying nuclear 5.9-inch guns). Seventeen of these submarines, and also the disrupting ships were launched and 14 were of enemy naval communications." completed, some having subse- Marshal Sokolovsky's credentials. quently rearmed with guided include having served as First missiles. Periodically there have Deputy Minister of Defence of the been rumours that the finished ships were delayed to allow their reconstruction as aircraft carriers. but there has been no evidence of such action. When one of these SVERDLOV-class cruisers was Navy includes the recent developtransferred to Indonesia in 1962 it was even reported that one of the unfinished ships in the class was being completed as a carrier for Indonesia!

Stalin's successor Nikita Khruschev opposed the development of conventional surface ships, dismissed the head of the Navy claiming he was trying to fight the next war with weapons of the last, and good for carrying political leaders scourged all available metals for under the Khruschev regime, the "See "Novol Boffins Do it Agoin", their war industries during World Red Navy began another major warship programme, this based on Pope 39.

did fly the hammer-and-sickle en- were armed with guns, but more recent units have advanced antiaircraft and anti-shipping missiles. Later ships also have gas-turbine power plants and elaborate electronic equipment.

> This belated increase in surface warship construction was coupled with an increase in naval air strength, reaching a peak of some 4,000 planes about 1957. With this new Red Fleet came an increase in world-wide naval and merchant operations.

Although Soviet leaders periodically ridiculed U.S. and British. carrier operations in this period, their concern for the flattops was evidenced by the use of surface warships, submarines, electronicladen trawlers, and reconnaissance aircraft to keep tabs on the ships. A high-level Soviet attitude towards carriers was revealed by Marshal of the Soviet Union Vasiliy, D. Sokolovsky in 1962, when he wrote that the role of the Red Navy in future wars "Will be primarily the defeat of carrier based shock units and the annihila-U,S.S.R., and Chief of Staff of the Soviet Army and Navy from 1949 until 1960.

The current growth of the Soviet ment of a number of advanced classes of destroyer-type warshipsand amphibious assault ships.\* This is again coupled with a surge of Soviet naval and merchant operations, the reinforcement of the Soviet squadron in the Mediterranean and the arms pipeline to-Eygpt and North Vietnam being the most evident examples. The Soviet acquisition of aircraft carriers - albeit helicopter ships at this time - is a further manifestation of Soviet Union's "super power" status.

The Navy', February-April, 1968,

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#### May-June-July, 1968

#### ANNUAL REPORT OF THE VICTORIAN DIVISION OF THE NAVY LEAGUE OF AUSTRALIA, FOR THE YEAR 1967

This is my first report to you since I became President of the Victorian Division of the League in September last, and so relieved Mr. R. H. Collins who had served three consecutive annual terms in a difficult period when a number of changes were being made to the Federal Organisation of the League.

With regard to the office of President, the League is now fully operas in the past. I should add that "incorporation" involves a number of legal advantages which I do not required throughout Australia, steps propose to go into now.

#### THE EXECUTIVE

At the Annual Meeting the following members were elected: Cdr. G. Ashley-Brown; Mr. W. Bell; Mr. R. H. Collins; Lt. Cdr. F. G. Evans; Captain C. I, Flaherty; Captain G. J. Fowle; Cdr. R. A. Nettlefold; Captain I. H. McDonald; Lt. Cdr. W. Speakman.

Since then the Executive has been increased to include: Captain Sam Renson, M.H.R.: Mr. J. H. Paterson: Sir Kenneth Luke

#### THE NAVY LEAGUE BALL

Under the imaginative leadership of Lady Burrell the Ladies Committee organised a very successful Dinner-Ball on 3rd October last. The change from the usual Oaks Eve date was made to bring the Ball into "Navy Week" which is celebrated in early October each year, and is considered a more appropriate period for our function than Race Week. I have used the term "successful" as it was socially most enjoyable and from the financial point of view, the Executive subsequently received a cheque for

The 1968 Dinner-Ball will be held on 3rd October; the Ladies' Committee is extremely energetic and apart from the Ball has arranged a picnic-visit to the Chateau Tahbilk on Sunday, 25th February, 1968. It is up to us all to support the Ladies' Committee, and in anticipation of this support, a "Notice" has already been forwarded to you concerning the Chateau Tahbilk visit.

ative as an "Incorporated Organis- gue requires a fairly substantial ination with a structure similar to come, and I remind members that that of a Public Company. The we are still responsible or the promembers (shareholders) elect the vision of accommodation and ad-Executive (or Board of Directors) ministration of the Australian Sea and the Executive in turn elects the Cadet Corps. (The Navy provides President, or Chairman of the uniform, training equipment, etc.). Board. I mention this because We estimate that in the financial some people wondered why the year 1968, some \$2,500 will be re-President was not elected at the last quired to maintain the existing Annual Meeting by the members seven "Open" Units, without any ecutives. provision for additional Units.

As many additional Units are have been taken to relieve the League of at least part of it's financial burden, but this is in the future, views, will attend some of our and in any case the League will always have an obligation to the Sea Cadets, an organisation which it raised and has maintained for WON, was nominated as the top very many years.

### THE NAVY

from supporting the Sea Cadets, not the least being to ensure the provision of adequate Naval defence the Transfer. for the Commonwealth and support of the Naval Service generally.

