R.N. TORPEDO DEPOTS

A BRIEF ACCOUNT OF THEIR FUNCTIONS

by

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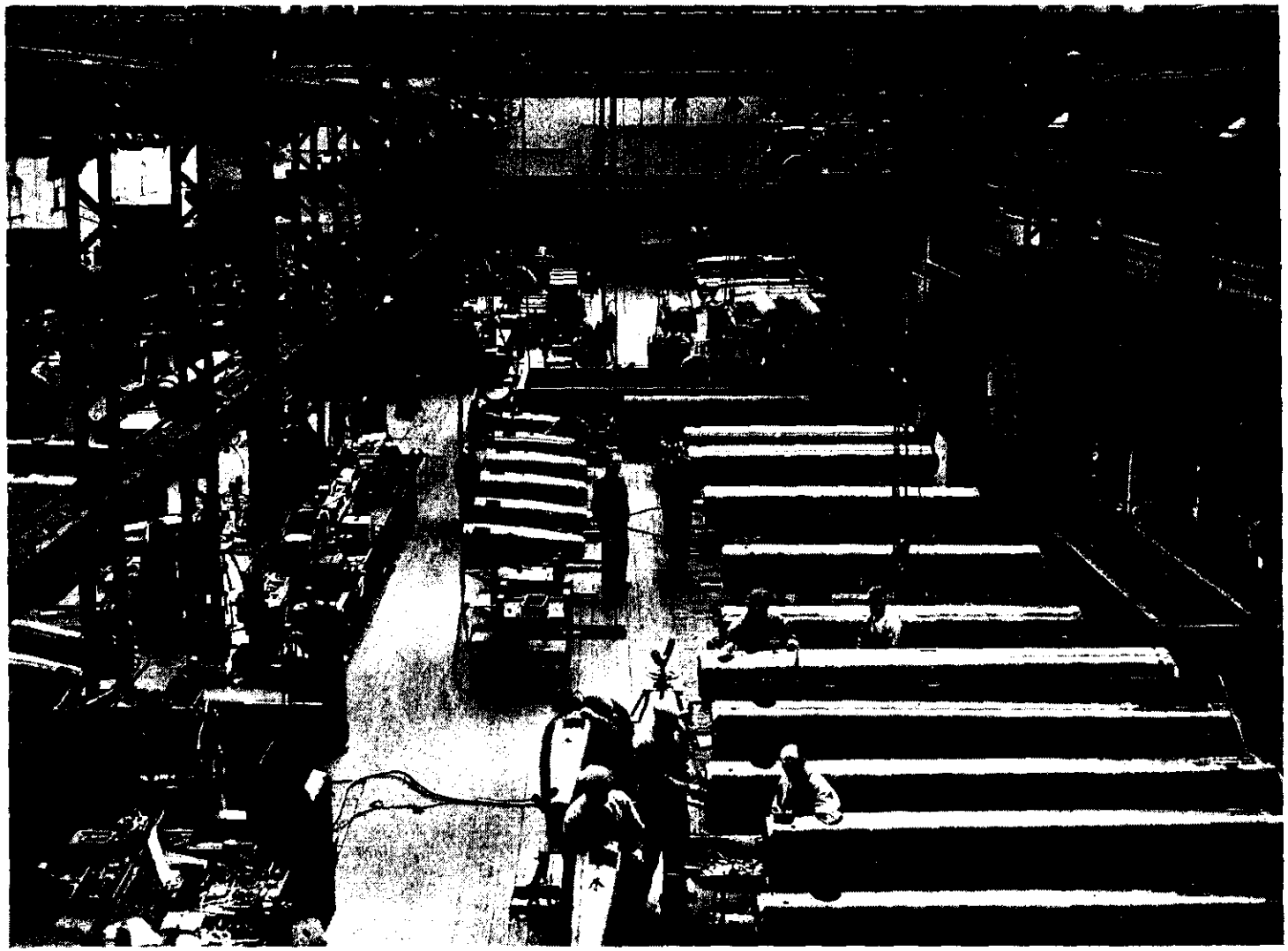
Many Engineer Officers may be unaware of the interesting functions performed by Torpedo Depots of which Engineer Officers are in charge within the organization of the Armament Supply Department.

