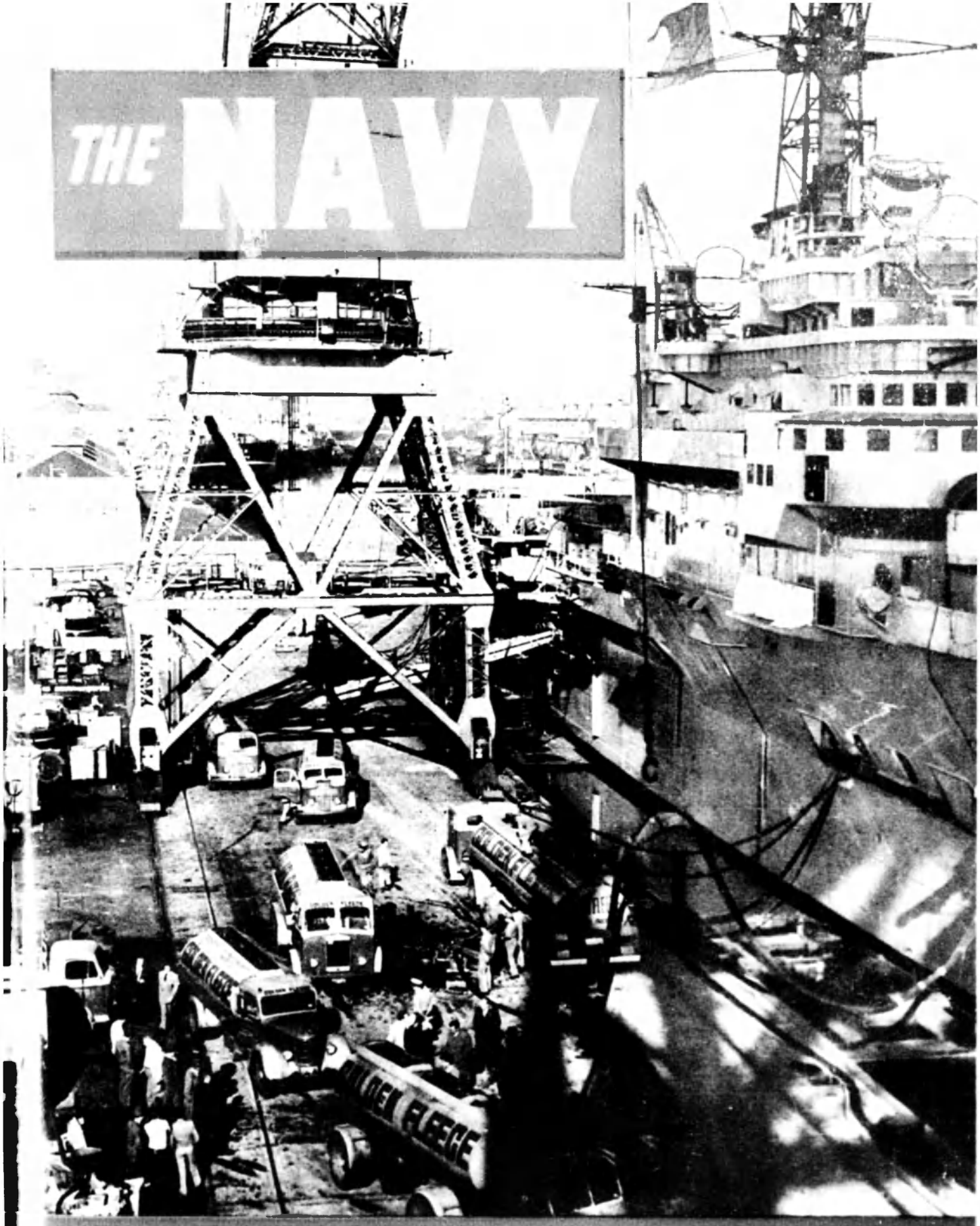
THE NAVY



AUSTRALIA'S MARITIME JOURNAL JULY, 1957 1/6

THE NAVY
Australia's Maritime Journal

VOL. 20. JULY, 1957. No. 7.

Published by The Navy League of Australia, 83 Pitt St., Sydney, N.S.W., and 308 High St., Preston, Victoria.

Circulating throughout R.A.N. Ships and Establishments.

"The Navy" is the Official Organ of The Navy League of Australia and the Ex-Naval Men's Association (Federal).

"The Navy" is the only journal in Australia devoted exclusively to Naval matters generally, and to the R.A.N. in particular.

SUBSCRIPTION RATE: 12 issues post free in the British Commonwealth, 20/-.

Copies of "Herald" photographs published may be obtained direct from Photo Sales, Sydney Morning Herald, Hunter St., Sydney.

THE NAVY LEAGUE OF AUSTRALIA

PATRON:

His Excellency The Governor-General.

FEDERAL COUNCIL:

President: Rear Admiral H. A. Showers C.B.E. (Retd.).
Deputy President: Cdr. R. A. Nettleford, D.S.C., V.R.D., R.A.N.R.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).

New South Wales Division:

Patron: His Excellency The Governor of New South Wales.
President: Rear-Admiral H. A. Showers, C.B.E.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).
Hon. Treasurer: [illegible] E. Trine, Esq.

Victorian Division:

Patron: His Excellency The Governor of Victoria.
President: Captain J. P. Williams, O.B.E.
Secretary: H. E. Touzel, 308 High Street, Preston, N.18.

South Australian Division:

Patron: His Excellency The Governor of South Australia.
President: Lieut. Comdr. C. C. Shinkfield R.A.N.R. (retd.)
Hon. Sec.: K. W. Adcock, Esq., 131 Grenfell Street, Adelaide.

Tasmanian Division:

Patron: Vice-Admiral Sir Guy Wyatt K.B.E., C.B., R.N. (retd.)
President: C. H. Hand, Esq., M.H.A.
Hon. Sec.: Comdr. G. E. W. W. Bayly O.B.E., V.R.D., R.A.N.V.R. (retd.), 726 Sandy Bay Rd., Lower Sandy Bay Hobart.

Western Australian Division:

Patron: His Excellency The Governor of Western Australia.
President: D. W. Brisbane, Esq.
Hon. Sec. - Hon. Treas.: K. Olson, Esq., 62 Blencowe St., West Leederville, W.A.

Queensland Division:

Patron: His Excellency The Governor of Queensland.
President: Comdr. N. S. Pixley, M.B.E., V.R.D., R.A.N.R. (retd.), Ryan House, Eagle Street, Brisbane.
Hon. Sec.: Lieut.-Comdr. O. C. McDonald, R.A.N.V.R. (retd.), Box 1441T, G.P.O. Brisbane.

Australian Capital Territory Division:

President: His Excellency, G. E. L. Alderton, C.M.G. (High Commissioner for New Zealand).
Hon. Sec. - Hon. Treas.: Comdr. A. D. McLachlan, R.A.N. (Retd.), 49 Froggatt St., Turner, Canberra, A.C.T. 'Phone J 2311.

AUSTRALIAN SEA CADET COUNCIL

[illegible] representatives of the Naval Board
Director of Naval Reserves, Capt. A. L. McNicholl, C.B.E., G.M., R.A.N. (Chairman).
Comdr. P. R. James, R.A.N.
Representatives of the Navy League
Comdr. R. A. Nettelfold, D.S.C., V.R.D., R.A.N.V.R.
L. C. Pearson, Esq.; L. Forsythe, Esq.
Lieut. (S) F. G. Evans, R.A.N.V.R.
Hon. Secretary: R. Neil Walford

VOL. 20 JULY, 1957 No. 7

THE NEW ROYAL NAVY

Two articles in this issue of "The Navy" (pages 18 and 26) deal with Britain's new naval policy.

The new policy is revolutionary and there are some understandable fears whether Britain's naval strength will be adequate in the period that must elapse before the "new look" Navy is realised.

The new naval policy is only part of a whole new concept of British defence.

This is evidently based on two main conclusions: first, that Britain cannot defend herself against an all-out nuclear attack; and secondly that her possession of the H-bomb has now given her a powerful strategic weapon to deter a potential enemy from waging war on her.

The British Government's Defence White Paper bluntly acknowledges Britain's vulnerability to nuclear attack.

"It must be frankly recognised," the White Paper states, "that there is at present no means of providing adequate protection for the people of this country against the consequences of an attack with nuclear weapons. Although, in the event of war, the fighter aircraft of the Royal Air Forces would unquestionably be able to take a heavy toll of enemy bombers, a proportion would inevitably get through. Even if it were only a dozen, they could with metagon bombs inflict widespread devastation.

"This makes it more than ever clear that the over-riding consideration in all military planning must be to prevent war rather than to prepare for it . . . the only existing safeguard against major aggression is the power to threaten retaliation with nuclear weapons."

The new Navy will be organised in carrier groups, each comprising one aircraft carrier and supporting ships. Of these, a new design of fleet escorts, considerably larger than the "Darings," will be equipped with guided weapons.

Emphasis is to be placed on "afloat support" to enable the Fleet to operate for long periods without being dependent on shore bases.

On the role of Naval forces in total war, the White Paper states: "This is somewhat uncertain," but continues: "It may well be that the initial nuclear bombardment and counter bombardment by aircraft or rockets would be so crippling as to bring the war to an end within a few weeks, or even days, in which case naval operations would not play any significant part.

"On the other hand, there is the possibility that the nuclear battle might not prove immediately decisive; and in that event it would be of great importance to defend Atlantic communications against submarine attack.

"It is therefore necessary for N.A.T.O. to maintain substantial naval forces and maritime air units. Britain must make her contribution, though it will have to be on a somewhat reduced scale."

Dealing with situations not involving total war, the White Paper states:

"On account of its mobility, the Royal Navy, together with the Royal Marines, provides an effective means of bringing power rapidly to bear in peacetime emergencies or limited hostilities. In modern conditions the role of the aircraft carrier, which is in effect a mobile air station, becomes increasingly significant."

The new policy sounds the end of the cruiser as we now know it and, of course, the end of the battleship.

The active cruiser strength (eight in commission) is to be reduced and finally replaced by the three "Tiger" class now under construction.

Of the Royal Navy's five battleships, all in reserve, four are to be scrapped, leaving only the *Vanguard*, which has been allocated to N.A.T.O.

The whole of the Reserve Fleet is to be reduced, but kept at "a rather higher state of readiness."

The ships not required will be scrapped or sold.

Big cuts are to be made in manpower, in expenditure on new construction of both ships and aircraft, by revision of research, repair and refit programmes, by limiting maintenance costs of the Fleet, by reducing the numbers of industrial and non-industrial civilian personnel, by closing certain establishments, and by a further rundown of the level of reserves of material in anticipation of lower requirements of the Fleet of the future.

The Navy vote is £316 million — £32,840,000 less than in 1956-57.

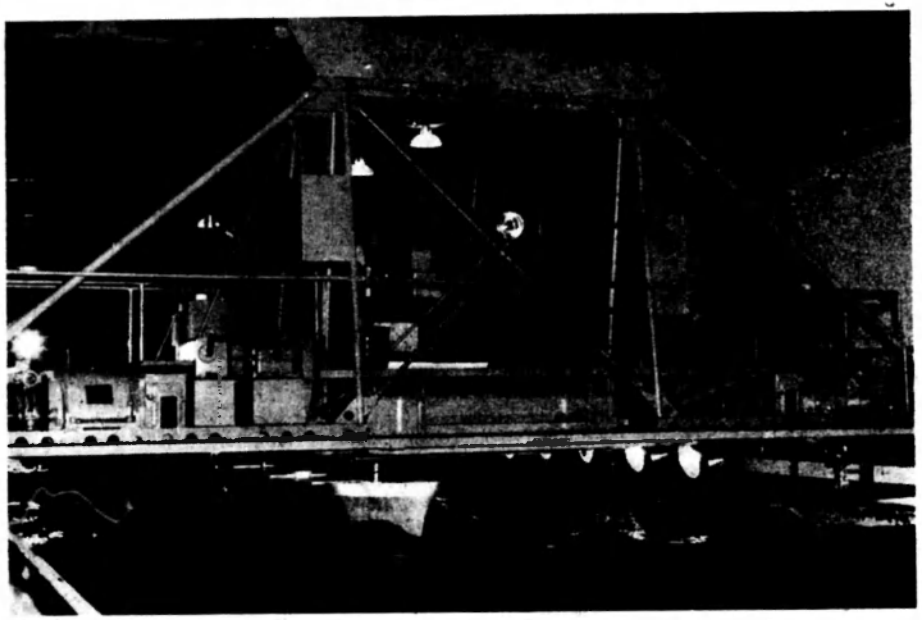
Increases in costs of materials, transport, salaries and wages, building construction and a higher scale of expenditure in connection with N.A.T.O. mean, however, that the reduction in spending on other services is more drastic than would appear.

The total manpower of all Services is to be reduced from the present combined strength of about 690,000 to approximately 375,000 by the end of 1962. There will be no further call-up under the National Service Acts after the end of 1960.

The White Paper announces the formation of a central reserve, to be maintained in the British Isles and possessing "the means of rapid mobility," including the transport resources of the Royal Air Forces, supplemented, when necessary, by Naval and other vessels and suitable civil aircraft.

Big Ships Do "Sea" Trials Indoors

At St. Albans, not far from London, technicians conduct "sea" trials of ships — long before they are built.



A model of the Orient Line's "Oriana" undergoes tests in the St. Albans tank.

THE ships are war models, 10 to 20 feet long. They float in an indoor tank, can be towed or driven by their own propellers in smooth water or miniature waves.

The whole purpose is to investigate any hydrodynamic problems in their design and performance.

From these measurements the equivalent figures for the full-scale ships are calculated by mathematical laws.

The tank, Vickers-Armstrong's ship model experiment tank, is the largest of the privately owned tanks in the United Kingdom, being second in size only to the Admiralty Experiment Works and the National Physical Laboratory tanks.

It has a staff of thirty-seven, made up of 12 naval architects and draughtsmen, 10 technical assistants, tracers and computers, five instrument makes, five joiners, four clay moulders and labourers, and a shorthand-typist.

The tank itself is a concrete basin filled with water. It has an overall length of 447 ft. 6 ins., of which 376 ft. 6 ins., with breadth 20 ft. 10 ins., and depth 11 ft. 3 ins., is used for experiments.

At one end there are docks for storing models, and for ballasting and fitting them up before testing.

Models may be tested either in calm water, or in rough seas created by the wavemaker mounted at one end of the tank.

At each end there are beaches for breaking up waves created either by the wavemaker or by the passage of the model.

The tank is spanned by a moving carriage which travels with the model under test, and carries the measuring apparatus with its operators.

The first experiment tank, as now known, was built in 1870-1872 at Torquay by its inventor, William Froude.

He had persuaded the Admiralty that by applying a theory developed by him, it would be possible to predict the power required to drive full-size ships from measurements on models. In view of the increasing uncertainty about the probable performance of ever larger and higher powered increasing importance in the design of ships.

Naturally Froude was mostly concerned with warships, but he ships, he was given a contract to build a tank and prove his theory.

This he succeeded in doing and the tank proved of immediate and struck up a great friendship with William Denny, chairman of the famous Dumbarton shipbuilders, who had invented and regularly carried out progressive measured mile trials with the merchant ships he built.

The two men co-operated in obtaining the vital comparison between ship and model results, and William Denny became so impressed with the usefulness of an experiment tank that in 1883-1884 he built one at Dumbarton for his own firm's use.

SHORTLY afterwards, the Torquay tank was dismantled and the equipment taken to a new and larger tank at Gosport, under the guidance of Froude's son, R. E. Froude, where it remains as part of the Admiralty experiment works.

In the following 20 years it became increasingly apparent that an experiment tank was essential during the design of warships, and most of the major naval nations built their own government tanks.

At the same time, the Dumbarton tank enabled Dennys to obtain a virtual monopoly of building high-speed, cross-channel steamers. But while some recognised the advantages of having occasional record-breaking liners tank-tested under contract, most private shipbuilders had neither the money nor the trained staff to invest in their own tank.

Three large firms, however, Armstrongs, Browns and Vickers, were at this time the major builders of warships for the world, and as such were extensively interested in tank results.

Early in this century, John Browns decided that it would add to their prestige as well as their technical interests to have a tank of their own, and built one at Clydebank.

In 1907, shortly after the Clydebank tank had been opened, its architect, Mr. J. M. Crawford, of Glasgow, submitted a specification to Vickers, Sons & Maxim, for a similar tank at Barrow-in-Furness.

This scheme fell through, but four years later another specification was drawn up on the instructions of Sir George Owens-Thurston, who had recently come from Armstrongs to be the chief naval architect of Vickers Limited.

The plans were drawn by Vickers Limited, Erith, acting on behalf of the head office in London. The scheme was for a similar tank to the earlier proposal, but with much more extensive workshop and office facilities.

In charge of the tank from its conception was Mr. B. Pryor, who had worked with Froude at Torquay and had been assistant naval architect with Armstrongs at Elswick, responsible to Sir George Owens-Thurston for hull design and powering.

The tank was erected in 1911-1912 by Ezra Dunham, a well-known St. Albans builder, the staff engaged in October, 1912, and the first model experiments run in February, 1913.

IN the early days of the tank, largely coincident with the first world war, work was concentrated almost entirely on naval ships under the direction of Sir George Owens-Thurston, who was one of the best known warship designers of that time.

In the slump period between the two wars the ship work of the establishment declined, but was replaced by extensive work on flying boats and seaplanes.

This work had been initiated in 1914 by Vickers Limited and subsequently included numerous contracts for the Air Ministry and private firms. Most of this work later passed to the Royal Aircraft Establishment tank at Farnborough, which was actually built by Vickers-Armstrongs Limited, Elswick.

With the decline of warship building between the two wars and again after the second world war, Vickers turned to the construction of large passenger liners and tankers, and new fields were entered at St. Albans.

Unusually extensive ad hoc and long term researches into passenger liner and tanker design were carried out, resulting in an unrivalled stock of data on these types of ships.

Early in the second world war the tank was extensively damaged during an air raid. After repairs the Admiralty experiment works, Haslar, were given a lien on the use of the facilities, and the establishment concentrated almost entirely on war work. In addition to purely Admiralty work, miscellaneous objects on both model and full-scale were tested for the Inter-Services Research Bureau in connection with river and coastl warfare.

AFTER the war there was an enormous increase in the demand for tank testing by the industry.

To play its part in meeting this demand, the company, possessing at St. Albans one of the very few such establishments in private ownership in the country, decided to expand the tank's activities to their fullest.

The present work of the tank may be divided into four categories:

- Routine commercial testing for ships about to be built by the company. The number of models for each ship varies from two or

three for an ordinary single-screw vessel to as many as 15 for difficult high-speed passenger liners, such as the *Oriana*.

Some forms are supplied by the shipyard naval architect, and others are designed at St. Albans.

● Exactly similar work for other shipbuilders or shipowners (only two of the many other shipbuilders in this country have comparable facilities of their own).

● Research work for the company, primarily aimed at improving the hull design of the types of ship it builds, and predicting accurately their performance on trial and in service.

● Research work for the British Shipbuilding Research Association, which was formed towards the end of the war to pool the limited research facilities of the shipbuilding industry.

At the end of 1956, 716 models had been tested or were in hand.

WORK being carried out at the St. Albans tank includes:

Methodical series investigations of ship resistance: The aims of these experiments are to find the effect on ship resistance of varying various parameters such as block coefficient, position of longitudinal centre of buoyancy, breadth/draught ratio, displacement/length ratio, etc.

A series of wax models is constructed in which so far as possible only one variable is altered at one time. The models are towed in the tank and the resistances are measured.

Supplementing these investigations, self-propulsion tests are made with a selection of the tug and trawler models.

Service performance: The standard of performance to be expected at sea under normal service conditions is of critical importance to the shipowner. To investigate the effect of waves on ship performance, models of typical merchant vessels are self-propelled in artificial waves created by the wavemaker at the far end of the tank and the performance is studied with particular reference to the effect of waves of different lengths and heights.

Structural investigation: In addition to its effect on the propulsive performance of the ship, the passage of the vessel through waves causes bending moments to be imposed on the hull in addition to those already arising from the weight and buoyancy distribution in still water.

Various methods are in use for the estimation of these wave bending moments. The accuracy of the methods is being investigated by measuring the bending moment experienced by a typical merchant ship hull when advancing through waves.

The model is articulated, i.e., cut at about the middle of the length and the stress induced by the bending moments is obtained by means of strain gauges, and from these results the bending moments can be calculated.

Slamming: When a vessel is pitching in waves, a phenomenon known as slamming sometimes occurs.

When this happens, very high pressures are generated between the hull and the water, generally resulting in damage to the bottom shell plating.

The exact physical mechanism which gives rise to this extraordinarily high pressure is not known. An attempt is being made to investigate the slamming phenomenon by self-propelling a typical cargo liner model in rough water.

The exact conditions of wave, pitching period, etc., at which slamming occurs will be determined and the impulsive pressures on the ship's hull will be measured.

Building the Giant Tankers

From "Petroleum Press Service"

Representatives of oil companies and their suppliers gathered in Folkestone (U.K.) recently for the summer meeting of the Institute of Petroleum. Among the papers presented under the general title of "The Influence on the Oil Industry," was one by Mr. G. Trypanis, of Niarchos (London) Ltd., on aspects of tanker construction and propulsion. This highly topical study forms the basis of this present article.

TANKER sizes have increased so rapidly of late that it is becoming difficult to find adjectives to describe them: "super," "giant" and "monster" are all in current use — and still the process of growth continues. Of the tanker tonnage now on the stocks throughout the world, almost 85 per cent. comprises ships of 30,000 to 100,000 tons d.w., and there is talk of building vessels up to 130,000 tons.

This astonishing increase in size, which has, of course, an economic justification, has been made possible by certain technical developments in shipbuilding and marine engineering. Mr. Trypanis's paper was largely concerned with the building and propulsion of these monster vessels, but he began with a brief reference to their operation.

From the standpoint of owner or charterer, the justification for stepping up the size is the reduction in operating costs thus achieved: it is estimated that transportation by a 50,000-ton vessel costs only about three-fifths as much, per ton of oil carried, as by a 12,000-tonner. By the time this size has been reached, however, the scope for further operating economics has been much reduced. On purely commercial considerations, therefore, the maximum size ordered might perhaps have been a vessel of 80-90,000 tons, since this is the largest that can be satisfactorily propelled by a single screw. The need for twin screws above this size if a high speed is to be attained means higher construction costs, more engine room staff and possibly a ten per cent. loss in propulsive efficiency. Moreover, the larger the vessel the more likely is it to run into difficulties over port facilities, dry docks, repairs, etc. Finally, there is the problem of

Sailors from the New Zealand cruiser "Royalist," which visited Sydney last month, played beach football with Nesavers from Maroubra Surf Club. Afterwards, Maori members of the ship's company entertained the Club with Maori dances—dressed appropriately.

finding suitable employment for so gigantic a unit. The largest tankers have little flexibility in use: they must, in effect, be regarded as the equivalent of pipelines, carrying the basic traffic between a few major loading ports and their equivalent refineries.

OPERATING economies apart, the feasibility of using the Suez Canal is an important factor for many owners. The largest vessel that can make the passage fully loaded is a tanker of 42,000 or 43,000 tons, while a 65,000-tonner is about the largest that can pass through in ballast or partly loaded. Hence the latter is probably the best size to build as a hedge against closure of the Canal; for, by sailing fully loaded round the Cape and returning in ballast via Suez, it can transport oil at about the same cost as a 43,000-tonner using the Canal both ways.

Though the technical know-how for building very large ships existed long before the need for monster tankers was recognised, the latter pose special problems of design and construction.

In particular, a vessel carrying, say, 100,000 tons of cargo under a single deck needs unprecedented thicknesses of hull plate amidships — a requirement which may have to be met by riveting two or more layers of thinner plate together. Builders of giant tankers, in common with those of other steel structures, have benefited from the improvement in the quality of steel which has resulted from the intensive metallurgical research of the past 20 years. They have benefited even more from the progress of the welder's art and the growing use of prefabrication.

Though the first all-welded ship was built at Birkenhead as long ago as the early 1920s, it was the Second World War, with its urgent need for speed in construction, which really brought the welded ship into its own. The familiar drawbacks of this method of construction — notably greater susceptibility to brittle fracture and to vibration — are being steadily overcome by improved metals and advances in design. And the advantages of faster and lighter construction and of smoother surface are being exploited to the full as automatic welding makes further headway.

Because it saves weight, welding means a lower initial cost. For an 18,000-ton tanker, the difference in hull weight between an all-welded and an all-riveted ship is about 2,000 tons; and though no riveted tanker of 30,000 tons has ever been built, the difference in this class would be about 3,300 tons. In other words, what would have been a tanker of 16,000 tons d.w. 20 years ago is capable to-day of carrying 18,000 tons. Moreover, its smoother hull makes possible either a higher speed for the same power or a 13 per cent. lower fuel consumption for the same speed. The saving in operating costs made possible by the all-welded ship is estimated by some authorities as high as 25 per cent.; but the precise figure will depend in part on the level of freight rates assumed.

TO the economies of welding the shipbuilder has added those of prefabrication — a technique in which the Japanese seem to be as far advanced as any.

Prefabrication enables large sections, each weighing up to 50 tons — even 100 tons in exceptional cases — to be assembled simultaneously and then fitted into the vessel. Besides allowing much of the work to be done under cover, this modern technique permits a more rational use of the labour force and increases the capacity of each slipway. According to some authorities, indeed, prefabrication and automatic welding together have quadrupled the capacity of some shipyards.

This explains why the shipbuilders of the world have been able to respond with such spectacular success to the oil industry's unprecedented demands for new tanker tonnage.

As regards methods of propulsion for to-day's super-tankers, by far the most popular is the steam turbine, which before the war was the preserve of warships and fast passenger liners. A number of tankers now work with steam pressures as high as 850 lb. per square inch, and at temperatures as high 850 deg. to 1,200 deg. F. — which compares with a maximum ten years ago of about 400 p.s.i. and 450 deg. F. This has reduced the overall service fuel consumption in the best installations to about 0.52 - 0.54 lb. per s.h.p., thus increasing the payload, as well as cutting fuel costs. In the author's view, however, the use of still higher steam conditions is unlikely because the added efficiency would not compensate for the increased difficulties of maintenance.

In the medium-sized power ranges (i.e., up to 8,000-10,000 s.h.p.) the diesel has, of course, taken a prominent place, especially the two-stroke supercharged unit operating on fuel oil. Here, too, there have been improvements in the power/weight ratio, as well as in fuel economy. For a slow speed diesel (up to 150 revolutions per minute) of 8,000 s.h.p., a representative weight to-day is 130 lb. per s.h.p., with a fuel consumption of 0.36 lb. of bunker "C" per s.h.p. In the medium-speed range (200-300 r.p.m.) the corresponding figures per s.h.p. are 62 lb. weight and 0.36 lb. consumption of gas oil.

RADICAL changes are more likely in methods of propulsion than in ship design in the near future.

During the past few years great improvements have been made in the marine gas turbine. But Mr. Trypanis's view is that the majority in the shipping world are not yet convinced that this power unit can compete in prime cost, fuel consumption or reliability with the steam turbine or the diesel.

He believes that a more promising line of development would be to combine the straight gas turbine with a free-piston gas generator. In this way, the advantages of high-compression combustion of the fuel (as in the diesel) could be combined with the utilization of the energy through a turbine operating at temperatures comparable with those encountered in the steam turbine.

This would make for lower maintenance costs and a fuel consumption comparable with that of the diesel, without the disadvantages of the diesel' weight, cumbersome unit size, heavy crankshaft and proneness to vibration.

Among other new ideas for marine propulsion, by far the most interesting is the use of nuclear power. Such a unit is not yet a commercial proposition. But the increase in the payload due to the small weight of the fuel (partly offset by several hundred tons of screening equipment) and the ability to operate for a year or more on a single fuel charge are advantages which will one day fully compensate for the much higher capital costs and the operating difficulties of the nuclear power plant. When the nuclear-powered tanker is a commercial reality, it will obviously be best suited to long hauls where the saving in fuel weight will be largest. It will be eminently suitable for powering monster tankers operating on a shuttle service to supply a given refinery with crude from one producing area.

Mr. Trypanis also foresees considerable development in tankers for the transport of propane and butane — if not for natural gas — of which there are some 20-25 units in service, mostly converted for this purpose.

A small Danish vessel of 499 gross tons, commissioned in 1953 for the transport of butane, was probably the first tanker specifically designed for L.P.G. Shell now have a number of L.P.G. vessels in the Caribbean service, and other companies are going in for the construction or charter of such vessels. In recent years intense interest has been aroused in the possibility of transporting liquefied natural gas, vast quantities of which are being flared in the Middle East — about 500 million cubic feet a day in Saudi Arabia alone.

This would be a formidable task, since natural gas can be liquefied only at extremely low temperatures. Thought is, however, being given to the problems involved and ingenious suggestions are being made as to how the energy used in liquefying the gas might be recovered. If the problem of constructing a suitably economical vessel for the long-distance transport of natural gas cannot be solved, there remains the possibility of extracting the 3 or 4 per cent. of butane and propane present and of transporting this. It is perhaps along these lines

that progress may at first be expected.

FINALLY, there is the intriguing possibility of the submarine tanker. Preliminary design work and tank tests for such vessels are in progress in Britain, while the Japanese are reported to be studying proposals for a 30,000-tonner of this type.

Such a vessel would be faster for a given power unit than a surface craft because it would be streamlined and would not have to overcome the wave-making resistance which accounts for the greater part of the power requirement of a surface vessel travelling at speed. For the same reasons, it would be lighter in weight. The author accordingly envisages a nuclear-powered submarine tanker (requiring no oxygen for combustion), remotely controlled from a bridge space by a handful of men. On arrival at the loading or discharging port, the vessel would be handed over to a shore-based staff, while its own small crew would work on a system similar to that adopted for airliner crews.

Even those who do not follow the author as far as this may agree with him about the desirability of some degree of standardization in tanker construction: the indiscriminate building of vessels of all sizes and types can only lead to inefficient utilization of capital. Giant tankers should, in his view, function as far as possible purely as mobile containers; equipment on the shore or floating terminal should take over any tasks that can be transferred to it.

Finally, he thinks that off-shore discharging (similar to the offshore loading practised in the Persian Gulf) could be adopted at some of the future refinery terminals to overcome draught limitations and to reduce capital expenditure.

REVIEWS

ROYAL NAVAL BRIGADE

The Devil's Wind, by Major-General G. L. Verney, D.S.O., M.V.O.; published by Hutchinson (London).

Major-General Verney has done as excellent a job with this enthralling history of the Royal Naval Brigade, landed from H.M.S. *Shannon* to reinforce the Army fighting in India during the days of the Mutiny, as he did with *The Guards Armoured Division* and his *Desert Rats*.

He has not only given us a clear picture of an episode in Naval history which has been almost forgotten, but has made his characters live again through their letters, firstly, but even more vividly by his selection from their correspondence.

Captain Peel, V.C., R.N., the commander of the Naval brigade is an unforgettable figure, all the clearer because his counterpart is still usual in the Navy. We have all known men such as these; to me the memory of Rear-Admiral Philip Mack, D.S.O., whom I knew as D.14 in H.M.S. *Janus* during the bad years before and after Greece, Tobruk, the Malta convoys and Crete, instantly sprang to mind. As Naval history, as an enthralling story and as a worthwhile recording of a glorious enterprise, *The Devil's Wind*, the Indian name for the Mutiny, is worth a place on everyone's shelves and nowhere more so than in ships and naval establishments. An excellent present for any man who has swallowed the anchor but still has salt water trickling through his arteries.— D.V.D.

—From the London "Navy"

THE FISHER LETTERS

Fear God and Dread Nought, Vol. II, the correspondence of Admiral of the Fleet Lord Fisher, edited by A. J. Marder, published by Jonathan Cape (London).

The second volume of "Jacky Fisher's" letters — the first was published in 1952 — covers a period of 10 years from 1904 when he returned to the Admiralty as First Sea Lord after being Commander-in-Chief at Portsmouth. That appointment he had engineered in order to be able to watch over the inaugural period of the new scheme of cadet training at Osborne which he, as Second Sea Lord, had been chiefly instrumental in introducing; and it also gave his leisure to work out the details of the larger schemes of reorganisation — both strategic and material — for the whole Navy on which he was bent. Ahead of most of his contemporaries, he had realised that these changes, or at any rate something like them, were demanded, the one by the recent development of the international situation and the other by the rapid technical and material progress of the day. His technical ideas were embodies in the evolution of the "Dreadnought" type of battleship, of high speed and a single-calibre armament; his strategic reorganisation making the Home Station the Navy's principal fleet instead of the Mediterranean, gave effect to his recognition of the fact that France was no longer the most probable enemy in a future war but Germany.

To achieve the first involved the adoption of the almost untried steam turbine for ship's main engines. The second was achieved without increasing the Navy Estimates — an absolutely necessary condition in the then political situation — by paying off and scrapping the large number of small ships which up to then had been maintained on almost all foreign stations for the purpose, traditional for a century past, of "showing the flag." Fisher condemned tradition — except when it suited his purpose to invoke it! — and maintained that as such ships in time of war could neither fight nor run away, they served no useful purpose at all; but all these measures provoked strong opposition from many of his contemporaries and most of all his seniors. He was never a man to fear opposition — indeed he revelled in it — though he never forgave those who opposed him. In his private opinion, to question any of his views or the wisdom of his plans of action was clear evidence of the cloven hoof, even if the offender had been high in favour not long before. Admiral Sir William May, for instance, whom he described in a letter written in 1907 as the "proper man" for command of the Channel Fleet, three years later had become "a cad, a coward and a sneak." Prince Louis of Battenberg in October, 1911, was "the very ablest admiral, after Sir Arthur Wilson, that we possess;" three months later he was "only a superior sort of *commistroyageur*." It is not too much to say that, when he found that to carry through the reforms and progress on which he was determined was going to arouse strong, even bitter opposition from many of his brother officers whom he either disliked or despised, he welcomed the opportunity of battle. Any sort of compromise was completely foreign to his nature, and though he exercised all his great powers of fascination and persuasion on politicians and journalists whose support he wished to enlist, he preferred to ride roughshod over opposition within the Navy. The unfortunate result of that propensity was that, as had happened more than once in the eighteenth century, but not since, naval officers were split into two bitterly opposed factions, the anti-Fisher party being led by Lord Charles Beresford — another man in whom a capacity for great charm was blended with love of a quarrel.

The story of all these stirring events is told — entirely from Fisher's own point of view, *bien entendu* — in the letters in the present volume; and as Fisher was an inspired letter-writer, very good reading they make. His exuberance and enthusiasm stand out in every line, as do his single-hearted devotion to the interests of his country and — as he saw it — of the Navy. The letters have been selected and edited by Professor Marder, of the University of Hawaii — Fisher always said that only an American could write his biography without prejudice — and has been untiring in elucidating every mention of a name, and every quotation, in the best tradition of conscientious American scholarship. He even finds it necessary — as an English editor probably would not — to explain the source of the quotation "nunc dimittis."— H.G.T.

—From the London "Navy"

NEWS OF THE WORLD'S NAVIES

Britain's shipbuilding programme

Ships accepted into R.N. service in the 12 months ended March 31 included one submarine, eight frigates, 14 coastal and seven inshore minesweepers, and four fast patrol boats.

The submarine was the experimental high test peroxide submarine *Explorer* — the second of her kind now in service. She is reported to have achieved a submerged speed of 25 knots and is believed to be the fastest submarine in the world.

The frigates comprised two "Whitby" class, four "Blackwood" class, one "Salisbury" class, and one "Leopard" class.

Ships (not included in the above) launched in the same period but not yet accepted, included two "Porpoise" class submarines, two "Blackwood" class frigates, and 11 coastal and four inshore minesweepers.

South African Navy praised

The First Lord of the Admiralty, the Earl of Selkirk, represented the Government of the United Kingdom at the ceremony marking the transfer of the naval base at Simonstown to the South African Government.

In a speech at the ceremony, the First Lord said that the South African Navy had grown from modest beginnings to play a distinguished role in the Second World War. To-day it was equipped with modern material of the highest quality and manned by men of great ability and sense of duty.

"We are confident that they will play the essential role which has always fallen to navies, the maintenance of free communications by sea," he said.

"South Africa, like the United Kingdom, is a trading community. That means sending the products of industry and agriculture and raw materials by sea.

"Great and important as has been the development of air transport, so far as I can see there is no sign that bulky freight will be carried by air. Thus sea communications must be maintained, and this role, in seas surrounding the south of their continent, will be fulfilled by the South African Navy.

