ORGANIZATIONAL ANALYSIS AND CHANGE

IN MERCHANT SHIPPING

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for the degree of Ph.D.

of the University of Bath

1975

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Signed . . . . . . . . .
This research was conducted during a period of rapid change within marine technology and within society ashore. The ships used for the field work were relatively highly mechanized and specialized. Two were owned by a large, old tanker company which had a stable labour force while the remaining two were owned by a small and very young company employing highly mobile officers recruited from other shipping companies. The focus of the research lay within the officer groups, their relationships with each other and with their managers ashore. Attention was paid to the manner in which both officers and shore managers were coping with technological change and to the degree of conflict experienced by individuals when comparing their work and life aboard ship with that of their contemporaries ashore.

The research report takes its place in the literature of open systems (after Emery et al); it extends our knowledge of organizational analysis by drawing attention to the importance of historical development at corporate and individual levels; and it gives an additional piece of knowledge on the nature of rules within bureaucracies.

The results show that the shipping company may be conceptualized as an open economic-socio-technical system the prime exports of which, for continued survival, must be reputation to its sources of finance, to its customers and to the parts of society from which people are recruited. Joint optimization of the overall system is achieved when conditions are such that the senior officers may derive rewards or satisfactions out of performing at superb levels as movement-maximisers (or cost-minimisers). The results further show that, within shipping companies, rules are experienced as supportive and that, among older officers, the occupationally mobile are far more resistant to change than those who spend all their working lives within one shipping company.
ACKNOWLEDGEMENTS

"It is the love of the people; it is their attachment to their government... which gives you your army and your navy, and infuses into both that liberal obedience, without which your army would be a base rabble, and your navy nothing but rotten timber"

(Edmund Burke 1729-1797)

It was the love of people who made this whole research project possible and I thank each and every one of them, especially Betty Moreby, for supporting me during three difficult but rewarding years.

I thank the Tavistock and Oslo Work Research people for opening their minds to me and allowing me to test out my ideas as they grew from certainty to uncertainty. I thank Geoffrey Hutton for forcing me to enter an Alladin's cave of literature about people in organisations.

I thank all those I am fortunate enough to work with in Plymouth — students and colleagues alike — for freely giving me their time and opinions; especially Tony Hutton who helped with the statistics, Ted Tapper who did so much computer work for me and Ernie Sweet who unfailingly produced the research instruments whenever I needed them.

I thank the people ashore and afloat within the two companies used for the field work, for each one gave a great deal of time and personal effort to make this research a success. I wish I could trace all those who participated in the random sample but, wherever they are, I thank them.

My sincere thanks go to the Nuffield Foundation for their so generously financing the field stages of this programme and, had he not been so tragically killed in an air crash, I would have liked to thank Per Waller of Bergen for his moral and financial support.

I only hope that, in this report, I have not let any of you down.

David Moreby

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CHAPTER 1: MERCHANT SHIPPING - A RAPIDLY CHANGING INDUSTRY

Merchant shipping is important for, directly or indirectly, nearly every person on this globe is partially dependent upon shipping for his food, warmth or comfort. Thus, along with the growth of world population, industrial development and increased consumption of energy has come an increase in international seaborne trade with a concomitant increased demand for the services of merchant ships.

Increased demand for shipping services may be met in a number of different ways - by increasing the absolute number of ships; by building bigger ships; by operating faster ships; and/or by increasing the annual carrying capacity of individual ships by reducing the time spent in port. This study focuses on the last method; that is, on the way in which the organization and members of the organization are affected when improvements in annual carrying capacity are effected by the design of more specialized and more mechanized ships.

The growths in seaborne trade and world shipping are shown in Table 1.1, and in Diagram 1.1. Particular attention is drawn to the rate of growth since about 1955.

Table 1.1: Growth in world seaborne trade and world shipping

<table>
<thead>
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<th>Year</th>
<th>Annual world seaborne trade (Million metric tons)</th>
<th>World merchant shipping (Million gross tons)</th>
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<tr>
<td></td>
<td>DRY CARGO</td>
<td>OIL</td>
</tr>
<tr>
<td>1850</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>1900</td>
<td>180</td>
<td>-</td>
</tr>
<tr>
<td>1950</td>
<td>300</td>
<td>225</td>
</tr>
<tr>
<td>1960</td>
<td>540</td>
<td>540</td>
</tr>
<tr>
<td>1965</td>
<td>770</td>
<td>870</td>
</tr>
<tr>
<td>1970</td>
<td>1140</td>
<td>1430</td>
</tr>
<tr>
<td>1972</td>
<td>1340</td>
<td>1440</td>
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</tbody>
</table>

In 1850, all cargo ships were general purpose cargo carriers. There were no special types of ships for, apart from relatively small differences in size, there were no features which distinguished one ship from another; each could enter almost any port in the world and could be employed on any trade. This meant that the early shipowners were never haunted by fears of their ships becoming commercially redundant for, if trade fell on one route, they simply switched their ships to another route. The cargoes carried were contained in boxes, bales or bags which were loaded, stowed and discharged by hand; liquid cargoes were contained in barrels which were handled in precisely the same way as parcels of dry cargo.