Torpedo Depots are provided in all the major commands of the Fleets at home and overseas as integral parts of the secure bases from which the Fleets must of necessity operate. The essential functions of Torpedo Depots are to replenish and refresh the Fleets with torpedoes, paravanes and associated components and stores. The major function in aggressive war is replenishment, and in peace refreshment ; but since opportunity for attack may not present itself over long periods, refreshment may also be a function of Torpedo Depots in war. For purposes of replenishment in war, Torpedo Depots obtain torpedoes from the sources of production, and in this respect they may be regarded as the spearhead of the Director of Armament Supply organization for the production, supply and transport of torpedoes. The existence and availability of the services of Torpedo Depots at strategic positions throughout the world enabled the most distant depots to be served during the recent war from the depots further behind in receding stages to the point where home depots were being replenished by new production torpedoes.

The primary prerequisite of replenishment and refreshment is quality, whether the issue be a torpedo, a paravane, a gyroscope, a pistol, a spare part, or an outfit of tools. Quality of manufacture and performance may not be assumed, but must be confirmed before new material is issued to the Fleet in replenishment. The acts of confirmation of quality consist of testing the propelling, depth-keeping, steering and auxiliary mechanisms under workshop conditions, which have been designed and developed from years of experience to simulate working conditions, and by these methods to ensure that the routine preparation by the user will reproduce the results which he expects.

The majority of Torpedo Depots are sited in H.M. Dockyards, and are subject to the general control of the Admirals Superintendent, and the detailed departmental control of the Director of Armament Supply (technical advice being given by senior Engineer Officers serving as Engineer Assistants to D.A.S.), but matters of high policy, *e.g.*, disposition of reserves of torpedoes and related stores, are communicated to Commanders-in-Chief of Stations and Fleets by the Secretary to the Admiralty. All administrative matters which require co-ordination within the Dockyard in which the Torpedo Depot is sited, *e.g.*, new works and machinery proposals, land and water transport proposals, certain staff matters, etc., are previously discussed with the Director of Armament Supply, for approval in principle, before they are forwarded to the Admiralty through the Administrative Authority.



DEVONPORT TORPEDO DEPOT—PART VIEW OF TORPEDO WORKSHOP

Torpedo Depots neither sited in a Dockyard nor subject to the general control of the Admiral Superintendent of an adjacent Dockyard or the Naval Officer-in-Charge of the district, are subject to the general control of the Commander-in-Chief of the area in which the Depot is sited.

Wherever a Torpedo Depot may be sited, close contact with the nearest Armament Depot is essential, since the explosive components of torpedoes, *e.g.*, warheads, primers, igniters, etc., are not stored in Torpedo Depots but in the magazines of Armament Depots. Thus careful liaison between the two Depots is necessary, particularly when torpedoes are required to be issued with their explosive components.

