

FIG. 1—H.M.S. 'GANGES'

H.M.S. GANGES

BY

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In 1898, H.M.S. *Ganges*, an 84-gun vessel of 2,285 tons and the fourth of her name, completed her conversion to a training ship and was moved to Harwich. She was moored near Shotley and, together with some hulks, comprised the new training establishment.

In 1899, the only buildings at Shotley consisted of two Martello towers and a fort housing a battery of 11 guns. In 1902, sick quarters and some recreational buildings were added and in 1903 the building of the present shore establishment was started. This was finally completed in 1905, when the ships were paid off and H.M.S. *Ganges* re-commissioned ashore.

From 1905, H.M.S. *Ganges* continued to train boy seamen and boy communication ratings. The numbers then were approximately 500 and this number has gradually increased with the expansion of the establishment, to the 1,800 juniors under training here today.

On 30th April, 1956, the first recruitment of junior M.E.s and junior N.A. mechanics arrived at H.M.S. *Ganges*. At present there are 320 J.M.(E)s and 250 J.N.A. mechanics under training.

ORGANIZATION OF H.M.S. 'GANGES'

The main establishment is divided into twelve training divisions averaging 130 juniors in each and headed by a divisional officer and an assistant divisional officer. The D.O. is invariably a General List officer, being a senior lieutenant or lieutenant-commander and his assistant either an S.D. officer or, as in two cases at present, an instructor lieutenant. At the beginning of this paragraph reference was made to the 'main establishment', the purpose of this differentiation is because all juniors join in batches, known as recruitments. There are nine of these a year and on arrival they are accommodated in the Annexe, which is to an extent a self-contained unit, for four weeks. Here they are kitted-up and do a certain amount of new entry training, after which they join the main establishment and are allocated to a Division.

Juniors of four Branches : Communications, Seamen, Engineer Mechanic and Naval Airman Mechanic, are trained here. The communications juniors stay for 16 months and are drafted direct to sea as part complement. The remainder stay for a year, after which they pass on to their appropriate Part II training establishment.

Junior M.(E)s and N.A. mechanics join as such, whereas the communications juniors are recruited while at the Annexe, being drawn from the other Branches. Approximately nine per cent of these juniors come from the combined Engineering Branches. It should be said, however, that the juniors who make up this percentage are carefully graded according to intellect and that there is no question of the Communications Branch removing all the 'cream' from the Engineering Branch. These transfers are entirely voluntary on the part of the junior and require parents' consent.

This is the only transfer of Branch normally allowed to the engineering juniors. There are, however, isolated cases where Branches are changed during training, particularly in the case of the engineering junior who proves that he has absolutely no mechanical aptitude.

GENERAL TRAINING SYLLABUS

To avoid confusion, all the remarks made under this heading will apply to the Seamen and Engineering Branch juniors. The overall Training Syllabus

of the Communications junior is different in some aspects and does not really come within the scope of this article.

SCHOOL

Half of the total instructional time is spent in the school. There are three educational 'streams' :—

- (1) *A.C. (Advanced Class)*: The final passing out standard approaches Ordinary Level G.C.E.
- (2) *G.C.U. (General Class Upper)* : Continues syllabus of Secondary Modern Schooling, and aims at exemption from E.T.1.
- (3) *G.C. (General Class)* : Aims at passing the E.T.F.A.A.R. (Educational Test Fleet Air Arm Ratings) and the A.B.'s Test.

All streams receive instruction at appropriate levels in :—

Mathematics	English
Mechanics	Geography
Electricity and Magnetism	History
General Science	Elementary Navigation

Final examinations are taken on completion of training. All A.C. classes should gain 'Exempt E.T.1', and a proportion take, in addition, E.T.2. The G.C.U. and G.C. classes take the same final examination and approximately 45 per cent of the G.C.U. and 10 per cent of the G.C. get 'Exempt E.T.1'.

The failure of the final examination entails back-classing for a period not exceeding three months. If in spite of this a boy fails, his retention in the Service needs Admiralty approval.