Between 1850 and 1900 steamships were introduced but, nevertheless, all cargo ships remained as general-purpose, unspecialized cargo carriers able to go anywhere and carry any cargo offered. However, as marine engineers gained greater experience in the operation of ships’ engines, shipowners were able to offer scheduled services to their customers and the first signs of specialization appeared on the shipping scene — "liners" became distinguishable from "tramps".*

*Note: For glossary of shipping terms see Appendix A
Although the first oil cargoes were carried in barrels, it was not long before ships were specially designed for the carriage of oil in bulk and, by 1910, the tanker had emerged as a special type of ship. By their very design, these tankers were unable to carry anything but liquid cargoes and, owing to their need for shore pipelines and tanks, could trade only between ports having the requisite facilities. Fearing commercial redundancy of such highly specialised ships, traditional shipowners of the day were loth to build and operate tankers; this forced the major oil companies into having to build and operate their own tanker fleets — an action which has had considerable impact on world shipping and seafaring ever since.

Equally significant as the specialization of these tankers was the total mechanization of their cargo-handling methods. At that time, dry cargo ships did have steam winches and derricks for lifting cargo but, nevertheless, each ship had to employ up to 100 stevedores in each port to stow and unstow her cargo; the tanker was able to load and discharge her whole cargo by mechanical means (i.e. by pumps and pipelines). This meant that, for equivalent tonnage of cargo, the tanker spent very much less time in port than did the cargo ship. Tankers became unpopular ships among seamen owing to the inability of tanker crews to get ashore for relaxation and, to counter this unpopularity, tanker owners generally offered more attractive wages and conditions of service than the dry cargo owners.

There were some slight modifications made to cargo liners — especially in their refrigerated capabilities — but it can be claimed that merchant ships remained almost unchanged for 40 or 50 years; that is, from 1910 to about 1955, the world merchant shipping fleet was composed of cargo liners, tramps and tankers. Of course, passenger liners existed throughout this period but such ships were excluded from this study.

Since about 1955, however, there has been an explosive increase in the number of different types of ships. Although many general-purpose tramps still exist, these types of ships could not meet the world demand for the seaborne transport of ore, bauxite, fertilisers and coal and, thus,
the bulk-carrier emerged as a specialized type of tramp in which all cargoes are carried in bulk, loaded and discharged by mechanical conveyors and grabs. These early bulk-carriers, in turn, have evolved into specialized bulk-carriers; for example, timber-carriers, ore-carriers and car-carriers. The early general-purpose tankers, able to carry any grade of oil anywhere, have been superseded by the more specialized Very Large Crude Carriers (VLCC's), chemical carriers, gas carriers (LNG's) and products tankers. The early cargo-liners have been replaced by container ships, barge carriers and pallet-ships.

In all cases the trend has been towards greater specialization of the ship-type and towards greater mechanization of its cargo-handling facility. Supporting evidence was obtained from the statistical records of Lloyd's Register of Shipping from 1890 to 1972. Unfortunately, records have not been kept of the dates when the first ship of each new type was launched but the principal (published) and supplementary (unpublished) annual returns clearly indicate when sufficient vessels of a new ship-type are in service to warrant a separate classification. As can be seen in Table 1.2, the number of distinguishable ship-types has grown from three (in 1922) to twenty-three (in 1972).

The surge towards specialization and mechanization in shipping has been made possible by increased technical knowledge but was probably caused by economic forces.

The customer environment has changed. Where, years ago, the customers were individuals or small firms who wanted to ship small parcels of raw materials or manufactured goods there are now large business enterprises and conglomerates requiring raw materials in large quantities and able to ship manufactured goods by the container- or ship-load.