So that members of the Executive can become better informed of

Naval "thinking", and be in a posi-You may wonder why the Lea- tion to exercise an independent and objective sense of judgement, we have decided to invite to our meetings from time to time, persons holding high office in the community.

To further this policy, the Minister for the Navy, the Honourable Don Chipp, M.P., willingly agreed to be our first "guest," and attended the December Meeting of the Ex-

The discussions with the Minister were extremely interesting, and it is hoped that other persons from whom we can learn, and also, to whom WE can express our own future meetings.

#### SEA CADETS

The Geelong Unit, T.S. BAR-Unit in Victoria following the 1968 OBJECTS OF THE LEAGUE, & Annual Inspection, and received VISIT BY THE MINISTER FOR custody of the Sea Cadet Colour at a ceremony held in Geelong in We have several "objects' apart November last, Councillor Sir Roy Fidge, Mayor of Geelong and a former Reserve Officer, effected

Yours Sincerely.

F. G. Evans. PRESIDENT.



Our cameraman at the Investiture, Government House, Melbourne, 1968. photographed three of the Sorvice personnel recently honoured by Hor Majesty the Queen. Left to right: Lt.-Col. Allon; Squadron Loader Hibben, A.F.C.; and Lt. Commander F. G. Evans, M.B.E., V.R.D., BANE, Fresident, Victorian Division, The Navy League of Australia and Sonior Officer ASCC.

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Service.

We invite you to swell our ranks and so keep up to date with Maritime Affairs to help to build an ever-increasing weight of informed public opinion. The Navy League will then become widely known and exercise an important influence in the life of the Australian Nation.

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#### H.M.A.S. MANOORA By BARRY JONES

With the outbreak of the Second World War, the Royal Australian Navy, which lacked the number of ships considered necessary for large scale war operations, requisitioned several ships on the Australian Coastal Trade.

OORA, owned by The Adelaide steamship Co Ltd Taken oven on October 14, 1939, for service as an Armed Merchant Cruiser (A.M.C.), as such she mounted inch anti-aircraft guns.

MANOORA, commissioned into the R.A.N. on December 12, 1939. at Sydney, under the command of A. H. Spurgeon, R.A.N., however, conversed to an A.M.C. was not completed until February 5, 1940. In March she sailed for Darwin, arriving on the 29th and thence to Macassar near Borneo, where she maintained a patrol until relieved by H.M.A.S. WESTRALIA in April.

In the same month Germany invaded Denmark and Norway and as a result the British Admiralty sent a signal to the Australian Naval Board saying that all Danish and Norwegian ships in the area were to be taken under British protection: As part of this operation, MANOORA intercepted the Norwegian tanker, HAVBOR, and escorted her, with another Norwegian tanker, THORDIS, to Darwin, leaving that port on April 15, and proceeding to Brisbane via Thursday Island. May found MANOORA in New Guinea. and she remained in those waters until the 22nd when she arrived at Townsville.

On May 31, the ship was at Hervey Bay, Queensland, when she was instructed to shadow the Italian merchant vessel ROMOLO. then at Brisbane. On June 5, the ROMOLO sailed, with MANOO-RA at a respectable distance. This continued until the 9th when, with no sign of Italy entering the war, the Australian ship discontinued the operation, but the chase was resumed later that day, the quarry being sighted on the 12th, however the distance between the two ships was thus that MANOORA could not reach the ROMOLO in time to prevent the ship being

board the crew of the vessel ADMIRAL WILEY, this ship having run ashore on a reef at Kitava Island, MANOORA arrived seven six inch guns and two three at Townsville on June 17, 1940. The rest of June and the remainder of the year was spent on the Australian station

> In January, 1941, MANOORA commenced patrols in the Ocean Island area, returning to Sydney on April 3, but maintained the Ocean Island patrol in May, MANOORA remained active throughout the following months, reaching Singapore on December 6, 1941, where two days later the ship experienced her first Japanese air raid. However, no damage was suffered and she continued her operations as an Armed Merchant Cruiser until September, 1942, when she arrived at Sydney to be converted to a Landing Ship Infantry (L.S.I.).

> The job of converting MAN-OORA into L.S.I. was no simple task. It involved much re-working of her initial accommodation to provide for the troops which the ship would later carry. One innovation that would make things a lot easier was the installation of a fresh water distilling plant. New boat davits which would carry the landing barges were fitted to the deck and the armament increased.

Her first operation was to transport Australian troops to Milne Bay (New Guinea). This she did in company with another Australian L.S.I. WESTRALIA. Both of the ships were escorted by the destroyer U.S.S. DRAYTON. The group arrived at Milne Bay on August 4, 1943. MANOORA, continued to carry troops to the New Guinea area until February, 1944, when she commenced overseas service. A change in command occurred in January when A. P. Cousin assumed command.

The largest operations in which MANOORA participated were the for children'."

One of these shins was the scuttled. The 129 people on board two Phillipines landings. The first coastal passenger vessel MAN- the ROMOLO were picked up by was at Leyte (Panaon) on October MANOORA, which later took on 20, 1944, three R.A.N. landing ships were present: KANIMBLA. WESTRALIA and MANOORA. Approximately 540 allied ships took part. The second landing at Lingayen was on January 9, 1945, and 955 ships were present.

> These operations were followed by landings at Brunei, Tarakan and Balikpapan in Borneo.