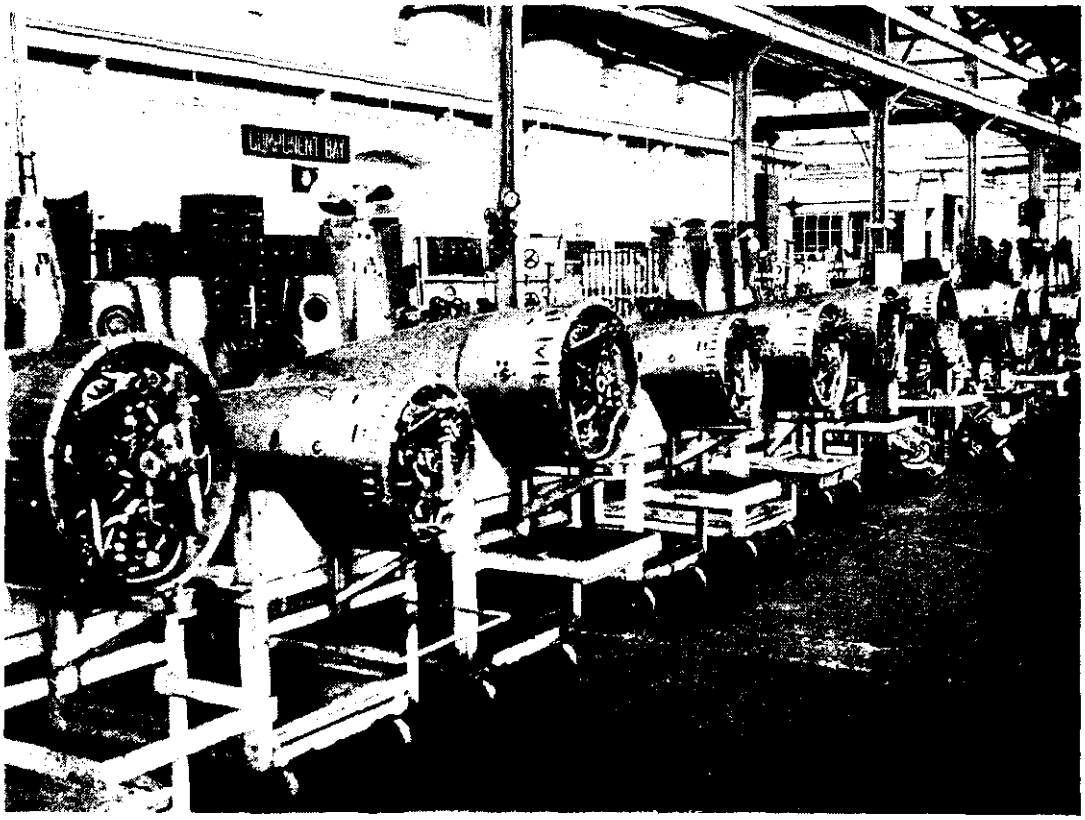
Apart from the Torpedo Engineer Officers and Assistant T.E.O.s, the Torpedo Depots are civilian manned and the staffs are broadly divided into three main sections—office, store and workshop. The senior civilian officer is usually either a Deputy or Assistant Armament Supply Officer who is in general charge of the administration of the office and store organizations and who takes charge of the Depot in the absence of both the T.E.O. and A.T.E.O. The office staff comprises Clerical Officers and subsidiary clerical grades ; the store staff comprises a Foreman of Stores, Assistant Foremen of Stores, Storehousemen, Storehouse assistants and labourers and also includes staff employed on transport duties. The workshop staff is under the control of a Foreman of Fitters, who has Inspectors of Fitters and Chargemen of Trades on his staff to take charge of the fitters, coppersmiths, blacksmiths, skilled and unskilled labourers involved.

The layout of a Torpedo Depot must, of necessity, include torpedo, paravane, gyroscope, pistol, coppersmith's, fitting and machining workshops and torpedo, paravane, components, gyroscope and pistol stores. The relative positions of these shops and stores to each other has been largely determined and restricted by such buildings as were, and are, available, but it is obviously desirable that one end of the torpedo store should be adjacent to the torpedo workshop to minimize internal transport, and that the other end, or a side, of the torpedo store should be adjacent to external rail, road and water transport facilities. The same general remarks are equally applicable to the paravane workshop and stores.

Associated with every torpedo workshop is an incorporated or separate high pressure air compressor room, and associated with every coppersmith's shop is an incorporated or separate test house.

A uniform torpedo workshop procedure is used at all Torpedo Depots. A workshop sheet on which is recorded all the examinations and modifications which are to be carried out during the intended operation or overhaul accompanies every torpedo into the workshop. The torpedo workshop staff is divided into five groups : (*a*) parting and stripping torpedoes ; (*b*) refitting all stripped-out components, *e.g.*, engines, depth gears, servomotor, main and disc reducers, group valves, tails, propellers, etc. ; (*c*) building-up engine rooms and afterbodies ; (*d*) building up depth gear compartments ; (*e*) coupling, testing and passing out the complete torpedoes. Other groups refit and test gyroscopes, pistols, flight-in-air tails and other components.

Minor body leaks are made good by coppersmiths working in the torpedo workshop and major leaks are made good in the coppersmith's shop. Coppersmiths remove dents in the light steel bodywork ; remove and remake the joints of air vessel bulkheads ; renew pipe lines and circuits, etc. ; remake balance chamber joints and, if necessary, fit new balance chambers. All air



AFTERBODY BAY

vessels and fluid bottles are periodically proof tested after internal cleaning and examination for pitting and corrosion. The proof testing is performed in a pit in an enclosed test house. Circumferential and axial expansion gauges are fitted to the air vessel and an oil pressure test is carried out using raw linseed oil. The expansions, retractions and permanent set, if any, are noted.

A wide range of machines is usually available in the machine shops for the manufacture of torpedo tools and components, jigs and gauges, on requisition from the Director of Armament Supply, and for carrying out the machine work of approved modifications to torpedo and paravane components.