Shipowners, too, have recognised the economic benefits of scale and, wherever warranted by the size of the trade, they prefer to build and operate larger rather than smaller ships. There are no theoretical reasons why the current annual seaborne trade of the world should not be carried in conventional cargo-liners, in small tramps and in general purpose tankers - except that the use of such ships would
<table>
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<th>1890</th>
<th>1922</th>
<th>1952</th>
<th>1965</th>
<th>1968</th>
<th>1972</th>
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| "Merchant
steamers"
"Merchant sail" | Tankers | Tankers | Tankers | Oil tankers | Oil tankers |              |
| Merchant | Non-tankers  | Non-tankers  | General Cargo | Ore & Bulk | Lithified gas carriers |              |
| sail      | Fishing       | Fishing       | Passenger | General Cargo | Chemical tankers |              |
|          |              |              | Fishing   | Passenger    | Miscellaneous tankers |              |
|          |              |              |          | Fishing      | Bulk/Oil carriers |              |
|          |              |              |          | Fishing      | Ore & Bulk carriers |              |
|          |              |              |          | Fighting     | General Cargo ships |              |
|          |              |              |          | Fishing      | Misc. cargo ships |              |
|          |              |              |          | Fishing      | Container ships |              |
|          |              |              |          | Fishing      | Lighter carriers |              |
|          |              |              |          | Fishing      | Vehicle carriers |              |
|          |              |              |          | Fishing      | Livestock carriers |              |
|          |              |              |          | Fishing      | Fish Factories |              |
|          |              |              |          | Fishing      | Fishing         |              |
|          |              |              |          | Fishing      | Passenger liners |              |
|          |              |              |          | Fishing      | Ferries         |              |
|          |              |              |          | Fishing      | Supply ships & tenders |              |
|          |              |              |          | Fishing      | Tugs            |              |
|          |              |              |          | Fishing      | Dredgers        |              |
|          |              |              |          | Fishing      | Cable ships     |              |
|          |              |              |          | Fishing      | Icebreakers     |              |
|          |              |              |          | Fishing      | Research ships  |              |
|          |              |              |          | Fishing      | Miscellaneous   |              |

Note: Unbracketed names are the principal ship-types appearing in the Annual Returns. Bracketed names are the ship-types recorded in the unpublished supplementary returns; in general, the supplementary records are kept of newly emerging ship-types and once sufficient numbers of ships of the new type are in service, such type appears as a principal ship-type.
require a twenty-fold increase in the number of tankers afloat today (with a consequent increased risk of oil pollution through collision) and about a fourteen-fold increase in the cost of sea transport to all customers.

Ships earn money by carrying cargo from one place to another; they do not earn money while lying in port. Thus the overall trend in shipping is towards reducing port time by speeding up cargo-handling methods — and this is achieved by integrating specialized ships with specialized port facilities by means of mechanized cargo-handling methods. This trend may be illustrated diagramatically as in Diagram 1.2.

Within the shipping industry, 'specialization' is taken to include both the ship's cargo-carrying facility and the limitation on the ports she may use. Thus a ship constructed to carry only one type of cargo (e.g. liquified natural gas) is 'specialized' just as is another ship designed to operate between two specific ports (e.g. a Roll-on/Roll-off ferry designed for, say, the Southampton-Le Havre route). Mechanization embraces both the propulsion machinery and the cargo-handling methods but, for purposes of Diagram 1.2, only the latter meaning is used.

Diagram 1.2 illustrates the overall technical changes in cargo ships from 1900 until the date of this research. It illustrates that ships are becoming more specialised (i.e. restricted in the range of cargoes they may carry and in the range of ports they may enter) and more mechanized in their cargo-handling methods. The trend is clearly from a low degree of mechanization and high degree of adaptability towards a high degree of mechanization and a low degree of adaptability: There are no grounds for thinking that this trend will change direction or reverse itself.

(It is acknowledged that exceptions to the general trend are found in the combination ships (known as OBO's, O/O's, etc — see Appendix A) which are designed to carry various dry and liquid bulk cargoes.)

One of the objectives of this research programme was to identify the manner in which seafarers are experiencing and coping with technical change and, fortunately, a major tanker company and a chemical-tanker company (both operating ships at the extreme of the diagonal in Diagram 1.2) offered facilities for field work aboard their ships.
Diagram 1.2: Developments in shipping 1900-1972 by degree of mechanization and specialization
While on the subject of long-term technical developments in shipping, it may be appropriate to sound a note of warning to future research workers. No matter what dimensions are used to plot technical progress (e.g., degree of mechanization, specialization, tonnage, speed or draught, to name but a few), it is possible to draw a smooth curve through the plotted points out of which may arise the notion that there is a smooth flow of technical development, somewhat like a river. In fact, there is a technological time continuum but, once a ship has been built, she is fixed at that point in the continuum and there she stays for the 15 or more years of her life.