> With the ending of hostilities, MANOORA commenced repatriating troops to Australia. In this role she visited the New Britain-New Guinea-Morotai and Borneo areas. The ship also made several trips to Japan.

> On December 6, 1947, MAN-OORA was paid off, ending her naval service after steaming 339,710 miles, and was converted to her original state as a passenger vessel, returned to her owners. The Adelaide Steamship Co. Ltd., in which service she remained until sold to the Indonesian Government on August 15, 1961, and renamed AMBULOMBO.

I met the young husband in the street and asked him what sort of a cook his wife was.

"Mind you. I'm not saving she isn't a god cook," the husband re-

"But now I know why her her family prays before every meal."

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automatically produce, by means of users whose trucks work under wet a computer, cutting instructions for and slippery conditions. any given design. The computer tapes information regarding the cutting sequence and other essential data. As this is fed into a diagraming machine to cut the steel. it simultaneously produces the design for the plate so that this can manufacturers to possess much more be checked back against the original blueprint. Hitachi Zosen says hesion than more orthodox jointing its method makes unskilled workers materials, and to have the added capable of high productivity with advantage of being quicker to lay, only ten day's training.

#### STICKLERS

heavy equipment on slippery and slanting surfaces (e.g., the decks of rolling ships), the Avon Rubber Co. It adheres to all timbers providing Ltd., of Melksham, England, has the seams are clean and dry, and developed a new "cling" solid tire, can be used on old decking which made of a specially compounded builders, has developed a system rubber. The tires were developed specifically for the British Navy of complicated ships' plates from Department which specified that can be planed and sanded only a they must not slip on wet wood few hours after the seam is filled. or steel surfaces with an angle of It is completely waterproof and on tape. The system, called HIZAC up to 25 degrees. Accepted by the weatherproof. The firm can also British Navy, the solid "cling" supply a special compressed air tires now are being made available driven mixing and dispensing parabolas as basic elements to in limited quantity for commercial machine.



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The material, called Dexema.

May-June-July, 1968

THE NAVY

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A promising new method for direct conversion of heat into electrical energy (eliminating conversion of heat into steam and steam into mechanical energy) has been announced by Japan's Agency of Industrial Science and Technology. In experiments at the Hitachi Research Laboratory, electricity was produced through the interaction of a magnetic field and fast-moving, high-temperature gases or plasma. The process, known as magneto-hydrodynamics, produced 1.9 kilowatts of electricity during 110 hours of continuous operation. Plasma temperature was about 2,700 degrees K (Kelvin Scale, based on thermodynamics with starting point of zero) at the generating duct inlet; speed of the plasma across the magnetic field was approximately 2,300 feet per second. Al&T anticipates completion of a large pilot plant by 1972.

#### SHIPS TV AND SRE SYSTEMS

Picture (below) shows a television studio, designed and installed by Peto Scott Ltd. in each of five Country-class destroyers. And from Redifon Ltd. details have been released of the Company's new SRE of ships. system and Communal Aerial am-

to 100 personal broadcast receivers derived from the book include from a single aerial, without restriction on the individual selection of programmes.

#### REFERENCE BOOK FOR **SEA-GOERS**

A unique reference book giving detailed information about wave conditions on most of the world's main shipping routes has just been published in Britain.

Oil companies and other fleet operators interested in optimum routes for the purpose of logistics planning are among those expected to make use of the new publication's comprehensive information.

The book, entitled "Ocean Wave Statistics", contains more than 3000 tables covering the height, period and direction of waves in 50 sea areas. These are derived from some million observations made by the officers of 500 British vessels between 1953 and 1961.

The project was initiated by the British National Physical Laboratory's Ship Division at Feltham, near London, so that it would be in a better position to advise shipowners on wave conditions to help research on the sea-going quality

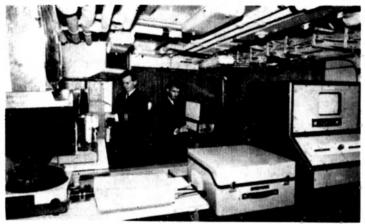
Designs benefits which may re-

weight saving, better hull design and the prevention of bulk shifting in cargo vessels plying specified routes.

Keen interest is being shown in the book in Britain and other countries by ship designers, builders and operators. It is expected to interest those engaged in civil engineering, oceanography, meteorology and fisheries research.

#### **ACOUSTIC CLADDINGS**

A method of acoustically cladding high-performance diesel engines has been developed by memhers of the Royal Naval Scientific Service at the Admiralty Engineerng Laboratory and progressed under contract by Messrs. Napier & Son. Ltd. The basic principle is that of covering the engine completely with a blanket of resilient polygrethane open-celled foam supporting a heavy external skin. The mass-spring relationship of heavy coating and soft foam results in a low natural resonance frequency, giving an attenuation of vibration between engine surface and the external skin of the cladding. The inner skin is of reinforced resin and fits the general contour of the engine, but is not attached to the engine surface. The two-inch-thick polyurethane foam is bonded to this inner plifier. This is a low cost system sult from the wider and more re- skin and to an outer skin which is providing for the operation of up liable knowledge of wave conditions itself a sandwich consisting of a



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> The Aluminaut is a 51 ft. aluminium-hull submarine owned by Reynolds International, Inc., a subsidiary of Reynolds. It has 1,901 North Fort Meyer Drive, worked under contact for the De- Arlington, Virginia, 22209.

partment of Defence in the search for the missing H-bomb off spain, for the Navy in tests of equipment and special missions, and for marine cable inspection for American Telephone & Telegraph.