"In this task they will not be alone, for it is agreed that the Royal Navy will be able to continue to use Simonstown and the Royal Naval Commander-in-Chief will continue to live in South Africa, although his headquarters will in future be situated at Wingfield, near Cape Town; and, in any war in which both countries are engaged, he will exercise command over such naval forces as may be assigned to him by the two Governments.

"We believe the agreement we have reached in these matters is thoroughly sound, will operate to our mutual advantage and promote closer understanding — if that is possible — between the South African Navy and the Royal Navy."

"Aurochs" replaces "Tactician" in Australia

The Royal Navy submarine *Aurochs* replaces the submarine H.M.S. *Tactician* as one of three units of the Fourth Submarine Squadron based at Balmoral (N.S.W.).

She is a modernised, snorkel-fitted submarine and has been serving with the Royal Navy on the Far East Station since March, 1956.

The *Tactician* left Sydney for the United Kingdom in January last year.

Helicopter's long-range mercy mission

An S55 Whirlwind helicopter, normally attached to H.M.S. *Bulwark*, was flown from Lee-on-Solent on April 12 to rescue an injured seaman from a Swedish merchant ship in the Bay of Biscay.

It was probably the longest range mercy mission yet undertaken by a helicopter.

To reach the merchant ship the helicopter flew to Culdrose Naval Air Station in Cornwall, then on to Brest, refuelling at both places, and from the French port to the ship.

The injured man, who had a fractured skull, was first seen by a naval doctor who was lowered on to the deck of the ship from the helicopter as it hovered, and was then lifted onto the machine by winch.

The helicopter returned to Brest where the patient was sent to a local hospital. After refuelling, the helicopter then returned to England.

Royal Navy Midshipmen leave the Fleet

A tradition of nearly 300 years ended at the end of April when midshipmen on the General List of the Royal Navy ceased to serve in the Fleet at sea.

Under the terms of the "New Officer Structure" plan announced in January, 1956, the early training of General List officers is reorganised in such a way as to ensure that when they first go to sea with the Fleet they possess not only a thorough grounding of general Naval knowledge, but also a large measure of professional knowledge, so that they can obtain the fullest advantage from their practical experience at sea and are capable of acting at once as efficient and intelligent understudies to ships' officers.

Young officers will not now join the Fleet from Dartmouth until the age of 20 or 21, when they will be promoted to the rank of Acting Sub-Lieutenant.

Navy boards tanker after mutiny report

The British frigate *Lock Alvie* boarded the tanker *Gervase Sleigh* in the Persian Gulf on June 13 after the tanker's master had radioed that his all-Chinese crew was about to mutiny.

The frigate provided a crew for the tanker and escorted her to Mena al Ahmedi, in Kuwait.

An armed party from the frigate arrested six members of the tanker crew and handed them over to police at Fao, a port in southern Iraq.

The other members of the crew also were put ashore at Fao after they had refused duty.

The *Gervaise Sleigh* is owned by the Singapore Navigation Company, of Singapore, a subsidiary of the Australian company H. C. Sleigh Ltd.

Steel shortage in Scottish yards

Ship construction in Scotland in 1957 will be controlled substantially by the flow of steel and indications already suggest that available volumes will not meet demand.

Sir James McNeill, president, Shipbuilding Conference, estimates total ship orders at six million tons of steel in 1957, half of it for tankers.

Attache at Washington

CAPTAIN W. B. M. Marks, C.B.E., D.S.C., R.A.N., who has been doing the Senior Officers' Technical Course in the United Kingdom, has been appointed Naval Representative and Naval Attache at the Australian Embassy in Washington.

He succeeds Captain T. K. Morrison, O.B.E., D.S.C., R.A.N., who has held the post in Washington since August, 1955.

Before leaving Australia for the United Kingdom towards the end of last years, Captain Marks was Director of Naval Ordnance and Underwater Weapons at Navy Office, Melbourne.

He had a distinguished record in the Second World War and in operations in Korean waters.

The last appointment Captain Morrison held before being sent to Washington was that of commanding officer of the fast anti-submarine frigate *Quadrant* and captain of the First Frigate Squadron.

CAPTAIN BLIGH'S CHRONOMETER

THE chronometer which belonged to Captain Bligh of the *Bounty* is now in perfect working order — thanks not only to the craftsmanship of the original makers, but to modern watch and clock experts.

British horologists have just overhauled the chronometer, which was made at a cost of £200 sterling by Larcom Kendall of London in 1771, at the request of the Board of Longitude.

ROYAL VISIT

THE opening of the University College of Rhodesia and Nyasaland on July 5 will be the Queen Mother's principal engagement during her tour of Central Africa from July 2 to 17.

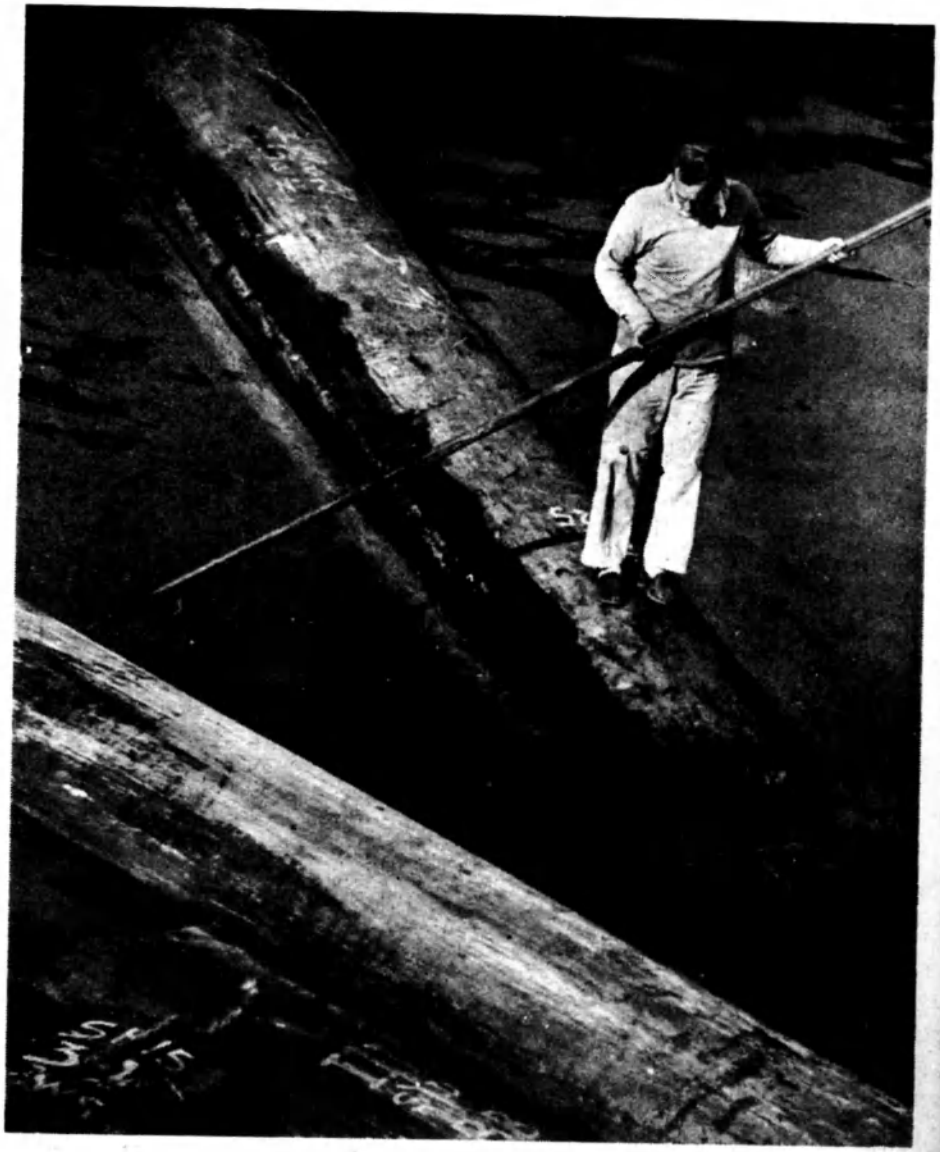
She will visit all three countries of the Federation — Northern Rhodesia, Southern Rhodesia, and Nyasaland.

Notable among the fixtures arranged for the Queen is the drive to Matopos, where Cecil Rhodes is buried.

COME IN, THE WATER'S FINE!

Two scenes on Sydney Harbour last month: A group of trainee frogmen from H.M.A.S. "Rushcutter" leap into the chilly water to carry out an underwater demolition exercise; and (right) a watersider floats logs into position after they were unloaded from the freighter "Eastern", which brought 924 of them from Borneo.

WHAT AND GET MY FEET WET?



The Navy in the Push-Button Era

By DONALD BARRY

THE future shape of the Navy has never appeared to hang so tenuously in the balance as during the past few months.

The Egyptian episode, the withdrawal of salvage forces from Port Said, the resignation of Sir Anthony Eden, the formation of the new administration under Mr. Macmillan, decisions to close establishments, the abandonment of the Reserve Air organisation, the drastic reduction of the size of the Royal Fleet Reserve, the announcement of a cut of 6,500 in naval manpower to be implemented during the financial year ending April next; all in some way helped to cloud the future. Where was it leading?

Overshadowing everything was the change in the defence policy resulting in the visit of the Minister of Defence to the United States and the Prime Minister to Bermuda. It was clear that agreements reached between the Prime Minister and President Eisenhower on nuclear weapons would have far-reaching effects, but there was then a long delay before the Government issued its annual White Paper on defence explaining the new policy.

When the White Paper was issued it was found to be one of the most revolutionary documents of our time. It dwarfed all other considerations and, in effect, ushered in the age of push-button weapons. Here was the answer to many questions. With stark realism it cleared the decks for the nuclear-missile age and called for major readjustments in all three Services.

There was no means of providing adequate protection for the civilian population against the consequences of attack with nuclear weapons, the White Paper bluntly admitted. This being so, the overriding consideration in all military planning must be to prevent war rather than to prepare for it. With singleness of purpose, the White Paper added: "The only existing safeguard against major aggression is the power to threaten retaliation with nuclear weapons."

This clearly means that "the deterrent," as the power to wage war with nuclear weapons has become known, is now first priority and conventional forces and weapons are of secondary consideration. It will result in drastic reductions in the conventional field but it will, in the long run, increase hitting power and give more specific aims. It will also sweep away prejudices which have confused defence issues since the war.

HOW does the Navy fit into this revolutionary conception? able, but in the Defence Paper it As I write, the Navy Estimates and White Paper, normally published in February, are not avail- is possible to discern the future in broad outline. Some may doubt the wisdom of the new policy, but its acceptance crystallises the naval task. This will be twofold: first, to help to prevent war by making an adequate contribution to meet hostilities on a global scale—a contribution which must be based on ability to wage war successfully with all available weapons; secondly, to be ready, as it has always been, to bring power rapidly to bear in peacetime emergencies or limited hostilities.

All other functions must be subordinate to these two cardinal purposes and the Government visualises that a smaller Navy will be adequate to discharge these responsibilities. The Navy must, however, be more mobile, and to attain additional mobility it is proposed in future to base the main elements of the Fleet on a small number of aircraft carrier groups, each composed of one aircraft carrier and a number of supporting ships. This inevitably means that the time-honoured system of Fleets operating from fixed bases will be replaced by flexible roving forces able to replenish and maintain themselves for lengthy periods without returning to port.

The Government is, however, uncertain as to the role of the Navy in total war. "It may well be," says the Defence Paper, "that the initial nuclear bombardment and counter-bombardment by aircraft or rockets would be so crippling as to bring the war to an end within a few weeks or even days, in which case naval operations would not play any significant part. On the other hand, there is a possibility that the nuclear battle might not prove immediately decisive; and in that event it would be of great importance to defend Atlantic communications against submarine attack. It is, therefore, necessary for NATO to maintain substantial naval forces and maritime air units. Britain must make her contribution, though (for financial and economic reasons) it will have to be on a somewhat reduced scale."

The White Paper is a bold and logical approach to the threatening challenge of the age. There is much yet to be explained and elaborated. There are omissions. One disturbing omission is that there is no mention of the ability of the Navy to strike with nuclear weapons; it perpetuates the short-sighted tendency to think only in terms of air and land forces in relation to nuclear weapons. If the Navy is to be recast then it has an important part to play as a deterrent. Nuclear weapons can be delivered by naval aircraft or fired with as much effect from the sea as they can from land. In nuclear war, ship launching platforms could be effectively positioned for surprise attack and by reason of their mobility would be less vulnerable to retaliatory attack than static airfields or land missile stations.

THIS theory was expounded by Mr. Humphrey Atkins, M.P. for Merton and Morden, in the debate on the Navy's Vote on Account in March. He said:

"One big disadvantage for this country is that, while we may have deterrents, we must also provide places from which to launch them. This is a small island, and such sites might readily be located and chartered. We might find them demolished by an enemy at the first onslaught, and then, at one stroke, we should be deprived of our power to retaliate. It seems to me that the Navy provides a possible solution to this problem. I do not say that it can be done immediately but in the future the Navy could provide mobile platforms from which nuclear weapons of one sort or another could be launched. Such mobile platforms could disappear from the ken of a potential enemy. They might be discovered eventually, but at least it would be possible to move them about, and that is something which could not be done with land sites. Whether such mobile platforms should take the form of an aircraft carrier, from which aircraft carrying powerful weapons could take off and return, or whether they should assume some other form from which ballistic weapons could be fired, I do not know, but I think that is a role which the Navy could perform."

Whatever the future holds in store, powers which control the sea will control more than two-thirds of the earth's surface. New weapons cannot alter geography. It is certain the Navy will have vital tasks to perform, but what of the present? How will the new policy immediately affect the Navy?

IN all considerations it is necessary to remember that changes will be gradual and that the present proposals are designed to cover a period of five years. Further, it is clear from the tone of the White Paper that doubts about the future of the aircraft carrier, around which all naval planning revolves, have finally been swept away. At last the aircraft carrier is accepted unquestionably as the premier naval unit. The Government admits that its role is becoming uncreasingly significant and the general public has accepted it as the modern capital ship. It has finally driven the battleship into complete retirement

Indeed, the battleship faces extinction. The Government intends that a considerable number of ships now in reserve shall be disposed of or scrapped. This is a death sentence for the four "King George V" class battleships and casts a shadow over the *Vanguard*, which in 11 years since her completion has never fired a gun in anger. Her destiny will not, however, be decided by Britain alone, as she has been allocated by name to NATO, and other nations would be consulted before she was relieved of her responsibilities in this respect.

Sea power to-day, the Defence White Paper emphasises, is centred round the aircraft carrier, and when such modern aircraft as the Vickers - Supermarine interceptor N113 and the De Havilland all-weather fighter D.H.110 (recently named the Scimitar and the Sea Vixen respectively) and the Blackburn N.A.39 strike aircraft come into service, the British carrier will be a much more formidable weapon than it is even to-day.

WHEN ballistic missiles replace bombing and torpedo-carrying aircraft, another type of ship may supersede the carrier, but it is generally considered that there will be another generation of aircraft carriers as we know them today and that there may always be a requirement for specialised types of naval aircraft.

There is still one ship of the present generation to be completed —H.M.S. *Hermes*. She is being built at the yard of Vickers-Armstrongs Ltd., Barrow-in-Furness, but it is not known when she will join the similar types of carriers in service, the *Centaur*, *Albion* and *Bulwark*. These ships, together with the larger *Eagle* and *Ark Royal*, are the backbone of our carrier forces. They are modern ships, all completed since the war, and equipped, or ultimately to be equipped, with many post-war devices making them very much finer ships than their wartime counterparts.

There is only one fleet carrier of World War fame now afloat—H.M.S. *Victorious*. She is at Portmouth being modernised. The duration of this modernisation may be some indication of the amount of work necessary to bring such a ship up to modern standards. She has been in dockyard hands several years and her completion date is still unknown. When she puts to sea again, however, she will be the equal of the *Eagle* and *Ark Royal* and will be an important addition to front-line carrier strength.

Since the war, the steam catapult, the angled deck, the deck-landing mirror sight, audio and the automatic device by which aircraft are rapidly centred for catapulting have made British carriers much more efficient ships than they were a decade ago. Britain has contributed more than any nation to the development of the aircraft carrier. As the Canadian Minister of National Defence said at the acceptance ceremony of H.M.C.S. *Bonaventure* in January: "The Royal Navy was the first in the world to take to the air. The world's first aircraft carrier was a British ship. The first naval aviators were officers of the Royal Navy, and it was from a British flight deck that a jet propelled aircraft was first flown.

"Three most important advances —the angled deck, the steam catapult and the mirror landing aid—are all British developments, and they constitute continuing evidence that the progressive spirit of the United Kingdom remains as ingeniously active and intelligently determined as ever."

IN carrier groups, as visualised in the Defence White Paper, our aircraft carriers would operate with powerfully armed support units—a protective arm which will eventually include guided weapons ships. Four Fleet escorts will be the first new construction ships to be equipped with guided weapons, but there is, as yet, no news of the laying of their keels. These ships may be expected to be equipped with the missile recently named "Sea-Slug," a ship-to-air weapon. It will be much longer before the guided weapons ship which can fire both ship-to-air and ship-to-ship missiles is built.

The Fleet escorts will have conventional guns as well as anti-aircraft missile launching equipment and their design is being based on the very successful "Daring" class ships. They will be bigger than the "Darings" and probably of the size of conventional light cruisers. The results of trials being carried out by H.M.S. *Girdle Ness*, the Navy's guided weapons trials ship—which has now fired many test missiles—will provide valuable information for the designers of these ships.

The guided weapons ship which will fire missiles at air and surface targets will undoubtedly be a much larger ship, probably of about 20,000 tons displacement. When she emerges she will have much more than a protective role. She will be a most powerful striking unit and may ultimately challenge the supremacy of the aircraft carrier when pilotless weapons are developed to the extent that they can replace piloted aircraft.

At present, however, the submarine is probably second only to the aircraft carrier in offensive power. Its importance is increasing rapidly and may continue to do so. It has been a deadly weapon in two world wars. With the development of submarines using high test peroxide and nuclear propulsion systems, the need to surface at regular intervals to recharge batteries will cease, and at the same time much greater submerged speeds will be possible because the vessels will be able to use their main propulsion machinery when submerged without polluting the air in the submarines.

Speeds attainable with the new systems will enable submerged submarines to keep up with all but the fastest surface ships. It is true that as means of offence increase so do means of defence, but it seems likely that the attacking power of submarines may be developed more rapidly than countermeasures.

THE U.S. Navy has already entered the era of nuclear-propelled submarines, while recent announcements indicate that Britain is now striding towards the day when her first nuclear submarine will be laid down. In preparation she has ear-marked the famous name *Dreadnought* for the first British nuclear-propelled submarine and has appointed a Rear Admiral Nuclear Propulsion.

An announcement by Vickers indicates how far the development of the nuclear submarine is advanced. For more than a year, it seems, Vickers Nuclear Engineering Ltd., a new company formed in February 1956, has been engaged on "an Admiralty project to design and develop a set of nuclear machinery suitable for installation in a submarine." Good progress has been made on a unit based on a pressurised water reactor, similar to that used in the U.S.S. *Nautilus*.

"The prototype machinery (says Vickers) will be installed in a land-based hull structure. There the machinery will be proved, and a series of tests and trials carried out. It will also be used for training personnel."

Vickers Nuclear Engineering Ltd. has permanent representatives at the Atomic Energy Research Establishment, Harwell, where a

FOOD FROM SCOTT'S 1912 EXPEDITION

The New Zealand polar expeditionary ship "Endeavour" arrived in Sydney last month carrying food located early this year in the camps established by Captain Robert Scott in the Murdo Sound area during his ill-fated expedition to the South Pole in 1912. It is being sent to Britain for scientific study. Pictured with samples of Scott's supplies are, from left, Petty Officer Wally Douglas, Leading Seaman Len Budden and "Endeavour's" master, Captain H. Kirkwood, who has made 10 trips to the Antarctic.

team of naval officers, led by a Captain, is based. The Admiralty is also interested in the application of nuclear reactors to ships other than submarines but this, according to an official statement, "is by no means round the corner," and the immediate concern of the team at Harwell is the production of a reactor for a submarine.

Meanwhile, the Admiralty is pushing ahead with the alternative method by which the submarine can be developed, the method commonly known as the H.T.P. system. H.T.P. systems are installed in the two experimental submarines *Explorer* and *Excalibur*, and the *Explorer* has achieved a speed of more than 25 knots submerged.

UNTIL the appearance of the guided weapons ship with ship-to-air and ship-to-ship missile launching equipment, the controversial gun cruiser will continue to be an important element of the fleet. But one of the most startling implications of the Defence White Paper is that our cruiser strength which, in recent years, has appeared to be disturbingly slender, is to be reduced further. The policy has been to hold on to most of the World War II ships until the next generation of cruisers—the guided missile cruisers — emerges. But the gap between the two types of ship is a yawning one, and to bridge it it was decided to complete the three "Tiger" class cruisers, *Tiger*, *Defence* and *Blake*, with the most modern gun armament. It now seems likely that these three ships may at some time have to fill the gap alone and will be the only ships in the fleet resembling cruisers as we know them to-day.

The fleet's defence against the underwater menace is mainly in its frigate and minesweeper forces. These are unlikely to be fundamentally affected by the new defence policy, although there may be some reductions as part of the general trend. Most new construction since the war has been in the frigate and minesweeper categories.

The past year has seen the frigate programme gain momentum, with several vessels coming forward. This programme is of vital importance. As the Vice-Chief of Naval Staff has said: "It is a sombre thought, but we are faced to-day with the formidable threat of over 475 Russian submarines—greater than the peak threat at the height of the German submarine campaign in the last war."

TO offset this threat of Russian submarine warfare Great Britain and other nations within NATO must have powerful anti-submarine forces. This is acknowledged by the Defence White Paper, which also says it is impossible for any country to protect itself in isolation under modern conditions. The new frigates are a most important contribution to collective defence, particularly as reports indicate that their design is of high order.

The initial post-war minesweeping programme, now nearly complete, is similarly of high importance, for history records that the Russians have used the mine skilfully and ingeniously in war. There is no doubt that they could use this weapon to saturate inshore and coastal waters, unless adequate measures are taken to meet the threat. It is with such a possibility in mind that a large fleet of coastal and inshore minesweepers has been built at a cost of about £75 million. This fleet includes some 250 ships, only 60 ocean-going types being of World War II origin.

THE foregoing are the highlights of the naval situation.

We live in confusing times. On the one hand, the Navy is asked to equip itself for nuclear war; on the other it is ordered to economise in men and material. These two apparently conflicting requirements must be reconciled. A major programme of new construction has long been advocated, but in the period of transition ahead—more revolutionary than the transition from the days of sail to the days of steam—it is unlikely that there will be any major building programme in the historically accepted sense.

There will be continued research and development. There will be progress towards nuclear propulsion and missile ships, there will be experimental types; but it will be many years before marine engineers solve all the technical problems involved in producting ships for the nuclear-missile Navy which can confidently be treated as more than prototypes.

The outlook is beset with imponderables, but it would be most unwise of any government to forget that major wars have been won by powers who have controlled the sea, or to let the words of Admiral Arleigh Burke, United States Chief of Naval Operations, pass unheeded:

"There can be no Free World association unless its navies are kept up to date. . . .

"The oceans provide new opportunities for the solution of some of the most pressing problems of our time. They are the key to many of our future security problems, at a price we can afford to pay. . . .

"For over four centuries the leaders of England have brought independence, prosperity and security to their country through their incomparable understanding of the oceans. To-day, when the ocean spaces clearly hold the key to the future, the Free World continues to look to England's deep, historical knowledge of the sea for inspiration and guidance."

—From the London "Navy."

MARITIME NEWS OF THE WORLD

From our Correspondents in LONDON and NEW YORK By AIR MAIL

France lifts boycott of Suez Canal

The new French Government last month lifted the ban on the Suez Canal and announced that French ships may use it again.

The decision followed talks between French and Egyptian banks in Switzerland when it was decided to allow Canal fees to be paid in transferable Sterling.

The Mollet Government had maintained France's boycott of the Canal although other user countries, including Britain, had decided to allow their ships to use the Canal.

The Mollet Government fell early in June.

Three tankers ordered by Israel line

The Israel Navigation Co. Ltd. has placed an order with shipyards in Germany for the construction of three 19,5000-d.w.-ton tankers.

The first of these tankers will be delivered in 1959.

Further negotiations cover tankers of 32,000-d.w.-tons.

The company at present owns four tankers with a total tonnage of 52,000 tons.

Mayflawsr II reaches port in 54 days

The *Mayflower II* reached Plymouth, Massachusetts (U.S.A.), on June 13, 54 days after leaving Plymouth, England.

She is a replica of the original Pilgrim ship which made the crossing in 1620.

A coastguard tug towed the *Mayflower II* from the entrance to Plymouth harbour, followed by a procession of yachts and other craft.

Church-bells pealed and crowds thronged the harbour shore.

The master of the *Mayflower II*, Australian Captain Alan Villiers, told reporters that the ship was "good, strong and sturdy."

It had "many imperfections which designers had now got rid of."

After a 12-day stay in Plymouth, the *Mayflower II* goes to New York for exhibition during the summer.

She then will be returned to Plymouth to become part of a permanent memorial to the Pilgrims.

The ship was built by public subscription in the U.K. as a gesture of friendship to the U.S.

Matson liners will call at Tahiti

Matson liners *Mariposa* and *Monterey* will make Tahiti a regular call on the run from the United States to Australia.

Under a new schedule, which will begin early in July, Australians sailing to San Francisco will stay in Honolulu for two days and a night instead of the one-day stay at present.

Mr. Harry A. Johnson, Matson Lines General Manager for the South Pacific area, announced the new sailing schedule in Sydney recently.

This began with the sailing of *Mariposa* from San Francisco on June 29.

With three weeks between sailings, *Mariposa* and *Monterey* will maintain the following 42-day round-trip itinerary: San Francisco, Los Angeles, Papeete, Auckland, Sydney; back to Auckland and then Suva (Fiji), Pago Pago (Samoa), Honolulu, San Francisco.

"The wishes of American and Australian travellers to visit Tahiti and to spend more time in Hawaii and other South Pacific ports led to the changes in the route," a company spokesman said.

Jap. pearlers will be closely scrutinised

The operations of Japanese pearling vessels fishing on Australian pearling grounds will be "closely supervised," the Australian Minister for Shipping and Transport, Senator Shane Paltridge, said in the Senate recently. Inspections would be carried out by vessel and by aircraft to ensure that pearling was confined to areas approved by Australia.

AUSTRALIA AND AMERICA

During his recent visit to Australia as official U.S. armed forces representative for the Coral Sea celebrations, Admiral Felix B. Stump, U.S. Commander-in-Chief, Pacific, gave a talk in the A.B.C.'s "Guest of Honour" session. The following are extracts of Admiral Stump's talk, in which he emphasises the value of Australian-American co-operation and warns that the Free World must not "be afraid to risk war to avoid war."

IT'S natural for Americans and Australians to be friends. It has been that way ever since the First World War, when it was about the first time that Americans and Australians came into intimate contact with each other.

Distances were much greater in those days. Then it took a month to get from the west coast of the United States to the east coast of Australia. Now we fly that in a matter of a day and a half.

We have radio and television that bring communication close between Australia and the United States.

You know, we come from the same stock, we have the same laws, we have the same system of jurisprudence, and we are descended from the same kind of hardy pioneers, who left the nations of Europe to come into a wild country and make a new nation.

I've always enjoyed the confidence of association with the armed forces of Australia. They have always been skilled in their professions — dependable, brave and reliable. I've served with the Air Force, with the Army and with the Navy. I know many of your leading officers, both from associating with them in the last war, and through my associations with them now in the various treaties that we are together in enforcing.

The Free World needs Australia.

We are in greater danger to-day than we have been in any time in our history. We've often had to fight for liberty. We started our fight for liberty eight hundred years ago, or about that, at the time of King John, when the Magna Carta was drawn up and signed.

We've had many civil wars in Great Britain to fight for liberty —the liberty of the individual. Our Revolution was a fight for liberty. At the start of the Revolution, the American people regarded themselves as British — they fought for the same rights that their fellow Englishmen had in Great Britain.

At this time we are confronted with a world Communism that has the same objective that Lenin had when he assembled a little band of some eighteen people in Moscow in 1904. They are determined to spread Communism over every nation in the world. They aret very serious and able enemies.

At present we are ahead of them. We have to keep that way.

I remember a conversation I had with Dr. Rhee, the President of Korea. He said that he visited our Secretary of State, Mr. Cordell Hull in the early 1930's, and Mr. Hull said: "Dr. Rhee, you know the United States Government can never get very far ahead of the American people, and on the other hand, the United States Government can never lag very far behind the American people."

"Must stay stronger than Communists"

THAT'S true in England, Australia, Canada and all the nations of the English-speaking world. In other words, what I'm trying to lead up to is that we, the average citizen of Australia, or average citizen of the United States, has a greater responsibility than the people of any other nations in the world.

The Russian or the Chinese Communist has nothing to say about their government. They don't have to know what's going on, and they *don't* know what's going on.

But our people in Australia and the United States, and the other countries of the Free World, have to know more about, and take more interest in world affairs and in their own government, than ever before.

To-day we are stronger than the Communists. It is absolutely necessary that we remain so. We must not be afraid to risk war in order to avoid war, because, if we were afraid to risk war, all the Communists would have to do would be to start little local affairs, and if we did nothing about it for fear of risking a general war, then they would win piece-meal.

If we are not afraid to risk war, we can stop them from now on, and we should stop them anywhere in the world that they start Communist aggression.

If the Russians want a Great War—a World War—they will start it, they will find a pretext. If they don't want it, they won't be able to be persuaded by anything that we do into starting it. They won't commit suicide.

You know, in the United States after Pearl Harbour, no American government would have prevented the United States from going to war. But it isn't that way in a totalitarian power.

You will remember that, back in the thirties, there was quite a full-sized war but local war, fought between Japan and Russia. No one ever saw anything about it in the Tokyo papers, nobody ever saw anything about it in the Moscow papers. So a totalitarian power can keep its people in absolute ignorance of what's going on. That's impossible in a democracy.

At present the armed forces of the Free World have a greater responsibility to their people than they have ever had before. We hear a lot about "stream-lining of forces." I don't know just what "stream-lining" means. Some people seem to think that you don't need as much, you don't need as many soldiers, sailors and airmen.

Well, that's true to a degree. As we get powerful weapons and ones that don't require mass formations of troops, or mass formations of aircraft or ships, we'll not need as many men; but we'll need more skilled men, and we will need even greater expenditure of funds for national events, because these new weapons of war cost a tremendous amount of money.

I don't like to pay taxes and I know no one in Australia likes to pay taxes to the great extent that we have to pay them. I don't like, for instance, to be taxed for foreign aid, but at present in the United States it's absolutely vital that we are taxed for foreign aid.

WE are spending about a billion dollars a year in Eastern Asia, and for that billion dollars a year we are getting approximately 1,700,000 Asian soldiers who are in the line to resist Communism, from Korea to Thailand.

So that expenditure of money is actually getting something a good deal cheaper than we could get it if we didn't do that. And if we hadn't had foreign aid to South-East Asia, in Korea, those countries could not have resisted Communism up to this time, and the whole area would have been Communist.

Australia is doing a good deal along that line through her membership in SEATO. She is a vital and important member of SEATO.

We are associated too, as you know, with Australia in our ANZUS Treaty. In our ANZUS Treaty between Australia, New Zealand and the United States, we have many mutual items of interest that do not apply to other areas of the world.

In all, we in the United States and those of you here in Australia have the same problems, we have the same ideals, we have the same ideas, and regardless of whether we want to or not, we are allies, and will be allies in any future war.

Fortunately, we like each other, we get on well together, and one thing about this Australian-American association that I want to mention is that they have as their objective the closer friendship and co-operation between, not Australia alone, but between the nations of the British Commonwealth and the United States, and that is a wonderful objective.

Through our friendship with Australia, we've become closer to the other nations of the British Commonwealth.

FUTURE OF THE AIR ARM

By OLIVER STEWART, M.C., A.F.C.— In London

GREAT possibilities and great risks attend a moment like the present when the whole of Britain's defence system is under review. It should be noted at the outset that the reason for this review is neither strategical nor tactical, but economic. It was brought about by circumstances which have nothing to do with the work of any of the three Services. It follows that every proposed move demands the closest scrutiny in order to make sure that essential arms are not being starved of equipment or given the wrong equipment merely because it is thought that money may be saved by that means.

Vigilance is needed in all matters relating to the Fleet Air Arm for these reasons. It has often in the past become the victim of changing policies and of political rivalries. It should not be allowed to do so again. Here the main objective will be to glance at some of the existing equipment and to suggest the kind of development that should be encouraged for the future.

It is a generally agreed fact that the submarine, instead of fading from the military picture, has become more prominent in it. Russia, it is said, can deploy between 400 and 500 submarines at the present time (some say the total is 600). And they are supposed to be able to launch various forms of guided missile. Exactly what war doctrine lies behind this large fleet of submarines is obscure. In most countries outside Soviet Russia, the submarine has been held to be a vehicle of diminishing importance. Whatever the reason for the Russian view, it imposes upon Britain the need to develop at the highest possible speed the appropriate means of countering submarines.

At the moment the Fleet Air Arm uses the Fairey Gannet as its anti-submarine aircraft. It is in this machine that training takes place at Eglinton, not far from Londonderry. It is the most interesting of all the fixed wing aircraft yet developed for its special purpose. Its Armstrong Siddeley Double Mamba power unit and its independent but co-axial airscrews have their own specialised merit. But there have been many indications in recent years that thought turns increasingly towards the helicopter for anti-submarine duties.

Helicopter development

If, therefore, Fleet Air Arm equipment is to be maintained in the state of readiness that is required, there must be a considerable concentration upon the development of different kinds of helicopter. At the present time the Westland company provides the Royal Navy with many of its helicopters. Most of them are as well known among moving wing machines as the Gannet is among fixed wing machines. They include the Dragonfly and the Whirlwind. And now the Westland Wessex is visualised as the Whirlwind's successor. This will have the Napier Gazelle gas turbine power unit and should represent a considerable forward step in this kind of aircraft. The measures that are being taken, however, to prepare a large helicopter expressly for anti-submarine work are at the moment confused, although much has been said of some of the speculative studies.

On the strike fighter side there is the first turboprop aircraft to go into service, the Westland Wyvern with the Armstrong Siddeley Python engine. Some indication has been given of the successor that is being planned for the Wyvern. This is the NA 39, an aircraft which is being prepared by the Blackburn company. It is still in the category of aircraft about which information is sharply restricted; but there have been a few statements about it and from these it appears that it is a twin-engined aircraft capable of high, supersonic speeds.

Atom bomb carrier

The other important twin-engined aircraft which has been selected and is now in production is the Supermarine N113, now known as the "Scimitar." This has two Rolls-Royce Avon engines and is armed with four 30 millimetre Aden cannon. It is capable of carrying the atomic bomb. The Scimitar is packed with interesting ideas, the most important being the "blown flaps." These should be particularly helpful for deck operation for they enable the approach to be made safely at a lower forward speed and they are also said to diminish the risk of a wing dropping.

The principle of blown flaps is now well known. Air is bled from the compressors of the jet engines and is ducted and led out so that it blows over the wing flaps. The stream of air thus released maintains the flow in a stable and smooth condition and delays the turbulence which goes with the stall. Blown flaps have been the subject of a great deal of experimental work both in this country and in the United States. The Americans put into production a trainer with some such system well over a year ago. The Scimitar, as the pioneer of an aircraft with blown flaps in the higher performance fighter class, will be watched attentively when it comes into service.

Meanwhile the Sea Vixen, which is the name given to the de Havilland 110, has been continuing to earn good opinions. In its latest form, with the pointed and hinged nose piece, the de Havilland is probably the most highly developed deck operating all-weather fighter yet ordered by the Royal Navy. The control system alone is worthy of weeks of study, for it embodies a host of original ideas, all of them making for improved conditions when the aircraft is being operated from carriers.

End of the manned fighter?

The Defence White Paper has said that the manned fighter is no longer of any value and that it will be scrapped. Not too much notice need be taken of such statements, for it is obvious enough that before the manned fighter can be superseded the missile must achieve greater trustworthiness and greater effectiveness than it does now. The Royal Navy will turn—is turning—to missiles just as is the Royal Air Force. But the transfer must be spread over a period during which the effectiveness of the missile must gradually be brought to the point where it equals and then excels that of the manned aircraft.

Those who know the facts about the firing trials of missiles, both of the winged variety and of the ballistic variety, are aware that there is a long way to go before such devices can be regarded seriously as capable of taking over all the work of the manned vehicles. The White Paper's statement must, therefore, be related to a practical time scale.