There are very few "single ship companies" today; most ships are units of medium or large fleets (companies). Thus the most commonly found situation is a company with some ships fifteen or twenty years old and some less than a year old. The older ships are fitted with relatively simple control systems and require particular forms of fabric and mechanical maintenance while the newest ships may be equipped with the most advanced navigational, control and cargo-handling devices requiring quite different operational and maintenance procedures. The shipboard organization, working practices, maintenance and storing systems which suit one age of ship may be suboptimal for another age of ship in the same fleet and the note of warning I would sound is that, when drawing conclusions about organizational characteristics from data collected aboard ship, careful attention be given to the age of the ship or ships used for the field work, to the age of the company and to the age-mix of the whole fleet.

The age-mix of one company's fleet presents problems when attempts are made to redesign the overall company's organization, its overall personnel policy and its overall monitoring and performance control systems.

The age-mix of a whole nation's ships presents even more severe problems when attempts are made to redesign national training systems or national wage agreements. Personal experience within companies and at national training boards has made me realise that some misunderstandings are rooted in the parties talking of ships of different ages.
The social effects of technical developments

Around 1850, when all merchant ships were sailing cargo vessels, all seafarers were sailors; that is, all were skilled at handling ships under sail. The Master, assisted by the Mates, navigated the ship; the only recognisable division between people was between the officers (Master and Mates) and the ratings (the remainder of the crew). There were no departmental specialisms and divisions.

When, in 1852, the British government enacted laws under which Masters and Mates of merchant ships were to be examined for certificates of competency, the absence of any differentiation between ships encouraged the legislators to introduce general certificates; that is, the holder of a certificate was authorised to serve in his certificated capacity in any British ship. It is worth remarking that the generality of certificates of competency for deck officers remains right up to the present day (1973), a feature which appears to conflict with the highly specialised nature of modern merchant ships.

When steam engines were introduced (in the latter half of the last century), new types of seafarers appeared on the scene - marine engineers and firemen. The firemen shovelled coal into the boilers while the engineers operated and maintained the engines. The total crew size grew and departmental divisions appeared between the "deck" and "engine" departments.

The introduction of wireless again brought a new type of seafarer - the wireless operator. In the early years neither the wireless operator nor the engineers were classed as "officers" but they gained such status just before World War II. Ships have always carried cooks and, by the 1930's, stewards were introduced in sufficient numbers to be identified as members of a separate department aboard ship. The head of this department is the chief steward and it was only during World War II that Chief Stewards were granted "officer" status.

Thus, the conventionally manned, modern cargo ship has a total crew of about 40 divided along two dimensions: One division is by functional department - deck, engine, catering and radio - while the other division is by rank. Each department
has its officers and ratings, except for the radio department which is staffed by one or two radio officers.

The number of people required to man a cargo ship rose from about 60 in large sailing ships to 100 or more in coal-fired steam ships. With the introduction of diesel engines and oil-fired boilers, firemen became redundant and average crew sizes fell to about 50. Today (1973), with highly mechanized engine rooms, the average crew numbers about 30 no matter how large the ship. Small coasting vessels are manned with much less than 30 people.

The reduction in total numbers of seafarers during a period of fleet expansion is given in Table 1.3.

Table 1.3: Comparison between total United Kingdom seamen and total United Kingdom fleet.

<table>
<thead>
<tr>
<th>Year</th>
<th>Seamen on effective register (1)</th>
<th>Total gross tonnage of U.K. fleet (2)</th>
<th>Gross tons per man (3) = (2)/(1)</th>
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<tbody>
<tr>
<td>1951</td>
<td>180,859</td>
<td>18,550,361</td>
<td>102</td>
</tr>
<tr>
<td>1960</td>
<td>160,030</td>
<td>21,130,874</td>
<td>132</td>
</tr>
<tr>
<td>1966</td>
<td>128,032</td>
<td>21,541,740</td>
<td>168</td>
</tr>
<tr>
<td>1970</td>
<td>107,918</td>
<td>25,824,820</td>
<td>239</td>
</tr>
</tbody>
</table>

Sources: (2) Lloyds Statistical Tables

(1) Department of Trade & Industry Returns plus an estimated allowance for non-European ratings serving on UK ships on articles opened and closed abroad.
Estimated allowances: 1951 +44,000
1960 +37,000
1970 +25,000
Source Rochdale (1970) 1966 +31,400

It should be mentioned that, in some modern ships under the British flag, departmental divisions between ratings have been abolished and all ratings form a common group of "general purpose ratings".