Ih has made for than 150 dives and holds the present world record sub.narine dive to 6250 ft.

Detailed information on the cruises is available from Reynolds Submarine Services Corporation,

#### CONTRIBUTIONS INVITED

The Editor invites persons to submit articles and photographs for inclusion in the magazine, but regrets that no payment can be made for contributions submitted. Contributions should be addressed: The Editor, "The Navy", Box C178, Clarence Street Post Office, Sydney, N.S.W., Australia.

The Editor does not hold himself responsible for manuscripts, though every effort will be made to return those with which a stamped and addressed envelope is enclosed.

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2. Warship advancement 1900 - to date (all navies)

Naturally, I will be delighted to research these subjects, however, my handicap is lack of reference material. I would therefore be appreciative if any readers possessing any works of reference (books, photographs, magazines, etc.) and who would be willing to donate same, kindly forward this material to:

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Persons interested in writing for the magazine (in an honorary capacity) on the above subjects are invited to forward manuscripts for consideration.

All material received will be acknowledged in future editions of "The Navy".

I hove received reference material from Rear Admiral H. A. Showers, C.B.E. and Mr. Vic Burley; also advice from Mr. Jack Millar and Mr. John Mortimer, and I am extremely grateful for their co-operation.

DENNIS TRICKETT, Editor.

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Page Eighty-two

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## Breaking a Ship on Purpose

By DAVID WILSON

if somebody planned to build a ship wholly of plantics, how could Careful analysis of the results may you tell that it would be safe to sail in a storm. How could you tell that the reactor on board a nuclear-powered ship would remain safe even after the worst possible collision of ships?

of entirely new materials or radi- coastal trading vessels or small oilcally new designs, work in the tankers. The basic philosophy beoffice or laboratory can hardly hind the new ideas is to apply to answer these questions. What you ship-building not only new materineed is really large parts of the als, but the skills and methods of new designs and materials, or large aircraft design. New companies, models and test them to breaking formed jointly by the aircraft inpoint. Then you can be satisfied that the theory and the practice been set up to develop the ideas. are in good agreement and you can have a real idea of the final strengths involved.

This is what is done at the Naval Construction Research Establishment at Rosyth on the banks of the Forth in Scotland. With some of the largest facilities for scientific tests in Britain, the staff there can find the final strength of whole sections of the hulls of ships, they can test large pieces of shipboard equipment for the strains of prolonged vibration, they can simulate the effect of one large ship ramming another broadside-on, they can test structures for effectiveness against underwater impacts either in the sea or in the laboratory and by means of water-pressuretanks they can investigate new structures for the hulls of submarines.

For example, new proposals for ship construction are now being developed in Britain - they are for laminated wood and plastic ships. Of course, laminated wood and resin-coated glass fibre have already been used for many years in the construction of pleasure craft such as sailing dinghies and even luxury motor-vachts. This is

Naval architects and the ship de- length of laminated wood or glasssigners, aided by computers, can fibre-plastic. Such ships might be make calculations, but in the face minesweepers, coastguard cutters, dustry and shipbuilding firms have Full sections of the hulls of the new ships have been built of both laminated wood and glass fibre.

> These hull-sections, around thirty feet long and about the same dimensions from keel to deck, have been taken to the Rosyth establishment. The most impressive piece of equipment there is already testing the first two prototype hulls-the wooden one first. It is an enormous structure which can easily contain these hull sections. It is a colossal box of steel girders-from its four vertical sides and from its roof hydraulic jacks can press against the sections of hull to produce loads of many tons in many directions.

Underneath the keel and the bilges of the experimental ship section there are huge bags which are filled with water at differing pressures so that the whole test structure can be made to undergo the stresses and strains, the twisting and pressures that it might meet with at sea.

simple affair of crushing specimens some piece of steelwork into the until they break and even saving that the maximum strength has been reached. At all sorts of criti- the Forth Estuary into the air. In a field in which British boat-builders cal points within the experimental are pioneers. But the new proposals hull there are strain-gauges; con- Establishment has produced a are rather different. The idea now tinuous readings from these are fed mounting which may be useful in is to build ships 100-200 feet in out by cable to recording machines. the civilian field, Basically it con-

well show which are the weak spots in the new designs. By fairly simple re-designing and strengthening of the crucial members much stronger hulls may be obtainable. There is a careful building up of a body of design knowledge and information that may eventually change the construction of small ships which provide the largest of all shipping markets in the world at the moment, with so many countries anxious to build up their fleets of trawlers and offshore fishing vessels, light coastal craft and transport ships.

Reactors in nuclear merchant ships pose different problems. Could the reactor be protected in a collision? The Naval Construction Research Establishment tackled this with large scale model structures. They have other large equipment rather like an enormous hydraulic press, standing some thirty feet high. Across the base of this they mounted a model of the hulldesign for the nuclear ship and down onto it they drove, with enormous force, a model of the steel bows of a hypothetical "ramming" ship. The exact results of this experiment have not been revealed but they keep the crumpled metal as an exhibit for visitors.