The school is housed in a self-contained building to which a new science block is currently being added. The staff is headed by an instructor captain who is assisted by an instructor commander and fifty instructor officers.

SEAMANSHIP AND SPECIALIST QUALIFICATION TRAINING

In theory, the remaining half of the instructional time is divided equally between Seamanship and S.Q. Training. In practice, however, allocations are made from both to cover Parade Instruction and P.T.

All three Branches do the same seamanship training and this starts on arrival in the main establishment. The training includes theoretical and practical work and a certain amount of Damage Control. On successful completion of this training a junior is fitted for employment as a seaman as part of complement.

Specialist Qualification training (S.Q.) starts, in the case of the junior seaman, in the 17th week on course. At this stage they are allocated according to their ability and choice, to one of the following Branches :—

R.P.
T.A.S.
Gunnery.

For the three weeks preceding this, they have spent a familiarization period with each branch. The subsequent S.Q. training constitutes the first part of the Part II training eventually completed in other establishments.

As already stated, the J.M.(E)s and J.N.A. mechanics are recruited as such. Their engineering S.Q. training, therefore, starts in the 12th week, as unlike their seamen counterparts there is no necessity for categorization.

S.Q. TRAINING OF ENGINEERING BRANCH JUNIORS

A total of 100 hours is spent in this training and it is spread over 22 weeks at the end of which a final examination is set. It must be emphasized at this point that the level aimed at in all the engineering instruction here is extremely basic (in spite of some of the splendid lecture titles !), and is intended to give

TABLE 1

<i>Lecture Heading</i>	<i>Note</i>
Tools	An introduction to the basic hand tools. Hammers, the hacksaw, chisels and files. No practical work.
Materials	Definition of ferrous and non-ferrous. Alloys. General interest lecture in methods of iron and steel production.
Joining Metals	General interest describing welding, brazing and riveting.
Benchwork	It will be seen that there are 30 periods spread over the course. The job is a kit-bag handle and is made entirely by the junior. It is not suggested that this is an ideal selection, but it does seem to provide the maximum of practical filing and hack-sawing with the minimum of drudgery, and has the advantage of being of practical use when finished. The work also includes drilling and riveting (the hinge on the handle). Generally speaking they all enjoy these benchwork periods and some produce an extraordinarily good job.
I.C.E. Theory and Construction	Two-and four-stroke cycle. Principal components.
Engine Stripping and Assembly	Ford 10 engines used. Aimed at teaching logical and tidy approach.
Hydraulics and Pneumatics	Definition. Simple demonstration rigs.
Valves	(For M.(E)s only) Basic types. Starting with sectioned water tap.
Aircraft Hydraulics	(For N.A. Mechs. only) Simple working A/C layout.

the junior a sound grounding in general principles, and in particular, in his chosen Trade, be it marine or air engineering. The following notes should be read in conjunction with FIG. 1 which illustrates the syllabus.

The Engineering Syllabus can be best described by dividing in into two periods. Period One, starting in the 12th week on course and ending at the 24th week and Period Two, continuing from there until the final examinations in the 34th week.

Period One

The syllabus (with two exceptions which will be mentioned) is exactly the same for both Branches.

TABLE 1 shows the standard, and gives explanatory notes on some of the lectures.

Period Two

In this period the two Branches split.

Engineering Mechanics

The aim is to provide a sound and basic knowledge of the boiler, boiler mountings and associated machinery. No attempt is made to cover outside machinery except for their being mentioned in general interest lectures on ships machinery and layout ; the only exception to this being the distilling plant, the principles of which are taught.