In the work on missiles there must be continuous awareness of the particular requirements of the war at sea. The United States have converted a warship into a missile carrier and it may be that some of the characteristics which are needed in an aircraft carrier would be out of place in a missile carrier. Similarly the missiles themselves must be conditioned and designed for the particular manner in which they would be carried and launched.

The carrier, however, shows no signs of rapid obsolescence. In fact there have been statements recently arguing that its value has increased. Consequently the work done to develop the methods of handling manned aircraft will continue to bear fruit. Commander Mitchell's steam catapult has enabled rapid progress to be made in the speed with which aircraft can be handled while the mirror landing aid is now accepted as possessing a greater potential for development in deck landing methods than was originally supposed. Where two steam catapults are in use, landing rates of three a minute are attainable.

None can doubt that the Fleet Air Arm — like the Royal Air Force—is approaching the parting of the ways, when a much greater responsibility will be placed upon the guided weapon. During the next few months it is likely that we shall become better informed about exactly what is proposed during the transfer. One thing is certain; it is that it would be in the highest degree foolish to throw away the benefits of the work that has been done for and with manned aircraft and to go off in an irresponsible chase after guided missiles.

There is a great popular attraction about the thought of handing the defences over to un-manned vehicles. It is the idea of the "press button war" which atracs so many writers of fiction. That is not the only thing. There is also a belief that, when you reduce the numbers of air crew, you also reduce the total cost. Undoubtedly the negotiations between Britain and the United States about the supplies of guided weapons, were begun, on our side at least, under the profound misconception that it would be cheaper if the defences of Great Britain were to be handed over to un-manned vehicles.

There could be no greater misconception. It has already been said that there is a potentially hostile fleet of between 400 and 500 submarines. If the defences are measured, as they should be, by the threat, there would be no means of ensuring an improvement in the defences by swinging to guided missiles than is at present spent on manned aircraft.

Missiles costly

The guided missile is enormously expensive. To convey a given charge to a given position with any certainty, it costs much more than a manned vehicle. The Germans are said to have spent over £100,000,000 on the development of the V2 and complexity has been rapidly increasing since those days. The associated equipment is vast in its extent and fantastic in its complexity. Let no one —whether he be a politician or anything else—imagine that missile defence systems will be cheaper or even as cheap as defences by the present methods. If missile defences are to be more effective than manned defences, they will certainly be not a little more expensive, but *much more expensive.*

At this stage the development of the Fleet Air Arm reaches a point of special interest and importance, but, as was said at the outset, all proposals for changing it and modifying it should be looked upon with critical vigilance.

—From the London "Navy."

THE UNITED STATES VIEW

NAVIES "FAR FROM FINISHED"

The development of a new weapon almost invariably has been accompanied by a claim that navies were finished, the U.S. Chief of Naval Operations, Admiral Arleigh Burke, said in London recently.
"But instead of spelling the doom of navies, powerful new weapons invariably add to our strength at sea," he said.

ADMIRAL Burke was addressing the English Speaking Union. He said:

"In the 19th century it was the rifled gun that was to do us in. Then it was the torpedo, the submarine, the airplane and the atomic bomb. Now the nuclear-powered submarine is the weapon that finally is to sink all ships at sea.

"Let us not underestimate the threat of the nuclear-powered, missile-firing submarine. However, new weapons will also be put to work to assist the Free World navies in controlling and using the seas.

"The need to use the oceans is greater to-day than ever before. The tonnage of material moved by sea continues to increase year after year. Over 99¼ per cent. of the total world volume of trade moves by sea. Less than one-half of one per cent. moves by air.

"Survival under attack depends on the ability of the free world to come quickly to the support of beleaguered nations by sea — with modern, hard-hitting Army, Navy, and Air Force teams. The Free World will continue to use the surface of the seas. The fact is that there can be no Free World unless we do.

"There can be no Free World association unless its navies are kept up to date. Guns no longer shoot down modern, high-flying planes. Guided missiles are needed. Navies must be equipped with the modern weapons and equipment needed to meet all threats at sea. Modern weapons and equipment are needed to cope with the innumerable tasks which navies must perform.

"The Royal Navy is to be congratulated on the steps it has taken, and will take, to maintain modern effectiveness. Modern devices, such as the new aircraft — Scimitar and Sea Vixen — the guided missile — Sea Slug — and other modern devices of which we have heard encouraging reports will all be needed in the future.

"We in the United States Navy are convinced that naval power will have a greater influence on the lives and affairs of nations in the years ahead than it has ever had in the past. In the nuclear-missile age, even more than in the past, the side which commands the seas will not be defeated.

"The greatness of Britain bears testimony to her long appreciation of this fundamental principle.

"SOME of the contributions you have made to the effectiveness of our mobile carrier striking forces — steam catapults, the angled carrier deck, the mirror-landing system, to name a few — are of particular significance."

Speaking of the specific problem of Free World security in the nuclear-missile age, Admiral Burke said: "Three things appear to be necessary:

"First, our main defences must be advanced as far toward the enemy threat as possible. In the event of nuclear attack it is doubtful whether defensive weapons based in home territories can get into action soon enough or far enough away to provide good protection for vital areas.

"The ocean areas of the world present opportunities to gain more time and space for defence. The location of ships at sea is generally unknown to an enemy. Ships must be searched for and located before they can be attacked. This takes extra time.

"Ships are deployed away from home, away from population centres of the homeland, near possible trouble areas. This gives the Free World extra space. The side which has extra time and space has a decisive advantage.

"Next, offensive weapons must be deployed as close to the source

Continued on page 32

For Sea Cadets

An Australian Sea Cadet in India

Cadet Leading Seaman Jonathan Sinclair, of the Geelong Grammar School (Victoria) Sea Cadet unit, was selected to represent the Australian Sea Cadet Corps at the Republic Day celebrations in India last February.

IN a packed 23-days visit he met boys and girls of India's National Cadet Corps, stayed at Indian military academies, saw the Himalayas, had afternoon tea and a chat with the President, met Russia's Marshal Zhukov and India's Prime Minister Nehru, was entertained by Governors and Cabinet Ministers, saw the Taj Mahal, and, of course, attended the Republic Day parade.

He has turned in a report on his trip which his senior officers have praised as being exceptionally good.

Among other things it covers notes on how he travelled, on military academies in India, people he met, and a description of the Republic Day parade.

With him were three other Australian cadets, two Army and one Air Force.

The following are extracts from his report:

WE travelled from Australia to Calcutta by tourist class on a Qantas Constellation. We spent one night in the plane, the other at Singapore. Sleeping was rather hard in this plane.

From Calcutta to Delhi we travelled by Indian Airways DC4. The seats did not work and one was broken, which showed that the maintenance is not as strict as in Australia.

From Jaipur to Poona and Bombay to Delhi, we used the Chief of the Air Staff's plane. This plane was very well looked after and most comfortable.

The airports we visited were modern and staffed by courteous officials. All airports except Djakarta treated us well.

We used trains a great deal from Delhi, Dehra Dun, Agra, Jaipur and Poona to Bombay.

Most of the trains are very old and not very comfortable, nor particularly clean, but the train from Poona to Bombay was very comfortable and fast. The meal we had on the train was the best meal on a train we ever had.

The stations were always very noisy and rather dirty, except for New Delhi station, which is new.

MILITARY ACADEMIES

● **Prince of Wales Military College, at Debra Dun (now the name has been changed to Sanaik School):**

This school is a preparatory one to the Military Academy, where a boy passes out as a second lieutenant.

The boys enter at the age of 11 to 12 years and this limit is strictly adhered to. The cadets stay here for four and a half to five years and then pass on to the Military Academy at Dehra Dun.

There is an entrance examination of English and Arithmetic papers. These exams occur twice a year. If they have passed the exam they are submitted for interview. Before a cadet can join, his parents must sign a declaration that he will make one of the forces his profession.

The parents pay for the education of the cadet 2,300 rupees a year, of which 1500 is for the education, the remainder being clothing, books, fares and all the incidentals.

There are a number of scholarships in each state for this school. Here the cadets do many subjects, and their school work is of a very high standard.

All the cadets wear uniforms and have regular parades and drill. Each year the senior cadets are put in charge of these parades. These develop character, leadership and self-reliance.

In each division there is a cadet captain, three section commanders and a number of N.C.O's for each section.

● **The Military Academy, at Dehra Dun:**

This academy is for the Army cadets after they have passed out of either the Sanaik School or the Military Academy at Poona.

The cadets enter the academy when they are 16½ or 17½, and spend three and a half to four and a half years. After they have finished their course, the cadets pass out as second lieutenants.

There are four divisions here. Each is separate from the others as it has its own block of buildings. In each block of buildings there are bedrooms (two to a room), with bathroom attached, ante-rooms, a dining room, and two rooms for billiards and table tennis and other games.

The subjects they learn are the same which we do in colleges. They do Arts, Science or Engineering. Also they do compulsory subjects dealing with military science.

Every day they do P.T. and drill, then to classes for the rest of the day.

Each division has a senior under officer, then for each section there is a junior under officer. There is an adjutant and a sergeant major to each division.

Also there are sergeants, corporals and lance corporals. These ranks only come in the last 18 months of training.

● **The National Defence Academy, at Poona:**

This academy has not been quite completed yet, but has been in use for three years.

There are three battalions here, Able, Baker, Charlie. These names will be changed soon. This is a combined services academy and after they finish their course the cadets go to Dehra Dun or Cochin or an Air Force base, depending on what service they are in.

The cadets come here when they are 14 to 15, and leave when they are 17½. They do a great deal of school work, but not specialized, until their last year, when they decide what course they will do. Every day they do P.T., then drill. They all do guard drill. This is also kept going at Dehra Dun.

This academy, being new, is very modern. The buildings are very elaborate, with many carvings and a great deal of carved work inside. They have all the sporting facilities, also a lot of land which is very hilly for practical exercises.

They have a lake for the Naval students, but there are no planes at the academy for the Air Force students.

In each battalion the senior cadet is a senior under officer, and in the squadrons there is a junior under officer.

Each battalion has a sergeant major and an adjutant, and also there are sergeants, corporals and lance corporals. These appointments come in the last 12 months of their training. When they go to Dehra Dun they lose these, but in the last 18 months of their training there, they are given priority.

PEOPLE I MET

While in India I met a great number of interesting people and of these some impressions of the more important are:

The President welcomed the overseas cadets at an afternoon tea on his roof garden at his estate near Delhi.

The N.C.C. cadets belonging to the Delhi circle were all present and the President had us stand on either side of him and the N.C.C. cadets formed a semi-circle around us.

He was very cordial in his welcome and assured us that the N.C.C. cadets would do everything to make our stay happy, and he hoped that through this meeting we would get to know as large a number of cadets as possible and form friendships with them.

After this he had informal chats with us and we had afternoon tea with him.

He was most interested in our Cadet Corps and its activities.

He inquired about our standard of living, the types of homes, what our parents did and particularly about farming and the size of farms in this country.

He was very interested in Secondary Industry and wanted to know what proportion of the population was engaged in industry, as compared with agriculture.

He asked about the Indian students here in Australia under the Colombo Plan and wanted to know how they were looked after and housed. He wanted to know if I knew what courses they mostly undertook.

We met Mr. Nehru, the Prime Minister, at an N.C.C. parade at Delhi.

He, like the others, was most interested in our Cadet Corps and covered practically the same ground as the President.

He was very cordial in welcoming us to India and hoped that we would have a pleasant visit.

We thanked him for his interest in inviting us to attend the Republic Day parade, and for the opportunity to see so much of his country and for the opportunity of meeting the N.C.C. cadets.

At the Australia Day luncheon, held at the Australian Embassy at Delhi, I met Lady Mountbatten, who was interested in the fact that on the visit of her husband to Australia, I was the flag bearer of the guard of honour, and had been introduced to him at Essendon.

I also met Vice Admiral Carlill, Chief of Naval Staff, who was very interested in the Sea Cadet Corps.

TWO days later at a folk dancing festival, Lady Mountbatten noticed that I watching and very kindly introduced me to Marshal Zhukov. I asked him about Russian Cadets and their courses and activities, and he said they worked along lines similar to ours.

He has extremely penetrating blue eyes and seems to read one's mind. He was very reserved in his answers, but was very interested and questioned me closely about our corps, about agriculture, housing and industry.

In Jaipur I met the Governor of Rajasthan at an afternoon tea party and later went to a polo match in which the Maharaja of Jaipur was playing.

I met him after the match. Both were very kindly men, asking much the same questions about Australia and likewise in talking hoped that I was having a good time and was being looked after by the N.C.C.

At Bombay we were invited to the office of the Minister of Education, who asked a great many questions about the different types of schools in Australia and who went to them and what were the rules concerning our certificates and how pupils were selected to go to the various schools and how students were selected for the Universities.

The Governor of Bombay invited the overseas cadets to his house, where we had afternoon tea. He hopes to visit Australia and was anxious to hear all we had to say about our country.

Everywhere I went I found the people most interested in what I had to say about Australia. As soon as one N.C.C. cadet and I started to speak, before long I would have an audience of twenty or thirty.

They were most kind and most interested and I did my best to tell them as much about Australia as I could, while avoiding awkward questions such as why such a small population for such a large country and so forth. In turn I learnt a great deal from them and feel such visits of this kind must contribute to friendship and understanding between the two countries.

REPUBLIC DAY PARADE

The purpose of our visit to India was the Republic Day parade. We got up at 0415 and arrived at our seats at 0700. These seats were erected for the day, a tubular steel type of seat. Many of the poorer people had been camping here for two days to see this parade. The parade was held at New Delhi, on a wide road near the Secretarial Buildings. It was a very cold morning and our seats were wet with dew.

At 0930 the parade started. The Prime Minister had arrived already by car. He received the President in State. The President was accompanied by 50 lancers, 15 ahead of his coach and 35 behind. The horses were all chestnut and the trapping of the horses and the coach were very beautiful.

The President was received on a covered-in dais. Just as he was received a twenty-one gun salute was commenced. At the finish of the salute, the lancers rode off with the coach.

Now the parade got going. The Army, being the senior service in India, led. First came their armoured equipment. Each regiment was led by the officer in charge. They showed tanks, artillery, Bren-gun carriers, range-finding equipment and maintenance equipment, and then came all the signals equipment.

All the equipment here was rather old but beautifully kept. All the Military places we visited had their equipment beautifully kept. This is because of the cheap labour.

Then the Army marched, showing some of its most famous regiments, Ghurka, Rajputana Rifles, and many others.

The Navy and Air Force came next. The Air Force showed their ground equipment which consisted of radar, weather apparatus, artillery, emergency equipment and the ground maintenance equipment.

In between each regiment there was a band. These bands had most colourful costumes. There were two Scotch pipe bands, but no Scotch regiment.

I thought the naval band was the best band.

Then a small squad of 10 elephants came past. These elephants had red and gold trappings. A lot of gold tassels hung from the howdah.

The first elephant had tigers painted on its face and trunk.

THE Camel Corps came next, about 60 in that squad. These looked most impressive as they walked along with their heads held aloof. They also had red and gold trappings.

The National Cadet Corps marched next with the boys Army, Navy and Air Force. These three squads were made up of boys from all over India.

It was a great honour to be chosen from their circle to march in the Republic Day celebrations.

The girls came next and got a cheer from the crowds.

After the N.C.C. came the A.C.C. which is junior to the N.C.C. Also there were Army, Navy, Air Force and girl squads marching.

School children came marching past singing songs. They were all wearing their school uniforms and had banners saying which school it was. The ages ranged from five to fifteen.

From every State there was one float. These floats were very highly decorated, portraying some important historical or industrial event. Also some of the floats showed the change in Government.

Then along the road came folk-dancers. Here people from every State were doing dances. These dances were very historical and have been going on for hundreds of years. Many of these folk dances. These dances were very historical and have been going on for hundreds of years. Many of these folk dances were religious ones.

When the folk dancing had finished the lancers came back and the President left in state.

Then came all the officials of the Government, Mr. Nehru, Marshal Zhukov, who led the parade of cars. The Republic Day celebrations were over.

The crowd was very silent and only occasionally cheered or clapped. The buildings opposite us were crowded. Many people had step-ladders or boxes, just as long as they could see this wonderful parade.

[Next month we will publish more of Cadet L/S Sinclair's report, in which he tells us about India's National Cadet Corps and Auxiliary Cadet Corps, of his visit to one of India's big irrigation and hydro-electric undertakings, and how he was farewelled with garlands of flowers around his neck.]

NAVIES "FAR FROM FINISHED"
Continued from page 28

of threat as possible. This provides another significant time and space advantage in event of attack. It adds substantially to the weight of fire that can be delivered on a target for a given expenditure of resources. This means superior economy of force; more attack capability for the amount of money expended.

"Third, additional dispersal and manoeuvring space must be found. The one remaining area of the world where space is relatively inexpensive and where unlimited dispersal can be achieved without interfering with people, is the oceans of the world.

"To ensure that these vast spaces remain available for the Free World, we must be able to control them, use them and deny them to our enemies. This requires a collective Free World effort. No single Free World nation can accomplish this vast assignment alone."

OF Soviet submarine construction, Admiral Burke said: "They are building them in huge numbers. They apparently see in the submarine a means of launching guided missiles against the United States. They see in the submarine an opportunity to inflict terrible losses on Free World shipping, perhaps even exceeding the accomplishments of Hitler's submarines, which destroyed millions of tons. The large number of submarines in the Soviet Fleet are a grave menace to-day to the sea communications upon which our partnership depends.

"In the event of nuclear war, the power to survive the initial assault, the power to recover, the power to organize, the power to shift resources, and the power to carry on to victory depends on the ability of our navies to move on the seas, to control them and to bring tremendous power to bear where it is needed, when it is needed.

"For over four centuries the leaders of England have brought independence, prosperity and security to their country through their incomparable understanding of the oceans.

"To-day, when the ocean spaces clearly hold the key to the future, the Free World continues to look to England's deep, historical knowledge of the sea for inspiration and guidance."

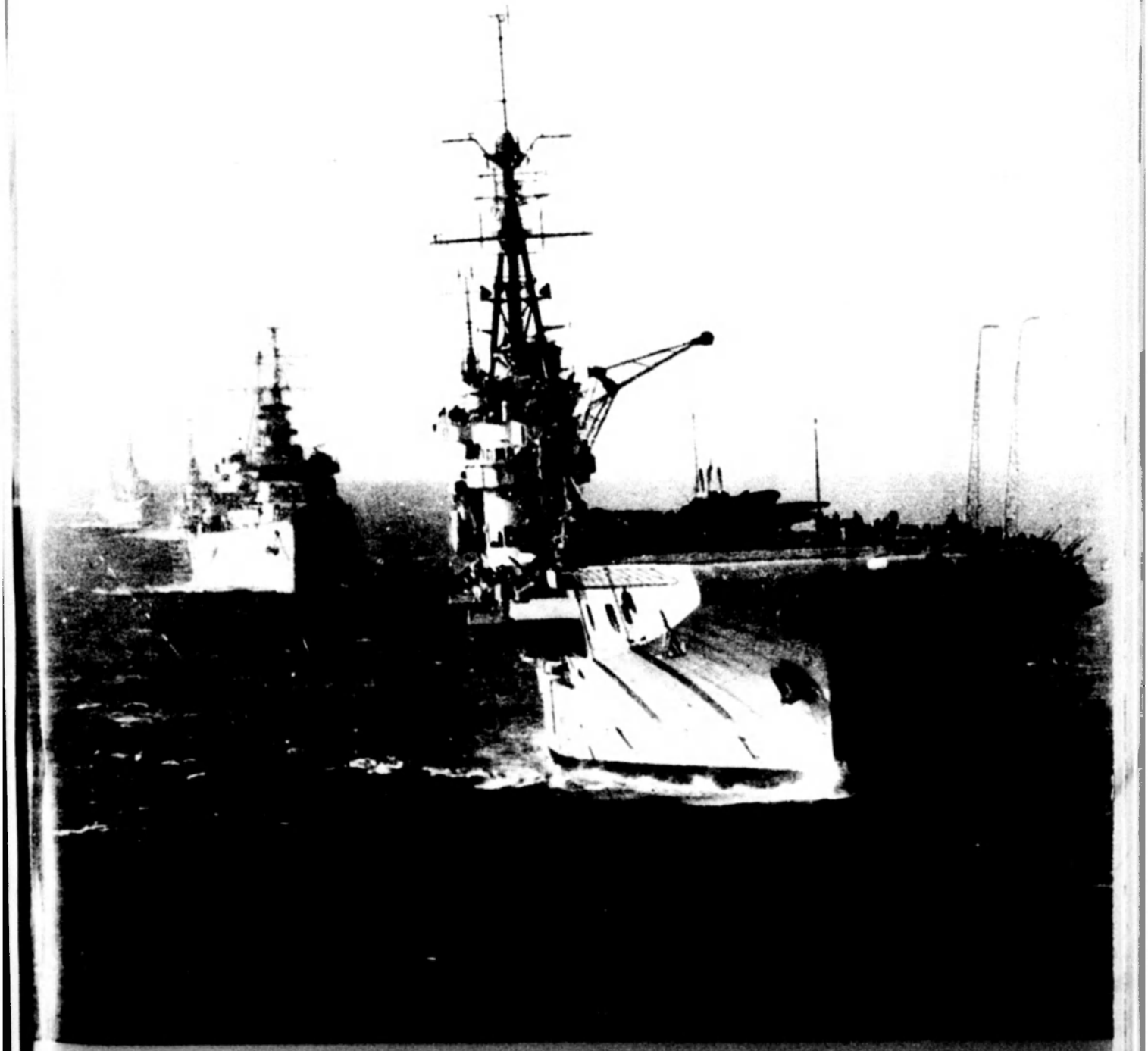
ADMIRAL'S DEATH

NEWS has been received from London of the death of the chairman of the Navy League of Great Britain, Admiral Sir Louis Hamilton, K.C.B., D.S.O.

He was First Naval Member and Chief of the Australian Commonwealth Naval Board from 1945 to '48.

The Navy League of Australia sent a telegram to the Navy League in the U.K. expressing sincere sympathy, and arranged for a wreath.

THE NAVY



AUSTRALIA'S MARITIME JOURNAL

AUGUST, 1957

1/6

THE NAVY

Australia's Maritime Journal

Vol. 20. AUGUST, 1957. No. 8.

Published by The Navy League of Australia, 83 Pitt St., Sydney, N.S.W., and 308 High St., Preston, Victoria.

Circulating throughout R.A.N. Ships and Establishments.

"The Navy" is the Official Organ of The Navy League of Australia and the Ex-Naval Men's Association (Federal).

"The Navy" is the only journal in Australia devoted exclusively to Naval matters generally, and to the R.A.N. in particular.

SUBSCRIPTION RATE: 12 issues post free in the British Commonwealth, 20/-.

Copies of "Herald" photographs published may be obtained direct from Photo Sales, Sydney Morning Herald, Hunter St., Sydney.

THE NAVY LEAGUE OF AUSTRALIA

PATRON:

His Excellency The Governor-General.

FEDERAL COUNCIL:

President: Rear Admiral H. A. Showers, C.B.E. (Retd.).
Deputy President: Cdr. R. A. Nettleford, D.S.C., V.R.D., R.A.N.R.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).

New South Wales Division:

Patron: His Excellency The Governor of New South Wales.
President: Rear-Admiral H. A. Showers, C.B.E.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).
Hon. Treasurer: F. E. Trigg, Esq.

Victorian Division:

Patron: His Excellency The Governor of Victoria.
President: Captain J. P. Williams, O.B.E.
Secretary: H. E. Touzel, 308 High Street, Preston, N.18.

South Australian Division:

Patron: His Excellency The Governor of South Australia.
President: Lieut. Comdr. O. C. Shinkfield, R.A.N.R. (retd.)
Hon. Sec.: K. W. Adcock, Esq., 131 Grenfell Street, Adelaide.

Tasmanian Division:

Patron: Vice-Admiral Sir Guy Wyatt, K.B.E., C.B., R.N. (retd.).
President: C. H. Hand, Esq., M.H.A.
Hon. Sec.: Comdr. G. E. W. W. Bayly, O.B.E., V.R.D., R.A.N.V.R. (retd.), 726 Sandy Bay Rd., Lower Sandy Bay, Hobart.

Western Australian Division:

Patron: His Excellency The Governor of Western Australia.
President: D. W. Brisbane, Esq.
Hon. Sec.-Hon. Treas.: K. Olson, Esq., 62 Blencowe St., West Leederville, W.A.

Queensland Division:

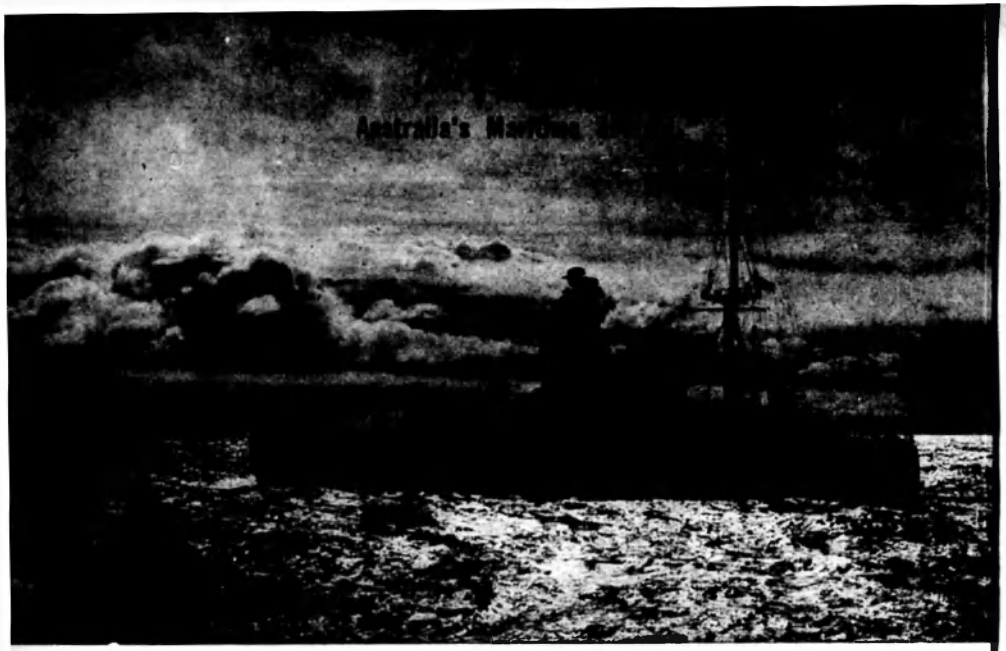
Patron: His Excellency The Governor of Queensland.
President: Comdr. N. S. Pixley, M.B.E., V.R.D., R.A.N.R. (retd.), Ryan House, Eagle Street, Brisbane.
Hon. Sec.: Lieut.-Comdr. O. C. McDonald, R.A.N.V.R. (retd.), Box 1441T, G.P.O., Brisbane.

Australian Capital Territory Division:

President: His Excellency, G. E. L. Alderton, C.M.G. (High Commissioner for New Zealand).
Hon. Sec.-Hon. Treas.: Comdr. A. D. McLachlan, R.A.N. (Retd.), 49 Proggan St., Turner, Canberra, A.C.T. 'Phone: J 2311.

AUSTRALIAN SEA CADET COUNCIL

Representatives of the Naval Board:
Director of Naval Reserves, Capt. A. W. L. McNicholl, C.B.E., G.M., R.A.N. (Chairman).
Comdr. P. R. James, R.A.N.
Representatives of The Navy League:
Comdr. R. A. Nettlefold, D.S.C., V.R.D., R.A.N.V.R.
L. G. Pearson, Esq.; L. Forsythe, Esq.
Lieut. (S) P. G. Evans, R.A.N.V.R.
Hon. Secretary: R. Neil Walford.



VOL. 20. AUGUST, 1957. No. 8.

RUSSIA'S NAVAL THREAT

At the 20th Communist Party Congress in February 1956, Marshal Zhukov said: "In a future war the struggle at sea will be of immeasurably greater importance than it was in the last war."

There is every indication that sea power is still a powerful element of Russia's overall war strategy.

To Britain and the Western Powers Russia's menacing naval build-up threatens the Atlantic 'life-line" which, if cut, would seriously impede the flow of sea-borne supplies and would write finish to any hope Britain might have of recovering from an initial nuclear attack.

The teeth of Russia's Navy are her submarines and heavy modern cruisers.

In June last year Russia had 475 submarines and was believed to be adding 60 to 70 a year—which should now put the strength of her submarine fleet over 500.

The gravity of this vast submarine force can be realised when it is remembered that Germany on the outbreak of World War II had a submarine fleet of 57—and with it took a murderous toll of allied shipping.

Russia also has 30 cruisers, of which 16 are of the powerful "Sverdlov" class—faster, larger, and more heavily gunned than any British cruiser. She is building six more.

More significant still Russia is now known to be adding to her Navy fleet oilers and submarine depot ships which will give her warships support afloat.

It is reasonable to expect that in war Russian submarines and cruisers, with their supply ships, will be strategically placed about the oceans of the world or in remote anchorages where they could maintain themselves for six months or more and be tackled only by our own cruisers, anti-submarine vessels, and strike aircraft.

This constitutes a threat vastly greater than Germany ever posed in the two world-wars, and one not less than the threat of nuclear attack.

Britain's Navy has become increasingly important in "limited" wars and disturbances—of which there have been many since the end of World War II and it is not unlikely there will be more.

In addition, in a "total" war the Navy could supplement the deterrent to a nuclear attack and the retaliation if the deterrent should fail.

It could do this by providing floating aerodromes in the form of carriers and mobile rocket bases in the form of surface guided missile ships and perhaps submarines.

Because of their mobility they would be less vulnerable than static land bases whose positions would undoubtedly be well known.

The disquieting thing, however, is that in spite of the grave Russian threat Britain's Navy is not adequate to fulfill these duties—and it will be many years before it is.

Britain has not laid down a carrier or cruiser designed since the war. She has not yet begun to build ships to carry the weapons of tomorrow—the guided missiles which are already mounted in several U.S. cruisers, destroyers, and submarines.

A British programme of new ship construction is indispensable. It cannot be delayed without the gravest risk to herself, the Commonwealth, and the free world.

BRITAIN AND THE H-BOMB

If Britain gave up the H-bomb without full conventional disarmament, success in a conventional war could only be at the cost of a second liberation of Europe by the forces of the New World. Success, moreover, was open to doubt if such a course were adopted.

This view has been expressed by Britain's Prime Minister, Mr. Harold Macmillan.

He made the following points in stating the case for the retention of the H-bomb deterrent until a genuine measure of disarmament, both in regard to men and weapons, was secured throughout the world:

- The whole purpose of the defence plan of Britain and her allies can be stated in a single phrase: to prevent war. "What would be the toll of a third world war fought with conventional weapons?"
- The forces immediately under NATO command are greatly outnumbered by the Soviet forces in Eastern Germany. Therefore, to give up the bomb without comprehensive disarmament by air, land and sea would make conventional war more likely and more prolonged.
- "We must not abandon the nuclear protection which has preserved peace for ten years and more without making sure that we do not expose ourselves to hopeless inferiority on the conventional basis."
- Mr. Macmillan quoted former Labour Prime Minister Attlee, who said: "It is no use telling the Russians that we would not be the first to use the H-bomb in a war . . ."; that would be an invitation to Russia to "knock Britain for six."
- "It is right and proper that all possible dangers to the future of health should be carefully assessed, but it is not right that they should be exaggerated . . ."
- "It is perhaps not without interest that at the very time that Britain, alongside her American ally, is emerging as a nuclear power, the Russian attitude towards disarmament appears to be less uncompromising than before."

RUSSIA'S SUBMARINES

By J. Meister

THE Soviets claim that the Russians invented — in addition to many other things—the submarine. Although this is not true, it must be admitted that they were among the first nations to be interested in this weapon.

As early as the Crimean war the Russians acquired a submarine constructed by Bauer, a German. In June 1854 this boat underwent successful eight-hour trials off Kronstadt, with 11 men on board; but the *Sea Devil* came too late to change the course of the war.

At the same time the Russian Spiridov projected a small submarine for the defence of Sevastopol, but nothing materialised before the fortress fell. In 1866, Alexandrovsky built a 300-ton submarine, which apparently did not prove a success. Drzewiecki followed in 1877 with a small one-man submarine, which must have given more satisfaction, because in 1879 the Russians did not hesitate to build 52 submarines of an improved four-man type. But these ugly looking craft did not fulfil the high expectations placed in them and they ended their careers ingloriously as buoys!

Alexandrovsky turned up in 1881 with yet another project for a 460-ton boat, but it is doubtful whether she was ever commissioned.

Again in 1886 Drzewiecki, who believed in small submarines, constructed a two-man submersible which seemed to give a better performance. The first reliable submarine was to be the Swedish *Nordenfeldt "III,"* built in 1887 in England, of 250 tons, purchased later by Russia; but she stranded in Denmark while *en route* to the Baltic and became a total loss.

In 1888 and 1896 the untiring Drzewiecki produced two more designs of semi-submarines of 150 and 190 tons, called "Acqua-blindes," but they were failures too. Poukalov's steel-hulled, electrically driven submarine built between 1896 and 1901 was the first modern Russian submarine, and in 1901 a one-man boat designed by Boikin was also successfully tried out on the Neva River.

THE 20-ton submarine *Pjotr Kochka*, constructed in 1902 by Kolbasijev and Kouteinikov, was the first Russian submarine to become involved in warlike operations. She was shipped to Port Arthur, but proved unable to attack the Japanese ships off the beleaguered naval base and had to be scuttled when the fortress capitulated.

The 1904-05 War forced the Russians to notable efforts in the field of submarine construction. They built a suicide submarine with a three-man crew, which failed to find any suitable target: they shipped the *Keta*, built in 1905 by Janovitchi, from Europe to the Amur River; and they purchased American and German-built submarines, which towards the end of the war operated off Vladivostock. Their activity, however, was more dangerous to themselves than to the Japanese.

Even though Boubnov-Beklemishev, Drzewiecki and Shurajev built or projected three more prototypes, including one submersible cruiser of 4,500 tons in 1910, Russian construction now concentrated on submarines of Krupp, Lake and Holland types, and between 1904 and 1907, 16 such craft were commissioned, while during the same period only eight vessels were built to the plans of Russian constructors.

The boats launched so far were all of a small type, but in 1908 the Russians started to build five medium types of about 400 tons, ordered one new boat from Fiat-Ansaldo, launched in 1913 in the Black Sea the minelaying submarine *Krab*, which was a complete novelty, and commissioned just before World War I the first large submarines of over 600 tons.

In 1914 the Czarist Navy had 12 submarines in the Baltic, five others were shipped in from the Pacific, and 23 more were built during the war. There were four submarines in the Black Sea, two more arrived by rail from the Pacific, and 19 others were built during the war, only five submarines remained in the Pacific and the Italian-built *Sviatoi Georgj* went to the Arctic. The Russians had also three army-built pocket submarines for the defence of Kronstadt; two of them were sent to the Arctic and the third to the Danube.

What success did these 74 Russian submarines obtain during the First World War? As only 43 of these boats were modern, and most of them were not available before 1916, the results were rather meagre, especially when compared to the harvest which 10 British submarines gathered in the Baltic!

THREE steamers were captured and seven sunk by submarines of the Baltic Fleet. In the Black Sea, some Turkish steamers and coastal craft were destroyed and captured, and the *Krab* laid mines off the Bosphorus: on the whole the results were better than in the Baltic. There were no sinkings in the Baltic. There were no sinkings in the Arctic. The three pocket submarines were lost up to the outbreak of the Bolshevik revolution in November 1917.

The Revolution and the Civil War almost destroyed the Russian Navy, including its submarine branch. The only success the Soviets claimed was the sinking of the British destroyer *Vittoria* off Seskaer in the Baltic on the 31st August, 1919.