The Establishment is, of course, primarily a naval one, staffed by members of the Royal Naval Scientific Service. Much of their work is concerned with defence matters. This involves trying tomeasure the effect of weapons and explosions upon ship structures. Sometimes experiments can be But the programme is not a dramatic to watch, as cranes lower water, and underwater explosions hurl columns of the grey waters of the course of this sort of work the

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HOBART — E. Chancellor Pty. Ltd., 32 Davey Street. I.AUNCESTON — John McKenzie & Co. Pty. Ltd., 63 Cameron Street. sists of a number of metal "spring leaves" like concentric ellipses, flattened top and bottom, with a damping material between the leaves. It can be made in various sizes to take different weights, and it was originally designed to provide safe supports for vital pieces of machinery inside a ship even when it was impacted by the force of explosions. A commercial firm is taking this up.

Although the most spectacular aspects of the NCRE's work are at the edge of the water beside the famous Rosyth Dockyard, the headquarters is in a converted mansion near Dunfermline. Here activity is on a more usual laboratory scale and is largely concerned with materials for ship-construction. There is much metallurgical work, mostly on the new high-strength steels, and on the problems of welding, but also on some of the so-called "exotic" materials.

In defence work, the actual cost of a material is not of prime importance, and, within reason, it is the performance of a new material that is most important. If the NCRE can show that some of the new materials they are examining are worth using for warship building, then production may be increased and the cost of the material brought down, possibly far enough to make it attractive to the manufacturer of consumer goods. So it may enter our ordinary lives.



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## WHEN WOMEN TAUGHT SAILORS TO COOK

By A. CECIL HAMPSHIRE

"An army," Napoleon is reputed to have remarked on one occasion, "marches on its stomach." This dictum is also true of the Navy and Air Force, It follows, therefore, that to win wars the men of the fighting services must have plenty of good food and competent cooks to prepare it.

horrified their Lordships.

for our anti-submarine patrol traw- ably increased. lers, their crews would be unable through sheer starvation to con-U-boats.

Some idea of the importance of the work of the Navy's anti-submarine and minesweeping trawlers may be gained from the fact that at the outset of the war they numbered a mere 400 vessels crewed by some 3000 officers and ratings, all fishermen. By 1944 the personnel of the Royal Naval Patnucleus, had grown to 70,000. Despatches.

chives is the story of how at one Naval Reserve officially came into filled by young conscripts who stage of World War II, shortage of being. During World War I the either volunteered to serve as the latter nearly put a vitally im- work of these little ships was trawler cooks or were drafted willyportant arm of the Royal Navy out principally minesweeping, a task nilly to sea as such. Not only had of action. The crisis was only nar- for which both ships and men most of these lads very little rowly averted by recourse to an were particularly suited. With the knowledge of cooking at all, but unconventional measure which in introduction of the asdic device for in anything of a seaway in their peace time would probably have submarine detection a proportion of wildly gyrating vessels they became officers and men of the Royal completely flaked out and useless The story began in the early Naval Reserve Patrol Services, the from seasickness, months of 1940 when the post-war title of the old Trawler Director of Anti-Submarine War- Section, were trained in anti-subfare despatched an urgent minute marine techniques. By 1939 some to the Second Sea Lord, Admiralty 200 of the best fishing trawlers in Board member in charge of per- the industry had been carmarked sonnel. Briefly, the Director repre- for the anti-submarine defence of sented in no uncertain terms that our coastal convoys in the war unless steps were immediately From the outbreak of hostilities ontaken to provide competent cooks wards these numbers were consider-

But one important point in the manning of both anti-submarine tinue the vital fight against Hitler's and minesweeping vessels had been overlooked by the planners. In peacetime the majority of trawler cooks in the fishing industry are men aged between fifty and sixty. They are experts at their job and paid accordingly. Thus in addition to the standard wage of a deckhand they also receive a substantial bonus on the catch.

rol. of which they had formed the quisitioning from the fishing in- ery classes conducted in the dustry were taken up by the spacious, well-equipped electric manning 7000 vessels. By the time Admiralty on the outbreak of war, galleys in the depots could not the war ended nearly 3000 officers most of the trawler cooks serving hope to transform ham-fisted amaand men of the Patrol Service had in them were, of course, over the teurs into expert small-ship chefs won decorations ranging from the age for call-up. Moreover, the capable of producing varied and Victoria Cross to Mentions in rate of pay laid down for the appetising meals on a two-foot by From the earliest times in our attract those individuals, most of galley of the average trawler history Britain's fishermen have them married men with families, whose unpredictable motions at sea provided one of her most import- who might otherwise have volun- necessitate the most skilful juggling ant naval reserves, and in 1910 the teered to serve. In consequence of pots and pans.

Buried in the Admiralty's ar- Trawler Section of the Royal the vacancies for cooks had to be

This was a very serious state of affairs, for if a trawler cook cannot do his job the crew cannot eat. Thus it was when the Director of Anti-Submarine Warfare addressed his urgent minute to the Second Sea Lord.

Arrangements were thereupon made for batches of raw young Patrol Service cooks to be sent to the general naval depots for training under the experienced Chief Cooks in the big modern galleys at those establishments. But this measure was soon found to be of little use. The barracks staff were far too busy coping with their own greatly increased routine work to spare the time to teach green voungsters anything more advanced in the culinary arts than how to When the trawlers due for re- peel potatoes. Furthermore, cook-Patrol Service cook was too low to four coal-fired range in the tiny Best Wishes to all Navy Personnel from . . .