The greatest limitation on boiler-room instruction is the lack of 'the real thing'. Most of the common items of boiler-room auxiliary machinery in sectional form are available, but it is difficult to instil a sense of realism in the

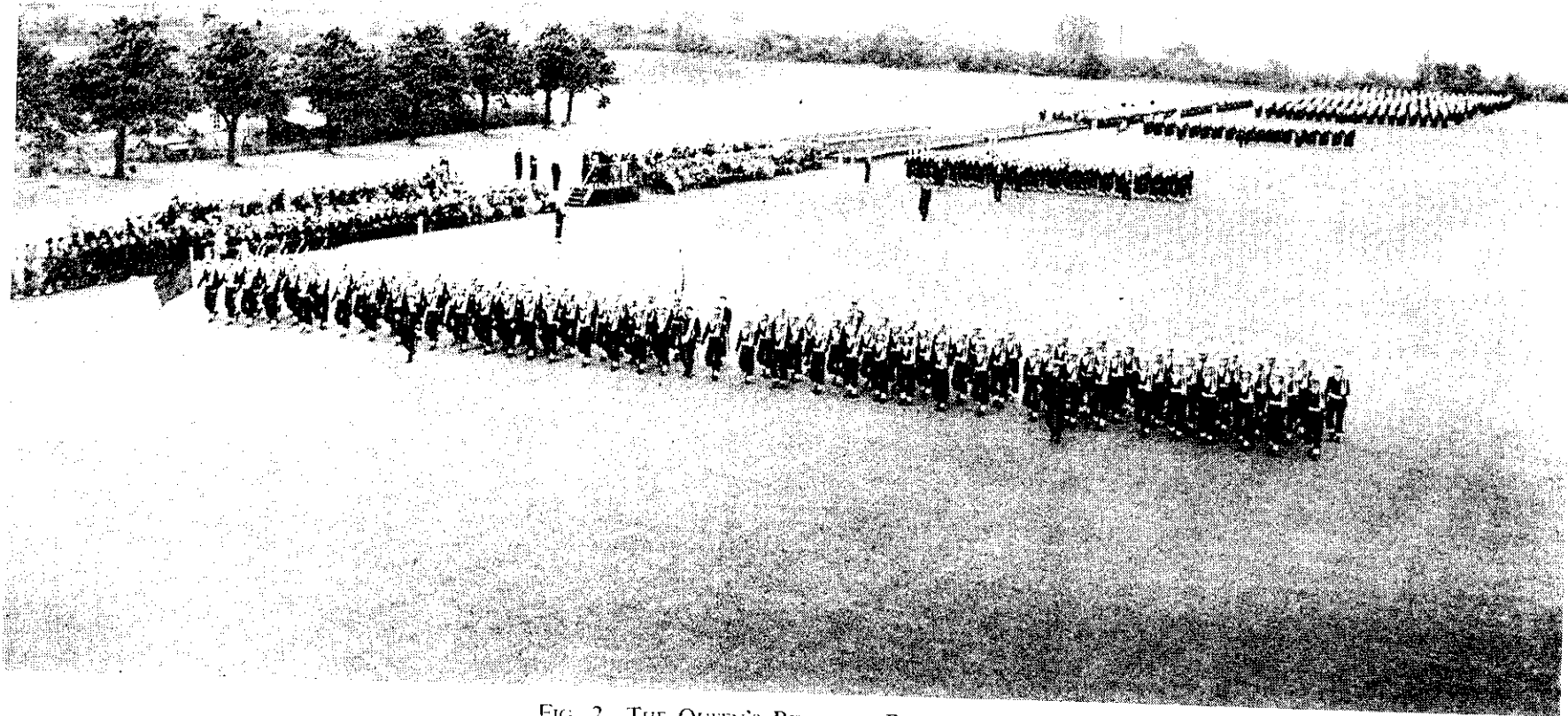


FIG. 2.—THE QUEEN'S BIRTHDAY REVIEW, 1958

		WEEKS IN MAIN ESTABLISHMENT																				
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
TOOLS 1	*	BENCHWORK	HYDRAULICS 1	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	FINAL EXAMINATION	J.M MI TRA	
TOOLS 2		BENCHWORK	HYDRAULICS & PNEUMATICS	DIESEL 1	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	BENCHWORK	FINAL EXAMINATION		
MATERIALS 1		TRANSFER OF HEAT	* I.C.E. THEORY 1	DIESEL 2	ENGINE STRIPPING 4	GUN STRIPPING (HISPANO 20 MM.)	COMBUSTION OF F.F.O.	PUMPS AND COMPRESSORS	CLOSED FEED SYSTEM	BENCHWORK	BENCHWORK									BENCHWORK		
							AIRCRAFT TYPES & ROLES	HYDRAULICS (AIR)	SAFETY IN HANGARS	MILLS TRAINER												
MATERIALS 2		INTRODUCTION TO HEAT ENGINE	* I.C.E. THEORY 2	I.C.E. THEORY 3	ENGINE ASSEMBLY 3	GUN STRIPPING (HISPANO 20 MM.)	F.F.O. SYSTEM	RECIPROCATING MACHINERY	DISTILLING PLANT	CAREERS AND ADVANCEMENT	BENCHWORK									BENCHWORK		
							FLIGHT 1	REFUELLING	AIR FRAMES 1													
THREADS	*	ENGINEERING DRAWING 2	ENGINE STRIPPING 1	ENGINE STRIPPING 3	ENGINE ASSEMBLY 4	POWERED FLIGHT 2	BOILERS 1	TURBINES	STEERING GEAR	←5's GO TO SEA	*	EXAMINATION RESULTS AND RECAP.										
							FLIGHT 2	GAS TURBINES	AIR FRAMES 2	AIR PARADE	*											