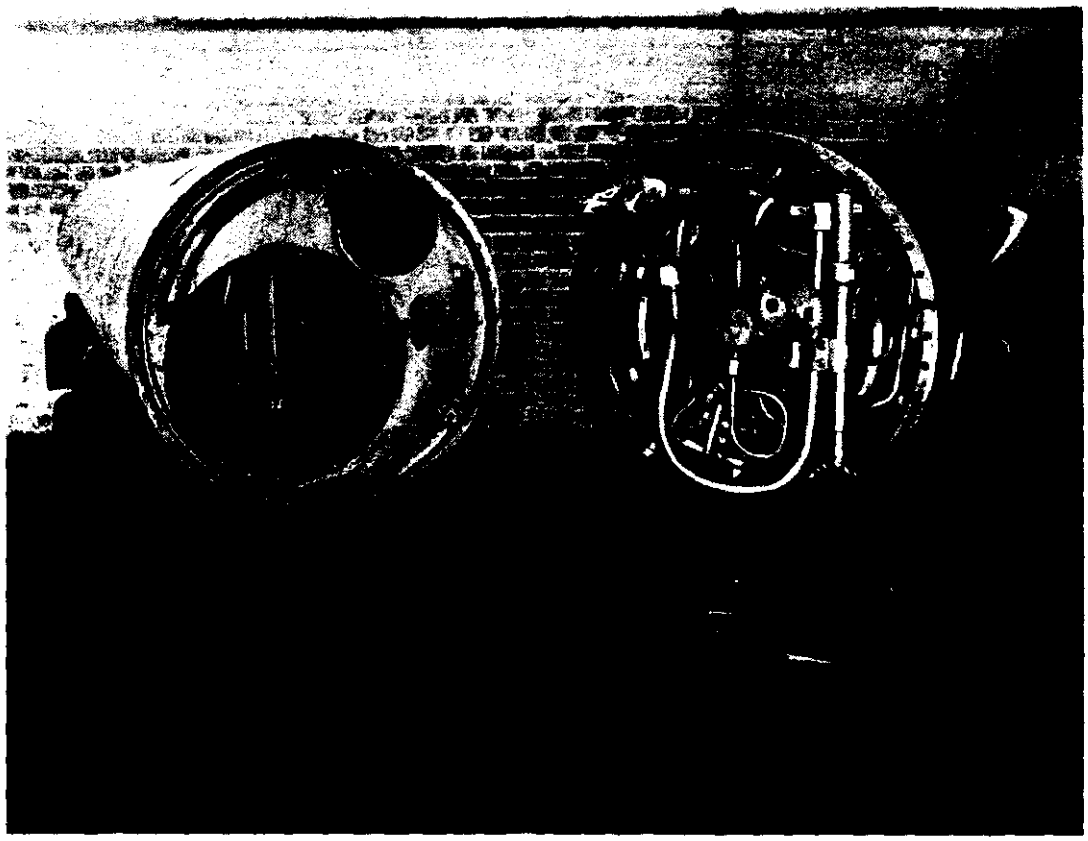
Efficient lifting appliances which occupy the minimum amount of head room in low buildings are essential in Torpedo Depots.

Torpedoes and paravanes (less planes) are stored in racks. The standard torpedo racks, each of which will stow 6 high × 12, are sited in pairs of lines, as many racks per line as the space available will permit, with a common working space for loading and withdrawing torpedoes between each line of a pair.

All component stores, spare parts, tools, etc., are kept in marked bins and special racks which are easily stowed and observed.

The office block of a Torpedo Depot, besides the usual quarters for the officers of the Depot, consists of a signal and messengers office, a main office, and a drawing office. Clerical officers, or clerks, are employed in the main offices in sections :—

(*a*) Registry, circulation, typing and despatch, docketing and filing correspondence.



A Torpedo Parted

(*b*) Stock ledgers, annual demand, intermediate provision and supply.