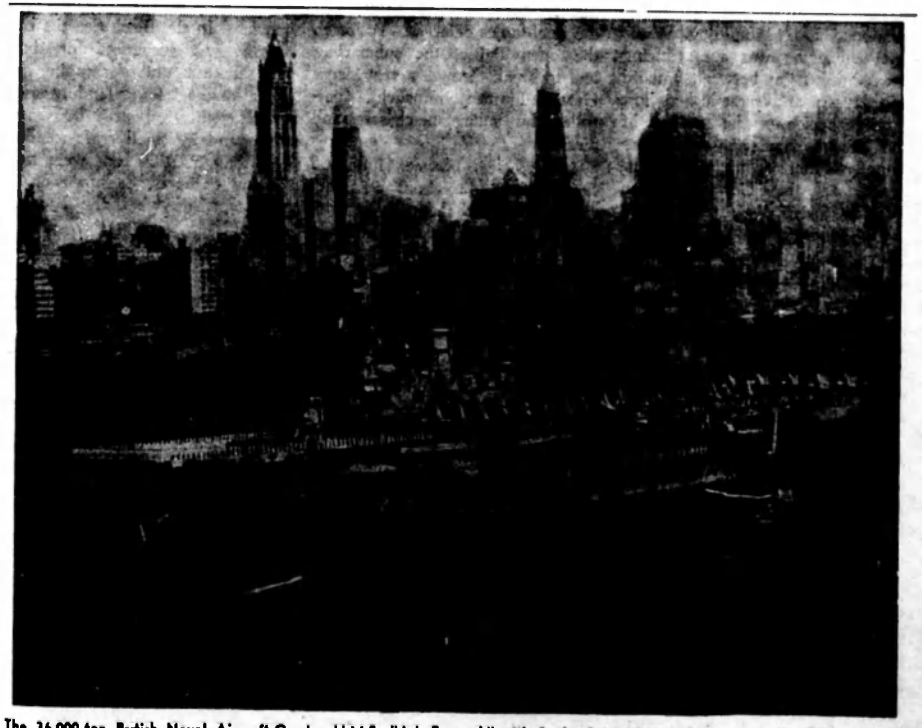
But the British scuttled 13 Russian submarines at Sevastopol prior to the evacuation of this town in March 1919, four others were scuttled in the Baltic, and some more never commissioned. One submarine fell into Finnish hands, and four were interned in 1920 with the rest of the White army and navy in Bizerta.

About 60 submarines building, including boats of 950-1,800 tons and a fed submersible cruisers of 2,000-3,000 tons, were never completed. During the operations on the Volga and in the Caspian Sea against the "Whites" and British armed vessels, the Soviets formed a flotilla of five old submarines transferred from the Baltic which, lacking trained crews, they used as surface-patrol craft.

When all was over, the Soviets scrapped 22 older submarines and possessed in 1923 only 10 boats in the Baltic and five in the Black Sea. They later added the refloated British *L55* which had been mined in 1919 off Kronstadt.

With the first five-year plan the building of a new submarine fleet started, and in 1930 the first boats of the "Dekabrist" class commissioned in the Baltic and Black Seas, to be followed in 1933 and 1935 by boats of the "Leninetz" type. Soon afterwards the first submarines of these types appeared in the Far East—mostly built by the new shipyard at Komsomolsk—and in the Arctic. With the second five-year plan Soviet submarines came into service in ever-increasing numbers.

The first type to be produced in very large numbers was the 200-



The 36,000-ton British Naval Aircraft-Carrier H.M.S. "Ark Royal," with Seahawk jet aircraft lined up on her flight deck, calls at New York after taking part in the International Navy Review, off Norfolk, Virginia. Ships of eighteen nations took part in the review, which formed part of the celebrations of the Jamestown Festival. It was the largest international naval review ever held in American waters, and consisted of more than 100 warships.

ton "M" class, which could also be shipped by rail from one theatre to another. The "Shja" type boats displaced 600 tons and were constructed in large numbers. Shortly before the war the Russians commissioned the first units of "S" and "K" classes of 780 and 1,390 tons respectively, while three submarines of the "P" class of 1,200 tons were complete failures.

IN 1939 there were about 72 submarines in service in the Baltic and 22 others still building; seven in the Arctic and three building; perhaps as many as 42 boats ready in the Black Sea and 13 building. The figures for the Pacific showed 74 submarines commissioned and 12 building. While one submarine was sunk during the Winter War between Finland and Russia and some others lost through accidents, the strength of the Soviet submarine fleet continued to increase up to the outbreak of the German-Russian War in 1941.

On June 22, 1941, there were 94 submarines in the Baltic, and 34 others building. Shortly afterwards 19 submarines were sent via the Stalin Canal to the Arctic; and as 16 others were not ready for service and 13 more were used for training, only 46 could actually be made available.

In the Arctic there were perhaps 20 boats, and in the Black Sea almost 50, while the Pacific fleet had reached over 80.

Altogether the Russians had between 250 and 260 submarines, of which only 15 were of old construction built under the Czarist navy.

Compared to these figures, the German submarine fleet with its 57 boats when war broke out did not look so formidable, and therefore much was to be expected from the Soviet submarines.

But the Finnish-Russian War had already produced very poor results. Only four merchant ships and one armed Finnish yacht were sunk. So it was hardly surprising that, during the five months of submarine warfare in the Baltic in 1941, the Soviets lost 27 submarines for one German steamer sunk by torpedoes and two naval auxiliaries by mines!

In the Black Sea and Arctic results were almost as poor although in the Black Sea the Axis convoys were at that time only escorted by the few and ill-trained Rumanian warships.

The Russians, however, had learnt something and prepared for the campaign of 1942 very thoroughly. Boats were degaussed, thickly covered with paint, and the fuel-tanks enlarged. To reach the open Baltic, the submarines had to break through a very dense German-Finnish minefield, patrolled by submarine-chasers and aircraft.

Nevertheless, between June and December 1942 about 25 submarines tried the dangerous trip, and many succeeded, some even two or three times.

Altogether 23 German, Finnish and neutral merchant ships were sunk by torpedo and gunfire, and four more small ships may have been lost through Russian-laid mines. But 10 submarines were destroyed, mostly by mines, and three by Finnish submarines.

In the Baltic, in fact, the Soviets had obtained some small success, but in the Arctic and in the Black Sea they continued to achieve very unsatisfactory results.

To prevent submarines in the Gulf of Finland from reaching the open Baltic again the Germans installed an anti-submarine net. This stopped any break-out in 1943 and cost the Russians two more submarines. In the autumn of 1944, after the Finnish armistice and the German retreat from Estonia, the Soviet submarines again operated in the Baltic. They sank about 25 ships among the ill-protected German transports, and lost at least one submarine. Among the ships sunk were three carrying refugees and wounded, causing the loss of over 15,000 lives.

THE submarine war in the Arctic cost the Germans about 30 cargo ships and some armed trawlers. These submarine-chasers, often armed only with depth charges and 20-mm. guns, were sometimes outgunned by the faster and heavily-armed large Soviet submarines.

Most of the sinkings off Northern Norway were, however, the work of British and Allied submarines. In the Black Sea the submarine war accounted for about the same amount of shipping and some auxiliaries and landing craft.

Altogether about 100 cargo ships and 30 small craft totalling less than 300,000 tons were sunk during the war, or not even 10 per cent. of what the Russians claimed.

No major German warship — battleship, cruiser, destroyer or submarine—was damaged or sunk by Soviet submarines.

The Soviets lost at least 40 submarines in the Baltic, 20 others in the Black Sea and another 20 in the Arctic, or almost one for every cargo vessel sunk.

Except for some submarines built during the war in the Far East and four received from the Royal Navy, Soviet submarine building had almost stopped. Only nine of the 34 on the stocks at Leningrad at the outbreak of the war were completed by 1945. Taking into account all the old boats to be scrapped, the Russians came out of the war with about 150 operational submarines, of which as many as 90 might have been in the Far East, 25 in the Baltic, perhaps 20 in the Arctic, and another 15 or 20 in the Black Sea.

They received 10 surrendered German submarines, they captured a few, half-scuttled, in East German ports and many more which were still building. They also received two former Italian submarines, and completed some of the unfinished German vessels.

At least 220 submarines were available when the Soviets started building up a new post-war submarine fleet in 1949-50. Soon they were able to produce as many as 60 units a year and to-day the figure may be around 80. Besides the improved, small "M" type they concentrated above all on the "W" design, of which last year as many as 230 were said to be in service.

At least 350 new submarines have been built since 1949-50, and over 500 are actually under the Soviet flag; while another 70 older boats have been discarded or sold to satellite powers, which may have as many as 50 units.

These 550 Communist submarines, almost 10 times more than the Germans boasted in 1939, and more than they ever had in service during the Second World War, doubtless present a certain menace. Nevertheless, it must not be overlooked that about 150 are older boats, useful only for coastal defence and training, and another 50 modern small submarines cannot operate very far from the Russian shores. The remaining 350 form the bulk of Soviet seapower.

THE distribution of Soviet submarines may be as follows:

	Baltic	Arctic	Black Sea	Pacific
Soviet Russia	150	100	100	150
Poland	10	—	—	—
Rumania	—	—	10	—
Bulgaria	—	—	—	30
China				

According to persistent rumours, a few submarines may now also be in the Mediterranean, based upon Albanian ports, and hoping later to use Egyptian, Syrian and Jugoslav harbours.

Though submarines can, during six months of the year, pass through the canal systems between the Baltic and Arctic and into the Black Sea, the bulk of the submarine fleet, 270 boats, is locked up in the Baltic and Black Seas. Only those in the Arctic and the Pacific could immediately operate against the vital Allied lifelines in the Atlantic and Pacific. Of over 150 ocean-going submarines based upon Polar and Far Eastern ports, not more than 50 can be operating at any given time against shipping, because at least one-third is always refitting, and probably more than one-third on passage to and from the operational theatre. This reduces the figure to about 20 submarines at a time in the Atlantic, and 30 in the Pacific.

But if the Soviet army could take and keep open the Danish and Turkish controlled Straits leading into the North Sea and the Mediterranean, the picture might change radically. The many submarines bottled up in these landlocked seas could then be thrown into the battle for seaborne trade.

However, merchant ships probably do not form the main target for the Soviet submarines. From German experience in two world wars, and from the results obtained by their own submarines, the Russians have concluded that even 500 submarines cannot sink sufficient merchant ships fast enough to secure a decisive success within a few months.

While the merchant shipbuilding capacity of the western hemisphere can increase, Russian ability to build submarines could not.

To-day they are building submarines as fast as they can, placing orders for merchant ships mostly abroad. In wartime Soviet shipbuilding capacity (about one million tons per year of which more than half is inland shipping only) would prove quite insufficient to replace losses of surface warships, submarines and merchant ships.

During the last war the Germans were able, at the best, to produce some 20 submarines per month, but it took 60 per cent.

of Germany's and Occupied Europe's output-capacity for electrical gear to build these submarines. And yet Germany lost the submarine war.

The Russians are therefore concentrating their effort upon a short submarine campaign, possibly sending all available submarines to sea simultaneously to attack Allied warships and troop transports.

Huge packs may try to prevent enemy task-forces, including the dreaded aircraft carriers, from penetrating Russian - controlled waters or from approaching the Russian coast to devastate Soviet shipping and industrial targets.

The many long-range submarines may even set traps for Allied naval forces near N.A.T.O. naval bases, create diversions at almost every point of the globe, and launch a few guided missiles against the many coastal towns which are still out of range of the Soviet army and air force.

Besides the relatively low efficiency co-efficient of their submarines, three handicaps have so far clouded Russian prospects. Their jumping-off bases are a very long way from the main N.A.T.O. bases and from important ports and shipping lanes. Much times might be lost in passage from and to the operational zones.

The Soviet army, however, may conquer better placed ports, as did the Germans in 1940, when their submarines could use the Norwegian and French bases. And as the Soviets seem suddenly to be building modern supply and depot ships, the mobility of the Soviet submarine fleet may much increase in the near future. Flotillas can be operated from hidden anchorages, which have first to be found and destroyed by Allied forces, and in the meantime — the notorious "broken back" period—the war might be lost elsewhere.

The second weakness lies in the equally remote bases of the naval air force. The modern submarine, travelling mostly underwater, has much difficulty in finding her small targets in the vast oceans.

THE main difficulties, which I can probably not be overcome, lie in complete lack of experience of oceanic submarine warfare, and in the Slav character. The few former German submarine officers working with the Soviet navy cannot change such imponderables.

The real danger lies therefore in Russia's ability to keep the Allied fleets so busy with defending themselves against Soviet submarines that, during the first few weeks or months of an eventual war, the N.A.T.O. armies might not receive all the supply and seaborne support they need to stop the vastly superior Soviet army.

Tactical atomic weapons are double-edged, and so are nuclear weapons. Even if all Russian home bases were destroyed, the Soviet army, navy and air force, depending on hidden supply depots and operating from still unknown bases, may for a few weeks keep their numerical superiority—just long enough to overrun Europe and to secure West European industrial centres which might not be atom-bombed at once.

The best means of thwarting such Soviet plans consists not only in guided missiles, but also in stronger, immediately available land forces in Europe, and in stronger, fully-commissioned naval forces.

Both the United States and Britain do have the warships, but too many are in reserve.

It would be of no use to Europe for a third world war to be won by the United States after a devastating atomic attack. The war must be either avoided by our strength, or at least won before the Rhine is crossed.

The Russians cannot win a world war, but the difficulty lies in persuading them of this.

The more warships the N.A.T.O. powers have ready, the longer will it take and the more difficult will it be for the Soviet submarines to obtain appreciable results.

In the meantime their chances of winning a "quick" war elsewhere will become slimmer.

—From the London "Navy."

THE SEASLUG

The Admiralty has disclosed further details of the Royal Navy's ship-to-air guided missile.

SEASLUG is the medium-range weapon which the Parliamentary Secretary to the Admiralty, Mr. Christopher Soames, informed the House of Commons during the debate on the Navy Estimates, is designed to engage any enemy bomber which evades the fighter defences of the Fleet.

It will do so at any height at which modern aircraft are capable of operating.

The Admiralty says that the first ships in which Seaslug will be fitted are the four guided weapon destroyers which have already been ordered. These ships are to be based on the design of the present "Daring" class ships but will be larger than the "Darings."

Seaslug has a system of propulsion which consists of a sustainer motor and four boosts. These latter are jettisoned after propelling the missile to super-sonic speed.

Seaslug is operated and fired from positions within a ship without any personnel being required to be on duty in exposed places.

Although a large number of officers and men are engaged in the maintenance of the missile equipment and in preparations for firing, the number engaged in the actual operation of firing is far smaller than the crew of a conventional gun turrent in a major warship.

Radar Detection

Targets are detected at long range by radar, and subsequently plotted for range, height and bearing. From this information a particular aircraft may be selected as the target for the missile. The details of the target's range, course and speed are obtained by the missile guidance and control system and used to position the weapon launcher, and enable the operator to determine when to fire the missile. He does this without ever seeing the target.

Missiles are fired from a triple-ramp launcher which is automatically fed from a magazine below decks.

The weapon has been developed by the Ministry of Supply, and has been tested at the proving grounds of Aberporth in Wales and Woomera in Australia.

At Aberporth some trial firings were made from the Clausen rolling platform, which is a mock-up of part of a ship floating in a concrete basin and capable of simulating all the conditions of roll and pitch likely to be encountered at sea.

Since the commissioning of H.M.S. *Girdle Ness*, the Navy's guided weapon trials ship, in last July, firings have been carried out at sea, of which the vast majority have been successful, the Admiralty adds.

All seaborne equipment, apart from the missile itself, has been developed under the direction of the Admiralty. This includes the launcher, magazine handling gear, radar and associated weapon direction and control equipment.

Naval interest in guided weapons started during World War II and the Royal Navy were leading protagonists of the guided weapon during the period 1943-1949.

During the war an Admiralty committee was set up to investigate means of providing the British Pacific Fleet with a short-range guided weapon to deal with the Japanese kamikaze suicide attacks, but Japan was defeated before the project was sufficiently advanced.

After the war the Ministry of Supply became responsible for guided weapon development.

The naval requirement for guided weapons was restated and eventually the first Service contract was awarded by the Ministry of Supply to the Hawker Siddeley Group, which in turn chose Sir W. G. Armstrong, Whitworth Aircraft Ltd., as the co-ordinating contractor. Other firms intimately associated with the development of this weapon system are: the General Electric Co., Sperry Gyro Co. Ltd., John Thompson Conveyor Co., Sir Geo. Godfrey and Partners, Vickers Armstrongs Ltd., Metropolitan Vickers Ltd., McMichael Radio Ltd., E.M.I. Engineering Development Ltd., and Imperial Chemical Industries.

NEW MEMBERS

The N.S.W. Division of the Navy League of Australia welcomes the following new fellows and associates:

Fellows

Mrs. I. R. Kelty.
C. H. Locke, Esq.
Comdr. R. P. Middleton.
Miss M. Pope.
F. B. Spencer, Esq.
G. G. Ashton, Esq.
W. J. Allner, Esq
Rear-Admiral C. J. Pope.
W. V. Rowe, Esq.
L. P. Plasto, Esq.

Associates

Mrs. L. A. Locke.
G. Plasto, Esq.
Lady Walder.

The Division notifies, with regret, the following resignations:

C. R. V. Jones, Esq.
G. R. Rickards, Esq.
H. C. Malcolm, Esq.

THE SEVENTH CONTINENT

French explorer Robert Pommier writes of his impressions of life in the Antarctic and explains why in the International Geophysical Year, just begun, so much interest is being taken in the South Polar region. (Republished from "World Veteran.")

By Robert Pommier

IT was almost midnight by our watches. It was very cold, and we had donned our polar outfits to cross the gangplank. The *Commandant Charcot*, white with frost and looking as if it were made of sugar, moved smoothly forward, rocking in the broad swell. The water was a sea of violet ink, and the huge iceberg at our side was throwing off steely pink glints. The sky was greenish-blue, and the sun, which never sets in January, was rolling its golden disk over the horizon. Far off, like a wall, could be seen the white cliffs of the Antarctic continent, and, even farther south, the high plateau, where wind-driven snow-clouds were leaving silvery wakes as they sped by.

There was a "plop" in the water, to starboard. The penguins in evening jackets sprang vertically up from the water, landed on their feet on a piece of floating ice and shook themselves, flapping their wings as they did so. A snow-petrel, wonderfully white, flew noiselessly above the mast on its way to land.

Such was my first vision of the Antarctic. We had left Australia, the last outpost of inhabited land, about a fortnight earlier, and before us stretched a continent of 14 million square kilometres, completely uninhabited, where we were to spend a year.

A few months later our hutment was completed at Adelie Land on a rocky promontory that we named Port Martin in honour of one of our shipmates who had died on board during the voyage.

In so pure and beautiful a landscape, men quickly make it their business to reduce everything to their own scale. Our house resembled a gypsy camp. It had been specially designed to resist the terrifying winds of Adelie Land which are the most violent in the world, at times attaining a speed of 160 miles an hour.

Our rubbish was scattered all about. Thousands of cases containing food and equipment were piled on top of each other, and forty sled-dogs strolled freely about the camp. Big radio antennae that stood out against the sky were our only means of communicating with other countries. The boat had gone. The sky had frozen into a single sheet of ice as far as the horizon. We were completely isolated.

Whenever I return from an expedition, I am always asked the same question: "Weren't you terribly bored in the Antarctic?"

Now the fact is that I was never bored for the simple reason that throughout the thirteen months of my stay I was always busy, from seven in the morning until midnight!

There were eleven of us: a surgeon, a civil engineer, a captain in the navy, a carpenter, a cook, two radio men, a meteorologist, a mechanic, a specialist in long-distance sled-trips (myself) and the head of our expedition, Andre Frank Liotard.

A ONE-HOUR job in a normal country takes three hours in the Antarctic. For example, one day I was at the top of a ladder nailing a piece of plywood to the roof of the house. I was taking my nails one by one from a tin can when a blast of wind whisked away the box. It dropped to the ground about ten yards off. Laying down my hammer, I descended the ladder and picked up the nails one by one. As I walked back, a second blast carried off the ladder. I had to recover that, too. With

Continued on page 16

NAVY HELICOPTER GIVES ENGINEERS A HELPING HAND

A Navy helicopter pilot last month helped the Sydney County Council to span a deep gorge with 33,000-volt power mains. The pilot, Lt.-Commander Gordon McPhee, took a 1¼-inch pilot rope over the Woronora River. Council engineers, using power winches, then used the rope to haul across a 3-inch rope and finally the two cables. The new mains will provide power to the Atomic Energy Commission's Lucas Heights Nuclear Reactor.

NEWS OF THE WORLD'S NAVIES

Flying radar control centre for R.N.

Partly removed from the secret list is an aircraft which will act as a flying radar control centre for the Royal Navy. It is the Fairey Gannet A.E.W. Mark III, a most important asset for carrier task forces.

By carrying radar search equipment to many thousands of feet, this aircraft will overcome line of sight limitations of radar beams at near sea level.

Like the human eye, a radar beam can only "see" in a straight line and will not bend over the horizon. At 50 feet the eye-to-horizon distance is only nine miles. At 25,000 feet it is 200 miles.

The new Gannet will be able to give early warning of the approach of enemy aircraft, whether at sea level or high altitude, and will establish course and speed long before they reach a target.

As an airborne intelligence centre the aircraft will also direct aircraft on to an interception course and will locate surface vessels and "snorting" submarines.

The first prototype is being constructed at the Fairey Aviation Company's works at Hayes, Middlesex, and the Ministry of Supply has placed production orders on behalf of the Navy.

The aircraft will be powered by two Armstrong Siddeley double mamba turbo prop engines housed in one installation.

Progress in French naval building

The French minesweeper D.33, built under the Off-Shore Programme, has been transferred to the French Navy at Cherbourg and named *Aries*.

A sister, the *Etoile Polaire*, has been launched.

They are 365-ton craft generally similar to our Albrighton class of wood and aluminium construction to Thornycroft design.

French destroyers *Surcouf*, *Chevalier-Paul* and *Dupetit-Thouars* of the "Surcouf" class, commissioned in 1955, have the new, unusually long, 5-in. A.A. guns. The chamber of this gun has been designed to use the 5-in. ammunition of the "Gearing" class American destroyers.

Destroyers refitted for Pakistan

The Pakistan destroyers *Tippu Sultan* (*ex-Onslow*, *ex-Pakenham*) and *Tughril* (*ex-Onslaught*, *ex-Pathfinder*) are to be refitted and converted in British yards under funds provided by the United States under the Mutual Security Act.

U.S. guided weapon ship program

Contracts have been let for the construction of nine U.S. guided weapon destroyers.

Contracts also have been placed for ten guided weapon frigates.

They will be considerably bigger than the destroyers, being 512 ft. long by 50 ft. beam with a light displacement of 3,900 tons.

They are expected to take three years to build, completing in December, 1959, and their design to BuShips specification has been developed by Gibbs & Cox, the New York naval architects.

They will be very much along the lines of British guided weapon frigates, but marked by pronounced sheer, both fore and aft, giving the impression of a low freeboard amidships.

The U.S. guided weapon cruiser CGN-160 is to be named the *Long Island*.

Contracts have been placed for the conversion of the light cruisers *Springfield* and *Oklahoma City* to guided weapon cruisers.

They are both of the Cleveland class of 10,500 tons, like the *Topeka*, *Providence*, *Galveston* and *Little Rock*, and were armed with twelve 6-in. guns.

The earlier conversions, *Boston* and *Canberra*, were 8-in. cruisers.

Three A-powered subs building at Groton

Three U.S. nuclear-powered submarines are building side by side at Groton, Connecticut. They are the *Skipjack*, *Skate* and *Triton*.

Combining the Albacore hull with nuclear propulsion the *Skipjack* is expected to be the fastest and most easily manoeuvred submarine ever built. She is in an early frame stage.

The *Skate* is at the launching stage, and *Triton* will be the world's nuclear reactors of super power, and is to be equipped as a mammoth radar picket station. Her framing is well advanced.

Names have been assigned as follows to other nuclear submarines—*SSN-588*, *Scamp*; *SSN-589*, *Scorpion*; *SSN-590*, *Sculpin*; *SSN-591*, *Shark*; *SSN-592*, *Snook*.

Midget submarine visits London

Thousands of overseas visitors in London have visited H.M. Submarine *Sprat*—one of the smallest warships ever to pay a courtesy visit up the Thames.

Sprat is one of the class of four commissioned in the past three years.

Sprat is a five-man submarine and is a descendant of the midget submarines *X5* and *X6* which torpedoed and seriously damaged the German battleship *Tirpitz* in Alten Fiord, Norway, in September 1944.

Although the principles remain the same that the vessel should be helped to the vicinity of the objective, there has been a change in offensive tactics.

Sprat, 54 feet long with a beam of just over six feet, and weight of 36 tons, has no superstructure beyond periscopes and does not fire torpedoes.

The conning tower is replaced by a hatch enabling a diver to emerge and place limpet charges. Fourteen of these charges and up to three tons of other high explosive charges which can be released from within are carried externally.

The normal practice is to dive under the target and to release the charges—timed—either on the sea-bed or fixed to the target.

Australian Navy's work in Geophysical Year

The Royal Australian Navy is co-operating in the activities of the International Geophysical Year further by directing its ships in the course of their normal duties to take special weather observations, in addition to those usually taken, when they are at sea or in remote anchorages.

From June 20, the opening day of the International Geophysical Year, all ships of the R.A.N., either at anchorages on the Australia station or in relatively unfrequented waters began taking the most accurate meteorological observations possible four times a day.

They will continue this until the Geophysical Year ends on December 31, 1958.

The observations are being reported every month to Navy Office, and from there sent to the Commonwealth Bureau of Meteorology, which distributes them throughout the world.

The R.A.N. did much of the preliminary work for the ocean gravity survey of the Pacific in March 1956.

The survey was carried out by Mr. H. M. Traphagen, of the Lamont Geological Observatory, of New York, and Mr. Gunson, of the Australian Bureau of Mineral Resources, in H.M.S. *Telemachus*, one of three Royal Navy submarines based on Sydney Harbour.

Duke sends his congratulations

The Duke of Gloucester has sent a message to the captain of the Royal Australian Navy fast anti-submarine frigate *Queenborough*, Captain C. M. Hudson, A.D.C., R.A.N., congratulating the ship's company on having won the Duke's cup for 1956.

The Duke presented the cup when he was Governor-General.

It is awarded each year to the ship of the Australian Fleet which the Flag Officer Commanding the Fleet judges to be foremost in general efficiency, cleanliness, seamanship and technical training during the preceding 12 months.

PRINCESS ROYAL TO VISIT NIGERIA

THE Princess Royal will visit Nigeria in November.

The main purposes of the visit will be to open two of Nigeria's major institutions of higher education, the Teaching Hospital at Ibadan and the Headquarters branch at Zaria of the Nigerian College of Arts, Science and Technology, and also to be present at a service at Onitsha Cathedral to mark the centenary of the Diocese of the Niger.

The Princess Royal, Dowager Countess of Harewood, is a sister of the late King George VI.

Besides holding honorary positions as Colonel-in-Chief of various British Regiments in Britain and overseas, she is a Major-General of the Women's Royal Army Corps, and Air Chief Commandant of her own formation, the Princess Mary's R.A.F. Nursing Service.

APPRENTICES

Fifty boys entered the R.A.N. Apprenticeship Training Establishment at Quakers Hill (N.S.W.) on July 7.

THE SEVENTH CONTINENT

Continued from page 12

the can of nails under my arm, I calmly climbed up to the roof only to see that the hammer had also flown off.

When that kind of thing happens, you have to go to the workshop, drill a hole in the handle of the hammer, and tie it to your wrist with a cord. It is also advisable to put the nails into your breast pocket. As for the ladder, if the weather is not too rough it won't fly away, as long as you're standing on it. The South Pole, as you can see, is a school of patience.

Each of us had a scientific or technical programme to carry out in accordance with a precise plan. And, of course, everyone had to lend a hand with the chores, for life is not easy when there are only twelve men to do everything.

My particular job was to do research in atmospheric optics. I had, in the house, a tiny laboratory where there was just enough room for me to sit on a stool amidst electric wires, milliamperemeters, photographic developing-tanks and enlargers. I would spend three hours a day grading sensitive plates. In the evening, when the sun was low, I had to set up my spectrograph outside and do time-exposures for more than an hour, chronometer in hand, at 40 below.

I was also in charge of the forty sled-dogs, who formed a joyous, though not always disciplined band. These animals — they were Greenland and Labrador huskies —saved us from solitude. Without them, our winter retreat would have been monotonous indeed. They were all fur and muscle, tender-hearted brutes, and it would hurt me to see them suffer.

From April to October, during the winter season, Adélie Land is swept by violent blizzards. We would be invaded by veritable rivers of powdery snow from the polar plateau. When the wind exceeded 90 miles an hour, we had to walk on all fours, and our faces would be covered in a few seconds with a positive mask of ice. As some of us had got lost during storms, we stretched ropes between the house and the various scientific shelters containing the marigraph, seismograph, anemometers and barometers. Bonjon, our meteorologist, who had to transmit his observations four times a day to Sydney, Australia, had to go out in all weathers and was the most exposed of all.

At times, in the middle of the night I would hear a dog howling. I knew each one's voice. "He's stuck," I would say to myself.

I had to dress myself very carefully (if you forget a button, fifty pounds of snow my get into your clothes) and go out armed with an ice-axe.

A "stuck" dog is a husky that has curled up in the snow, with his snout buried in the hair of his tail, and has remained out in the storm for hours without moving. His breathing and bodily heat have melted the ice beneath him. When he tries to get up, he discovers he is unable to move an inch and begins to howl.

I would hunt for the animal with my flashlight, moving along, for the most part, on all fours. When I found him, I would cut the ice with my axe so as to liberate him. Finally geting to his feet, with big lumps of ice hanging from his chest, the animal would lick my face to show his gratitude —which would cause superficial but painful frostbite.

IN an expedition, people of all opinions and beliefs find themselves thrown together and obliged to look at each other for a year on end. Living without water, or almost—you have to melt ice for it —in a rather advanced state of uncleanliness (clothes spotted with motor-oil and seal grease), crowded together in tiny quarters, sleeping in rows of berths, the men could find any number of reasons for quarreling. But I am proud to say that a perfect understanding always prevails in French teams, probably because we have applied two basic principles: firstly, not to take oneself too seriously, and secondly, to have a strong sense of humour.

At present, about a dozen nations are represented in the Antarctic, where several hundred scientists and technicians are working within the framework of the International Geophysical Year. Three million dollars have been set aside for the making of precious observations that will enable us to master the "science of the earth."

Efforts are being directed to the Antarctic because it is the only region that has not yet been really explored, and because the pressure currents and magnetic waves emanating from the poles exert, in all likelihood, a strong influence on atmosphere conditions throughout the world.

The programme of the various missions is a vast one and includes studies of the ionosphere, meteorology, glaciology, oceanography and determination of longitudes.

The chief efforts are directed to the ionosphere, the region of the upper atmosphere situated at an altitude of 50 to 250 miles. This zone, in which the air is rarefied, is a very good conductor of electricity and is supposed to be responsible for the phenomena of "fading" that disturb long distance radio communications. In view of the location of the great population centres, most of the radio-electric waves that are used in telecommunications pass over the poles.

The ionosphere is at present being explored by means of special electronic sounding apparatus, and with Aerobee rockets that attain an altitude of about 150 miles and "Rockoons," a smaller model that are launched from balloons, and can rise to a height of 60 miles. It should be mentioned in passing that the forthcoming projection of the famous American "satellite" will take place within the framework of the same activities.

Polar scientists are also interested in cosmic rays, for cosmic bombardment is particularly intense in these regions, where the terrestrial magnetic field, which is vertically oriented, merely deflects the radiations.

In the field of climatology, the scientific missions hope to gather valuable information that will make possible long-distance forecasts for air traffic, agriculture and the tourist trade. As the weight of the Antarctic ice has been calculated at a *quadrillion tons*, is is obvious that this enormous mass exerts an influence on the climate of the entire earth.

ALL these expeditions, which, at the present moment, are in their winter quarters for the purpose of continuing their investigations, are working in a spirit of perfect co-operation, thus proving that there is no question of a cold war at the South Pole. For example, 17 Frenchmen who are at Geology Point in Adelie Land are in permanent touch by radio with Americans, Englishmen, Russians, Australians, New Zealanders, Norwegians and Japanese.

All the expeditions have the most modern devices and equipment at their disposal. But the fact remains that the Antarctic is still an almost complete desert. One can get some idea of the population density by imagining Europe inhabited by a handful of persons in London, Paris, Oslo, Berlin, Rome and Madrid.

In a hundred years or so, this area which is known as the seventh continent, may serve as a world frigidaire. Planes travelling to and from Australia and America will cross each other above the South Pole and tourists will go skiing on Erebus, the volcanic mountain.

But meanwhile there is still a great deal to do, and all young men who are fond of action and scientific research will be able to sign up for these expeditions and pass a year in the great solitude of the polar night.

QUEEN AT PARADE

The Queen seen riding the Police horse Imperial as she left Buckingham Palace for the traditional Trooping of Colour ceremony on Horse Guards Parade in London. The parade marked Her Majesty's official birthday. The Queen, who rode along the Mall to Horse Guards Parade, wore the now familiar black tricorne hat, blue riding shirt and scarlet tunic, and in her hat the blue plume of the Irish Guards, whose 1st Battalion Colour was trooped at this year's ceremony.

SEARCH FOR OIL AT SEA

Marine monsters face a new invasion of their dark and dangerous world. For the oil industry, in its ceaseless search for new resources, has taken up the challenge of the open sea.

From a Special Correspondent

IT'S a tough, exacting challenge which only the big and strong can meet but already oilmen by skill and fortitude have overcome the challenge of water, tides and weather to provide the world with fresh power resources.

Australia is one of the nations which may take up the challenge of the sea. A company was recently given the rights for offshore drilling near Lakes Entrance, Gippsland. This is the first time the Victorian Mines Department has granted a licence to prospect for oil over the sea of the Victorian coast.

Oil production from under the sea is not new — for many years productive "onshore" structures, which extend beneath the sea, have been tapped for short distances "offshore."

Off the United States west coast, for example, production has been going on for over 50 years from wells drilled from piers.

But it is only during the past two or three years that the real undersea search has spread widely. And with it it has brought a host of new problems, some of them staggering in their complexity and cost.

But as the oilmen develop new techniques and cut their engineering costs, the closer they draw to the find of the exciting raw material which already has over 2,500 uses in our modern world.

Recent developments of aqualung techniques have enabled divers to move about freely on the sea-bed and have made possible for the first time extensive geological work under the "cruel" sea. It's not a job for the chicken-hearted, and it's not one for the organisation which is not prepared to gamble millions of pounds on the search.

Cost is Heavy

A recent survey in water 150 feet deep off the U.S. West Coast by a three-man team of specialist diver-geologists cost nearly £300 a day. In the States small marine drilling platforms cost up to about £500,000. One large stationary platform, 220 feet by 106 feet, cost the equivalent of £650,000. A giant wholly self-contained mobile unit, including platform, drilling rig, cargo vessel, tender, etc., may cost close to £3,000,000.

It may be thought that Australia, with more than 6,000 miles of coastline, offers a rich potential field of wealth beneath the waves. It may at that, but experience so far has shown that most offshore oil strikes have occurred in the region of land oil fields.

But oilmen, who each year spend millions of pounds on the luck of their drills, are prepared to gamble that more oil lies under the sea than under dry land. They've got solid backing for that. About two-thirds of marine sedimentary rocks on the earth's crust are in the submerged extensions of our land masses.

These underwater shelves reach out to water some 600 feet deep, then plunge abruptly to great depths. And entombed in these land fringes are the great proportions of the residues of organic waste — the source of oil.

Just where in the seas of the world is the search taking place? The biggest incentives to finding oil under the sea lie in the United States because of high and sharply rising costs of exploration and development on land. Drilling in the U.S. Gulf of Mexico began in earnest towards the end of 1953.

To-day, there are over 700 wells producing submarine crude in the Gulf with a cumulative production at the end of last year of about 100 million barrels of crude oil and condensate, and of over 210 billion cubic feet of marketed natural gas.

Surveys, Drilling

Off Mexico, drilling has started south of Tampico. In the Gulf of Paria, between Venezuela and Trinidad, two wells have been completed six miles off the coast, and both are producers.

An aerial photo-magnetic survey has been made over 12,000 square miles off Cuba; a marine seismic survey is covering 1,700 square miles 200 miles south-west of Nassau in the Bahamas; exploration is going on off the coast of Peru.

In the Persian Gulf the underwater search is really on. The largest offshore area so far known was discovered here in 1951 at Safaniya in Saudi Arabia. It covers over 70,000 acres with wells up to 10 miles from land. Off Qatar one company drilled a well 50 miles out to sea to a depth of 12,000 feet before abandoning it.

Sixty miles out from the shores of Abu Dhabi two companies are drilling in 50 feet of water. Exploration has started off the Mediterranean coasts of Egypt and Libya, and may begin in the Gulf of Suez.

Off British Borneo, in the South China Sea, drilling is going on 25 miles out, and off Japan a geological survey has been made.

The Soviet is already producing from underwater wells in the Caspian Sea and drilling is to go on in the North Sea off Hamburg with a survey off the coast of the Netherlands up to 30 miles out, west of the Hook of Holland.

Geophysical surveys have been made off southern England and off the French coast in the Bay of Biscay.

The present technical limit of underwater drilling is about 200 feet — given suitable conditions — but the deepest water in which a well has been drilled so far is 112 feet.