JOINING OF METALS		BENCHWORK	ENGINE STRIPPING 2	VALVES 1	LUBRICATION AND OILS 1	FLIGHT DECK MATERIALS (INTEREST LECTURE)	BOILERS 2	MAIN PROPULSION UNIT	REFRIGERATION	PULSE OF THE SHIP												
				HYDRAULICS 2			FLIGHT 3	AIRCRAFT FIRE FIGHTING	CLEANLINESS OF AIRCRAFT	FLEET AIR ARM ORGANIZATION												
MARKING OUT JOB AND BENCHWORK			ENGINE ASSEMBLY 1	VALVES 2	LUBRICATION AND OILS 2	FLIGHT DECK	GENERATION OF STEAM	AUXILIARY MACHINERY	PRACTICAL BOAT RUNNING	F.F.O. 3												
				HYDRAULICS 3			FLIGHT 4	EJECTION SEAT EQUIPMENT	AIRCRAFT FUEL SYSTEM	MILLS TRAINER												
STEEL	*		ENGINE ASSEMBLY 2	INTRODUCTION TO HEAT ENGINE	POWERED FLIGHT 1	HALF WAY EXAMINATION	GENERAL LAYOUT		REVISION	REVISION												
				REVISION	*		AIRCRAFT HANDLING	EXAMINATION														
ENGINEERING DRAWING 1			BENCHWORK	WHAT DRIVES A SHIP	M.(E)s	N.A.M.s	SYSTEMS GENERALLY		BOILER ROOM AUXILIARIES													
							GAS TURBINE		ARMING UP AN AIRCRAFT													
BENCHWORK			FREEHAND SKETCHING				ENGINE ROOM AUXILIARIES															
							A/C REFUELLING		CARE MUST BE TAKEN													
			BENCHWORK				CONFINED SPACES															
							PYROTECHNICS															
			INTRODUCTION TO HEAT ENGINE 2			VISIT TO * POWER STATION, IPSWICH, J.M.E. ONLY	BENCHWORK															
						VISIT TO R.A.F. STATION WATTISHAM N.A.M.s ONLY (FORENOON)																

LEGEND

* Film and Lecture

J.M.(E)s Periods in w
M.(E)s and t
are split

J.N.A.M.s

Common
Periods

FIG. 1 — ENGINEERING TRAINING SYLLABUS FOR J.M.(E)S AND J.N.A.M.S.