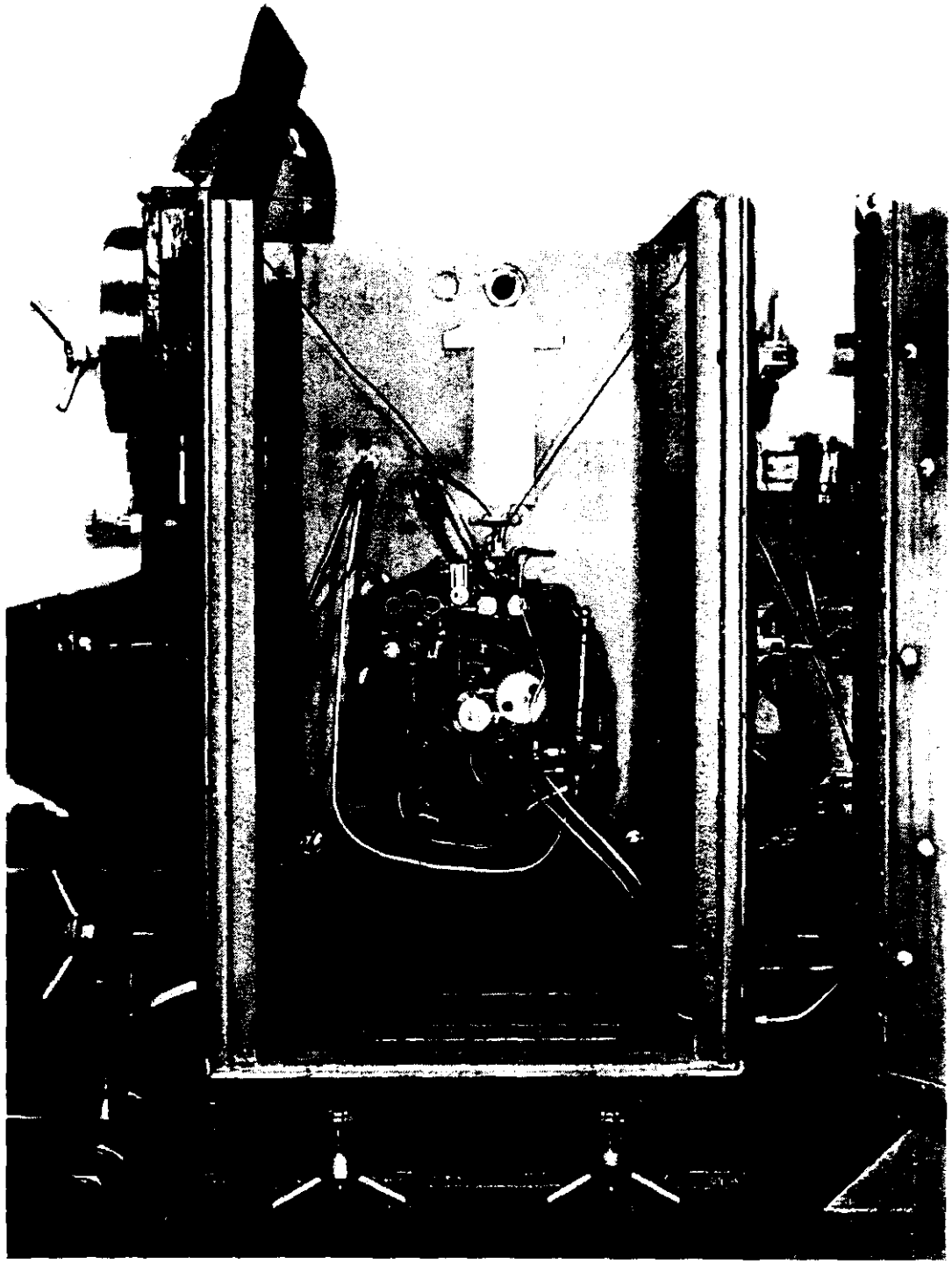
(*c*) Accounts (reconciling consignment notes, invoices, issue and receipt vouchers) and stocktaking. Local purchase.

(*d*) Establishment, staff records, preparation of entry and discharge notes, and cash and canteen trading accounts in isolated Depots.

(*e*) Torpedo and paravane allocation registers and returns, history sheets.

