E.D. OFFICERS AND THEIR EMPLOYMENT

BY

COMMANDER P. D. TATTON-BROWN, R.N.

The United States Navy has been described by a Fleet Admiral as ' a great engineering project ', and this clearly illustrates the technical approach of all Line Officers. The U.S. Navy hardly existed as a navy in the days of sail, and its ships have always been propelled by machinery, either steam, or internal combustion. As a result of this background, all Line Officers in their graduation course get a thorough engineering education in the widest sense of the phrase. About half the time at Annapolis is spent on engineering and allied subjects. Thus the general level of technical training is higher than in the Royal Navy and the ' Engineering Duty ' officer is more nearly equivalent to what used to be called our E ' dagger ' officer.

TABLE I.—TYPICAL CAREERS OF E.D. OFFICERS

Approx. Age	*Rank*	*E.D. (ce) Constructor Engineer*	*E.D. (g) General Engineer*
18½ to 22½	Mid. Ensign	Four years graduation course at Annapolis (or other civilian university). 50 per cent of course on mechanical engineering.	
22½ 23 24 25	Lt.JG	2 to 3 years at sea as a Line Officer	5—6 years at sea as a Line Officer
26 27 28	Lt.JG	M.I.T. Post Graduate Course for 3 years qualifies as E.D. (ce)	
29 30 31	Lt.	Shipyard	General Line and Monterey P.G. Schools.
32 33	Lt.	Sea Duty	Sea Duty (Line. Applies for and is designated E.D.)
34 35 36	Lt.Cdr. or Cdr.	Bu Ships or Shipyard or Laboratory or Sup. Ships	Shipyard
37 38 39	Lt.Cdr. or Cdr.	Bureau of Ships	
40 41 42	Cdr.	Shipyard, Laboratory, or Supervisor of Shipbuilding	
43 44 45	Capt.	Sea Duty on a Staff	
46 47 48	Capt.	Bureau of Ships	
49 50 51 52	Adml.	Shipyard or Laboratory, or Superintendent of Shipbuilding	
53 54 55 56	Adml.	If Admiral by now see Appendix on Distribution by Rank	

A typical career of the two most usual types of E.D. officer are shown in Table I. Briefly, the policy is that :—

(*a*) The Line officer who is most interested in matters mechanical applies for a course at the Massachusetts Institute of Technology and will if, recommended, take it after three years at sea, thereby qualifying for the E.D. designation as a ' construction engineer '.

(*b*) After six years at sea, all Line officers take a course at the General Line School, and may then be selected for various post graduate courses at

TABLE II.—ENGINEERING DUTY OFFICERS—BASIC SPECIALIZATIONS—1ST MARCH, 1955

Qualification	*Captains*	*Commanders*	*Lt. Cdrs.*	*Lts. and below*	*Total*	*Approx. Percentage*	*Remarks*
c = Hull Constructor	76	9	—	—	85	10	Course stopped in 1938. Numbers will fall to zero
ce = Constructor Engineer	1	143	53	63	260	31	These are the basis of the E.D. structure who complete 3 years at M.I.T. or equivalent after 3 years at sea.
ch = Chemical Engineer	1	2	—	1	4	½	This will in future be a sub-specialization of the general engineer. 1 trained every 2 years
de = Diesel Engineer	1	10	5	2	18	2½	do.
e = Machinery	67	39	5	—	111	13	Now combined with construction under ce
ee = Electrical Engineer	1	10	11	1	23	2¾	Now absorbed in the general engineering specialization
ex = Electronic Engineer	31	70	60	26	187	22	A growing E.D. specialization fed by P.G. schools and M.I.T.
g = General Engineer	—	2	4	5	11	1¼	A growing specialization fed by P.G. schools from Line officers
me = Mechanical Engineer	5	41	32	2	80	9½	Now absorbed by general engineers
mi = Management and Industrial Engineer	3	4	2	—	9	1	do.
mt = Metallurgical Engineer	—	4	4	—	8	1	do.
na = Naval Architects	2	28	9	—	39	4½	No longer entered—absorbed by engineers
pe = Petroleum Engineers	1	5	3	—	9	1	Now absorbed by general engineers
Total	189	367	188	100	844	100	

TABLE III

ENGINEERING DUTY OFFICERS
BASIC SPECIALIZATIONS IN FUTURE

ce = Construction Engineer	...	Qualifies at an M.I.T. post graduate course lasting three years.
ex = Electronic Engineer	...	Qualifies at post graduate courses.
g = General Engineer	...	Qualifies at Monterey or allied post graduate schools from Line Officer.
Percentages may become:—		ce = 38 per cent ex = 22 per cent g = 40 per cent

' ce ' course during the last year has a bias towards one of five subjects :—

(i) Hull or Naval Architecture
(ii) Electrical Engineering
(iii) Nuclear Power
(iv) Electronics (may lead to ex)
(v) Ship Propulsion

' g ' course has a bias to :—

(i) Gas Turbines
(ii) Diesel Engines
(iii) Mechanical Engineering
(iv) Electrical Engineering
(v) Nuclear Power

Officers taking the post graduate courses for the ' g ' E.D. qualification will probably have served about 9 years as Line Officers.

Monterey or civilian schools administered by Monterey. After this post graduate course, a Line officer returns to sea and must then decide either to continue as a seagoing officer, or specialize permanently in some aspect of the U.S. Navy's activities. Some, who wish to specialize, apply for the E.D. designation and are selected, depending on their post graduate qualifications. Many Line officers pass a post graduate course in mechanical engineering but remain Line officers.