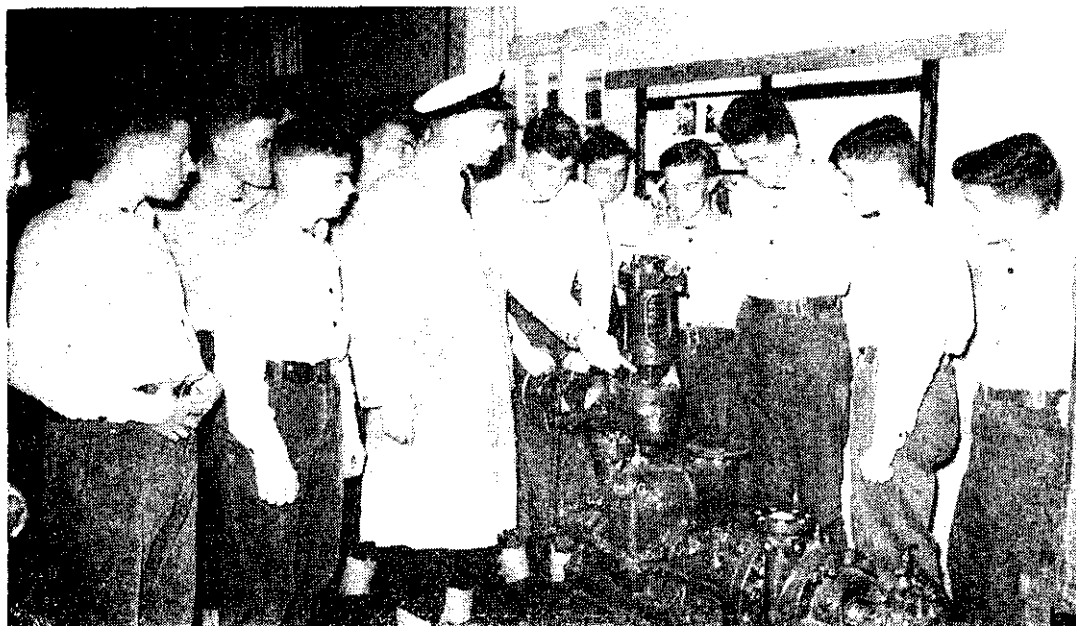


FIG. 3--J.M.(E)S--28 WEEKS ON COURSE

case of the boiler itself, when only diagrams can be used. A compromise has been reached whereby there are two practical periods in the domestic boiler house. This, of course, is far from ideal but does give the juniors a certain 'atmosphere' and they can see the practical use of feed pump, fans and boiler mountings. They also do a silver nitrate test.

Naval Air Mechanics

As with the M.(E), the aim is a sound and basic knowledge which will stand him in good stead in Part II Training.

The training includes the following subjects :—

Theory of flight.—Props consist of home-made wind tunnel, aided by a pusser's fan, a 'flying-scale' type 'Seafire' with adjustable control surfaces and an elderly ME109, minus tail, which indicates the desirability of having one.

Hydraulics, pneumatics and air-frame fuel system.—Instruction is carried out on simplified working layouts.

Gas Turbine.—General principles and components taught with no attempt at detail. Sectioned 'Clyde' and 'Avon' engines are used.

Simple aircraft servicing.—This is confined to trying to teach a sense of 'critical awareness' (for want of a better expression) when dealing with the most basic aircraft components. For instance, care and inspection of wheels, canopies and stressed skin surfaces.

In addition to the training aids in the classrooms, there are two aircraft (Seahawk Mk. I and Firefly Trainer—both A.9'd!) for practical instruction. The Seahawk is ground-run and all hydraulic services operated.

CHARACTER TRAINING

Every opportunity is taken throughout training to develop a sense of responsibility, qualities of initiative and self-reliance, perseverance, etc. The training of sailing coxswains is particularly useful in this respect.