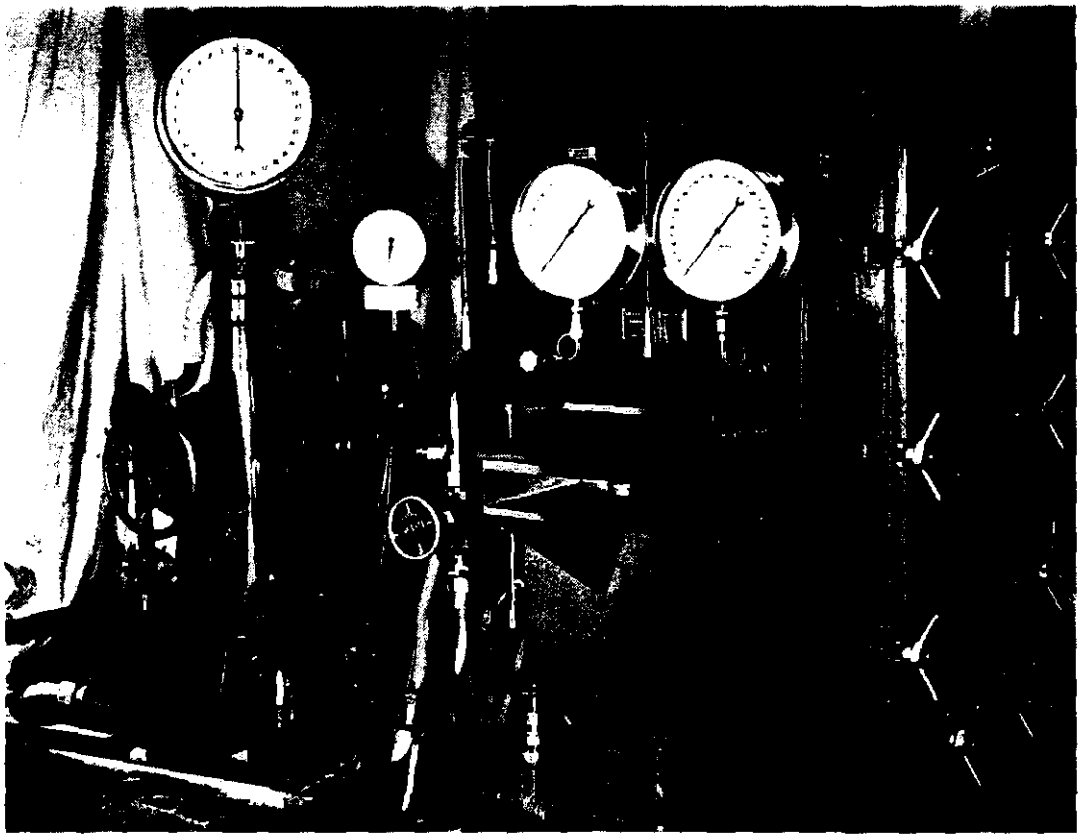
In all Depots there is ample employment in the drawing office for at least one drawing office assistant in keeping all technical books, instructions, drawing and records up-to-date, and in giving general assistance to the Torpedo Engineer Officer and technical staffs, in planning workshop layout, abstracting material requirements for approved modifications and manufacturing requisitions, preparing works and machinery proposals, and in the preparation of supplementary drawings for use in the workshops and stores.

Most Torpedo Engineer Officers normally learn the job as Assistant Torpedo Engineer Officers at Main or Ranging Depots at Home ; alternatively, they may receive first appointments as Officers-in-Charge of small overseas Depots whilst holding the rank of Lieutenant (E) or Lieutenant-Commander (E). In the latter case, arrangements are usually made for these officers, before proceeding overseas, to undergo short intensive courses at Home Torpedo or Ranging Depots, and to spend a few days in the department of the Director of Armament Supply where they meet many experienced civilian officers of the Armament Supply Department and receive much helpful guidance and advice.



BRAKE MACHINE FOR TESTING TORPEDO ENGINES
SHOWING ENGINE MOUNTED IN TESTING TANK

An officer newly appointed to the Department may not be conscious of the valuable prior qualifications he brings to his new job, but he may be assured that his mechanical and electrical training, his knowledge of the properties of materials and the principles of combustion and lubrication and his experience



BRAKE MACHINE FOR TESTING TORPEDO ENGINES
GENERAL VIEW

and observations during sea service will be employed and tested to the fullest extent.