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It was at this psychological under instruction, and being re- air lighters, aircraft tenders, balmoment that, like a good fairy, quired to eat what they cooked! loon servicing craft and wreck dis-Miss Grace Musson appeared on Miss Musson and her enthusiastic persal vessels. the scene. Peacetime head of Lowestoft's Technical College, this with their unpromising material. grey-haired, twinkling eved expert. They ran their establishment with suggested an ideal - if unorthodox the smooth efficiency of an assem-- solution to the problem.

plained, had by 1940 become the young men to the number of 160 headquarters, or depot, of the at a time, most of whom had Royal Naval Patrol Service. A never in their lives even boiled an local pleasure park with its con- egg. At the other there emerged cert hall and other associated trained cooks whose culinary creabuildings had been taken over as tions could almost bear comparison an assembly base; hotels and with the products of a highly schools had been requisitioned for trained hotel chef. accommodation and training, and numerous boarding houses and peacetime bed-and-breakfast establishments were roped in to provide billets for men awaiting their ships. The whole place was given the ship name H.M.S. EUROPA. with the official title of Patrol Service Central Depot, and over all reigned a Commodore whose office was a seafront hotel.

It was to this harassed officer that Miss Musson suggested the establishment of a cookery school idea and, without waiting to obtain higher approval, authorised her to go ahead. The good results were quickly apparent, and subsequently, with Admiralty blessing, a Lowestoft infants' school whose usual occupants had long since been sent away to a safer part of the country, was officially requisitioned to become the new cookery school.

As Instructresses, Miss Musson gathered about her eleven domestic science teachers, aged from 25 to 47, who, due to the evacuation of their usual pupils, were also out of a job. A number of coal-fired ranges of the kind to be found in the average fishing trawler were installed in the school classrooms. Each stove was sited in a small compartment no larger than the galley of a trawler, and upon it the trainees were required to prepare and cook a complete daily set of meals under conditions which almost exactly simulated those at sea, with the exception, of course, of the motion of the vessel in a seaway.

band of ladies worked miracles bly line in a factory. At one end Lowestoft, it should be ex- of the "factory" there entered

Nor did instruction end there.

One of the teachers, Mrs. Gwendoline Dempster, sat down each evening after her day's work was finished and compiled a special cookery book for the little ships of the Patrol Service. Written in everyday language that seamen could understand, it outlined the rudiment of small-ship catering, how to make the best use of whatfor his men. He jumped at the ever raw materials were available, the planning of varied daily menus, and included a number of recipes for dishes well within the scope of her readers, with detailed instructions on preparation and cooking. The book was plentifully illustrated with explanatory line drawings, one of which, captioned "A Place for Everything in its Place" stressed the not unimportant virtue of tidiness in a small galley. So successful was it that other Services clamoured for copies.

As the war went on, men from every part of the Commonwealth, including Australia, Canada, New Zealand, South Africa and Newfoundland, found themselves serving in the small craft of the Royal Naval Patrol Service. For the little ships were present in every theatre of war, from the Arctic to the Pacific. During the Normandy invasion in 1944 the Patrol Service was called upon to man in addition to their trawlers, fuel and water-carriers, fast motor boats. Courses lasting five weeks were aircraft safety launches, tugs for instituted, the embryo cooks being towing parts of Mulberry harbour, accommodated in the school while cargo lighters, harbour launches,

That all the crews were as well fed as their comrades in the larger ships of the fleet was due in no small measure to the devoted little band of women at Lowestoft who braved the 20,000 bombs harled upon the town to teach the men of that wartime Navy within the Navy how to cook.



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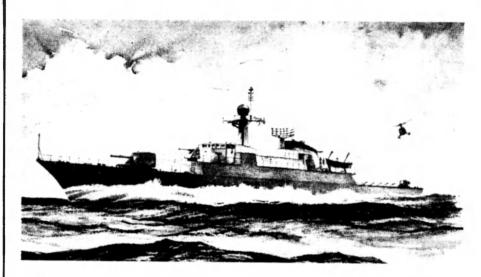
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## THE PHILOSOPHY OF THE MODERH FRIGATE

BY D. PHILLIPS-BIRT A.M.R.I.N.A.

The frigates being built in Vosper with some help from than is commonly found", at the quality of compactness in common for a frigate (Mark 5)) not widely knots - an appreciably higher relatively small ships which as a conception but lighter, it seems, 310 ft. than the longer destroyers. result of receiving the benefit of the in displacement, with a distinctly Four of these vessels being built at latest technical developments are different hull form, and powered present for the Imperial Iranian able to offer more in terms of for higher speeds - for which, it Government by the Vosper-Thornyspeed and armament per ton of dis- is understood, the Yarrow design croft Group and the Shipbuilding placement than other vessels of may later also be developed. The Group of Vickers are officially their class.