Opportunities also arise on Expedition Training. Each Division has at least one weekend per term allocated to it for this purpose. The whole Division takes part and is divided up into workable parties of about 15 juniors with an officer or instructor in charge of each. They leave the establishment on the Friday afternoon and return late on the Sunday having fended for themselves



FIG 4 --THE QUEEN'S COLOUR GUARD

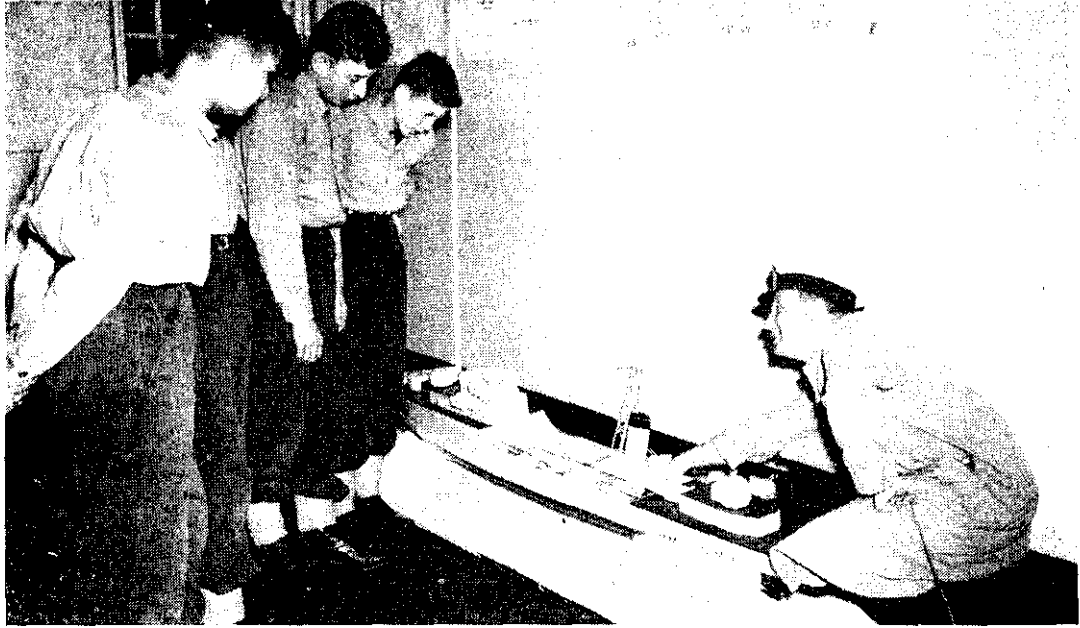


FIG. 5 --J.M.(E)S --WHAT DRIVES A SHIP

under canvas or in an M.F.V. and cutters as the case may be. Every effort is made to vary these expeditions and they have included the Pennine Walk, combined night exercises with H.M.S. *Ceres*, canoeing with Youth Clubs, visits to Cambridge, sailing cutters up the coast, the M.F.V.s to the Continent, and so on.

In addition, the Duke of Edinburgh Award Scheme is operating very successfully on a voluntary basis.

PASSING OUT FROM H.M.S. 'GANGES'

All juniors must pass the final examination in school subjects and seamanship. Failure in either automatically entails back-classing or, in the case of repeated failures, probable removal from the Service.

Failure in S.Q. or lack of satisfactory standard in kit may result in back-classing, but do not in themselves constitute a reason for removal from the Service.

At any stage of his training a junior may be removed on the grounds of unsuitability, particularly with regard to character.

DIVISIONAL OFFICERS AND INSTRUCTORS

As mentioned before, the Divisional Officers are all of the General List and may be of any Branch. At the time of writing there are eight Seaman Branch officers, including submarine and aviation specialists, three Engineer officers (M/E, A/E and O/E), and one Supply and Secretariat officer.

The instructors (all chief and petty officers) are chosen on very similar lines except that they are drawn from the Branches under training at *Ganges*.