The specialization of E.D. officers are shown in Tables II and III. Table II shows the divisions as they exist today, where the picture is complicated by large numbers of reserve officers who became regulars after the war. Table III shows the simpler system which is expected to prevail in the future. The specializations are not considered important by the Director of BuShips Naval Personnel, who said ' all E.D. officers specialize in the Bureau of Ships' business '.

The distribution of E.D. officers by rank, and geographically, is shown in Tables IV and V. The large number of reserves serving temporarily will be noticed. These illustrate the shortage of E.D. officers which persists and prevents more being sent to sea. All seagoing billets are assigned to Line officers, except a few Repair Officers in depot ships and Fleet and Type Maintenance Officers on staffs. The Engineer Officer in the *Forrestal*, for example,

TABLE IV.—DISTRIBUTION OF E.D. OFFICERS BY RANK
(1st March, 1955)

ADMIRALS—19

1. Chief of the Bureau of Ships
2. Commander, Naval Shipyard—Puget Sound
3. Commander, Naval Shipyard—New York
4. Commander, Naval Shipyard—Norfolk
5. Commander, Naval Shipyard—Mare Island
6. Commander, Naval Shipyard—Boston
7. Commander, Naval Shipyard—Philadelphia
8. Assistant Secretary of the Navy—for Industry
9. Chief of the Office of Industrial Relations
10. Deputy Chief of the Bureau of Ships
11. U.S.N. Shipbuilding Representative—Europe (in Paris)
12. Chief of Naval Reactor Branch—Atomic Energy Commission
13. Inspector General—Bureau of Ships
14. Assistant Chief of the Bureau of Ships—Design and Research
15. Assistant Chief of the Bureau of Ships—Shipbuilding and Maintenance
16. Assistant Chief of the Bureau of Ships—Field Activities
17. Assistant Chief of the Bureau of Ships—Director of Planning
18. Vice-Chief of Naval Material
19. Chief of Naval Research—C.N.R.

CAPTAINS	189	(14 Reserve Officers)
COMMANDERS	377	(135 Reserve Officers)
LIEUTENANT COMMANDERS ..	437	(78 Reserve Officers)
LIEUTENANTS AND BELOW ..	299	(177 Reserve Officers)
	1,302	(404 Reserve Officers)

may be a Line officer, but BuShips hopes to be able to spare an E.D. officer for this appointment.

E.D. (Ordnance) officers and Air E.D. officers are quite separate from BuShips administered E.D. List, and cannot interchange appointments.

The E.D. officer wears the same uniform as the Line officer and is sometimes called a ' Restricted ' Line officer ; (according to a Vice-Admiral of the United States Navy :—' He can only be recognized by the slightly more erudite expression on his face '.).

The E.D. officer moves his employment every $2\frac{1}{2}$ to 3 years, so he cannot be expected to become an expert in one subject only. He is supported at the Bureau of Ships by a large number of highly qualified and highly paid engineers, chemists, and physicists. These civilians correspond roughly to the R.N.S.S. and the best dockyard trained draughtsmen, but in general provide a background of training and experience which is lacking in the Admiralty Technical Departments.

At present, some of the more highly qualified E.D. officers are trying to leave the Navy and join industry. They are not permitted to retire at present because of the shortage of officers, but in normal times they would be, as it is considered helpful to the Navy to have their own trained officers serving in industry.

TABLE V.—DISTRIBUTION OF E.D. OFFICERS—GEOGRAPHICALLY
(1st March, 1955)

At Sea		
In seagoing ships	21	
On Reserve Fleet Staffs	26	
In Staff appointments, Fleet and Type Staffs	86	
Total	133	10 per cent
At Headquarters		
BuShips	219	
BuOrd and Activities	6	
BuAer and Activities	2	
BuSanda and Activities	18	
Chief of Naval Operations	32	
Office of Naval Research	12	
Office of Naval Material	22	
Secretary of the Navy	14	
Secretary of Defence	14	(Includes Panama Canal Co., Maritime Admin., etc.)
Atomic Energy Commission	11	
Total	350	27 per cent
At Shipyards		
In U.S.A.	350	
At overseas bases and shipyards	70	
In laboratories (N.B.T.L., E.E.S., etc.)	69	
Total	489	38 per cent
Overseeing Duties		
Supervisors of Shipbuilding	95	
Inspectors of Navy Material	30	
Industrial Managers	134	
Ship Scheduling Activity	8	
Total	267	20 per cent
Miscellaneous		
Military Sea Transport Service	11	
Attaches and overseas missions	28	
Schools—on staffs of same	24	
Total	63	5 per cent
Grand Total	1,302	100 per cent

TABLE VI.—COMPLEMENTS OF TYPICAL ACTIVITIES

Activity	*Total*	*Percentage E.D. Officers*	*Percentage Line Officers*	*Percentage Staff Corps*	*Percentage Warrant Officers*
Bureau of Ships	290	76	19	5	0
Typical Shipyard	—	32	15	39*	14
Typical Large Superintendent of Shipbuilding	27	56	30	7	7
Typical Small Superintendent of Shipbuilding	11	55	27	9	9

* *Note:* The Staff Corps at a shipyard include supply and medical officers for a large naval district as well as the shipyard.

BuOrd. This Bureau has about 260 officers, of which 36 only are E.D.(Ordnance) officers who are not interchangeable with E.D. officers. They are generally Line officers who become specialized in one facet of Ordnance engineering, or who are unfit for sea duty.

BuAer. This Bureau is roughly 50 per cent Air E.D. officers who are not interchangeable with E.D. officers.

BuSanda and other Bureaux of this type are staffed almost entirely by the Staff Corps, who are, in general, non-seagoing. They are of the Pay, Supply, Medical Departments, etc. They are not basically Line officers.

BuShips. Total employed : 4,000 approximately.

BuShips Field Activities. Total employed : 135,000 approximately.