The oil industry has got to be big to face up to the sea's challenge. It has gone out to 63 miles;

Continued on page 30

FRANCE'S NEW NAVY

FRANCE BUILDS UP HER BATTERED FLEET . . . FRENCH ADMIRAL IN NEW YORK PAYS TRIBUTE TO AMERICAN HELP

From a Special Correspondent

NEW YORK, July 15: In their traditional red pompoms, blue collars, and blue-and-white-striped shirts, sailors of the French Navy have been making a gay, colorful, early-summer splash along the eastern United States seacoast.

They arrived, 2,900-strong, in a squadron of six ships to take part in the recent Naval Review of the Jamestown Festival. Afterward, the offices and men engaged in manoeuvres with elements of the U.S. Atlantic Fleet, and visited various east coast ports.

A striking proof of the close postwar tie between the American interest and the French Navy, the visiting squadron consisted of:

- The cruiser *De Grasse* and the destroyer *Chevalier Paul* and *Dupetit Thouars*, designed and built in France and equipped in part with material received under the United State military aid programme;
- The destroyer-escorts *Le Lorrain* and *Le Gascon*, two of an 18-ship series designed and built in France, seven of them financed with U.S. aid funds;
- The aircraft carrier *Bois Belleau*, formerly the *Belleau Wood*, loaned to France by the U.S. Navy, with the aircraft aboard her supplied under the United States military assistance programme.

Underscoring the French Navy's importance to France, the United States, and the Atlantic Alliance, Admiral Henri Nomy, Chief of the French Navy General Staff, on the occasion of his squadron's visit to the United States made these pertinent comments:

"I'm sure there's no need for me to stress to Americans, whose country won its independence with the help of Admiral de Grasse, how important her Navy is to France. May I simply say that what was true in the days of the American Revolution is still true in 1957. France's maritime interests are as valid to-day as they were then, for in large part her economy depends on the sea and her geographical position makes her well-suited to use it.

"Perhaps it is pertinent to add here that the French merchant marine fleet, in its full postwar development, now totals 3,645,000 tons and ranks eighth in the world. This shows how important the sea lanes are to the French economy. Half of France's frontiers are seacoasts, and the seas washing them are some of the most intensively sailed in the world.

"To the great benefit of the free world's defences, France stands like an enormous pier, extending continental Europe into the Atlantic. And through her overseas territories, France controls key points, essential to the naval strategy of the West."

"WHEN World War II ended, France's Navy was reduced to a third of its 1939 strength. With the majority of French ports and naval yards seriously damaged, the Navy's tonnage (260,000) was made up of odd, non-standardised and frequently badly battered ships. . . .

"But undiscouraged by its apparently overwhelming task, the Navy set to work. Soon its efforts received encouragement and, in line with the proverb 'God helps those who help themselves,' practical assistance.

"This aid and encouragement came almost entirely from the United States Navy, and from its great postwar leaders, Admirals Fechteler, Carney and Burke, to whom I should like to repeat the French Navy's gratitude.

"Since 1951 the ships and planes built with French funds in our shipyards and factories have been joined by ships and planes sent from America. Later on, when our production capacity was restored, we also received ships built in France with American funds. Meanwhile, a part of our personnel — primarily in naval aviation — was receiving training at U.S. Navy schools which we were not yet able to give in France.

"Thus, in 1957, the French Navy is 77,000 men strong and includes a fleet of 376,970 tons afloat, 132,390 tons under construction, and a naval air arm of 850 planes.

"All this material (which is still almost entirely of conventional design) and all our personnel are in fighting trim. Their operational readiness has been tested and praised by the great naval commanders of NATO who frequently put them through practice manoeuvres.

"Having sketched the recent past and present state of our Navy, I might be tempted to speak of its future. But the future is always a difficult question to broach. So rather than play the prophet, I prefer simply to express my confidence and make a wish.

"This wish is that the French Navy, within a few years, will

Continued on page 25

REVIEWS

STORM AT SEA

Gale Force, by Elleston Trevor; published by Heinemann (London).

Anyone who writes a serious tale about a ship fighting a gale must be judged — and must be prepared to be judged — by the yardstick of Conrad's *Typhoon*. Conrad, like Masefield to-day, was a master of literature, and it would be unfair to blame the author of this excellent yarn because he is not of their stature. But he is an honest craftsman with ability to create suspense and then to sustain it.

The S.S. *Atlantic Whipper*, 6,000 tons, is 200 miles off Land's End homeward bound with 10 passengers, 40 seamen, and a cargo of grain. It begins to blow, and soon the ship is in such trouble that the master makes the distress signal. His signal is picked up ashore and by other ships running for shelter. The attempts to rescue her are told in vivid journalese.

Events happen swiftly—a common occurrence in a seaway — and the master faces a choice. Shall he give up or shall he try to achieve the impossible by saving his ship? To reveal the nature of his choice, and whether he succeeded at it or failed, would be to mar the reader's enjoyment of a spirited sea yarn.

The author has evidently based his story on a recent drama of the sea, but parts of his narrative are truly imaginative, and it seems a pity that he chose to clutter them with the conventional love affairs and stock types. Had he cut his narrative by half, concentrating, as Conrad did, on the barest essentials, he might have written a really outstanding novel. Even as it is, the tale stands high above the average of sea yarns.—J.H.B.P.

—From the London "Navy."

COURAGE AND SKILL

Two Small Ships, by Donald Forbes; published by Hutchinson (London).

Have there been too many books about personal experiences in small ships in the last war? Does not each book tell the same story? My answer is that we can never have too many of these personal records and that each one reveals some new facets of a story of gallantry and endurance under more testing conditions than in previous wars because the weapons were more lethal.

This is the story of two destroyers which fought in all the campaigns in the Western Hemisphere — the North Sea, Daker, Malta Convoy, Battle of the Atlantic, North African landings, Western approaches and, finally, the Sicilian landings.

I do not think that in any previous war naval officers experienced every form of battle in so many seas or so many great moments in maritime history.

The author brings out the sterling qualities of the British sailor, his uncomplaining cheerfulness under the most trying conditions, his loyalty, his skill and courage.

This book reminds us again, that at the outset of war there has always been a demand for small ships which cannot be met, and that until new ships leave the slips the small ships are strained to the limit and, in the last two wars, have been insufficient in numbers to prevent the enemy inflicting heavy damage to our seaborne trade. It has been almost a miracle that we have survived to win through in the end.—W.M.J.

—From the London "Navy."

THE FRENCH VIEW

Trafalgar, by Rene Maine; published by Thames & Hudson (U.K.).

To be able to read an account from "the other side of the hill" of one of the greatest British sea actions is always an exciting experience. In this book we are given a French view of the campaign of Trafalgar. It is not, of course, a repetition of the notorious account which appeared in the official French newspaper *Le Moniteur* after the battle, reporting a glorious French victory and the surrender of Nelson to the all-conquering Villeneuve, but a sober appraisement by a French historian, now translated into English.

In its essentials M. Rene Maine's narrative sticks close enough to the generally accepted

account of the campaign, as we know it in this country to be accepted as a sound enough basis. Having had the benefit of consulting the French records of the period, he adds excerpts from the letters of Napoleon, Decres and Villeneuve himself to explain the French movements before the battle.

M. Maine attributes the disaster of Trafalgar chiefly to the lack of grip and vision of the French admirals, not only Villeneuve but also those of the subsidiary squadrons who were to have played a part in the grand design against England.

This, of course, is partly true, but they were up against a master of grand strategy in William Pitt, aided by half a dozen of the most brilliant admirals whom England had produced in all her long sea history.

This is, indeed, a most interesting account of the Trafalgar campaign.

It leaves something to be desired, in English eyes, in the accuracy of its nautical terms, and a few historical points are somewhat suspect.

Even in the pain of his wound Nelson would hardly have used the words "Cast anchor." The translators of this book could have served the author better by taking advice on these maritime matters before committing them to print.— P.K.K.

—From the London "Navy."

ROLLING DOWN TO RIO

Pamir, a Voyage to Rio in a Four-Masted Barque, by Hilary Tunstall-Behrens; published by Routledge and Keegan Paul (U.K.).

The *Pamir*, one of the famous "P" Liners (of whom it was always said that their rope running rigging was rove new all through every voyage, and there was four miles of it), lay idle in Teneriffe for five and a half years during the First World War. She was then handed over to Italy for reparations, but they could not use her, and being sold to Eriksen, the famous Finnish sailing-ship owner, for only £4,500, she was used in the Australian grain trade. Then, in 1951, this great four-master barque was fitted out in a German harbour for trading voyages to South America.

The British author of this interesting book, after leaving Oxford, had his imagination fired at the sight of her and he signed on as a member of a very miscellaneous crew. His account of a trip to Rio will delight all sailors and landlubbers. Among the numerous illustrations of one of the Margate lifeboat standing by when the *Pamir* seemed to be very much in need of rescue.— H.B.

—From the London "Navy."

MARITIME NEWS OF THE WORLD

From our Correspondents in LONDON and NEW YORK
By AIR MAIL

A verse from the Antarctic

Temperatures down to 67 degrees of frost and winds up to fifty knots were some of the hazards being faced by Dr. Fuch's Transantarctic expedition, according to cables received in London.

The wind cut away the top snow surface and vehicle drivers suddenly climbed unexpected snow slopes or plunged into deep gullies.

Men were reduced to crawling to find the edges of the next hazard.

But the tailpiece to the cable indicates that the men are in high spirits. This was the tailpiece:

When we were very young
We thought the snow was fun.
Now all the world is white
We know that we were right.

Translators' troubles in South Africa

In South Africa everything is being translated into Afrikaans and so far the translators have done remarkably well with odds and ends.

Now they have been stumped, however. They were ordered to translate nautical terms into Afrikaans and they have come up against three terms which have defied the smartest translator in the country.

The terms? The commonest in nautical language: splicing the mainbrace, anchor away, and forecastle.

In a recent pamphlet the Union Government's translators officially give forecastle as "fo'c'sle" as the correct spelling.

The translators have now appealed to Holland for help in the hope that Holland may have Dutch terms for these words which can be converted into Afrikaans.

Italian ship for British migrants

The liner *Fairsea* will be used to bring British assisted migrants to Australia for the next four years.

The first voyage will be between September 20 and October 31. It is expected the ship will make four or five voyages a year.

On a minimum of four voyages, the *Fairsea* will be able to lift more than 5,000 assisted British migrants each year.

The Australian Minister for Immigration, Mr. Athol Townley, signed the agreement in Melbourne on May 10 with representatives of SITMAR (Societa Italiana Transporti Marittimi), owners of "*Fairsea*."

Under the agreement, the Australian Government will pay approximately the same rate as that paid for migrants carried by commercial shipping lines from Britain to Australia.

The "*Fairsea*" has already been used for three trips with British migrants under single voyage chartering arrangements.

Japan's big Pacific salmon catch

Japanese Pacific high seas salmon catch was 78.6 million fish in 1956 against 70.9 million in 1955.

The fishery from the home islands produced 26.3 million fish in 1956 compared with 6.8 million the previous year.

These increased catches resulted in a corresponding increase in the 1956 canned salmon pack which was 112.7% higher than in 1955.

The Japanese were therefore able to overcome the restrictions imposed by Russia, limiting the Japanese catch in a high seas zone off Siberia by a quota and licensing system.

The fishing efforts of the Japanese long distance salmon fleet were supplemented by the near water salmon fleet which benefited from a salmon run much closer to the coast than usual.

No dividend from Canal Company

The directors of the Suez Canal Company have not recommended a dividend for 1956.

The chairman of directors, M. Francois Charles-Roux, told the annual meetings of shareholders this in Paris.

Egypt nationalised the Suez Canal in June 1956, seized the Suez Canal Company's assets in Egypt, and set up an Egyptian authority to control the canal.

New sea terminal at Tilbury

Europe's newest ocean terminal, at Tilbury, on the Thames, costing between £1,500,000 and £1,750,000 stg., is now operating. The new berth, which is built on 30 concrete monoliths weighing up to 4,200 tons each, has taken four years to complete.

The new quay and terminal buildings have been designed by the Port of London Authority specifically for the use of the large liners, approaching 30,000 gross tons, now being operated by the P. and O. and Orient Companies, and it will be able to accommodate the new 40,000-ton ships being built for the Australian run.

The Tilbury terminal now provides a high standard of comfortable and convenient accommodation for passengers and their friends.

Last year 120,000 passengers passed through Tilbury landing stage.

The company's balance sheet shows a surplus for 1956 of £A6,591,000, more than £50 million worth of assets outside Egypt, and more than £87 million worth of assets in Egypt.

M. Charles-Roux told the meeting that the company should begin negotiations with the Egyptian Government for compensation for the nationalisation of the canal.

If these negotiations were not successful arbitration would have to be sought, he added.

DESTROYER FROM U.S.

Another destroyer, the *Formoe*, has been transferred from the U.S.A. and renamed the *Diego Cao*.

Personalities

APPOINTED TO SEATO

Commander G. V. Gladstone, D.S.C., and Bar, R.A.N., now Commander of the Royal Australian Naval College at Crib Point (V.), has been appointed Naval Member of the SEATO Military Planning Staff at Bangkok.

HE will relieve Commander D. Nicholls, R.A.N., who is returning to Australia for another appointment.

Commander Gladstone will leave Sydney for Bangkok by air on August 14.

Commander Gladstone is a graduate of the Royal Australian Naval College. He has passed the Royal Naval Staff College Course and the Joint Services Staff College Course in the United Kingdom and has had staff experience both at sea and on the staff of the R.A.N. Liaison Officer in London.

In World War II he served in H.M.A.S. *Australia*, H.M.A.S. *Quickmatch*, and H.M.S. *Sussex*. He also served in the war in Korea in H.M.A.S. *Warramunga*.

While in the *Quickmatch* he won the D.S.C. for his part in the attack on the Japanese base at Sabang (Sumatra). He won the Bar to that decoration while in the *Warramunga* in Korea.

He was also awarded the United States Bronze Star Medal for his services in Korea.

* * *

The Royal Australian Navy has announced the following promotions to date from June 30:

Royal Australian Navy

To be Captain:

Acting Captain G. J. B. Crabb, D.S.C., of Mt. Waverley, Victoria.

Commander F. W. Purves, of Sydney.

To be Commander:

Acting Commander J. L. W. Merson, of Melbourne.

Acting Commander F. T. Sherborne, of Sydney.

Lieutenant Commander L. M. Ponton, of Salisbury.

Lieutenant Commander B. H. Loxton, of Sydney.

To be Surgeon Commander:

Acting Surgeon Commander J. A. B. Cotsell, of Sydney.

Citizen Naval Forces

Royal Australian Naval Reserve

To be Commander:

Lieutenant Commander E. Hackford, of Pascoe Vale South, Victoria.

To be Lieutenant Commander:

Lieutenant R. W. P. Shrimpton, of Rosanna, Victoria.

Lieutenant J. J. Ravenscroft, of Perth.

Lieutenant G. D. P. Cordner, of Glen Iris, Victoria.

Lieutenant N. G. Browning, of Applecross, Western Australia.

Lieutenant L. MacD. Muir, of Canterbury, Victoria.

Lieutenant E. Bryden-Brown of Killara, New South Wales.

To be Instructor Lieutenant-Commander:

Instructor Lieutenant R. Thomson, of Wangaratta, Victoria.

To be Lieutenant Commander (Special Branch):

Lieutenant N. J. Rowan, of Balwyn, Victoria.

Lieutenant A. W. Willee, of Surrey Hills, Victoria.

Lieutenant G. A. Chandler, of Wahroonga, New South Wales.

Royal Australian Naval Volunteer Reserve

To be Lieutenant Commander:

Lieutenant T. R. McCrow, of Camp Hill, Queensland.

FRANCE'S NEW NAVY

Continued from page 20

have another occasion to send a naval force on an official visit to the United States, and that the American people may then see new ships equipped with what we have come to call 'new weapons,' such as those now used by the U.S. Navy. For this modernisation, we are all working with the will and perseverance of men determined to contribute to the greatness of their own country as well as the cause of all free nations."

BY the end of World War II, the French naval tonnage not only was seriously depleted, but its remaining vessels were old and unmatched.

To meet the immense reconstruction task, the Navy's General Headquarters worked out a "Navy Plan" aimed at a minimum tonnage of 360,000. This was deemed necessary to meet the country's need and its commitments to the North Atlantic Treaty Organisation.

In this plan, the French Navy, by 1963, will comprise 300,000 tons of combat ships, 13,000 tons of amphibious vessels, and 47,000 tons of auxiliary ships.

The combat ships are expected to include:

- Three medium aircraft carriers (22,000 tons) — the *Arromanches*, *La Fayette*, and *Bois Belleau*.
- Two anti-aircraft cruisers — the *De Grasse* and the *Colbert*, the latter possibly to be adapted for guided missiles.
- Nineteen destroyers of the T-47 and T-53 type.
- Eighteen destroyer-escorts of the E-50 and E-52 type.
- Some fast conventional submarines.
- Some escort vessels of the "Union Française" type.
- Some patrol ships and mine sweepers.
- A certain number of "transition" ships, "designed to use the weapons currently being tested or developed for use against surface ships, aircraft, and submarines."
- A helicopter-carrier to replace the *Jeanne* d'Arc as the Cadet training ship.

Research into atom-propelled submarines is being carried out actively and one such submarine is in the blueprint stage.

The reconstruction and modernisation now being carried out will provide the French Navy with:

An *amphibious fleet* ready to intervene quickly and with the maximum firepower in any menaced area.

An *auxiliary fleet* to give mobile logistical support, the kind of support increasingly necessary because of the danger run by naval forces moored in a harbour, and of the destruction which may threaten naval bases.

A *Fleet Air Arm* of 21 combat flotillas, including:

- The aircraft needed on the three aircraft carriers;
- Interceptors, fighters and assault planes (12 flotillas);
- Heavy land-based ASM aircraft;
- Helicopters.

Most of these planes will be French-built.

SINCE 1948, some $1.3 thousand million have been invested in new French naval ships. Out of that total, United States aid has amounted to 36 per cent., in the amounts of $156 million in direct financial aid, $150 million in off-shore contracts, and $196 million in transfer of old or new ships.

The French Navy has four main bases, at Brest, Toulon, Mers-el-Kebir (Algeria), and Bizerte (Tunisia). Its four secondary bases are at Cherbourg, Lorient, Dakar (French West Africa), and Diego Suarez (Madagascar).

A great many of these bases were occupied during World War II and heavily bombarded. By the time of the Liberation, between 70 and 95 per cent. of the metropolitan French bases, as well as Bizerte, were destroyed.

In the rebuilding effort, priority was given in this order: Mers-el-

Kebir, Brest, Bizerte, Toulon. Now, in 1957, the reconstruction of these bases is in full progress.

French Naval Aviation has 26 bases in France and the French Union.

The most important are those at Lann-Bihoue (near Lorient), Hyeres and Saint Raphael (near Toulon), Bizerte and Karouba (Tunisia), Lartigue (near Oran in Algeria), Port Lyautey (Morocco), Dakar (Senégal).

To repair the heavy damage to all its air bases in metropolitan France and to provide for modern reconstruction, the French Navy since 1945 has spent more than $430 million.

In the French Navy to-day, 66,000 men are serving on ships and in land-based facilities exclusive of naval air bases, and 11,000 men in naval aviation. Some 35,000 served aboard ships, about 35,000 are on shore duties, and more than 6,000 are in schools or in recruit training centres.

In the French navy yards there are 1,650 engineers (with a military status), 4,100 clerks, and 43,500 workers.

AMONG the more important French naval traditions are the sailors' red pompon beret, blue collar and bue-and-white-striped jersey, the sentry's presentation of arms before an admiral's apartment with an ancient halberd, the shrill piping of the topmen, "steak and fries" every Thursday and the half-pint of wine at every meal, and the hammocks which provide steady sleep against the roll of the ship.

The sailor's beret with its little red tuft has a noble ancestry. Sailors of France have always worn woollen caps, whether they were simple fishermen, merchant seamen, or men of the line in the King's Navy. The colour varied from grey to red to blue, and it was usually knitted personally by its owner.

For a long time, however, the sailor's cap and its tuft remained undefined in shape.

Navy regulations in the days of Napoleon required a "work cap" but failed to specify its shape, size or colour.

Only during the Second Empire in 1858 was the work cap standardised and its tuft defined. It had to be knitted of blue yarn decorated with two dark red stripes, and the tuft was to be made of strands of two colours, blue and red.

The blue strands were dropped in 1870, and the solid red pompon remained. This pompon is now popularly regarded as a symbol of good luck, and when the sailor is on-shore in France people are apt to come up and touch it for luck.

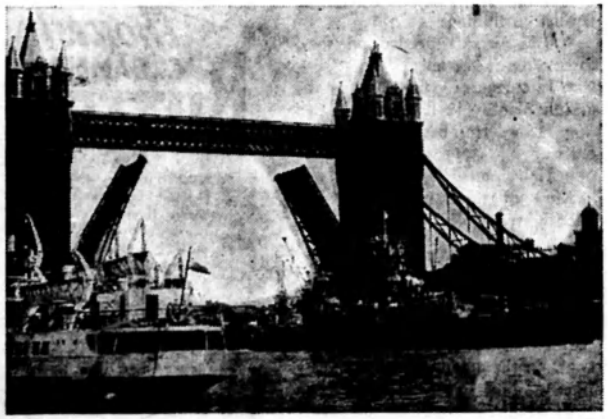
The origin of the serving of wine aboard French ships is lost in ancient history. One of the first references is found in a court case in 1538, in which it was attested that bad wine was given to a crew to drink.

The first official regulation dealing with this subject, however, was probably the Ordinance of April 15, 1689, which set the daily ration at three-quarters of a pint "cut" with an equal amount of water. This was to be served at meals. Between meals, crews could only drink a brew made of a mixture of water and vinegar!

This Ordinance applied to ships sailing along French coasts. For those on longer voyages, for example to Africa or America, brandy was substituted for wine. There also was a further exception. Because grapes did not grow well in Brittany or Normandy, apples and malt took their place, so that ships plying between Saint Malo and Dunkirk could serve beer or cider in place of wine.

To-day, the daily ration varies from a basic half litre (about a pint) to perhaps as much as one and a half pints.

The French Navy points out that this tradition seems sure to stay, "for recent offers of milk instead of wine produced no customers."



Seen passing under London's famous Tower Bridge before being moored in the Pool of London during a visit is the frigate H.M.S. "Salisbury"—the first of the new "Salisbury Class" frigates for the British Royal Navy. H.M.S. "Salisbury," 1938 tons, carries a complement of nine officers and 198 men. Designed for direction of carrier-borne and shore-based aircraft, she carries more radar equipment than any other ship of her size.

FISHING SURVEY IS BEGUN

THE Australian Department of Primary Industry has begun a survey of prawn resources off the North-East Australian coast.

It is also investigating the possibility of establishing commercial fishing in the Great Australian Bight. First result of the survey has been the discovery of an important new prawning ground, of about 750 square miles, off the south Queensland coast.

The Minister for Primary Industry, Mr. W. McMahon, announcing this last month, said that prawn fishing could be the basis of a valuable export trade, mainly with the United States, where prawns were a favourite sea food.

Better supplies of fresh and frozen fish would be available to country towns as well as metropolitan areas if the investigation of fishing in the Bight was successful, he added.

He said the Fisheries Division of his department would use the most modern prawning trawler available to conduct the prawn survey.

Australia exported about 100,000 lb. of prawns in 1955-56. By mid-January the 1956-57 exports had reached 206,000 lb.—worth about £70,000.

The known grounds in northern N.S.W. and southern Queensland were already being heavily fished. It was necessary to find out the extent of the prawning grounds.

Catch Declines

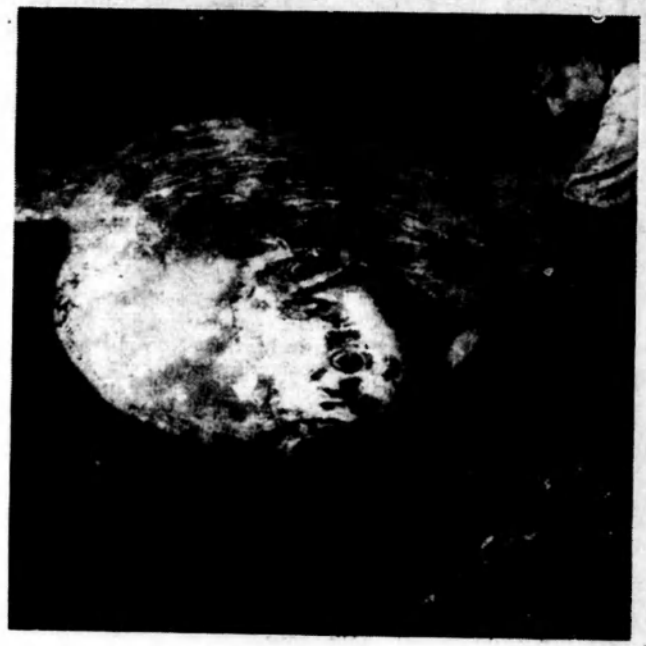
Mr. McMahon said the Government would buy a modern diesel trawler, equipped with cold-storage facilities, to investigate the fishing potential of the Great Australian Bight.

He added: "In recent years Australian catches of fish have declined — particularly in Victoria, N.S.W., and to a lesser extent South Australia.

"Imports have risen.

"This indicates that the market would have no difficulty in absorbing additional supplies."

Australia's production of fresh fish in 1955-56 was 64 million lb. (live weight), valued at about £5.4 million. Imports (frozen, smoked, salted, and dried — but not canned) were 55 million lb., valued at about £2.2 million.



Mr. E. Burns, of Crow's Nest, Sydney, with a giant sunfish he found at Neutral Bay, Sydney Harbour. The fish was more than 7 feet long and nearly 6 feet wide. It was believed to have drowned after being trapped on rocks by the falling tide.

RUBBER FISHBAIT

INSHORE fishermen in Britain are reaping a harvest with a cheap and unusual bait.

The skipper of an inshore vessel which landed its catch at Grimsby on June 12 said: "We have found that by baiting our hooks with small pieces of rubber we are now catching, in addition to the usual cod and haddock, large quantities of a fish known as coalie, a species of cod which has never before responded to line fishing.

BRITAIN'S MERCHANT NAVY

By Viscount Simon, C.M.G.

President of the Chamber of Shipping of the United Kingdom.

IN this island country of ours, our Merchant Navy is all too often taken for granted. We could not have survived without it, and so we tend to think of it as little as we think of the air we breathe. Yet those who indulge in mountain climbing know that at higher altitudes the rarefied atmosphere brings not only discomfort but danger. The same would certainly be true of our national life, if the strength of our shipping industry was allowed to decline.

In his recent Budget statement, the Chancellor of the Exchequer referred to British shipping as a "unique industry which is the lifeline of our country."

This is no exaggeration. It may be only in times of war or emergency that the general public realises how vitally dependent this country is upon our Merchant Navy and upon the men who man our ships, but in fact we are just as dependent in peace time. It would be impossible to feed our population or to maintain our manufacturing industries without it. Imports would cost us more, if we could get them at all. Exports would yield us less. Our standard of living would inevitably be lowered. And our balance of payments would be tipped seriously to the wrong side.

In recent years British shipping has earned annually in foreign exchange about £250,000,000. It ranks, therefore, as one of our major export industries. What is more, a decline in our shipping means not only that we lose these valuable earnings, but that we have to "import" shipping services — that is, to employ foreign ships. If we fail to sell our motor cars abroad, we are not compelled to buy foreign cars. But since shipping services are essential to our life, we must buy from others if we cannot provide these services ourselves.

These facts indicate the importance of the contribution which the Merchant Navy makes to our prosperity, and to our whole way of life. It is vital that our shipping should be adequate not only to carry the bulk of our own overseas trade, but also to participate substantially in trade between foreign countries and so help our foreign exchange position. Can it continue to fulfil this dual task?

I believe it can — but only if the dangers which threaten it are first recognised and then overcome.

Before we take a look at some of these dangers, it may be well to draw an outline of the present position. Since 1937 the world's sea-borne trade has expanded by nearly two-thirds, and the world's tonnage of merchant ships by 63 per cent. In the same period the tonnage of British merchant ships has increased by only 12 per cent.

"No Real Gain"

In a time of such rapid expansion, it was perhaps not to be expected that the British share would be maintained, nor was it necessary that it should be. Indeed, looking further back to 50 years ago, Britain owned not far short of half the world's tonnage, but in the years that followed, other countries, starting later in the race, naturally grew faster than we did.

But although we may have to accept it as inevitable that the preponderant position which British shipping held in those days could not be retained, it is nevertheless disturbing that during the last 20 years we have barely advanced at all, while others have gone ahead by leaps and bounds.

And a closer examination of the position does nothing to allay our concern.

A large part of the small increase in our tonnage since 1937 is due to the transfer to United Kingdom registry of ships previously registered in Canada, and is, therefore, from the point of view of the Commonwealth, no real gain.

The tonnage of tramp ships — the ships that bring us most of our requirements of grain and sugar, of iron ore and of other bulk commodities — has fallen.

And although our tanker fleet has increased, and will be increased further in the next few years by new buildings already contracted for, it has not grown as rapidly as has the world's sea-borne trade in oil, or even as rapidly as this country's imports.

This is a situation which no one can regard with complacency. What are the reasons for it?

It is well first to recall the grievous losses suffered by the British Merchant Navy, in men and in ships, during the last war. We honour the memory of nearly 35,000 men who gave up their lives. We do not always remember to-day that nearly 11,000,000 gross tons of our merchant shipping were sunk — well over half the United Kingdom merchant fleet as it stood in July, 1939.

Before expansion was possible, these ships had to be replaced. At the same time some of the ships that had survived the war had already exceeded their normal span of useful life and needed replacement. To build up the fleet again to its pre-war size was an immense task, undertaken under most difficult conditions, sharing inadequate resources in labour and materials with other industries which had suffered war damage and were faced with arrears of maintenance. Other nations, of course, both allies and enemies, had also suffered heavy losses of shipping during the war, but in many cases special steps of one kind and another were taken, as a matter of Government policy, to assist their replacement and to encourage expansion.

We have also seen during the post-war period the growth of merchant fleets in countries which had not previously owned ships, or had perhaps owned a few engaged mainly in local trades. These countries had been content to rely on shipping services provided by Britain and other traditional maritime nations. But the war showed them the danger of too much dependence on ships that could be, and were, withdrawn when their home countries were assailed, and the lesson was driven home by currency difficulties in later years.

This is a natural development to which we in Britain cannot properly object. What we may, and do, object to is that the pattern of trade should be artificially distorted and traffic forced into these ships, as is happening in a number of countries to-day.

It has recently been argued that this is not discrimination. With respect to those who put this argument forward, there is no other English word to describe it. Nations who adopt this policy may seek to justify it, but they really cannot deny that it is discrimination.

For what it amounts to is that a merchant — who, be it observed, may not belong to the country which imposes the ban — is refused the right to select which ship he uses, in the interests of the shipowners of the country which lays down the rule.

Flags of Convenience

This is, however, not the most serious of the dangers which assail the British Merchant Navy.

There can be no doubt that the most powerful threat comes from the rapid growth of fleets flying the so-called "flags of convenience."

These flags have been used for different purposes. For example, in the United States, where high operating costs made it exceedingly difficult for their ships to compete in the open markets of the world, ships were registered in Panama to enable American owners to employ crews under other than home conditions.

These ships remained American-owned, and had the practice spread no further, it is unlikely much would have been heard of it on this side of the Atlantic.

In fact, during the early part of the last war, the transfer of some U.S. ships to "flags of convenience" enabled them to carry supplies to this country at a time when ships flying the Stars and Stripes were forbidden to do so by the terms of the Neutrality Act.

More recently a new use has been found for these flags. Certain shipowners have discovered that they can so order their affairs as to escape taxation in their own countries, and by registering ships in Panama, Liberia, Honduras or Costa Rica (to name the four principal countries which offer the benefit of practically free registration) they can trade them across the world with little or no liability to tax. Under these conditions the tonnage of ships under the flags mentioned has risen from a mere 800,000 gross tons in 1939 to 10,400,000 tons in 1956.

British shipowners are prevented from following this course by the Merchant Shipping Act, and it is right that they should be — for these ships are not only trading virtually free of tax, but in the unhappy event of war a large number would also be free of requisition, and so able to extort any price their owners like from a Government wishing to obtain their services.

It is obvious that competition from ships operated under these conditions is extremely severe. It is largely because of this and not from any desire to secure a benefit at the expense of other taxpayers, that the shipping industry has consistently urged that some special treatment in the matter of taxation is necessary for its survival.

Skill and Enterprise

The duty and responsibility rest now upon our shipowners to use all their skill and enterprise to combat the competition which faces them from the three sides — from tradition maritime nations anxious, as we are, to retain and if possible enlarge their business, from the new maritime nations seeking to develop their merchant fleets and finally, and most severely, from those shipowners who have contracted in one way or another out of national responsibilities, avoiding the burdens of taxation which fall on the rest of us.

I believe that we shall compete, and compete successfully, provided not merely shipowners but the whole nation realises what we are up against, and provided the nation gives the support that is needed to the firm resolve of British shipowners to maintain and expand our Merchant Navy, on which so much depends.

—From the London "Navy."

MARITIME NEWS

Continued from page 24

"Cutty Sark" now officially retired

The Queen on June 26 declared open to the public the *Cutty Sark*, last of the tea clippers, now laid up at Greenwich in a permanent dry dock.

The Queen thus began the official retirement of a ship which in her heyday outsailed most of her rivals by days—even weeks—in the China tea trade and the Australian wool run.

The *Cutty Sark* was launched in 1869. She once sailed 363 miles in 24 hours, an average of more than 15 knots.

In her declining days—in the 1920s—she served as a tramp under the Portuguese flag, and eventually became a Merchant Navy training ship.

Four years ago a world-wide appeal for £250,000 was launched to preserve her. So far £220,000 has been subscribed.

Australia host to [illegible]

Australia will be host country to an international training centre in fisheries co-operatives and administration.

The training centre will be held from December 16 this year to January 25, 1958, at Sydney and Adelaide. Participants will be nominated by the member Governments of the Indo-Pacific Fisheries Council.

Total enrolments will be limited to about 35.

The training centre is being sponsored by the Food and Agriculture Organisation and the Australian Government, with assistance from the Government of Hong Kong, where a training centre in marketing was held, and from Canada which, under the Colombo Plan, has been assisting the Ceylon Government to develop its fisheries.

Demand for abolition of shipping conferences

Sir William Rootes, British motor magnate and chairman of the Dollar Exports Council, wants abolished shipping conferences which regulate sea freight rates.

In London last month, after he had returned from a six-month's export promotion tour of North and Latin America, Sir William said: "Let the Government bring in the Restrictive Trade Practices Act.

"Let us get some freedom and before we know where we are we will be back as the leading shipping country.

"What we want is a little cut-throat competition in shipping."

Turbine-driven tanker delivered to owners

The turbine - driven tanker *Hydatina*, of 18,000 d.w. tons, built by Lithgows Ltd. for Shell Tankers, and last of four similar ships, was delivered recently to the owners.

Shell Tankers placed this business in April, 1951, as part of a programme of 46 new tankers.

The changing situation can be seen in the current Shell programme, which calls for tankers of up to 65,000 d.w. tons.

Clyde shipbuilders are planning extensive developments to meet this evident demand for larger tankers, and already a number of schemes have been put in hand — for example, by John Brown and Co. Ltd., of Clydebank, and by Lithgows Ltd., of Port Glasgow.

Impetus has been given by the international situation, and the Clyde is thinking in terms of 52,000, 65,000, 83,000 and even 100,000 d.w. tons.

SEARCH FOR OIL

Continued from page 19

it may have to go further. The sea, in its changing moods, can wreck equipment, take lives. But of one thing oilmen are certain: it will demand huge expenditure on one of the most costly engineering projects of all time.

A well, 63 miles off Galveston, Texas, cost a million dollars for drilling alone. Two companies operating in the Persian Gulf estimate that their undersea test well will cost them a total of 14 million dollars, and a company operating off Qatar, also in the Persian Gulf, has spent already 21 million dollars.

Worthwhile Gamble

But oilmen consider the gamble worthwhile. Some experts believe that the underwater exploration will eventually add 25 per cent. to known oil reserves, others predict a doubling of present known supplies.

And so the search goes on — in winds and waves, and on the sea bed where unknown dangers lurk.

Men risk their lives and the "oil sailors" watch anxiously for the "big blow" which may wreck months of patient work and cause cripping losses in equipment.

Off Qatar, in the Persian Gulf, where the waters are shallow but the storms are dangerous, one company lost its mobile drilling platform — a mere cost of 2.5 million dollars!