The instructors from the Engineering Branches are mechanics, aircraft mechanics, air fitters and in one case, a P.O.M.(E). They are all primarily drafted as 'A' instructors. This means that shortly after arrival they collect a Divisional class of juniors direct from the Annexe and then remain with that class throughout their training. Their duties in this respect are largely domestic, but include Parade Training and river work. The influence of an 'A' instructor on his class and the individuals that comprise it, is very great. It is no

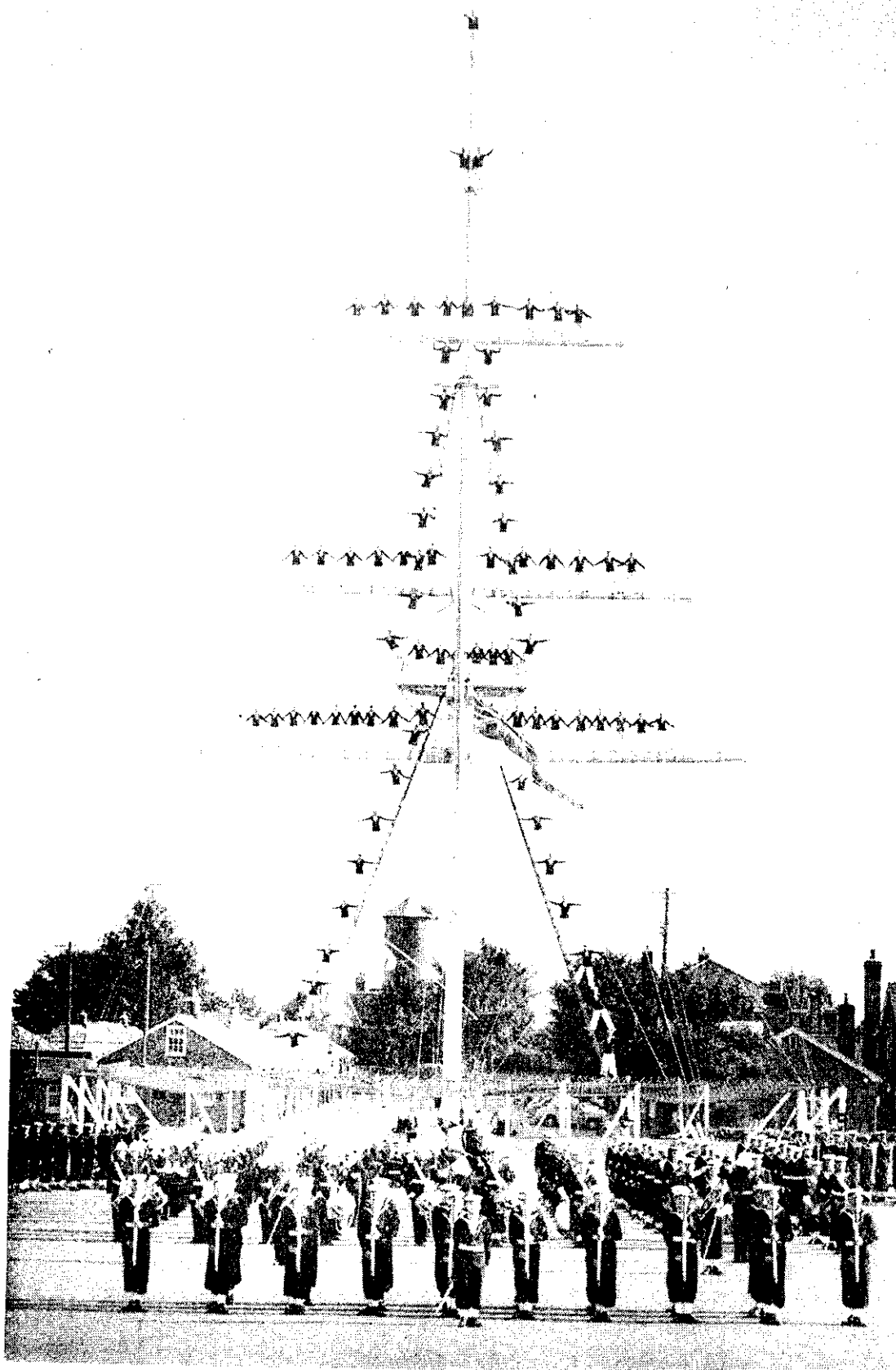


FIG. 6—MANNING THE MAST—PARENTS' DAY

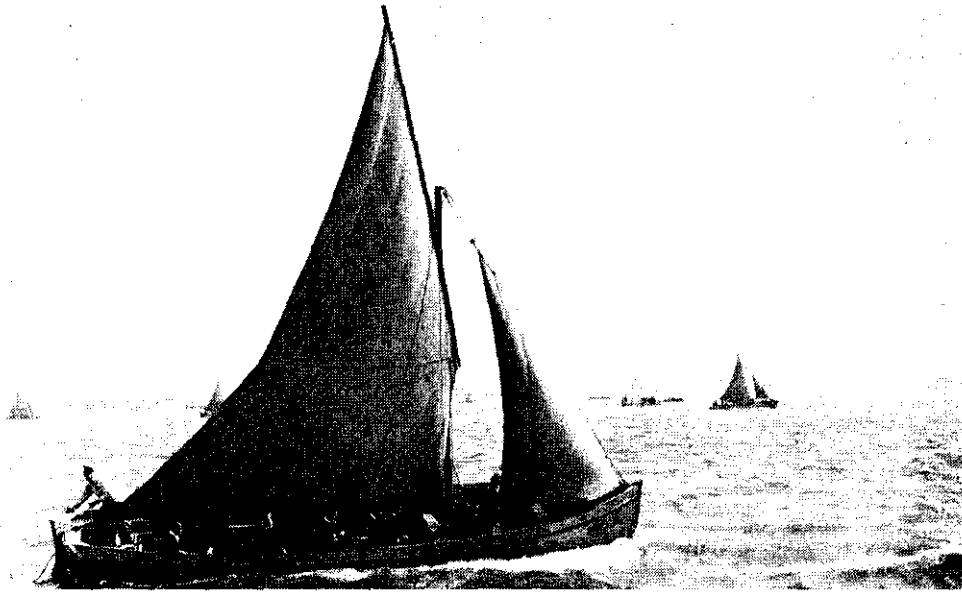


FIG. 7—THE RIVER

exaggeration to say that a bad instructor will produce a bad class, even withstanding the intrinsic quality of the individual members.

Any given class may contain a mixture of all three Branches, or may consist entirely of one Branch—the latter is unusual, as mixing of the Branches is intentional and desirable.

The 'A' instructor of the Engineering Branch may not, therefore, have engineering juniors in his class, or conversely the engineering junior may not have an instructor from the Engineering Branch.

The Engineering S.Q. training is carried out in the Technical Training Centre and the instructing is done primarily by the 'A' instructors who, when the composition of the Divisional classes allows, instructs his own class, but in some cases will be instructing juniors from a class having a Seaman Branch instructor.

His class having passed out, the 'A' instructor of the Engineering Branch will normally do a spell as a 'B' instructor in the Technical Training Centre. His duties are then that of a staff instructor and he will be employed on full time technical instruction.

The overall standard of the Engineering Branch instructor is high. He is particularly conscious of being the representative of his Branch in a predominantly, and traditionally, seaman establishment. For this reason his aim is to do as well, if not better, in all things which are traditionally within the scope of the Seaman Branch, than the Seaman Branch themselves. He succeeds in this to a surprising degree.

CONCLUSION

The inclusion of Engineering Branch juniors within the training structure of H.M.S. *Ganges* was bound to produce difficulties. Many have been overcome, some have yet to be, and undoubtedly others will arise. All these are of little account if the main aim is achieved; that of producing an engineering rating who has a common upbringing and background with his seaman counterpart, and who will, in years to come, work with him without mutual Branch prejudice in the knowledge that they are both Sailors.