The Clydeside firm of Yarrow, for example, describe their version of a frigate as "a new long-range ocean going warship" and say that "displacement, capital cost and complement of the vessel have been kept down to about 60 per cent of equivalent figures for existing first-rate frigates without serious reduction in fire power or performance". An order for one of these ships has been placed by the Royal Malaysian Navy

British yards for export have the Vickers have produced a design very high maximum speed of 40 with the new corvettes. They are different in size from the Yarrow relative speed for their length of Vosper ships are able to carry a called "fast destroyers". total armament weight of 100 tons, The Yarrow frigate with, it ap-

described as "a much higher pro- pears, a load displacement appreciportion of the ship's displacement ably heavier than that of the Vos-

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Class	Lenth	Displacement	Power	Speed	Power- displacement
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Havack	185	300	3000	26	10
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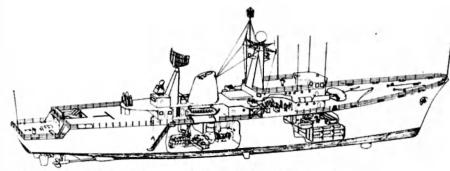
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The general arrangement of one of the series of the Yarrow frigate which also shows in the cut-outs the control room directly below the most, a portion of the accommodation and the main engines.

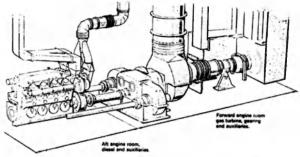
carry an armament weight of 150 high power and low weight tons: but with half the latter's For the answer to the riddle of lem when high speeds of 40 knots almost 20,600 h.p.

A seamark in the Yarrow story SNAKE for example, carried about able to provide the package of of constructing fast warships no. 4.9 h.p. per ton of displacement, power in a form light enough for curred in 1893, when the This was raised to 5.1 in the ships of this size, requiring for HAVOCK was commissioned and GRASSHOPPER but remained the their speed some 35 h.p. per ton. brought to a close a most unsame in the more powerful and larger. Vosper have described these happy period of technical experi- SHARPSHOOTER class, while it frigates as "about the same size as ments by the Navy with what were dropped to less than 3.5 in yet the British "Hunt" class which did misappropriately named "torpedo-more unsuccessful DRYADS. The such admirable service during the catchers". These were not intended breakthrough which came with the last war, and clearly demonstrated to catch torpedoes, but the ships Yarrow HAVOCK was the result the capacity of a well-designed ship were also not fast enough to catch of the ship having a power-dis- of this size for world-wide service". the torpedo-boats that launched placement ratio of about 10. The The Vosper ships are 30 ft. longer them. The RATTLESNAKE of table showing the power-displace- (310 ft.) than the HUNTS, and 1886 was a disappointment, having ment figures for the GRASS- in practice there may not be much a speed of 18.5 knots, which was HOPPER, the HAVOCK and for to choose between them in disseveral knots lower than that of the new Vosper corvette KRO- placement, but rather more than the French torpedo-boats. She was MANTSE which was described double the power of the HUNTS followed by the GRASSHOPPER last month, reveals the logic be- (classified as frigates) has to be class in which, using the same hind this aspect of design and per- installed to achieve 40 instead of power, weights were reduced and speed raised to 194 knots. This too was disappointing. The SHARP-SHOOTER class of 1889-90 were 30 ft. longer than the GRASS-HOPPERS. making them 230 ft. overall, and carried 1,000 more horsepower (3,700 instead of 2,700) but a maximum speed of 20 knots was still only just reached, while in 1892 the DRYAD class appeared with speeds back at 19 knots. The matter appeared to the Admiralty as a riddle in naval architecture; which indeed it was at the then state of knowledge of the subject. And that old story is still running on today, its plot less of a mystery than it was, but still

power installed her maximum the unhappy torpedo-catchers lay are required from ships such as speed is 27 knots, using a single in the ratio of the powers in the Vosper frigates. In the congas turbine capable of developing stalled in the various ships to tinuing power-weight struggle, at their displacements. The RATTLE- present only the gas turbine is

THE NAVY

per ships, is stated to be able to involving the same struggle for formance during the last 80 years; and suggests too the present prob-



A sketch showing the main Propulsion Machinery Arrangement







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the Vosper Frigate. The armament shown is that of the standard ship, not of the Iranian version.

tons lighter in displacement, an using the steam turbine.

In the contemporary phase of marine engineering, in order to combine the lightest and most compact source of maximum power for full speed with an adequate range at cruising speed, when no more than 10-20 per cent of the full power will be used, a duel engine system becomes necessary; for the big specific consumption of the gas turbine destroys the virtue of its high power-weight if it is run for long periods at partial power. The balance is achieved by means of diesel machinery which, thanks to the hydrodynamic facts of ship resistance, may be able to give a cruising speed of more than half the rarely used maximum speed for less than one-fifth the power. In the Vosper frigates the maximum speed of 18 knots under the twin diesel engines may be maintained with 10 per cent of the power needed under the twin gas turbines for 40 knots.

installed as the TRIBAL destroyers tween the two engines, which engineering achievement impossible gives a speed of 16 knots, and a vessels. range of about 5,200 miles may be obtained. The turbine, in its separate compartment, drives aft into the same train of gears and at almost 20,600 h.p. gives 27 knots. Developments are being studied to produce speeds of up to 36 knots by installing two gas turbines each driving one shaft, as in the Vosper ships.

compartments contains the diesel, bracket speeds, at a small price in high speed performance.

maximum speed owing to the increased displacement.