And in the Gulf of Mexico they look searchingly at the sky and watch the waves break because there the hurricanes blow.

Here in Australia we can only watch and wait until our own oilmen go down to the sea in large numbers to use the same techniques that oilmen the world over use in their unceasing and valiant search for "the wealth beneath the waves."

For Sea Cadets

Evolution of Naval Gunnery

By F. J. Commack

MAN learns by his mistakes and although the shape of guns and even their size, changed little for several centuries, British gunfounders did at least use their experience in producing better guns, while the makers of gunpowder found ways of making better and more uniform powder.

The value of cannon became better understood and whereas at first, guns had been mounted wherever the shape of the ship made it most convenient, it soon became evident that for the future, armament must in a large degree dictate the shape of war vessels, and naval architecture began to change accordingly.

By the time of Henry VIII, the importance of broadside fire had led to the mounting of many guns on every deck, and to a new and better kind of naval tactics, in which boarding lost much of its importance and warships fired broadside after broadside into the enemy, before trying to grapple.

Not that ship design was always sound. Only too often the ship was over-gunned and we find accounts of some that turned over when their guns broke loose during a gale and of others that flooded because their gun ports were so near the water that they became submerged when the ship heeled over in a stiff breeze.

Phineas Pett in the time of Charles II broke new ground in ship design at the yards in Chatham and by Nelson's day we had reached the zenith of ship construction in the era of sail.

But science meanwhile had not stood still. Benjamin Robins with his new ideas on gunnery was only one of many men who in the early seventeen hundreds were delving into the mysteries of chemistry and physics, electricity and mechanics.

England, by 1770, had begun to be a great industrial power, with steam-driven engines in her factories.

By 1820, she could claim to be the workshop of the world and as the leading naval power, was seeking every device that would improve her navy. By 1850, steam-driven screw-propelled warships were part of the fleet and only a few years later, our first iron-clads were launched.

An insistent demand arose for bigger guns with longer ranges; the ships could carry them, we had better steel, new explosives had been discovered, the way seemed open for drastic changes in naval armament.

The latest development in bombardment — the H-bomb. This is a picture of Britain's first H-bomb exploding in the recent Christmas Island test series.

BRITISH engineers responded nobly. Guns of 10 tons weight appeared, of 20 tons, of 60 tons, even of 100 tons! But there was in fact, a limit and two facts soon showed us that we could not proceed indefinitely in this direction.

For one thing, ships became broader and broader in the beam to accommodate these enormous weapons, their ammunition gained in weight, they needed more armour, and before long it grew almost impossible to find room in them for engines powerful enough

to drive them through the water.

On the other hand, we ran headlong into the problem of loading.

A 100-ton gun is a big gun in length as well as in weight and calibre, and it became no easy matter to reach the muzzle of these monsters to load them.

True, breech loading had been tried, but a satisfactory breech sealing device was still lacking and the old muzzle-loader held its own. Guns' crews disliked the "blow-back" of gases from the breech loader and the new explosives soon widened any crack through which such gases could escape.

Both army and navy clung to the muzzle loading principle until in 1879, H.M.S. *Thunderer* managed to "double load" one of her great guns and blew it to pieces together with its mounting and its gun's crew.

The outcry that followed forced a new search for a satisfactory breech mechanism and in a very few years one was found and adopted.

By 1890 guns were being made of improved steel and the muzzle-loader was a thing of the past. The elongated projectile had now taken the place of the round shot and, to keep it steady in its flight, the bore of the gun was rifled so that the shell spun as it travelled towards its target.

All these things helped to give longer ranges and better accuracy with smaller bores, so that ships could carry more guns and house them in armoured turrets.

Naval engagement tended to be fought at greater and greater ranges, though close-combat battle had still to be considered. By this time also, the science of explosive manufacture had progressed considerably and a small shell was capable of doing as much damage as one ten times its size, fifty years before.

We must of course view all these developments not in isolation, but within a frame that held a picture of vast progress in all matters scientific. This was the age of the steam turbine, of oil fuel, of new discoveries in the field of electricity.

Every new invention helped man towards an easier manner of life, but at the same time could be used for increasing the destructiveness of war. The scientists turned their attention to the perfection of naval gunnery. With fast-moving ships, accuracy of fire presented new problems and the Navy needed improved techniques to attain it. Moreover, while guns were able to hit the enemy harder than ever before, we also wanted to hit him oftener and this needed an improved rate of fire.

TO give apparatus that would ensure better accuracy, the opticians joined hands with the mathematician, and by 1920 better sighting gear had been coupled to machines that did in split seconds the range calculations that before had taken many minutes.

To gain rapidity of fire, new means of operating the breech mechanisms of guns were designed, "run-out" after recoil was speeded up and ammunition supply was simplified.

But the best of all for this purpose, the quick-firing principle was perfected in which, instead of the breech being sealed against gas escape by the expansion of an obturator pad in the breech mechanism, a brass cartridge case was employed that swelled when the explosion took place and prevented any of the gases of the explosion from escaping from the breech.

Every modern contrivance was called in to assist the new speed of gun operation; the telephone, electric controls, intricate mechanisms of all kinds were added, until the warship became one of the most complicated of all man's weapons.

To everyone it seemed that we could reach no nearer to perfection. Powerful guns could be loaded, placed at the correct angle and fired, in a matter of moments, shells could tear their way through the toughest armour, an enemy sighted miles away could be engaged and hit repeatedly.

And then, in the Second World War, the final marvel was added and our ships went to sea with a strange metal framework turning and turning on their masts; a framework that could detect an enemy ship far beyond the horizon or in the blackest night and transmit to the waiting gunnery experts below such accurate details that the guns could be laid and fired at an enemy that no one had ever seen and who might well be sent to the bottom before he was even in sight.

Radar had added the final refinement to naval gunnery.

TASMANIAN DIVISION

The Director of Naval Reserves, Captain J. A. Tancred, D.S.C., R.A.N., with Lieut. Cdr. Copeland, R.A.N., inspected all units of the Tasmanian Division of the Sea Cadet Corps recently.

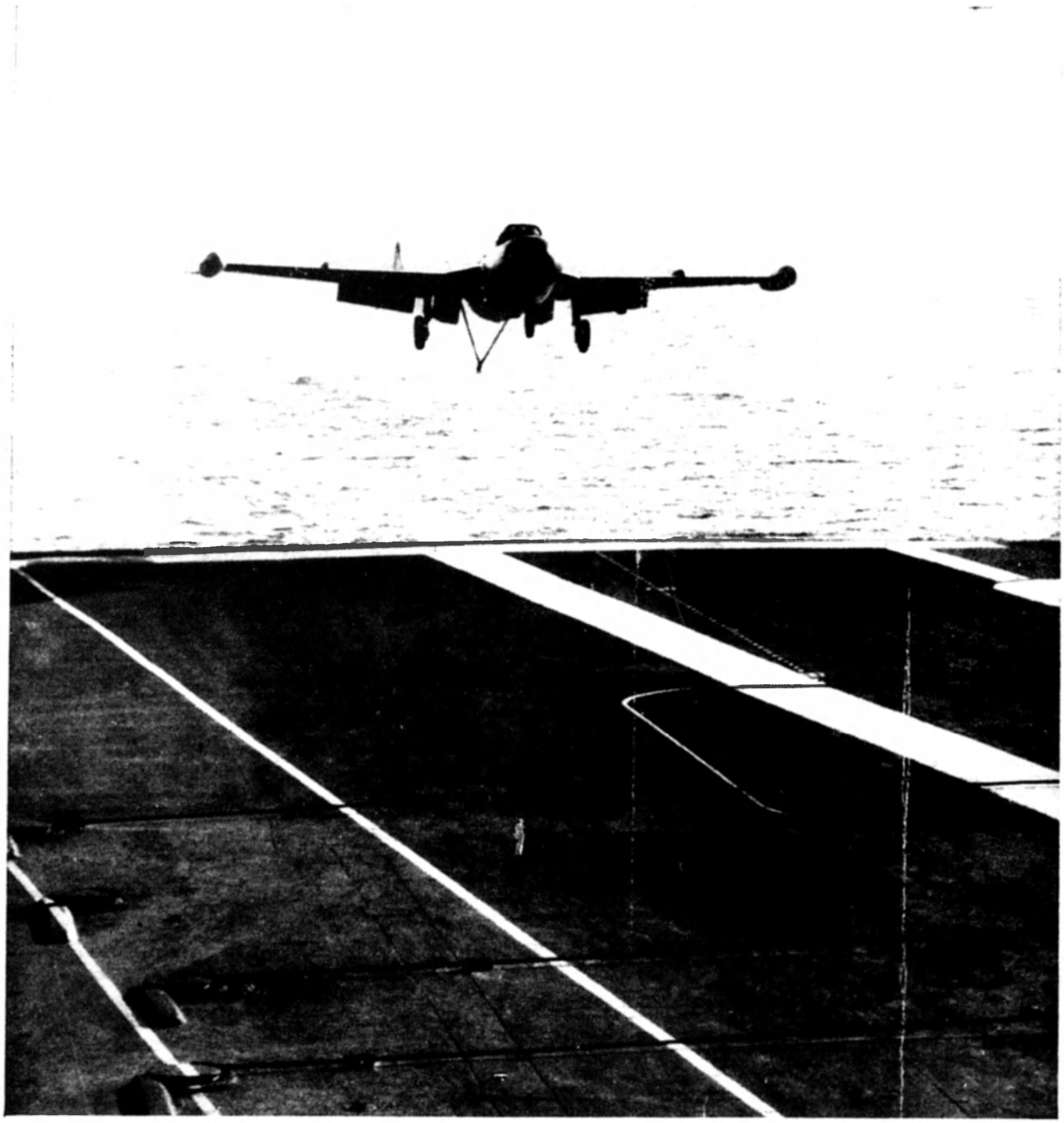
The Andrews Trophy, awarded to the best all round unit for the year, was won by the Burnie unit, T.S. *Emu* with T.S. *Derwent* (Hobart) and T.S. *Tamar* (Launceston) equal in second place.

T.S. *Leven* (Ulverstone) has moved into new headquarters at the Ulverstone Rowing Club shed.

T.S. *Emu* (Burnie) will soon be able to use the boatshed which the unit is building on the banks of the Emu.

All units took part in the Youth Sunday marches. — G.E.W.W.B.

Building Publishing Co. Pty. Ltd., 20 Loftus St., Sydney.



A De Havilland Sea Venom makes its final approach over the round-down of an aircraft carrier. The Sea Venom is a two-seat, all-weather, day and night jet fighter now in service with the navies of Australia and Great Britain.

AIRCRAFT

ENGINES

Fitted with the most up-to-date radar and electronic equipment, De Havilland Sea Venoms form a large part of the fighting power of H.M.A.S. Melbourne, Australia's newest carrier and the largest ship of the Australian fleet.

DE HAVILLAND AIRCRAFT (AUSTRALIA) PTY. LTD.

NAVY

AUSTRALIA'S MARITIME JOURNAL SEPTEMBER, 1957 1/6

CONTENTS

VOL. 20. SEPTEMBER, 1957. No. 9.

Published by The Navy League of Australia, 83 Pitt St., Sydney, N.S.W., and 308 High St., Preston, Victoria.

Circulating throughout R.A.N. Ships and Establishments.

"The Navy" is the Official Organ of The Navy League of Australia and the Ex-Naval Men's Association (Federal).

"The Navy" is the only journal in Australia devoted exclusively to Naval matters generally, and to the R.A.N. in particular.

SUBSCRIPTION RATE: 12 issues post free in the British Commonwealth, 20/-.

Copies of "Herald" photographs published may be obtained direct from Photo Sales, Sydney Morning Herald, Hunter St., Sydney.

THE NAVY LEAGUE OF AUSTRALIA

PATRON:

His Excellency The Governor-General.

FEDERAL COUNCIL:

President: Rear Admiral H. A. Showers, C.B.E. (Retd.).
Deputy President: Cdr. R. A. Nettleford, D.S.C., V.R.D., R.A.N.R.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).

New South Wales Division:

Patron: His Excellency The Governor of New South Wales.
President: Rear-Admiral H. A. Showers, C.B.E.
Secretary: Rear Admiral G. D. Moore, C.B.E. (Retd.).
Hon. Treasurer: F. E. Trigg, Esq.

Victorian Division:

Patron: His Excellency The Governor of Victoria.
President: Captain J. P. Williams, O.B.E.
Secretary: H. E. Tousel, 308 High Street, Preston, N.18.

South Australian Division:

Patron: His Excellency The Governor of South Australia.
President: Lieut.-Comdr. C. C. Shinkfield, R.A.N.R. (retd.).
Hon. Secy.: K. W. Adcock, Esq., 131 Grenfell Street, Adelaide.

Tasmanian Division:

Patron: Vice-Admiral Sir Guy Wyatt, K.B.E., C.B., R.N. (retd.).
President: C. H. Hand, Esq., M.H.A.
Hon. Secy.: Comdr. G. E. W. W. Bayly, O.B.E., V.R.D., R.A.N.V.R. (retd.), 726 Sandy Bay Rd., Lower Sandy Bay, Hobart.

Western Australian Division:

Patron: His Excellency The Governor of Western Australia.
President: D. W. Brisbane, Esq.
Hon. Sec.-Hon. Treas.: K. Olson, Esq., 62 Blencowe St., West Leederville, W.A.

Queensland Division:

Patron: His Excellency The Governor of Queensland.
President: Comdr. N. S. Pixley, M.B.E., V.R.D., R.A.N.R. (retd.), Ryan House, Eagle Street, Brisbane.
Hon. Secy.: Lieut.-Comdr. O. C. McDonald, R.A.N.V.R. (retd.), Box 1441T, G.P.O., Brisbane.

Australian Capital Territory Division:

President: His Excellency, G. E. L. Alderton, C.M.G. (High Commissioner for New Zealand).
Hon. Sec.-Hon. Treas.: Comdr. A. D. McLachlan, R.A.N. (Retd.), 49 Froggatt St., Turner, Canberra, A.C.T. 'Phone J 2311.

AUSTRALIAN SEA CADET COUNCIL

Representatives of the Naval Board:
Director of Naval Reserves, Capt. A. W. L. McNicholl, C.B.E., C.M., R.A.N. (Chairman).
Comdr. F. R. James, R.A.N.
Representatives of The Navy League:
Comdr. R. A. Nettlefold, D.S.C., V.R.D., R.A.N.V.R.
L. G. Pearson, Esq.; L. Forsythe, Esq.
Lieut. (S) F. G. Evans, R.A.N.V.R.
Hon. Secretary: R. Neil Walford.

VOL. 20. SEPTEMBER, 1957. No. 9.

THE NEW DEFENCE POLICY

The way in which the Royal Navy is adapting itself to the new era of nuclear weapons, guided missiles and nuclear propulsion was explained in a statement issued by the Admiralty in London earlier this year.

Britain's main defence effort is now being directed to the prevention of war rather than to waging it, and the main decision is to make the biggest contribution the country can afford to the free world's power of retaliation with nuclear weapons.

This is mainly the task of the strategic air forces and the Royal Air Force is steadily building up Britain's strategic bomber force and stock pile of nuclear weapons.

Another important requirement in the policy of preventing war, however, is to have the means of preventing any limited outbreak of war from spreading into world war.

To quote from the Admiralty statement: "The part to be played by the Navy in peace and in limited emergencies has always been clear. To-day it is more important than ever that our armed forces should be quickly on the spot when there is trouble, to prevent a local fire from spreading."

Naval forces possess great mobility; their carrier aircraft provide striking power and air cover for landings; and their marines are a trained force at immediate readiness for amphibious operations.

To meet its peacetime or limited war commitments, the new Navy is being reorganised into task groups, built round the air power of the carrier.

These groups have taken the place of the battle fleet of the past and form the foundation of fighting strength upon which all naval operations depend.

To enable them to operate for long periods independently of shore bases, increased emphasis is being given to "afloat support."

The existing force of maintenance ships — supply ships, ammunition carriers and oilers — is being modernised, and towards the end of 1957 a start will be made in converting a light fleet carrier into a heavy repair ship.

The front-line aircraft carriers will be kept fully up-to-date in order to be able to operate all existing and planned naval aircraft.

They will have the equipment and facilities to arm their aircraft with air-to-air guided weapons.

Good progress is being made in re-equipping the fleet with new aircraft of the highest performance: a twin-engined day-fighter, the Scimitar, is expected in the fleet by the middle of next year, and the new all-weather fighter, the Sea Vixen, is coming along well. Its armament includes air-to-air guided weapons.

A new naval strike aircraft, the NA 39, will have long range and ability to carry an atomic bomb.

Considerable numbers of Whirlwind helicopters will be in service this year. Their main role is for anti-submarine operations, but they can also carry troops.

The first guided weapon ships of Britain's Royal Navy will be a new design of fleet escorts, larger than the present destroyer.

They will have long endurance and a very powerful armament, including the guided missile, "Sea Slug." The Navy's guided weapons, and the system for firing them, are tested in the experimental guided-weapon ship *Girdleness*.

A number of satisfactory firings with the new weapons have already been carried out.

Admiral Burke, the United States Chief of Naval Operations, recently said in London: "The development of a new weapon has almost invariably been accompanied by a claim that navies were doomed. But new weapons also help navies; new weapons always increase naval strength."

In the United Kingdom Government's view, the phase of fighting with nuclear weapons might not prove decisive; and if a world war dragged on in spite of the appalling devastation caused by hydrogen bombs, the main allied problem might be to provide help and food for a devastated Britain and Western Europe.

Soviet Russia has built up a vast fleet of submarines, supported by strong forces of cruisers, destroyers and naval aircraft, with the obvious aim of preventing the free world from using the sea in war.

The combined strength of the Allied Navies and Maritime Air Forces would be stretched to the utmost to retain control of the sea fight through the convoys in the face of the Soviet naval threat.

The Royal Navy, therefore, in co-operation with Coastal Command Royal Air Force, is as important as ever to the defence of Britain, and even more important than in the past as a means of dealing with peacetime emergencies

It must make the strongest possible contribution to the naval strength of the free world and must be in the forefront in the development of new weapons to meet the new threats on and under the sea and in the air.

British Commonwealth Defence

Britain's Minister for Defence, Mr. Duncan Sandys, last month visited Australia for talks with the Prime Minister, Mr. Menzies, and senior Cabinet Ministers on joint defence measures. The following is a talk which Mr. Sandys gave in the A.B.C.'s Guest of Honour programme after the talks.

By the Right Honourable DUNCAN SANDYS
British Minister for Defence

THE main purpose of my visit to Australia has been to continue the talks on defence which were begun a few months ago when your Prime Minister, Mr. Menzies, and your Defence Minister, Sir Philip McBride, came to London for the Commonwealth Conference.

In the last ten years the problem of defence has completely changed in almost every aspect.

The present threat from Russia, which has replaced the earlier threat from Germany, is in every way far more formidable. The danger of war, instead of being centred primarily in Europe, now extends right round the world.

With the vast territory and population of the Soviet Union and Communist China and their huge armaments, both conventional and atomic, they are in a position to attack almost any country they wish. But I do not believe there is any real likelihood of a direct large scale military attack upon the free world so long as all of us (each country according to its capacity) continue to maintain together an effective system of collective defence.

For to-day, with the greatly increased range and power of modern weapons, no country, however large or strong, can hope to defend itself, except in combination with others. That is why, in the last few years, we have built up a chain of defensive alliances covering all the most critical areas.

Europe is guarded by NATO; the Middle East by the Baghdad Pact; and South East Asia, in which you are particularly interested, by SEATO.

Britain has felt it her duty to join and contribute forces to all these three alliances. In fact, we are the only country in that position.

Under NATO we have to-day some 90,000 British soldiers and airmen in Germany.

In Cyprus and in the Arabian Peninsula, we are maintaining forces of all three services available to support the Baghdad Pact.

As our contribution to the defence of S.E. Asia, we have at present about 40,000 troops of the British Army and Air Force in Malaya and Singapore.

If you add to that the Australians and New Zealanders serving in Malaya, there are altogether close on 43,000 Commonwealth troops in that theatre.

In two world wars, we learnt to admire and respect the fighting qualities of the Australians and New Zealanders, and I can assure you that we are very glad indeed to have your men serving alongside ours in this critical area, the defence of which is so vital for the whole free world and perhaps most of all for Australia.

With the successful progress of the operations against the Malayan terrorists, we shall be able to withdraw some of the units which are now engaged on internal security duties. But it is our intention to continue to keep substantial land and air forces in that area, in addition to our Far East Fleet, based on Singapore.

This system of regional alliances in Europe, in the Middle East and in South East Asia provide defensive strength on the spot and they are a warning to all of our determination to resist attack.

The forces assigned to them are sufficient to withstand limited acts of aggression within the area and, if necessary, they can be rapidly reinforced.

Conventional Forces

However, we must recognise that these defence systems, which are composed primarily of conventional forces, could not by themselves withstand, for more than a limited period, a full-scale all-out attack by Russia and China, with their immense superiority in numbers and in conventional arms.

But fortunately our conventional forces, vitally important as they are, do not have to bear the strain alone. Behind them stands the deadly power of massive nuclear retaliation.

So long as the free world possesses this power, and shows that, if need be, it will not shrink from using it, Russia, even though she too possesses nuclear weapons, will assuredly hesitate to start a war (which must inevitably result in the wholesale devastation of her cities and the annihilation of a large part of her population).

At present, this nuclear deterrent is provided almost wholly by the United States, with its immense stock of atomic and hydrogen bombs and its chain of air bases stretching around the globe.

Continued on page 8

The British Minister for Defence, Mr. Duncan Sandys (right), with the U.K. High Commissioner to Australia, Lord Carrington, on his arrival by air at Sydney Airport.

COMMONWEALTH DEFENCE

Continued from page 6

The fact that we enjoy peace and freedom to-day is largely due to the nuclear strength of the Americans, to whom we are all profoundly grateful.

But we in Britain, as the second largest military power in the free world, with our Commonwealth links and other obligations and interests, have not felt it right to remain entirely dependent upon another country, however friendly, for this vital nuclear element of modern defence.

That is why, soon after the war, Britain decided herself to enter the nuclear field.

We have completed the development of a powerful atomic bomb. This is now in regular production; and we have already built up a reasonable stockpile of these weapons.

We are now, therefore, in a position to make a limited contribution to the nuclear deterrent either from bases in Britain, or from bases overseas.

We have been much assisted in the development of the atomic bomb by the testing facilities provided by Australia—first at Monte Bello Island and now at Maralinga.

Your help has been quite invaluable and we greatly appreciate your co-operation.

As the world saw at Hiroshima, the atomic bomb is a weapon of devastating power. But, since then, hydrogen bombs, hundreds of times more powerful, have been evolved.

Britain successfully tested her first hydrogen bomb at Christmas Island a few months ago, and we intend to manufacture a stock of these also.

For quite a number of years ahead, manned aircraft will continue to be the primary method of delivering nuclear weapons over long distances. But, in due course, the manned bomber will undoubtedly be replaced by the long-range ballistic rocket.

We are pressing ahead with the development of these rockets in close co-operation with the Australian Government. With the increasing range of the weapons to be tested, the vast area and unique facilities which Australia has provided at Woomera will be supremely valuable; and, when I went there last week, I was glad to see the splendid progress made since my visit four years ago. This, I think, is another fine example of co-operation between Australia and Britain, within the framework of the British Commonwealth.

The Commonwealth, like all living organisms, is constantly evolving and adapting itself to the changing circumstances of the world.

It is impressive to-day to see how wide this association of free nations has become.

Sharing as it does our British parliamentary traditions and our British standards of justice, the Commonwealth provides a unique link between nations, large and small, of different races and creeds, spread over the surface of the globe.

In the difficult world of to-day, in which there is so much suspicion and mistrust, the British Commonwealth can, I believe, make a very special contribution to international understanding.

The influence and leadership of its members in different continents and among different groups of nations may well play a material part in restoring confidence to the world. No nation wants war and war can serve no nation's interest.

If only this essential confidence can be restored, the way will be open for disarmament and real peace; once released from the fear of war and the burden of armaments, there is scarcely any limit to the progress which man can hope to achieve in this scientific age

---

Four new tankers join BP fleet

Four new tankers have recently been added to the BP. fleet — two of 16,000 tons s.d.w. and two of 32,000 tons s.d.w.

The 16,000-ton *British Renown* was built by J. L. Thompson & Sons of Sunderland. It was taken over from the builders on June 17.

The *British Vigilance*, also of 16,000 tons, was built by Sir James Laing & Sons of Sunderland. It was taken over on June 21.

The 32,000-ton *British Valour* built by Swan, Hunter & Wigham Richardson of Wallsend-on-Tyne, was taken over on July 11.

The *British Glory*, also of 32,000 tons, was built by Vickers-Armstrong at Barrow-in-Furness. It was taken over on June 8.

Old Russian battleships to be scrapped

The old Russian battleship *Oktyabrskaya Revolutsia* is to be scrapped and the *Sevastopol* is expected to follow her.

Only the ex-Italian *Novorossisk* in the Black Sea remains of the Soviet armoured fleet, and with the Chilean *Almirante Latorre* and Turkey's *Yavuz*, represent the last survivors of the first "Dreadnought" decade of 1906-16.

The *Petropavlosk* has been laid up for a long time as a training ship without her forecastle, which was badly damaged by air attack in 1941.

The *Poltava* was broken up in 1923.

A TASK IN THE INTERNATIONAL GEOPHYSICAL YEAR IS . . .

STUDYING THE WAVES

By **PROFESSOR J. C. JAEGER**

From an A.B.C. Talk

THE study of tides and waves in the oceans is one of the oldest and most important branches of science but you would be surprised to know how little we really know about the details of how waves behave near the shore and about the way in which they are generated at sea.

One reason for this is that the waves we see on the beaches usually come from storm centres many hundreds of miles away in the open sea.

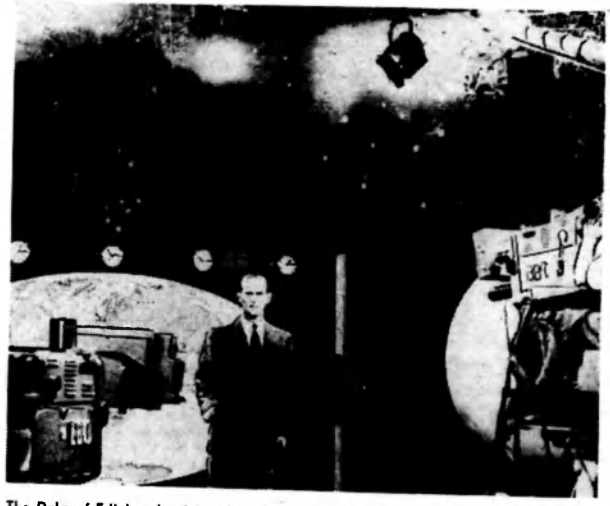
To study the way in which ocean waves are generated you have to go to these storm centres and they are not altogether pleasant places.

Vaughan Cornish, who was one of the great early observers, writes of such an experience: "Several ships sank with all hands and our liner was for a time in peril until brought around with great difficulty to face the waves which had struck her abeam. With just enough steam to hold her bows head-on to the sea, the ship was kept hove-to until one o'clock in the afternoon of this memorable day. The opportunity for which I had longed for years had arrived and at last I had a stationary post of observation amidst the great waves of the ocean."

Clearly he was a real enthusiast with a cast iron stomach and he goes on to describe how he sat in his deck chair with his stop-watch observing the waves.

His great difficulty was that a ship bobbing about in a high sea is a very bad place from which to get accurate observations of waves, and it is only in the last few years

Continued on page 10



The Duke of Edinburgh, pictured in the studio of the British Broadcasting Corporation during the programme "The Restless Sphere." The seventy-five-minute broadcast heralded the beginning of the International Geophysical Year, which Prince Philip said was "the greatest example of world-wide scientific co-operation in the history of our race."

During the International Geophysical Year, which lasts eighteen months, scientists in 64 countries will make observations for a common pool of knowledge.

that we have been able to make measurements with instruments fitted in ships.

The height of the wave relative to the ship can be measured by a pressure-sensitive element and the motion of the ship measured by an accelerometer so that the actual shape of the waves the ship is passing through can be recorded.

The waves travelling in different directions can be studied by steaming on various courses.

Storms at sea are associated with meteorological disturbances such as cyclones or cold fronts; they are often several hundreds of miles across and move at speeds of the order of thirty miles an hour.

The level of the sea within the storm area changes like an inverted barometer so that if the barometer falls by one inch the sea level will rise by about a foot.

Within the storm area there will be squalls of wind gusting at speeds of up to sixty miles an hour or more.

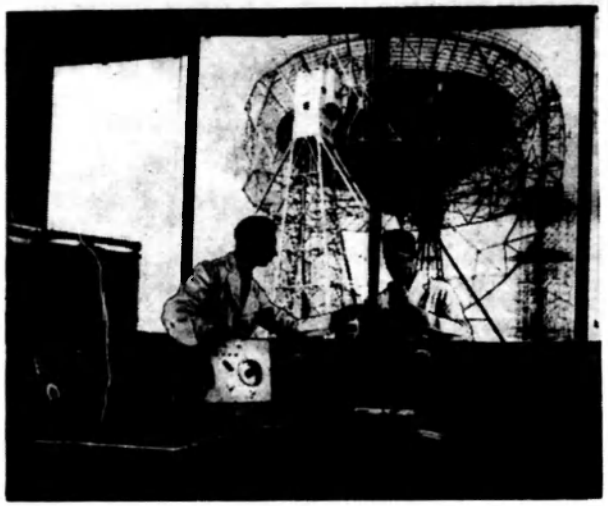
These squalls build up waves, essentially, by pushing on their crests until they are moving with almost the same speed as the wind.

The height of the waves depends on the time for which the squall blows: the longer the time, the higher the waves. Thus a storm produces a confused system of waves moving in all directions and with periods of up to 15 or 20 seconds.

The period of a wave is the time of one up and down oscillation, and periods of 5 to 10 seconds predominate in the waves coming out from the storm area.

To follow the progress of these waves you have to know a little more about the way in which water waves move.

In deep water the speed of the waves depends only on their period, and there is a rough rule that the speed in miles per hour is three and a half times the period in seconds.



A view taken from the control desk of Britain's radio telescope now nearing completion at Jodrell Bank in Cheshire. It is by far the largest in the world and has been designed to follow automatically a star in its course across the heavens, taking into account the movement of the earth round its axis and round the sun.

The telescope is constructed of steel and weighs 2000 tons. The reflector bowl, which rotates on two great trunnions, alone weighs 750 tons.
The telescope will be able to reach out into space to a distance of 1000 million light years. It will be able to send radio pulses to the planets and receive back echoes from which it may be possible to deduce valuable information. It can also be used to track earth satellites.

The long rollers which come into our surf beaches have periods of about 10 seconds and so they move with speeds of about 35 miles per hour in deep water.

The waves which come out from a storm centre have, for the most part, periods of between 5 and 10 seconds but those with shorter periods die away more rapidly so that the effect at a distance of a thousand miles or so is that of about ten seconds period travelling away from the storm. On this, of course, there will be superimposed chop or shorter waves whipped up by the local winds.

Another important effect caused by storms at sea is the small oscillations which frequently appear on seismograph records. Seismologists call those microseisms.

Their origin was a puzzle for many years, and they were attributed to many causes such as the pounding of surf on beaches. But it has recently been shown that when two sets of ocean waves, of the same period but travelling in opposite directions, collide, the floor of the ocean is set into vibration with half the period of the waves.

Thus the common waves of ten seconds period would cause microseisms of five seconds period. These vibrations of the ocean floor are transmitted along it and recorded on seismographs near the coast.

Since microseisms often originate in cyclone centres it is possible to use them to track the movement of cyclones at sea.

This is one problem which will be studied in the International Geophysical Year and on which scientists in the University of Queensland have been working for some time.

So far I have been talking about the way in which waves are generated in the deep oceans, but when they reach the coast things become much more complicated.

The theory of water waves is much more difficult than that of other types of wave motion such as light or sound.

This is because the effect of the depth of the water on the speed of the waves is rather complicated.

In deep water, the water movement due to the waves dies out rapidly with increasing distance from the surface and the speed of the waves is independent of the depth and depends only on the period of the waves.

But when the length of the waves, that is the distance between successive crests, is greater than the depth of the water, the bottom begins to make its influence felt and to slow up the waves so that in shallow water the speed of the waves depends on the depth.

For waves coming in from the oceans, this slowing up begins at the edge of the continental shelf and tends to turn the waves so as to face inwards towards the shore.

And as the water gets shallower the slowing up becomes more important and ultimately leads to the breaking of waves on sloping beaches.

The story is not so simple as this since many other effects occur in shallow waters. For example, you may have noticed that the highest waves on a surf beach occur in groups at intervals of a few minutes.

These groups are called surf-beats and are associated with long waves of the same period.

"Coastal engineering" is the name given to the study of practical problems such as the prevention of flooding and erosion by tides and waves and it can be of enormous financial importance.

But it must be based on sound theory and observation of tides and long and short period waves.

Scientists were very interested in these subjects in the nineteenth century but they became unfashionable when the vogue of the atom set in.

Recently, with the possibility of making large scale observations with modern apparatus there has been a revival of interest in them.

To a great extent this has been due to the work of the large Oceanographic Institutions such as Scripps and Wood's Hole in the United States and the National Institute of Oceanography in England.

Because of this growing interest, the co-operative study of tides and waves is one of the most important activities of the International Geophysical Year.

Australia, New Zealand, France and the United States are trying to get as complete a cover as possible in the Pacific.

Most of the phenomena I have been mentioning, including tidal surges and sometimes long waves, show up on tide recorders and, in addition, we are installing a number of long wave recorders which are specially sensitive to periods of about 5 minutes and do not react to waves of short periods.

These instruments are mostly being installed near lighthouses and are looked after by the keepers and, in fact, without the friendly co-operation of the Lighthouse Service we could not have done very much.

OPERATION HANDCUFF

By LIEUTENANT-COMMANDER C. W. TAYLOR, O.B.E., D.S.C., R.D., R.N.R. (Retd.)

SHE lay low in the water. At times her conning tower seemed to have no substance with the long black shape that was her hull. I found myself counting the figures assembling on her deck, in obedience to the order just broadcast through the loud hailer from *Lowestoft*. I decided that there were still some of her ship's company below. I turned to Commander Hunter, who was gazing intently at the U-Boat as she rode lazily in the low Atlantic swell, barely two cables' length away from us.

"I think we should board her now, Sir, my blokes are all ready." I pointed to the destroyer's whaler as it hung at the height of the lower deck, on its davits, manned by two of the *Lowestoft's* ship's company.

My 10 members of *Vampire's* ship's company, in their submarine sweaters, were standing in the waist, ready to slide down the manning ropes as soon as the boat hit the water.

It occurred to me at that moment that this was a very fitting climax to our somewhat arduous and exciting commission of nearly 18 months in the Mediterranean.

Our moan at having our V.E. celebration interrupted was a thing of the past.

"Right, you can get cracking as soon as you like." The tall, slim Commanding Officer of *Lowestoft* grinned at me. "Good luck," he added, "bring 'em back alive!"

"Heil Hitler," I murmured and slid down the ladder to the lower deck.

Three minutes later we were pulling towards *U.541*. The swell seemed steeper now we were actually in it. I looked back. The four 3-in. guns, manned and trained on the U-Boat looked very reassuring.

Unstrapping the holster of my pistol, I turned my attention to our objective. It was going to be awkward boarding her in that swell.

I decided we should go alongside her port bow and benefit by what little lee she was giving us from the wind.

"Cox'n, you remain in the boat with the two destroyer lads and fend her off. When the Huns get into the boat, let them do the rowing. You'll have to make several trips, I expect. Let them make the last trip without you. I want you for the passage."

"Aye, aye, Sir," replied Kelly. He was as phlegmatic as the day he joined *Vampire* before launching at Vickers nearly two years ago.

"Miller, you stick by me and don't use that Tommy gun unless I tell you." Leading Seaman Miller grinned and patted the weapon by his side. Miller's wife had been killed in East London by a direct hit on their house. I wondered whether I was wise to let him have the gun.

We bumped alongside the U-Boat and I jumped for the casing. I mis-timed the lift of the swell and stumbled, not quite falling flat on my face. Someone helped me to my feet. I saw the lads running along the deck towards the conning tower, led by C.P.O. Sellers.

We had rehearsed this many times. I had no worries. They all had their specific jobs to do and providing there was no opposition, *U-541* should be in our hands in no time. I turned my attention to the German officer standing beside me.

"Where is your Captain?" I asked. He pointed to the conning tower. I made my way aft, pushing past the assembled crew standing on the casing.

THEY looked as if they hadn't seen the sun for months. They probably hadn't, the submarine had a Schnorkel.