The British staff of an overseas Depot is small in relation to the number of native workers employed, but is well-balanced, and will probably consist of an Assistant Armament Supply Officer, or a Departmental Clerical Officer, a Foreman or Inspector of Fitters, an Assistant Foreman of Stores or a Storehouseman, and possibly seven or eight Chargemen of Fitters, and a Chargeman of Coppersmiths. The Torpedo Engineer Officer is responsible for the provision, supply, maintenance and repair of all the torpedoes, paravanes, torpedo gyroscopes, pistols and components, etc., on the Station, and if the Depot includes a small range, he will be responsible for re-ranging and re-passing all torpedoes which have undergone major repairs, or are due for periodical re-ranging or fault finding ranging. The stocks on the Station will include approved reserves, but he will not, as a rule, be burdened with additional bulk stocks, apart from an approved Fleet allowance of special Fleet practice torpedoes. His activities will be largely regulated by Station Orders and standing and supplementary instructions issued by the Director of Armament Supply.

The maintenance and repair of torpedoes, in large numbers, calls for careful forward planning to even out the demand upon the repair organisation and ensure economical employment of the repair staff, but the planning should take into account the probability of unforeseen demands at times when the

Fleet is in port between cruises. The newly-arrived Torpedo Engineer Officer would be well advised to survey the dates upon which every torpedo on the Station falls due for periodical proof testing and to plan accordingly ; he may well find, for example, every destroyer in a Flotilla previously equipped with torpedoes at approximately the same time, and all torpedoes in the Flotilla consequently falling due for proof-testing simultaneously. These particular tests may never be allowed to become overdue, and, therefore, should be commenced well in advance to spread out the work. The final stage of his forward planning is to give plenty of notice to T.A.S. Officers of H.M. ships of the torpedoes it is desired to exchange when next in port.

The Torpedo Engineer Officers' technical role is primarily to ensure, by personal investigation, guidance and decision that the basic specifications for all examinations, modifications and repairs are intelligently carried out, to satisfy himself that the specifications do, in fact, fulfil the requirements, and to study the suitability of the design of the test gear and components for the particular purpose. Torpedo and component design is never static, neither is it a selective and closed field of study. Constructive criticism is welcomed from any quarter, but unauthorized changes in design are not permissible. The word " specification " is used in an inclusive sense to cover all the applicable literature and drawings, of which there is a large amount, none of it superfluous. The next technical role follows from the first, and it is to plan and organize the production and the economical allocation of the labour force to meet the Station requirements.

There are many ancillary aspects of good management, *e.g.*, control and encouragement of staff, maintenance of plant and transport, economical consumption of light, power, fuel, gas, oil and materials, security organization, custody of books, papers and drawings, handling and dealing with correspondence, etc., which must be attended to before the Torpedo Engineer Officer may regard the job as being under control.

The Torpedo Engineer Officer in charge of a Ranging Depot deals with a different, but equally interesting and important, aspect of torpedo work. All newly manufactured torpedoes are finally accepted into the service after satisfactory running trials on a range. These trials establish the ability of a torpedo to conform to the legendary requirements of speeds, depth-keeping, deflection, range, list, and consumption of fluids. Similar trials are carried out with torpedoes which have undergone major repairs at non-ranging Depots, and with a small percentage of all torpedoes refitted at non-ranging Depots as a check upon standards of condition.

After these trials, torpedoes are stripped down at the ranging or the parent Depot and every part is thoroughly examined for condition after ranging. If the trials results are unsatisfactory, extensive exploratory examinations may be necessary at the range, and this is the field in which the Torpedo Engineer Officer may expect to apply his powers of analytical deduction and, if a change in design is found to be necessary, to form and make his recommendations.

Besides these specific duties, the Torpedo Engineer Officer is responsible for the general details of management previously described, the care and maintenance of torpedo recovery boats and targets, supervision of target moorings, and the control and use of all gear and appliances for the location and recovery of sunken torpedoes.

Independent research trials are frequently carried out at Ranging Depots under the direction and supervision of the Superintendent Torpedo Experiment and Design, but in close co-operation with the Torpedo Engineer Officer.

All ranging experience to date demonstrates without a shadow of doubt that the running performance of a torpedo is not yet an exhausted subject about which there is nothing more of value to learn ; the maintenance of known standards alone requires continual supervision and investigation to prevent deterioration, and the summing up and analysis of all the forces, human and material, tending towards deterioration are complicated and inevitable tasks which must be performed before the way to improvement can be seen. Many Engineer Officers have rendered distinguished service at Ranging Depots and have made important contributions to the never ceasing task of improving the torpedo and its performance.

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