It was the object of the Vosper frigates to produce vessels of about half the cost and displacement of contemporary Royal Navy frigates such as the LEANDERS, yet large enough to carry powerful antisubmarine, anti-surface and anti-aircraft armament of the latest type, and to have an excellent degree of seaworthiness. The last is a crucial matter. In very general terms, effective seakeeping qualities, which entail amongst much else the ability to maintain a useful speed in an ocean seaway, tend to be a function of size. The improved seaworthiness of small ships is due to a concentration on the latter's 25.5 knots. The Vosper with its power take-off leading this aspect of design during recent ships have much the same power forward into the gear train be- years, to a broad general study of ocean seaways and ship reactions of 1936-39, while being some 600 gives the diesel a 2: 1 reduction, to them, undertaken on behalf of Running at 3,900 h.p. the diesel all sizes and types of ocean-going

A series of model tests was undertaken in the Vickers tank. making a direct comparison under head sea conditions between the Mark 5 frigates and the larger LEANDER class. A wide range of speeds was examined, in both regular and irregular seas. A statistical analysis of the results is reported to have shown a remarkably good The duel engine system has comparison between the smaller and some disadvantages, which show larger ship. The ability of the most clearly in the range of speeds former to stand up well in pitching above the maximum for diesel conditions may without doubt be propulsion and below the high- attributed in considerable part to rating turbine speeds. Considering the knuckle in the forebody secthe Vosper frigates: maximum tions extending from the boldly cruising speeds under the 16- overhanging stem aft to the vicinity cylinder Paxman diesels is 18 of the bridge, a feature adopted knots, and up to this speed an in the Vosper corvettes also. The excellent cruising range is obtain- merits of this feature in combinaable, but for cruising between, tion with an outreaching, modified say, 18 and 28 knots the range clipper stem, have become so well drops severely owing to the high recognised today in all types and specific consumption of the gas sizes of ship, that its absence - as turbine, and in this bracket of in the LEANDERS - cannot apspeeds the steam turbine ships- pear other than surprising. It is The Yarrow and Vosner ships the LEANDERS, for example — the obvious way to embody adehave the same combination of show to advantage. The critical quate reserve buoyancy above the diesel and gas turbine machinery, speed bracket is not, of course, so necessarily fine lines, demanded by but twins of each engine in the wide in the Yarrow frigates with high speed, in the sections in the latter give double the power of their lower maximum speed and vicinity of the waterline. And it is the Yarrow frigate, which is desingle turbine. In the Vosper important as a means of countersigned for 27 knots maximum. The ships tankage is provided for an acting the excessive lifting power layout of the engine rooms in the additional 100 tons of fuel to cater of the broad, flat stern, which is latter ships is illustrated. The after for an adequate range at the unavoidably necessary again for

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THE NAVY

May-June-July, 1968

The drawings and photographs family resemblance between the ships despite the disparity in size. The same balance and unity in the composition of the profile is evident throughout the series -Mark 1 and Mark 2 corvettes, Mark 5 frigates - improved if anything in the bigger ships, as usually may be achieved owing to the proportionately less height that becomes practicable with greater length. Today, when the jagged profiles of so many warships sugsugests a number of unrelated parts joined together in desperation, these ships have an aesthetic quality indicating technical assurance and the influence of a single controlling mind of good taste. Whatever the operational value of such distinction may be, it must surely delight the eye of a seaman.

#### Roger J. Tulloch

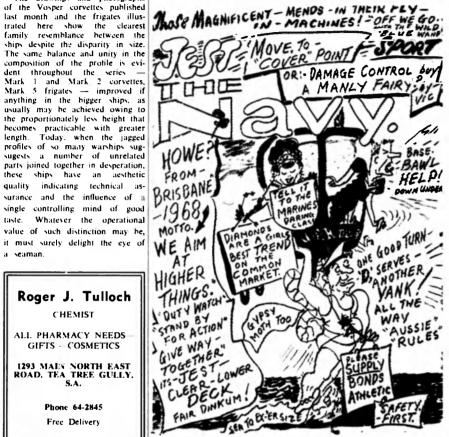
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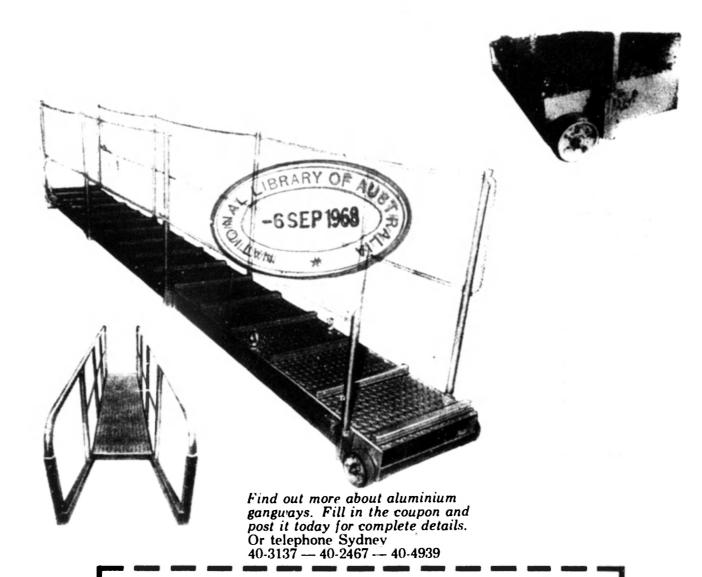
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