"Kapitan Lieutenant Petersen." He saluted. I returned the salute and studied the man. I liked what I saw. He was fair haired, with calm blue eyes. I felt he was younger than he looked. He wore the Iron Cross 1st Class and several other decorations.

"You understand, Captain, that you are to surrender your submarine to me and obey my orders. I shall hold you responsible for the safety of my boarding party," I said. He glanced at Miller, close behind me, who I felt sure was fingering his Tommy gun.

"I understand. I have my orders from Admiral Doenitz. I shall obey them. There will be no trouble." He shrugged his shoulders. His English was excellent.

"Good," I replied. "You will leave on board one Engineer Officer and two engine men. The rest of you will go to the destroyer." I pointed in the direction of *Lowestoft*. He seemed surprised.

"Your men will not understand the Unterseeboot," he said.

"I am a British Submarine Commander," I replied, "and these are my men." He suddenly smiled for the first time and held out his hand. I took it.

"You will give me 10 minutes to get ready?" he asked. I nodded and he disappeared down below.

C.P.O. Sellers emerged from the hatch. He had a large bruise on his cheek.

"Everything O.K. down below, Sir, and all the sea Kingstons are shut." He fingered his face.

"Well done, Chief." I was relieved to hear that any risk of their scuttling the boat had been catered for. "What happened to your face?"

"There's a nasty piece of work down there, a real Nazi. I fixed him with a spanner," there was a note of satisfaction in his reply. I glanced at Miller. He looked green with envy.

"Where is this fellow, now?" I asked.

"The Hun Skipper was giving him hell in the control room when I came up to report to you, Sir," replied Sellers.

I nodded. I hoped that was all the trouble we were going to have.

"Chief, start getting these fellows into the boat, and tell Kelly to take as many as he can, they can double bank on the oars." I watched Sellers shepherding the Jerries into the boat.

THEY seemed docile enough. I wondered how many men were still below and was about to call down the hatch when I heard shouting and noise coming from down below.

A German appeared at the top of the ladder closely followed by the Captain. Before anyone could do or say anything this new arrival came right up to me and spat in my face.

"English pig!" he snarled. There was a sudden burst of fire and he clutched his leg. Miller stood with the Tommy gun smoking in his hand.

Petersen went over to the man and let forth a torrent of German at him. I got the impression he was not being sympathetic. I wiped my beard and shouted down for someone to get some bandages. The man was bleeding badly from his left leg.

"I regret this, Kommandant," Petersen had joined me as I watched the whaler pulling towards *Lowestoft*.

"Not your fault, Captain," I replied, "I'll send him in the next boat load." The destroyer's Aldis started to blink. Miller was reading it aloud.

"Heard firing, any trouble?" I admired Hunter's brevity.

"Reply, 'Spot of temper, expect one German casualty in next boat. Situation normal'," I said and Miller reluctantly laid down his gun and started semaphoring my message.

Petersen, I suddenly noticed, had changed into his No. 1 uniform and looked the complete German Naval officer. I became very conscious of my own rather faded khaki shirt and shorts.

"How many men are still down below?" I asked him.

"Only the Engineer and two Obermaschinists," he replied.

"Good, please tell some of your ship's company to put that man in the boat," I said, pointing to the rather deflated looking product of the Third Reich, sitting clutching his leg at a safe distance from Miller, who had retaken possession of his beloved Tommy gun.

As the U.Boat commander supervised the moving of the casualty into the boat, which had just returned alongside, I lit my first cigarette since we had left Lowestoft and glanced at my watch. Only 45 minutes had elapsed since we had lowered the whaler. It seemed longer, somehow.

PETERSON came back on the conning tower.

"I will go now," he said, and saluted me, standing very straight. I noticed he had a large autographed portrait of Doenitz in his hand. "I have naturally destroyed my code books. The navigation books are safe and the Unterseeboot is at full buoyancy. The Anschluss compass is not working. My engineer will obey your orders." His report was concise and complete, well in keeping with the man himself.

I felt a surge of sympathy for him. He must be going through hell inside himself. I tried to visualise myself in his place. I remember hoping I would have the same dignity.

"*Auf wiedersehen*, Captain, and thank you," I held out my hand. He shook it firmly and turned away. I watched him glance up at the White Ensign which was now flying above the Reichkriegflagg, before he got into the boat. I was glad to see that Coxswain Kelly, standing on the deck of the U-Boat, saluted him as he went over the side.

I wished I had remembered to bring a bos'un's pipe.

—From "The London Navy."

NEWS OF THE WORLD'S NAVIES

Germany salvages wartime submarines

The West German Navy's first submarine *UW20* was put afloat at Kiel, recently.

She is the former *U2365* of 250 tons which was scuttled off the Danish coast in 1945, salvaged about a year ago, and now reconditioned for training purposes.

The following notice, which appears at intervals in a German monthly naval paper, throws a side light on one way in which the Germans are managing to build up their Navy again: "Hints from former naval personnel have led to our locating and salvaging *U-1* (ex *U-2356*) amongst others. He who gives us such hints will partake of the pecuniary advantage resulting from such salvages."

The salvaging of *U-1* was followed by the recovery of *U-2*, both of Type XXIII, and some weeks ago another boat of Type XXI (the peroxide design) was detected by means of electro-acoustic equipment in Flensburg-Fohrde, north of Kiel.

Although undamaged, it is doubtful if she will be allowed to commission in Germany as her displacement exceeds the 300 ton limit allowed for submarines.

By the end of this year it is hoped that four boats, all salvaged and reconditioned, will be in service at a cost of less than one-third of newly built vessels.

The Germans aim to muster two mineships, 18 destroyers, 40 M.T.B.s, 54 sweepers, 10 escort ships, 12 submarines, 36 landing craft and 58 aircraft.

The defence committee of the Bundestag has agreed to the purchase of seven "Hunt" and "Black Swan" class frigates and three M.T.B.s from Great Britain; one sub-chaser and six sweepers from the U.S.A.; and five sweepers from France.

French Naval movements

Fleet escorts *Casabianca*, *Maille Breze*, *Guepratte* and *Du Chayla* have been commissioned.

The escort vessel *Le Bourguignon*, built in France under the Off-Shore Programme, was finally transferred in June by the U.S.A.

The frigate *La Confiance* (ex-*Tonkinois*, ex-H.M.S. *Movola*) replaces the ageing sloop *Dumont D'Urville* in the Pacific.

At the same time, the ex-U.S. minesweepers *Zinnia* and *Petunia* replace their sister ships *Lotus* at Tahiti and *Tiare* at Nouema.

They will be renamed after their predecessors.

The fishery protection vessel *Ailette*, ex-German minesweeper M.24, has been replaced by the frigate *L'Escarmouche*, ex-H.M.S. *Frome*.

New helicopters for A/S work

The first deliveries of a new Mark of Whirlwind helicopter, designed for anti-submarine operations, have been made to the Royal Navy by Westland Aircraft Ltd.

The Mark VII Whirlwind, as it is known, is the first to be built in Britain specifically for submarine warfare.

It has been designed to carry equipment and weapons capable of detecting, seeking out and destroying its foe.

The first of the new Whirlwinds were delivered to the helicopter flight of No. 700 Squadron with whom they will undergo intensive proving trials before going into general squadron service.

The flight is commanded by Lieutenant-Commander J. S. Sproule, R.N., who invented the Sproule rescue net and other helicopter devices and equipment.

The helicopters with their log books were handed over to Lieutenant-Commander Sproule and his pilots at Yeovil by Mr. E. C. Wheeldon, Managing Director of Westland Aircraft, Limited.

Helicopters transfer stores at sea

An interesting operation took place on the *Ark Royal's* return to the United Kingdom.

In the approaches to the English Channel, a team of helicopters transferred the entire effects — several tons of equipment, heavy stores, personal luggage and maintenance crews — of one of *Ark Royal's* squadrons to H.M.S. *Bulwark*.

The operation was done in 50 "lifts" as the ships steamed two cables apart.

U.S. may have to increase manpower

U.S. Admiral Arthur Radford gave a warning last month that the United States might have to increase its own defence strength "so that nearly every able-bodied young man of military age would spend several years in military service overseas."

This, Admiral Radford said, would be the alternative if Congress refused to grant the full foreign aid programme asked for by President Eisenhower.

Admiral Radford, former chairman of the U.S. Joint Chiefs-of-Staffs, was one of a delegation from the Administration giving evidence before the Senate Appropriations Committee.

Admiral Radford said the cost would be "staggering" if the U.S. had to increase its manpower strength.

"We could adopt a 'Fortress America' concept," he said.

"In the world we live in to-day, such a concept is entirely negative and would merely mean that we postponed an ultimate and violent showdown with international Communism or, in the long run, would capitulate."

South Africa's navy is growing

Nations of the Commonwealth are making an increasing contribution to British naval strength.

The South African Navy, at present, has ships valued at £20,000,000 under construction or on order at British shipyards.

This was made known by Brigadier H. S. Cilliers, military adviser to the South African High Commissioner in the United Kingdom, at the launching ceremony of one of the ships, the coastal minesweeper *Windhoek*, from the yard of Messrs. John Thornycroft, at Southampton.

"In a few years," said Brigadier Cilliers, "we will be able to play our part in ensuring the free passage of shipping not only round the strategically important Cape of Good Hope, but through waters surrounding Southern Africa, should the need arise."

In 1939, the South African Naval Forces consisted of two officers, one rating and half a ship, plus the services of a fishing survey vessel for approximately six months of the year. To-day the strength of the South African Navy is 2,000 officers and men.

Encouraging as this may be, economic and security factors call for a rapidly increasing contribution from the Commonwealth.

This is particularly so in the Pacific. Since the War, the Royal Australian Navy has taken a far greater share than formerly in the security of the Southern Pacific, but it is the opinion of Admiral Stump, the Commander-in-Chief of the United States Pacific Fleet, that Australia's forces in the Pacific should be ten times as strong as they are.

R.A.N. aircraft carriers will visit S.A.

The Royal Australian Navy aircraft carrier *Melbourne* will visit Adelaide from October 24 to October 28, accompanied by the fast anti-submarine frigate *Queenborough*.

The aircraft carrier *Sydney*, the Fleet training ship, will visit Port Lincoln at the same time.

The *Melbourne* flagship of the Australian Fleet will be wearing the flag of the Flag Officer Commanding the Fleet (Rear Admiral D. H. Harries, O.B.E.) and will be commanded by Captain O. H. Becher, D.S.O., D.S.C. and Bar.

The *Queenborough* will be commanded by Captain C. M. Hudson, R.A.N., Captain (F.) 1st Frigate Squadron, and the *Sydney* by Captain J. S. Mesley, M.V.O., D.S.C., R.A.N.

The three ships will pay their visit to South Australia following the conclusion of Fleet exercises in the Jervis Bay area.

More U.S. carriers to use mirror system

The decklanding-by-mirror system, invented for British aircraft carriers, is to be installed on more United States ships and naval bases.

The U.S. Navy has found it has cut the accident rate for planes landing on carriers by more than half — from 2.4 per thousand landings to 0.98.

In this it was aided by another British invention, the angled deck.

A U.S. naval spokesman has announced that the mirror landing system is to be installed in an additional 14 American aircraft carriers and on the runways of 60 naval air stations.

Under this British system the pilot focuses on a spot of light reflected in a large curved mirror on the flight deck and is thus guided to follow a path which brings the plane safely to the deck.

PREPARING FOR THE SAILING SEASON

With the sailing season opening this month, hundreds of enthusiasts have been busyagetting their craft ready. At the Balmoral 12-foot Sailing Club the White family, from Mosman, spent one Sunday last month scraping their Moth-class Taeping. From the left they are: Sabina (8), Dinah (13), Camilla (10) and Nicky (6).

THE BIG TANKER PROGRAMME

Where Does the Money Come From?

As the oil companies expand their trade, tanker-building orders are rising spectacularly

By a Special Correspondent

THE other week, a major oil company in Britain announced another new tanker-building programme — covering 26 tankers totalling about 1,150,000 deadweight tons — the cost of which will approximate £80 million at prevailing prices.

This announcement followed hard upon the statement by another oil-company executive that during the next four or five years the petroleum industry would spend about £300 million annually on tanker construction — exclusive of any accompanying expenditure on this work in the U.S.A. and the U.S.S.R. by the nationals of these countries.

For countries such as Britain, whose industrial activities include shipbuilding as a substantial undertaking, the envisaged tanker programme must be of great potential value. In the case of the U.K., for example, tanker building has habitually accounted for between 45 per cent. and 55 per cent. of all work reaching its yards during the past ten years.

The prospect of an indefinite continuation of such specialist work will be wholeheartedly welcomed.

Yet even as the thousands of shipyard employees swarm about the new vessels taking shape on the stocks, they can hardly help but wonder from time to time as to how the money is raised by the oil companies wherewith to pay for so prodigiously costly purchases.

The Petroleum Information Bureau in Sydney says that the first fundamental to be understood is the essentially international basis upon which the petroleum industry is founded.

It stresses that despite the fact that in some areas, such as Persia, expediency has dictated a measure of co-ordination of effort, the international character of the oil industry does not imply any agreement between the major oil companies on mutually convenient production or marketing spheres of interest.

THE Petroleum Information Bureau states: "Competition in every single phase of the industry's operations, from the securing of rights to explore for fresh oil resources to extended outlets for finished products, is fiercely — if healthily — keen. A company holds its place through one merit only — efficiency.

"No comfortable 'agreement' cushions it against opposition from its rivals.

"In this connection, Britain furnishes an excellent example. Despite her substantial participation in oil refining, Britain has only a relatively token output of crude oil itself (currently running at the rate of about 65,000 metric tons annually).

"Yet British interests, including their association in certain areas with Dutch partners, are now concerned in oil production in over 20 different countries and with these partners, are responsible for the recovery of well over 100 million metric tons of petroleum a year.

"Equally widespread are the refining and marketing operations of these interests — operations which extend from North America and Latin America through Europe to Oceania and the Far East.

"This vast distribution of interest in the international petroleum industry brings in its wake correspondingly large gross earnings to companies operating on a world-wide scale—and since these companies are almost entirely self-financing, finding 80 per cent. or more of their working capital from their own resources, only large-scale earnings are adequate if future financial requirements are to be met.

"IT has been said that if the petroleum industry made the same proportionate call upon the public money markets as is made by some other major enterprises, there would be a grave risk of these markets collapsing under the strain with a crippling shortage of capital all round.

"As the industry is now spending, in all currencies, the equivalent of £3,000 million annually on its varied development projects, it is easy to appreciate the drain that might be made on the public money markets if the oil companies were to adopt a less provident policy over the husbanding of their earnings.

"The average net profit (wholesale) per gallon on all finished products is less than one penny. It is these humble coppers, in their almost countless millions, that form the great bulk of the industry's working capital. Some of them will go to pay for the new tankers whose construction is so largely helping to keep British shipyards fully occupied."

THE SOVIET'S SEA POWER

By J. MEISTER

SINCE the end of World War II, the Soviet Navy has been much expanded, and this development is bound to intrigue and disturb the Western nations and above all Britain who depends so much on her sea-borne trade.

It must nevertheless not be overlooked that several times in the past the Russian Navy has already held a position second-to-none, after the Napoleonic Wars for example. The Crimean War and the conflict with Japan, however, led to the almost complete downfall of Muscovite sea-power.

To-day, Soviet Russia is again the second naval power after the U.S., but only so far as tonnage of warships is concerned, and not if one considers fighting value.

As a matter of fact, Russia has so far not a single aircraft carrier (against over 110 among NATO powers) nor any modern battleship (against 18 among the Allied nations).

Since the war Russia has commissioned at least 21 cruisers, while a few more may still be building.

The Soviet Navy has actually six prewar-built cruisers of "Kirov" type, five cruisers of "Tchapajev" type, the keels of which were laid down before the war but which were not completed before 1948-49, and at least 16 postwar-built cruisers of the "Sverdlov" type.

One former German cruiser, another of Italian origin, and two very old cruisers built for the Czarist Navy complete the picture. Against these 31 Soviet cruisers, the NATO nations have over 100 cruisers, including 21 heavy U.S. cruisers with 8-inch guns.

Besides the Russian effort to construct cruisers, the build-up of the destroyer force deserves mention. At the end of the war, the Soviets were left with about 40 destroyers of prewar design.

They soon added about a dozen units of the "O" class of 1,800 tons, followed by the "Skory" class of 2,200 tons. The "Skorys," of which more than 70 were built between 1950 and 1955, were the first Soviet-built "ocean-going" destroyers.

The Soviets have since produced two further improved and heavier types, the "Tallin" class of at least 3,000 and the "Kotlin" class of more than 3,100 tons.

While the classic armament of these latest additions to the "Red Navy" is rather weak (four 3.9-inch, 12 or 16 37-mm. guns, 10 torpedo tubes and mines) it is suspected that they may have, or receive, a retractable armament of launching platforms for guided missiles and A.A. rockets.

Weak A/S equipment

Among the surprising features of the new Soviet cruisers and destroyers is the reliance upon both radar and optical gunsights, strong torpedo armament, and very weak anti-submarine equipment.

Against about 150 modern Russian destroyers, which might be used in offensive operations, the Allies possess more than 460 such units, ocean-going, fast and powerful.

Nevertheless, it must be stressed that in peacetime and during the first few months of a third world war, the Allied supremacy would remain a matter of paper strength only, because roughly two-thirds of the existing NATO warships are laid up in reserve, while in the Soviet Navy even in peacetime no major warships are decommissioned.

Fifty years ago, when the battleship was still the "capital ship" and when naval actions were won by gunfire and naval wars by the outcome of a few such engagements, Russia's sea-power was much hampered by the fact that geography imposed the maintenance of separate fleets in the Baltic, the Black Sea and the Pacific.

Russia, being above all a land-power, could not afford to keep strong enough fleets everywhere, nor was she able to concentrate her three main fleets without interference from the enemy.

This was one of the primary causes of the loss of the war against Japan 1904-05.

But under to-day's conditions of naval warfare, which do not call for any concentration of heavy warships, the peacetime distribution of the Soviet naval forces may prove rather advantageous for the Russians.

The geographical conditions favour the break-out of cruisers based upon Murmansk-Polaranoje and Petropavlovsk into the Atlantic and Pacific, and it may, therefore, prove more difficult to "bottle-up" potential Soviet raiders than was the case with the German commerce destroyers during both world wars.

The actual distribution of Soviet surface ships may be as follows:

	Arctic	Baltic	Black Sea	Pacific
Cruisers	6	11	8	6
Destroyers	30	60	20	40

Pacific fleet grows

It seems also probable that the transfer of cruisers built in the Baltic to the Arctic and from there with the help of icebreakers via the Northern Sea Route to the Pacific, will continue and further strengthen the Soviet Pacific fleet, which may soon reach 45 per cent. of the total tonnage of Russian naval forces.

Another possible move may be the creation of a Russian Mediterranean fleet (which existed between the eighteenth century and 1914 almost without interruption) of a few cruisers, destroyers, submarines and depot ships.

Such a fleet could, like the U.S. 6th fleet, cruise between Jugoslavia, Albania, Syria and Egypt, staying a few weeks in each country and creating additional political and psychological troubles and problems in the Balkans and the Near East.

But if we look at what the Russians were able to do in past wars with cruisers and raiding forces, the picture looks far less dangerous!

Besides "showing the flag" cruisers were always built to scout for battle fleets, to destroy the commerce of the enemy and to protect their own seaborne trade.

While scouting for battle fleets has almost ceased, A.A. gunfire support for aircraft carrier task forces as well as shore bombardments have been added. How did the Russians get on with these tasks in the past?

During the Crimean War, 1854-56, the Russians had in the Baltic 10 and in the Black Sea eight steam-driven cruisers or, as they were then called, frigates.

While the ships in the Baltic remained very passive behind the mines and guns of the fortresses of Kronstadt and Sveaborg, the cruisers of the Black Sea fleet tried a few short forays, but only one, executed in July 1854 by the Vladimir under the command of Captain Boutakov, achieved the sinking of seven Turkish merchant ships and the capture of two more.

This raid, however, took place before the Anglo-French armies landed near Sevastopol and before the naval base was closely blockaded.

In the Far East the Russians had three frigates and four transports, which restricted themselves to the defence of Nikolaiev on the Amur and Petropavlovsk.

At the latter place they gained some success when they helped to repulse an Allied landing operation on 4th September 1854; and a year later, when the British Navy tried to blockade the port, they were able to break through and to escape with the whole garrison to the Amur River.

Surprisingly enough, the Russians never tried to send cruisers, sloops or even armed merchantmen from Archangel or Petropavlovsk into the open spaces of the Atlantic and the Pacific, where they could have secured many victims before being hunted down by the slow, if numerous, Allied cruisers.

During the American Civil War, in 1863, six Russian cruisers and gun-boats left the Baltic for New York, and six others belonging to the Pacific fleet anchored at San Francisco.

The Russians believed, and still believe, that this "show of force" kept England from actively helping the Southern States against the Union.

As a result of the Crimean War, Russia's Black Sea fleet was bound not to exceed six warships of more than 800 tons and four of 200 tons, but after 1870 Russai started to build up a stronger navy, which was not yet ready when the Russo-Turkish War of 1877-78 broke out.

The materially stronger Turkish fleet, although commanded by a British naval officer, made a rather poor show. Besides two unseaworthy circular batteries, four old corvettes and some odd gun-boats and sloops, the Russians armed 15 merchant ships and attacked on a few occasions Turkish war and merchant ships.

The armed steamer *Great Duke Constatin* sank at least four small Turkish ships, the Czar's circular yacht *Livadavia* another one, and the steamer *Vesta* (1,880 tons, five

THE SOVIET'S SEA POWER

By J. MEISTER

SINCE the end of World War II, the Soviet Navy has been much expanded, and this development is bound to intrigue and disturb the Western nations and above all Britain who depends so much on her sea-borne trade.

It must nevertheless not be overlooked that several times in the past the Russian Navy has already held a position second-to-none, after the Napoleonic Wars for example. The Crimean War and the conflict with Japan, however, led to the almost complete downfall of Muscovite sea-power.

To-day, Soviet Russia is again the second naval power after the U.S., but only so far as tonnage of warships is concerned, and not if one considers fighting value.

As a matter of fact, Russia has so far not a single aircraft carrier (against over 110 among NATO powers) nor any modern battleship (against 18 among the Allied nations).

Since the war Russia has commissioned at least 21 cruisers, while a few more may still be building.

The Soviet Navy has actually six prewar-built cruisers of "Kirov" type, five cruisers of "Tchapajev" type, the keels of which were laid down before the war but which were not completed before 1948-49, and at least 16 postwar-built cruisers of the "Sverdlov" type.

One former German cruiser, another of Italian origin, and two very old cruisers built for the Czarist Navy complete the picture. Against these 31 Soviet cruisers, the NATO nations have over 100 cruisers, including 21 heavy U.S. cruisers with 8-inch guns.

Besides the Russian effort to construct cruisers, the build-up of the destroyer force deserves mention. At the end of the war, the Soviets were left with about 40 destroyers of prewar design.

They soon added about a dozen units of the "O" class of 1,800 tons, followed by the "Skory" class of 2,200 tons. The "Skorys," of which more than 70 were built between 1950 and 1955, were the first Soviet-built "ocean-going" destroyers.

The Soviets have since produced two further improved and heavier types, the "Tallin" class of at least 3,000 and the "Kotlin" class of more than 3,100 tons.

While the classic armament of these latest additions to the "Red Navy" is rather weak (four 3.9-inch, 12 or 16 37-mm. guns, 10 torpedo tubes and mines) it is suspected that they may have, or receive, a retractable armament of launching platforms for guided missiles and A.A. rockets.

Weak A/S equipment

Among the surprising features of the new Soviet cruisers and destroyers is the reliance upon both radar and optical gunsights, strong torpedo armament, and very weak anti-submarine equipment.

Against about 150 modern Russian destroyers, which might be used in offensive operations, the Allies possess more than 460 such units, ocean-going, fast and powerful.

Nevertheless, it must be stressed that in peacetime and during the first few months of a third world war, the Allied supremacy would remain a matter of paper strength only, because roughly two-thirds of the existing NATO warships are laid up in reserve, while in the Soviet Navy even in peacetime no major warships are decommissioned.

Fifty years ago, when the battleship was still the "capital ship" and when naval actions were won by gunfire and naval wars by the outcome of a few such engagements, Russia's sea-power was much hampered by the fact that geography imposed the maintenance of separate fleets in the Baltic, the Black Sea and the Pacific.

Russia, being above all a land-power, could not afford to keep strong enough fleets overywhere, nor was she able to concentrate her three main fleets without interference from the enemy.

This was one of the primary causes of the loss of the war against Japan 1904-05.

But under to-day's conditions of naval warfare, which do not call for any concentration of heavy warships, the peacetime distribution of the Soviet naval forces may prove rather advantageous for the Russians.

The geographical conditions favour the break-out of cruisers based upon Murmansk-Polaranoje and Petropavlovsk into the Atlantic and Pacific, and it may, therefore, prove more difficult to "bottle-up" potential Soviet raiders than was the case with the German commerce destroyers during both world wars.

The actual distribution of Soviet surface ships may be as follows:

	Arctic	Baltic	Black Sea	Pacific
Cruisers	6	11	8	6
Destroyers	30	60	20	40

Pacific fleet grows

It seems also probable that the transfer of cruisers built in the Baltic to the Arctic and from there with the help of icebreakers via the Northern Sea Route to the Pacific, will continue and further strengthen the Soviet Pacific fleet, which may soon reach 45 per cent. of the total tonnage of Russian naval forces.

Another possible move may be the creation of a Russian Mediterranean fleet (which existed between the eighteenth century and 1914 almost without interruption) of a few cruisers, destroyers, submarines and depot ships.

Such a fleet could, like the U.S. 6th fleet, cruise between Jugoslavia, Albania, Syria and Egypt, staying a few weeks in each country and creating additional political and psychological troubles and problems in the Balkans and the Near East.

But if we look at what the Russians were able to do in past wars with cruisers and raiding forces, the picture looks far less dangerous!

Besides "showing the flag" cruisers were always built to scout for battle fleets, to destroy the commerce of the enemy and to protect their own seaborne trade.

While scouting for battle fleets has almost ceased, A.A. gunfire support for aircraft carrier task forces as well as shore bombardments have been added. How did the Russians get on with these tasks in the past?

During the Crimean War, 1854-56, the Russians had in the Baltic 10 and in the Black Sea eight steam-driven cruisers or, as they were then called, frigates.

While the ships in the Baltic remained very passive behind the mines and guns of the fortresses of Kronstadt and Sveaborg, the cruisers of the Black Sea fleet tried a few short forays, but only one, executed in July 1854 by the *Vladimir* under the command of Captain Boutakov, achieved the sinking of seven Turkish merchant ships and the capture of two more.

This raid, however, took place before the Anglo-French armies landed near Sevastopol and before the naval base was closely blockaded.

In the Far East the Russians had three frigates and four transports, which restricted themselves to the defence of Nikolaiev on the Amur and Petropavlovsk.

At the latter place they gained some success when they helped to repulse an Allied landing operation on 4th September 1854; and a year later, when the British Navy tried to blockade the port, they were able to break through and to escape with the whole garrison to the Amur River.

Surprisingly enough, the Russians never tried to send cruisers, sloops or even armed merchantmen from Archangel or Petropavlovsk into the open spaces of the Atlantic and the Pacific, where they could have secured many victims before being hunted down by the slow, if numerous, Allied cruisers.

During the American Civil War, in 1863, six Russian cruisers and gun-boats left the Baltic for New York, and six others belonging to the Pacific fleet anchored at San Francisco.

The Russians believed, and still believe, that this "show of force" kept England from actively helping the Southern States against the Union.

As a result of the Crimean War, Russia's Black Sea fleet was bound not to exceed six warships of more than 800 tons and four of 200 tons, but after 1870 Russai started to build up a stronger navy, which was not yet ready when the Russo-Turkish War of 1877-78 broke out.

The materially stronger Turkish fleet, although commanded by a British naval officer, made a rather poor show. Besides two unseaworthy circular batteries, four old corvettes and some odd gun-boats and sloops, the Russians armed 15 merchant ships and attacked on a few occasions Turkish war and merchant ships.

The armed steamer *Great Duke Constatin* sank at least four small Turkish ships, the Czar's circular yacht *Livadavia* another one, and the steamer *Vesta* (1,880 tons, five

6-inch guns, 12 knots) on the 23rd July 1877 had a sharp fight with the Turkish armoured cruiser *Fetchi* Boulend (1,760 tons, five 11-inch guns, 13 knots) and was able to escape.

Still, the Russians did not harass Turkish trade and coastal shipping as much as they should and could have done.

When the Russo-Japanese War broke out in February 1904, the Russian Pacific fleet consisted of seven battleships, four armoured cruisers, seven other cruisers, two auxiliary cruisers, 35 torpedo boats and 12 gun-boats.

The cruiser *Varjag* was sunk by the Japanese at Tchemulpo, others were scuttled at Port Arthur, some gunboats interned in China and two cruisers in Indo-China.

Only one neutral merchant ship had been captured in the Yellow Sea.

The four cruisers based on Vladivostok undertook altogether 10 raids against Japanese shipping, sinking 15 enemy merchant ships and transports and capturing three more.

Among the ships encountered were three Japanese transports; and the sinking of the unescorted *Hitachi Maru* with the heavy artillery for the siege of Port Arthur (18 11.1-inch howitzers) on board, delayed considerably the conquest of the fortress and cost the Japanese army terrible loss of life.

The longest Russian raid took three cruisers from the 18th to the 30th July 1904 through the Tsugaru Strait into the Pacific off Tokio, and nine ships were destroyed or captured.

But during the next raid, Japanese forces caught up with the Russian ships and sank the armoured cruiser *Rurik* after a brave fight.

Two more cruisers of the Vladivostok squadron suffered accidental damage, and cruiser warfare faded out.

The Russian Admiralty therefore ordered the auxiliary cruiser *Lena* (11,000 tons, six 4.7-inch and six 3-inch guns, 20 knots) to proceed from Vladivostok to the Pacific and to carry on cruiser warfare; but, owing to the mutinous state of her ship's company, she had to be interned at San Francisco on the 12th September 1904.

"Second Pacific squadron"

To replace the destroyed Pacific fleet, Russia despatched from the Baltic the so-called "Second Pacific Squadron," which besides eight battleships, three coast defence vessels and nine torpedo boats included one armoured cruiser, four large and three small cruisers, one armed yacht and six auxiliary cruisers.

While en route, they captured two British merchant ships which carried contraband.

Shortly before the battle of Tsushima the auxiliary cruisers *Kuban* and *Terek* were detached from the main fleet to make a diversion off the east coast of Japan, but their behaviour was so "discret," that the Japanese never knew that they were there!

On the 25th May 1905, the auxiliary cruisers *Dniepr* and *Rion* were sent into the Yellow Sea to conduct cruiser warfare.

Altogether, these four armed liners sank six Japanese and neutral merchant ships and returned afterwards unmolested to European ports.

During the battle of Tsushima, five cruisers and the auxiliary cruisers *Ural* were sunk (besides almost all the other vessels of the Second Pacific Squadron); three more cruisers escaped into Manilla; and only the armed yacht *Almaz* and two torpedo boats reached Vladivostok!

Russian attempts to capture neutral ships with contraband in the Mediterranean and the Red Sea met with sharp protests from England and Germany.

Actually, the armoured gunboat *Khabry* had stopped a British steamer in the Mediterranean, and during July 1904 the armed liners *Smolensk* and *Saint Petersburg*, which had left the Black Sea unarmed, mounted guns when in the Red Sea and there captured one British and two German merchantmen.

Continued on page 22

ITALIAN NAVAL OPS.

Submarines Attacking, by Admiral Aldo Cocchia; published by William Kimber (U.K.).

Submarines Attacking is not, as its name implies, a narrative mainly about submarine operations, but a record of various encounters between the British and Italian naval forces during the Second World War.

The author, though himself a naval officer, took only a minor part in the incidents described and makes no attempt to deal with the technical or tactical aspect.

He is concerned solely with the human side and has selected particular incidents which illustrate the patriotism and bravery of Italian naval personnel.

Admiral Cocchia clearly wrote his book with Italian readers in mind. It contains neither maps nor charts of any sort and the majority of the names of the Italian officers and ships mentioned are quite unknown in this country, except to the historian.

We are all, however, well aware of the brilliant and sometimes successful efforts of the Italian human torpedoes to destroy or damage our ships at Alexandria, Gibraltar and Malta, and the author might well have described these episodes in greater detail.

The emphasis is all on the preliminaries — on the way, for example, the Italian frogmen established and built up their base at Algeciras unknown to the Spanish authorities.

One of the most interesting chapters deals with the decision to provide a number of German U-boats with Italian crews.

In the spring of 1943, when the Axis submarines were suffering heavy losses in the Atlantic, Doenitz agreed that Italian crews should man certain of the new U-boats provided the seven Italian submarines which had been operating from Bordeaux were used as blockade runners to the Far East.

Five of the seven actually started with valuable cargoes for Singapore, but only three reached their destination.

The Armistice with Italy intervened before they could make the return voyage and they were taken over by the Germans at Singapore.

They carried 150 tons of cargo which necessitated the removal of their entire armament and a section of their batteries.

The book is illustrated with some excellent photographs and is well translated. But it should be bought for light reading and not as an accurate record of events.— G.P.T.

SPECIAL SERVICE

H.M.S. Fidelity, by Marcel Jullian, published by Souvenir Press (U.K.).

For some years there have been vague reports of a naval vessel during the last war which carried a First Officer in the Women's Royal Naval Service as part of her normal complement.

Gradually, other small details of this ship gained currency, though there was little enough known of her full story.

This story is now told in *H.M.S. Fidelity*, written from reports of former members of her complement by Marcel Jullian.

The *Fidelity* was the French merchant vessel *Le Rhone*, and she was taken over and converted into what was, perhaps, euphemistically called a patrol vessel.

She was commanded, and largely manned, by Frenchmen who were given British *noms de guerre* and official naval ranks and ratings. She sailed under the White Ensign.

So much we know. We know, too, that she was torpedoed at the end of 1942 while sailing with a convoy, her final destination being the Eastern Fleet.

There were no survivors from the ship herself, though a few who had been earlier embarked in a launch were rescued.

The rest of the story is told in this book.

It does not, in truth, amount to very much apart from the vivid characterisation of the *Fidelity's* amazing Commanding Officer, a Corsican named Costa, whose British pseudonym was Jack Langlais, and the rather mysterious Madeleine Guesclin, who was transformed into First Officer Barclay and was lost with the ship.

Indeed, the book is worth reading for this characterisation alone, for they were truly an extraordinary pair.— P.K.K.

UNDERWATER HERO

Frogman V.C., by Ian Fraser; published by Angus & Robertson.

The midget submarine commanded by Lieutenant-Commander Ian Fraser attacked a big Japanese cruiser that was apparently resting on the bottom, so that there was no possibility to settle under her keel, yet this great adventure resulted in the destruction of the cruiser and the conferring on Fraser of the V.C.

His other activities in a tank at Manchester and in more serious operations make this book a must for every high-spirited boy in the land.— H.B.

THE SOVIET'S SEA POWER

Continued from page 20

Altogether Russian attacks against the Japanese shipping, upon which depended both the life of Japan and the supply of its armies fighting in Manchuria, had completely failed.

They had cost the Russians, however, 11 cruisers and two auxiliary cruisers lost, six interned!

In the 10 years between the Russo-Japanese and the First World War, the Russians made notable efforts to build up a new navy, both in material and in spirit, and some results were obtained.

But in 1914 the few cruisers of the Vladivostok squadron failed to protect the Russian shipping off this port against the *Emden*, and at Penang the cruiser *Jemtchug* was surprised and sunk by the same famous German raider.

The Baltic 1914-1918

In the Baltic the Russian cruisers undertook several minelaying raids deep into the central part of the German-controlled sea lanes, and on one occasion, on the 2nd July, 1915, after a confused action with German cruisers and torpedo boats, they drove the damaged German minelayer *Albatross* ashore in Sweden, where she was interned.

Although successful, these raids were not undertaken often enough to have a decisive influence upon the war at sea.

Only four enemy merchant ships were captured.

But in the Black Sea the numerically superior Russian naval forces were able to inflict heavy losses upon Turkish coastal shipping off the Anatolian coast. Cruisers and above all destroyers and torpedo boats often shelled the little Turkish ports, annihilated several small convovs, and strangled the important coal trade from Zunguldak to the Bosporus.

This good record, due above all to the dynamic personality of the Russian Admirals Eberhardt and Koltchak, was soon destroyed by the Revolution; and during the civil war and the Allied intervention the Bolsheviks made no use of their opportunities to attack the shipping of a dozen nations.

A single Estonian merchant ship was seized by the destroyer *Spartak* at the end of 1918 in the Baltic.

During the winter war between Finland and Russia, 1939-40, the numerically stronger Soviet Navy was quite unable to stop Finnish shipping along the coast of the Gulf of Finland or across the Bothnian Gulf, or to destroy Finnish coastal fortifications.

But the worst show Russian surface forces ever put up took place during the Second World War.

In 1941 there were two battleships, two modern cruisers and about 30 destroyers in the Baltic, and one battleship, two modern and three older cruisers and up to 25 destroyers in the Black Sea.

In the Arctic there were also about a dozen destroyers, and from 1944 on, one lend-lease former British battleship, one former American cruiser and nine destroyers.

During the whole war, neither in the Arctic, the Baltic nor the Black Sea, did Soviet Russian battleships, cruisers or destroyers sink any Axis war or merchant ships, not even small craft! At the same time, about 50 Soviet destroyers, one cruiser and one battleship were lost!

Very few naval actions took place, all of them disastrous for the Soviets.

On the 6th July 1941 two destroyers encountered a German minesweeper and a naval auxiliary in the Irben Strait, but they were driven back by the inferior German vessels.

Another attack by a destroyer against a German convoy was thwarted by German M.T.B.s; and a fight between German minesweepers and two destroyers, supporting four M.T.B.s, ended with the destruction of one Soviet M.T.B.

Afterwards, and until the end of the war, the surviving Soviet destroyers and cruisers lay at Kronstadt and Leningrad, from time to time shelling the German positions around the beleaguered town, but never daring to go out to attack the very weak German-Finnish naval forces which guarded the minefields and nets in the Gulf of Finland!

Black Sea engagement

In the Arctic, only one fight took place, on the 17th December 1941, when four German destroyers fell upon two Soviet destroyers at the entrance to the White Sea. In a sharp action with guns and torpedoes at short range one Soviet vessel was probably sunk.

In the Black Sea, the Russians were about 10 times superior to the German-Roumanian naval forces which were running convoys as far as the North Caucasian ports and the Bosporus.

Nevertheless, the Soviets were only once able to overtake one of these convoys, on the 14th December 1942 off Sulina.

The convoy consisted of three Roumanian steamers, one Roumanian torpedo boat and four German minesweeping launches.

They were attacked by two Soviet destroyers, and while the four Roumanian ships escaped, the four minesweeping launches, with 20 mm. A.A. guns and a smoke screen, fought the Russian vessels for more than one hour at a range

Continued on page 24

MARITIME NEWS OF THE WORLD

From our Correspondents in LONDON and NEW YORK

By AIR MAIL

Lloyd's report shows age of tankers

An interesting examination of the ages of the various vessels comprising the world's oil tanker fleet was recently made in the annual report of Lloyd's Register of Shipping.

Of this fleet, which approximated some 42 million deadweight tons at July, 1956 (the date to which the examination relates), the report estimates that no less than 58 per cent of the tonnage represented vessels of post-war construction.

Moreover, a further 27 per cent was between 10 and 14 years old, into which age-group came tonnage constructed during the war and which survived the hostilities.

Within the overall picture of the respective age-groups of the fleet, there were some interesting comparisons to be seen.

For the U.K., which owned within a very little of 20 per cent of world tanker tonnage, the age analysis showed a pattern close to that of the world fleet as a whole.

Norway, as a result of substantial wartime losses and post-war acquisitions, had a higher-than-average number of vessels under 10 years old.

The U.S.A. had a large number of ships coming within the 10-14 year age group — betokening the prodigies of shipbuilding accomplished by that country during the war years.

While there has been this unmistakable emphasis on "youth" in the composition of the world tanker fleet, it is also interesting to note how recurrent pressure on available tonnage appears to have preserved that small proportion of obsolete or near-obsolete vessels that ordinarily would have been unlikely to have survived in service.

Into this category come tankers of 20 years old or over. At the time of the survey they comprised 8 per cent of the world fleet.

Shipping lines offer combined tickets

Two major Pacific shipping companies are now offering combined return tickets for Pacific travel.

Mr. John L. O'Brien, Passenger Traffic Manager in the South Pacific for Matson Lines, and Mr. John D. Bates, General Manager in Australia for the Orient Steam Navigation Company Limited, have announced that their companies will issue combined tickets from Australia and New Zealand to Honolulu and North America, and return.

They said the tickets would represent a saving of about 10 per cent on two single fares.

A passenger with a combined ticket may travel from Sydney to San Francisco by an Orient liner, and return by at Matson liner.

Although only making a single journey with each company he will receive a round-trip concession.

Strange craft launched in Germany

Adma Enterprise is the name given to a strange craft launched at Audorf, on the Kiel Canal, recently.

The word Adma stands for Abu Dhabi Marine Areas, a company two-thirds owned by BP and one-third by Compagnie Francaise des Petrolcs.

Adma Enterprise is not a ship in the ordinary sense of the word — it is a drilling barge which will be used to pursue submarine oil.

Its creation was a combined operation and very much an international affair. With Anglo-French ownership, it was designed by the DeLong Corporation of New York and built by the German Company, Gutehoffnungshutte Sterkrade Aktiengesellschaft of Sterkrade-Oberhausen, and will be operated by Abu Dhabi Marine Areas Limited.

It is designed to operate in water up to 80 ft. deep. Its dimensions are approximately 200 ft. x 100 ft. x 15 ft., its weight being 4,200 tons and when water-

borne has a draught of 10 ft. 6 ins.

After its trials, the barge will be towed to the Persian Gulf and will operate in an area some 22 miles from Das Island.

It is equipped with four retractable legs of 10 ft. in diameter and 160 ft. in length. These legs can be elevated or lowered by eight DeLong hydraulic jacks.

A drilling unit will be installed with pipe racks, drill pipe and storage facilities for the cement, chemicals, mud, etc., required for the drilling operations on the site.

Comfortable air conditioned living accommodation will be provided for 50 people.

THE SOVIET'S SEA POWER

Continued from page 22

of about 3,000 yards, until the Soviets had had enough and retired.

One is forced to conclude that during World War II the Soviets did not make any reasonable use of their cruisers and destroyers.

Allied naval officers in the Arctic came to much the same conclusion when observing the Soviet destroyers which came out to meet the Murmansk convoys.

The record of the Czarist Navy was not always brilliant, but that of the Soviet Navy was even poorer.

The Russians were definitely not gifted leaders from the point of view of cruiser warfare and the handling of raiders. The Russian character and the dull Soviet system do not favour the development of naval officers with initiative, willing to take responsibility and able to cruise for month after month without detailed instructions.

Therefore, and because no foreign bases are for the time being available, and because the land-based Soviet naval air force cannot replace the missing aircraft carriers, it may be assumed that the Soviets do not intend to undertake ocean raiding operations on a very large scale.

Though a few armed merchant ships (raiders) may be used, not much is to be expected from such measures. But the Soviets may intend to despatch some merchant ships, loaded with light arms and a few hundred men and political commissars to overseas countries and colonies, where they could create political and economic troubles.

What purpose?

So, what purpose may the 31 Russian cruisers serve? And may be a few more still to be commissioned? Originally, Stalin had ordered the construction of most of these ships after the Second World War, when he hoped to wage a series of "minor" and "local" wars to secure domination over Korea, Greece, Turkey and the Scandinavian nations.

Fortunately, the Allied intervention and, above all, N.A.T.O., and finally, the dictator's timely death, prevented the execution of this project.

But the strength of Soviet surface and submarine forces in the Baltic and Black Sea gives the Russians, in case of war, supremacy over the fleets of all other nations bordering these waters.

As long as the N.A.T.O. powers keep control of the Danish- and Turkish-controlled straits, this is not so dangerous; but if ever the Russians should take these key positions, the whole situation would be much improved for the Soviets.

In the Arctic and the Pacific the Russians must, even in case of war, carry supplies by sea to such places as island outposts, or the big naval base at Petropavlovsk.

These convoys form interesting targets for Allied submarines, aircraft and surface forces. The Russians hope to run these convoys under the protection of the shore-based air force, with a close escort of anti-submarine vessels, and a seaward task force of modern cruisers and destroyers to ward off Allied ships.

When attacked in the past, the Russian ships have always fought very stubbornly, and for this reason naval operations in Soviet coastal waters may reflect far more impact of Soviet sea power than operations which might take place in the open spaces of the oceans.

It seems that some still unidentified large ships are actually building in Russia. They may be cruisers, aircraft carriers or even guided missile vessels; but whatever they may be will they influence or change the historical, geographical and psychological shortcomings of Russian sea power?

—From "The London Navy."

New vessels to lift herring catch

Between 1938 and 1953 the British herring catch decreased by 28 per cent but the Dutch catch increased by 68 per cent.

In an effort to halt this British drift, a Yarmouth firm, Henry Sutton Ltd., is introducing Dutch type drifter - trawler - processing vessels. They are being built in Poland because British yards could not guarantee delivery before about three years.

Reporting this, Fishing News says that Henry Sutton is paying for one ship. The second will be purchased by the Herring Industry Board and chartered to Sutton's.

If the ships are successful, Sutton's intend to order more under the Board's grants and loans scheme.

British herring vessels are having to go further afield for their catches, and the new ships will have a range of some 4,000 miles and will carry enough fuel, water and provisions for 22 days.

They will be diesel ships with a cruising speed of nine knots and will be 113 ft. overall.

Crew will number sixteen, accommodated in two 4-berth and one 6-berth cabins, each skipper having his own cabin. Central heating will be installed throughout.

BRITAIN BUILDS WHALING SHIPS

By G. A. ALLAN — le Leadee

The high quality of the passenger liners, cargo vessels of all types and sizes, and oil tankers made in Britain's shipyards is well known. Less is known about the special ships built for the deep-sea Whaling industry

THESE vessels are mainly of two types; factory ships, usually of substantial tonnage, with broad decks for the easy dismemberment of the whales and deep tanks for receiving and carrying the oil, and small, fast catching ships for pursuing the whales and killing them with modern and relatively painless harpooning equipment.

In addition to the traditional barbed harpoon and the explosive harpoon, electrocution is now practised by some whalers. This method is claimed to stun the victim immediately.

The idea of a mobile factory ship, in which the whale carcases could be cut up and processed with the most efficient equipment and the oil, extracted from the blubber, bones and meat, with the minimum of delay, originated after World War I.

The modern whale factory ship makes it unnecessary for the carcases to be landed on Antarctic islands for dismemberment and brings back the oil, meat and by-products in the best possible condition.

Five United Kingdom firms, all well known in general shipbuilding, have made something of a speciality of whaling vessels. They are: Inglis (A. and J.) Ltd., of Glasgow, Scotland; the Furness Shipbuilding Company Ltd., of Haverton Hill, County Durham, England; Harland and Wolff Ltd., of Belfast, Northern Ireland; Smith's Dock Company Ltd., of Middlesbrough, Yorkshire, England; and Hall Russell and Company Ltd., of Aberdeen, Scotland.

The whaling factory ships built by the Furness Shipbuilding Company are the *Southern Venturer* and *Southern Harvester*, for the South Georgia Company, subsidiary of Chr. Salvesen and Company; the *Norhval* and the *Kosmos V* for Norwegian owners.

The *Southern Venturer*, constructed for the carriage of whale oil, incorporates more than 1,000 tons of steel. She is an excellent example of the modern whaling tanker with the addition of a between-deck 22 feet high, arranged to accommodate the whaling factory equipment.

Her principal dimensions are 550 feet in length, 74 feet in breadth and the loaded dead-weight tonnage is 20,500.

The nine cargo tanks, with a total capacity for about 19,000 tons of oil, are divided into 36 compartments.

Helicopters used

The cruiser-type stern has an opening in the centre leading to the sloping slipway, carried through the engine casing to the level of the upper deck, so that the whale carcases can be hauled up to the flensing deck where they are stripped of their blubber and then cut to pieces.

The upper deck is clear of all obstructions to facilitate the handling of the heavy carcases, and efficient drainage is provided. The blubber, meat and bones are passed through hatches to the extraction plant in the vessel's factory section.

The extracting and refining

machinery for the producing of whale oil, before it is piped to the main tanks below, is situated in the main between-decks.

In addition to the conventional rendering equipment, special plant is installed for the extraction of liver oil and the preparation of meat and bone meals.

Westland S.55 helicopters are used by Chr. Salvesen and Company, of Leith, Scotland, with their Antarctic whaling operations.

These aircraft, two of which are based on each of the floating factories *Southern Venturer* and *Southern Harvester*, operate from flight decks specially constructed at the stern of the vessels.

Helicopters are very suitable for this type of work as their vertical take-offs and landings eliminate any necessity for launching apparatus.

Another British-built factory ship, the *Thorshavet*, has been operating in Antarctic waters since her completion by Harland and Wolff for the well-known Norwegian whaling firm of A/S Thor Dahl. Of about 21,000 tons deadweight carrying capacity, this vessel is 560 feet long and propelled by two six-cylinder diesel engines. On the flensing deck are two steam winches for hauling the whale carcases up the sloping slipway in the stern on to the deck for dismemberment.

The world's largest whaling ship, originally named the *Juan Peron*, and now renamed the *Cruz del Sur*, was built by Harland and Wolff for the Compania Argentina de Pesca.

Of 25,324 tons deadweight carrying capacity, she is similar in general layout to the *Thorshavet* and the *Norhval*.

Another Harland and Wolff ship, the *Balaena*, built for United Whalers Ltd., of London, acts as a "mother-ship" to a fleet of about ten catching vessels.

28,579 WHALES KILLED IN ANTARCTIC

TWENTY whaling fleets in the Antarctic this year, yield of 313,753 tons, worth 28,579 baleen whales for an oil about £A30 millions.

In 1956, 19 fleets, with 259 catchers, killed 28,547 whales for 295,525 tons of oil.

The 1957 catch was equal to 14,736.8 B.W.U., compared with the target ceiling of 14,500.

The average oil yield was 128.1 barrels per B.W.U., compared with 120.9 in 1956 and 117.3 in 1955.

The figures are from the Norwegian Whaling Gazette.

The 28,579 whales killed in 1957 comprised 25,687 fin, 1,504 blue, 711 sei, and 677 humpback.

A table shows how the catch was shared by the national fleets.

	Fleets	Catchers	Whales	Oil (tons)	Oil (barrels per B.W.U.)
Norway ...	9	94	11,980	142,893	138.1
Japan	5	54	6,662	69,892	117.4
U.K.	3	35	4,702	50,955	132.3
U.S.S.R. ...	1	18	2,428	21,856	111.1
N'lands ...	1	14	1,289	14,607	129.2
S. Africa ...	1	10	1,518	13,550	114.3

APPOINTED A.D.C.'S TO THE QUEEN

Captain E. H. Leitch, C.B.E., R.A.N., at present engaged on special duties at Navy Office, Melbourne, has been appointed an aide-de-camp to the Queen.

COMMANDER G. S. H. Champion, R.D., R.A.N.R. (S), has also been appointed an aide-de-camp.

Until recently Captain Leitch was supply officer at Flinders Naval Depot, Crib Point (V.).

Before he was appointed to that post in May, 1955, he was secretary for seven years to Vice Admiral Sir John Collins, K.B.E., C.B., when he was First Naval Member of the Australian Commonwealth Naval Board and Chief of the Naval Staff.

Captain Leitch served with distinction in the Second World War and was on the bridge of H.M.A.S. *Australia* with Vice Admiral (then Commodore) Collins when the ship was attacked by a Japanese "suicide" pilot in the operations in Leyte Gulf.

Both he and Commodore Collins were severely wounded.

He jointed the Royal Australian Navy in 1919. He was promoted captain in 1946.

Commands Nankin

Commander Champion is at present in command of the E. & A. Line's *Nankin*.

He joined the A.U.S.N. Co. Ltd. as a cadet in January, 1935. In 1936-37 he did seven months' training as a midshipman, R.A.N.R.(s), serving in H.M.A. ships *Australia* and *Vendetta*. He then returned to A.U.S.N. and shortly afterwards transferred to the E. & A. Line.

On the outbreak of war he was mobilised as a Sub-Lieutenant and served in that rank and as Lieutenant in H.M.S. *Kanimbla* until mid-1942.

After carrying out anti-submarine and other courses, he took command of small vessels in light coastal forces and in 1944 commanded the 1st New Guinea flotilla of Fairmiles.

After about 1½ years in Fairmiles he transferred to corvettes and was later in command of H.M.A.S. *Lithgow* and for a short period H.M.A.S. *Rockhampton*. He received several M.I.D's during 1945. After demobilisation in January, 1946, and having obtained a mate's and mastre's foreign-going certificate, he rejoined the E. & A. Company in November, 1946.

Fills New Post

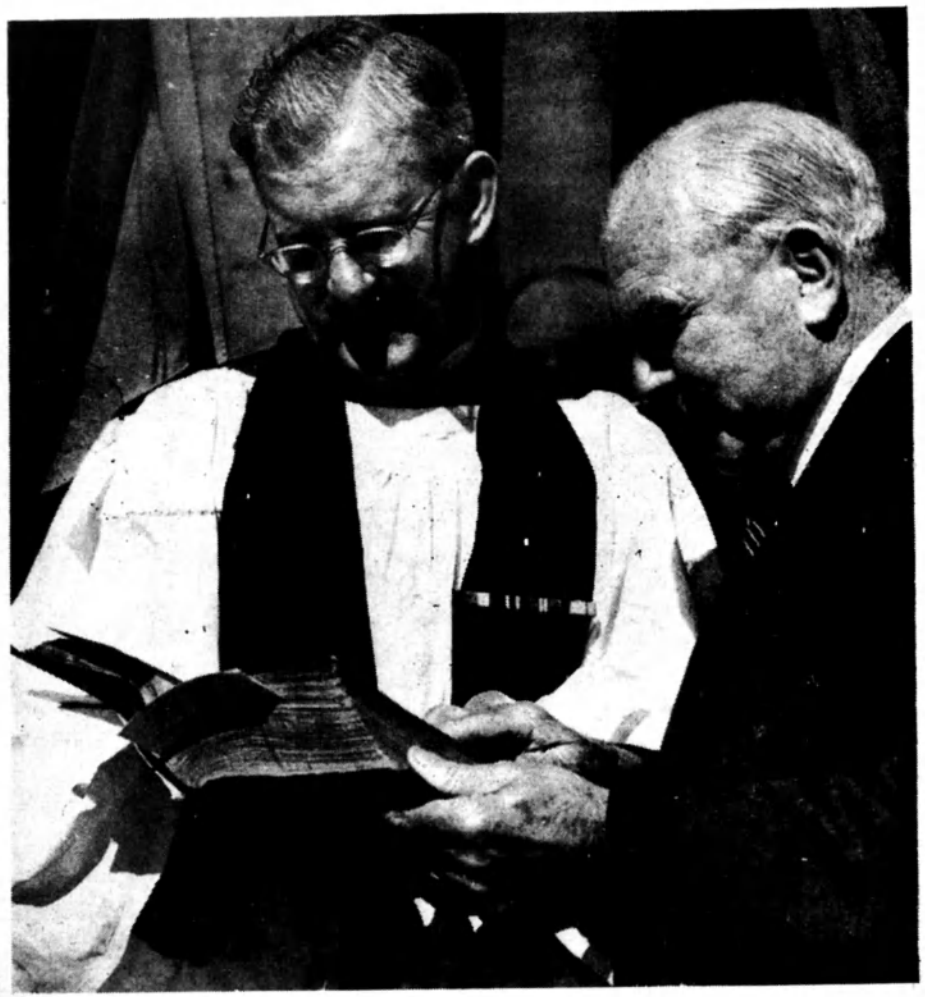
Mr. John L. O'Brien has been appointed as passenger traffic manager for Matson Lines in the South Pacific.

This is a new post which the company says it has created to meet the increasing demand of passenger traffic for South Pacific travel.

He was formerly general sales manager, passenger traffic department, at San Francisco. Before World War II he was in charge of a Matson subsidiary in Sydney — the American Railroad Travel and Information Bureau.

He served in the U.S. Army Air Corps from 1942 to 1945, and was then appointed Matson Lines' general agent at Chicago.

DUNBAR BIBLE AT CHURCH SERVICE



A service to commemorate the centenary of the sinking of the "Dunbar" off South Head (Sydney) on August 21, 1857, was held in St. John's Church of England, Darlinghurst, last month. All but one of the 112 people on the "Dunbar" were drowned. The picture above shows the Rev. Dr. A. W. Morton, rector of St. John's, showing the Bible from the "Dunbar" to Sir James Bissett.

For Sea Cadets

NINETY FATHOMS

By B. HARPER

IT seemed an age before I surfaced into the sunshine from that dark-green hissing world.

I had never realised that a slide of some 20 feet down a tilting ship's side would plunge me so deep. After all, I had been down many of those swimming pool chutes, but, of course, they turn up at the ends, throwing you on to the water, not into it.

Without thinking too much about what I was doing I struck out for the open, away from the black carpet of oil which was already spreading away from the men who were thrashing about with so much vigour, but with so little apparent aim. Yes, this was like the baths again, getting away from the shrieking kids in the shallow end to the cool, quiet swimmers in the deep.

After about ten minutes I turned on my back and trod water idly. Nearby, spaced over the water like marking buoys at a regatta, were the heads of other shipmates, shouting greetings to each other like exuberant schoolboys.

"Good old 'Arpie.' What a caper this is!"

I waved back, but decided that it was no time for shouting. It was, as he had so aptly put it, a "caper." To be demoted from the stately glory of a destroyer's bridge into the middle of the North Sea itself, and there to be left swimming aimlessly and feeling ridiculous, was, indeed some caper.

As I trod water, I realised that I was still fully dressed. True, I had dropped my respirator and steel helmet at the bottom of the bridge ladder, but I was still wearing bell-bottoms, two roll-neck sweaters and my heavy boots, and I decided that I could well do without the boots. It was quite a job unlacing them, but eventually they were released. It was then that I became obsessed with the gravity of the situation.

There were my boots, on their way down through ninety fathoms of green silence to that sunless, muddy bed below me, a bed which, with less good fortune, might have been my own There was I, suspended in water 500 feet above the ground, and my boots were sinking slowly from me, never again to be seen by man, only to be sniffed at by curious fish or waved at by friendly fronds of seaweed. There was something sinister in the idea.

The ship was going now. . . .

Like a Cenotaph

Her fore-end was standing vertically in the sea like a cenotaph, which — in a sense — she was. Somewhere inside was "Stripey" Adams, who had burst into tears after we had been hit and collapsed on the mess-deck floor, howling like a child and stubbornly resisting all entreatics to save himself. He couldn't swim.

Poor old "Stripey," he'd been a real swashbuckling sailor in harbour, full of the big talk and profanity, desperately keen to impress newcomers and the youngsters with his knowledge of Navy ways. But Hitler had found him out in the end. "Stripey" couldn't stand up to the very thing for which the Navy had trained him for some fifteen years, although, I suppose, he would never have thought of it that way.

He had probably joined to escape from a rotten home, a drunken parent, or a gaggle of fussy, inhibiting sisters. He had been the jaunty young sailor who had left the street for a man's life, his cap set back on his head and his mind throbbing to the belief that all the girls knew he was off to Singapore in a cruiser.

Poor old "Stripey" — that it should come to this. He was somewhere inside that gaunt column of steel, with mess-deck equipment breaking loose all around him and the water greedily cascading in, rushing and bubbling through every crevice of his dark tomb.

The stern of the ship, blown off by the direct hit on the the after oil tanks, had up-ended and was floating apart, gradually sinking as the air fought its way out as big foaming bubbles. The two huge propellers showed themselves to me, rather shamefacedly, for the first time. Those screws, which had pushed us on many a convoy mission, had slid us furtively up Narvik Fjord, and had hastened us to the evacuation of France, were now, it seemed, raising their hands in resignation and saying, "This is not our doing. . . ."

The water bobbed with heads and debris. One single Carley float was loaded with black figures, coughing the oil from their stomachs. Here and there hands clutched frenziedly at the air, but it couldn't support them and they disappeared in a swirl of foam. Some men shouted. Some tried to joke, others swore. One group was singing—"When this bloody war is over, oh how happy we shall be. . . ."

And the bombers—they would already be planing low over Holland on their way back to base. They would soon be reporting a successful mission; one destroyer

sunk, another damaged. They would also need to report the loss of two of their squadron, for in the midst of the attack, after they had swept on us from the western horizon, we had seen two fall crazily into the sea.

But the boys who, even now, would be approaching the runway, would be feeling good. And I, aimlessly treading water twenty miles from the Dutch coast, could understand their elation.

We had felt the same when we had pom-pommed those German troops near Narvik and seen them spreadeagled on the snow among the birches. We had cheered when we sank that U-boat off the Irish Coast, sent it slowly down to a much deeper grave, to the fish and the seaweed—like my boots.

This war was, after all, an impartial affair. God wasn't taking sides. He wasn't even refereeing; He was merely in a ring-side seat.

The stern had gone now, but the bows still stood to attention, though not as tall as before.

Away to the north, the other destroyer lay motionless, heeled over at an alarming angle with her funnels hissing steam. And the fussy little minesweepers, converted fishing trawlers from Grimsby, where nosing in and out picking up survivors. The scene was quieter now. The game was over and it only remained to clear up the litter.

Eventually I was near enough to the *William Wesney* to swim across and grasp the rescue net. A seaman leaned over the side, grasped the seat of my trousers and lfited me head-over-heels, on to the deck. I was as weak as a kitten, but lurched down the ladder into the mess-deck, where a dozen other survivors were stripping off their sodden clothes and padding about in search of borrowed towels. A keg of rum had been broached and the mess-deck took on the appearance of a wild, Bohemian party, with men in all states of undress talking excitedly and swaying unsteadily, mug in hand.

When I went up on deck again, twenty minutes later, our ship had gone. The sea was calm again, though oil-stained, but down in that green, silent world lay our ship—and my boots.

—From "The Sea Cadet," London.

SPEED KING'S TAILOR-MADE COCKPIT

British motor racing driver Stirling Moss is seen here being fitted into the "tailor-made" cockpit of the specially designed M.G. racing car in which he established five new world speed records at Bonneville Salt Flats, Utah, United States, last month.

Nuclear propulsion for merchant ships

The managing director of the Industrial Group of the U.K. Atomic Energy Authority, Sir Christopher Hinton, has stated that British scientists soon should settle the problem of nuclear propulsion for average sized merchant ships.

A reactor of a new design might be necessary to power ships of 15,000 tons or less.

"At the moment feasibility studies are going on at Harwell on this," he said.

"We hope to have our minds clearer during the second half of this year."

BRITISH AIRCRAFT SETS NEW RECORD

THE British experimental fighter aircraft P1A signalised its first appearance before world press representatives on July 17 by flying faster than the world's record air speed of 1,132 m.p.h.—the record held by Britain's Fairey Delta II.

The exact speed attained by the P1 is still a secret.

The makers, however, revealed that it was achieved during normal testing and no attempt was being made on the record. A spokesman said the aircraft was still accelerating when the pilot throttled back.

The pilot said after the flight that the P1 was unique among supersonic fighters in its manoeuvrability and in tight turning, both at low and high speeds.

"We hope to have our minds clearer during the second half of this year."

For Sea Cadets

Sailing the Seas Lone-handed

By T. J. GRENSON

MANY have set out in the hope of conquering the Seven Seas lone-handed. Last year Mr. Edward Allcard left Plymouth on a solitary voyage round the world in his 10-ton ketch *Sea Wanderer*, and he expected to be away four years.

He had already made three Atlantic crossings in small boats, but the Seven Seas are a much bigger proposition, and those who have successfully accomplished the circumnavigation of the globe alone (this cuts out two-man voyages, which are more numerous) can be listed on the fingers of one hand: Captain Slocum, Alain Gerbault, Harry Pidgeon, Louis Bernicot, and Monsieur Jacques-Yves Le Toumelin.

Such voyages are necessarily gambles, and their issue depends on the possession not only of a staunch vessel, but of unlimited resource, courage, and endurance. In some ways the most famous hermit of the Seven Seas who succeeded in rounding the globe was Captain Slocum of Nova Scotia. He was just over fifty years old when he set off on his lone voyage of adventure. Employment at sea was scarce, so in 1892 he purchased the *Spray*, an ancient sloop of a mere 13 tons, and set to work to rebuild her. The job meant over a year of arduous labour and cost about £125, but by then she was perfectly seaworthy.

Then he set off from Boston for Gibraltar and the Azores; thence to the South American ports and on to Australia, and he eventually rounded the globe. It sounds simple enough, but the veteran captain met with sufficient adventures to satisfy the most daring.

THE QUEEN AT GARTER CEREMONY

The Queen and Prince Philip walk in the procession of Knights of the Garter to St. George's Chapel, Windsor, for the Garter Installation Service. Earlier, Her Majesty had invested Lord Ismay, former Secretary-General of N.A.T.O., and Lord Middleton, Lord Lieutenant of the East Riding, as Knights Companions of the Most Noble Order of the Garter.

Attending the ceremony were representatives from thirteen N.A.T.O. countries.

For instance, the difficulties of navigation in the Straits of Magellan were added to by the hostility of the natives. Full of resource, he freely sprinkled his deck with tintacks, and one night he was awakened by the howls of the savages as they leapt on (and off) them.

Slocum met with many notable people, including Mrs. R. L. Stevenson, Lord Milner, and President Kruger. The last-named firmly refused to discuss sailing round the world. For, to his dying day, the old Boer held that the world was flat.

The captain's account of his trip is one of the classics of the sea, and this is also true of the story of another lone-handed epic of the oceans. Of all the one-man voyagers of recent times Alain Gerbault is the most celebrated, for he gave his life to wanderings. In 1923 this intrepid hermit of the Seven Seas, fresh from triumphs as a tennis champion, forsook civilisation and set sail from

Cannes on the Riviera in a 10-ton yacht, the *Firecrest*, built thirty years earlier.

The little craft was sound, but her sails were rotten, and throughout the 142 days of the run to New York he was occupied in patching them. Gales were so frequent that he could get little sleep, and living mainly on condensed milk, potatoes and water, it is not surprising that his health suffered. He was once unconscious for some forty-eight hours, an example of the terrible perils experienced by the lone traveller. By the time he made port he had traversed 5,000 miles.

In November, 1924, Gerbault resumed his voyage via the Panama Canal, and then sailed boldly on across the Pacific to Port Moresby in New Guinea, which he reached eighteen months later after almost losing his vessel on a reef in the Wallis Group. He pushed on through the Indian Ocean, rounded the Cape of Good Hope, and then sailed north to the North Atlantic, reaching Le Havre during July 1929. He had completed 40,000 miles and was rightly given a tumultuous reception.

The most recent world-navigator was Monsieur Jacques-Yves Le Toumelin, who rounded the globe between 1949 and 1952. He set out from Le Croisac without announcing his intentions, in the *Kurun*, which he designed himself. For most of his voyaging he was alone, except for two stowaways—and not human ones. They were a lizard and a frog! After an untortunate fight with a hand in Morocco he decided to sail alone, finding complete solitude the sweetest. For the most part he followed Gerbault's route, and visited his grave at Bora-Bora.

Yet another remarkable lone-handed voyage of like nature was made by Harry Pidgeon. He built his own boat, a 34-foot yawl, at a cost of £200, and a year and a half of hard work. He sailed from Los Angeles in November, 1921, and for six weeks never sighted smoke or sail. He crossed the Pacific, went on to Australia, India, South Africa, Panama, and so home.

The voyage took him a fortnight under four years, during which time he never arrived in port complaining of hunger or shortage of water. From first to last his little boat, the *Islander*, sustained no damage he could not repair with his own resources—a remarkable achievement for a man with no professional training as a sailor.

Finally, Captain Bernicot's solitary voyage round the world in his 41-ft. cutter *Anahita* belongs now to the history of seafaring, for it was in 1936 that this middle-aged, retired sea captain started out from his native Brittany to cross the Atlantic, the Pacific, the Indian Ocean, and so round the Cape and back to home waters after just about twenty-one months of lonely navigation.

As long as the world and the indomitable spirit of man endure there will be adventurers like those over whom the oceans cast an irresistible spell, and against which they are prepared to pit their strength, and if needs be their lives.

—From "The Sea Cadet," London.

Canadian fisherman must have life-jackets

Fishermen whose work exposes them to "a serious risk of drowning" must now be supplied with self-inflating life-jackets, says Western Fisheries (Vancouver).

Approved devices must have "buoyant effect sufficient to maintain his head above water without any effort on his part."

This has been ordered by the British Columbian Workmen's Compensation Board.

In the last five years, 188 men have lost their lives in industrial drownings, the journal says.

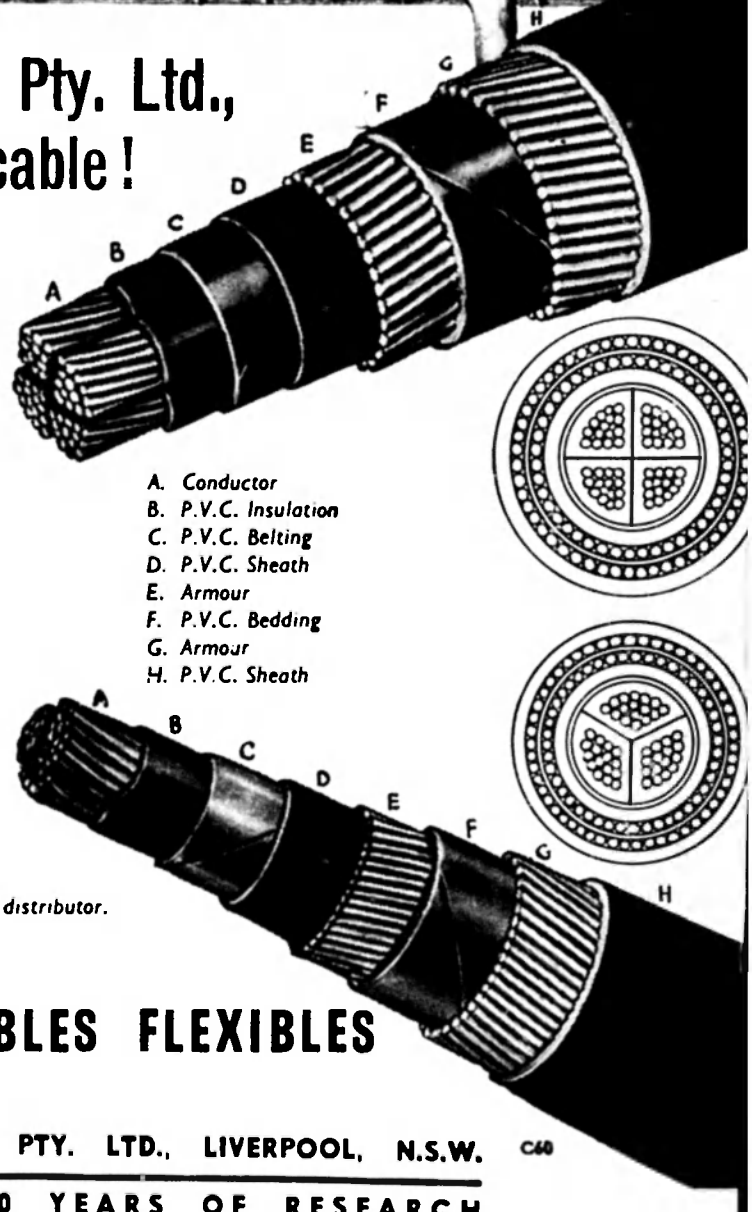
Building Publishing Co. Pty. Ltd., 20 Loftus St., Sydney.

Cable Makers Australia Pty. Ltd., pioneers another new cable!

P.V.C. or polythene insulated twin 3- and 4-core cables with *SHAPED CONDUCTORS*, P.V.C. sheathed and/or armoured and P.V.C. served cables, 250V to 11KV.

The use of sector-shaped conductors, insulated by a fully patented process and pre-spiralled to eliminate internal mechanical stresses, results in a more compact cable and one of smaller outside diameter than an equivalent cable embodying circular conductors. The resultant saving in material is passed on to users in the form of lower cost.

In this new and more economical cable design, you have yet another example of the technical leadership and advanced research techniques of Cable Makers Australia Pty. Ltd.



A. Conductor
B. P.V.C. Insulation
C. P.V.C. Belting
D. P.V.C. Sheath
E. Armour
F. P.V.C. Bedding
G. Armour
H. P.V.C. Sheath

For further particulars, prices, etc., enquire from any C.M.A. distributor.

C.M.A. WIRES CABLES FLEXIBLES

Regd. Trade Mark Nos 36936-7-8

CABLE MAKERS AUSTRALIA PTY. LTD., LIVERPOOL, N.S.W. C60

BACKED BY OVER 100 YEARS OF RESEARCH