In the days of sail, ships stayed away from Britain for months or years on end; radio had not been invented; and the relatively fragile ships of the day were often exposed to perils necessitating a high degree of discipline on board. Under the 1894 Merchant Shipping Act, Masters were empowered to punish seamen for disobedience or misconduct by making deductions from the offenders' wages. The system
of fining a seaman aboard ship for a misdemeanour is known as "logging" (from the statutory requirement for the Master to enter the facts of the case in the ship's official log book). Although slightly modified, the logging system was still in force at the time of the field research (1972). When a certificated officer commits an offence, he is not "fined"; instead, the facts are entered in the ship's official log book and the matter reported to the Department of Trade & Industry.

In the early days, when all cargo was loaded and discharged manually, ships spent a few days or weeks in each port. This gave the crew ample time to go ashore for relaxation; it also gave rise to the still currently held belief that, by going to sea, a man can see the world and visit exotic foreign ports! (Seamen will understand the exclamation mark). But, since the earliest days of tankers, and since about 1955 for most specialised ships, the length of stay of a ship in any one port is measured in hours rather than in days and modern seafarers are finding it increasingly difficult - if not impossible - to get ashore for relaxation and sightseeing. The result is that the modern seafarer cannot relieve tension by getting away from his shipmates nor by role-switching ashore; and personal tension-relieving mechanisms become highly important factors in securing or disrupting shipboard harmony.

In summary, the gross social effects of technical developments in shipping have been:
- the introduction of new types of specialist seafarers;
- increased departmental and rank differentials;
- a reduction in the sizes of crews aboard ship;
- less opportunity for seafarers to get ashore in ports abroad;

all of which have taken place within unchanged (or changed only to a minor degree) merchant shipping laws concerning certificates of competency, ranks and shipboard disciplinary methods.
Organizational effects of technical developments.

One of the most important technical developments - so far as the organization of shipping companies was concerned - was the introduction of the overseas telegraph cable. Of even greater significance, however, was the invention of the wireless for, once radios were installed in ships, Masters and owners could communicate with each other at almost any time.

In the pre-telegraph and pre-radio days, Masters had full and complete responsibility for the commercial success of each voyage. The shipmaster had to search for cargo, negotiate the freight rates, store and supply his ship, engage the crew, load the cargo, sail and navigate the ship to its destination and direct any maintenance work which might be required. Within the definitions of Dalton (1950) the shipmaster was a "line manager" in his purest form. Remnants of this early position and role of the shipmaster are still to be found in much of present day legislation, in company rules and regulations, in training and examinations, and in the organizational status of the Master's position. For example, in the British Merchant Navy, it is still impossible for anyone except a deck officer to be promoted to command of a merchant ship.

With the introduction of the telegraph and wireless, radical changes took place in the organization of shipping companies. The shipowner himself - or members of his shore staff - sought out the cargo, negotiated freight rates (often through a shipbroker), and simply instructed the shipmaster where to go, what to load and where to deliver it. Also, shipowners were able to control and co-ordinate many more ships at a time, and individual shipowners were superseded by partnerships and companies. Former shipmasters were appointed to positions within the shore office as marine superintendents with the tasks of monitoring the performance of ships and crews and advising the rest of the shore staff on maritime affairs. In many companies, Masters found themselves having to report to the marine superintendent instead of directly to the shipowner; this is the most common hierarchical form today.
Masters and Marine Superintendents had—and still have—no marine engineering experience and, by the 1920's in most companies, former Chief Engineers had been brought into head offices as Engineer Superintendents.

As the mechanical and overall technical complexity of ships developed, the engineer superintendents were given additional responsibilities so that, by the 1950's, engineer superintendents took charge of all new-buildings (ships under construction for the company) while marine superintendents retained responsibility for matters concerning ship safety, manning and cargo.

By the late 1960's, specialist departments were to be found in most companies. Engineer superintendents had evolved into technical directors heading large groups of technical experts in head office; personnel managers had emerged as distinct from marine superintendents; the purchasing and supply of stores for all the company's ships were centralised under purchasing managers; and, in most liner trades, the loading and discharge of cargo was controlled directly by cargo superintendents.

The changes in organizational roles and responsibilities from 1850 to 1970 are illustrated in Diagram 1.3 on the following page.

Although Dalton (1950) differentiated between "line managers" (people directly responsible for achieving the company's objectives by having direct control of the company's resources) and "staff specialists" (functional experts having no direct control of company resources but acting as supporters of line managers), it would be more realistic these days to recognise a continuum joining the extremes of line manager and staff specialist. All managers are located somewhere along this continuum.

When I plot the positions of Masters and Chief Engineers along that continuum I find that, over time, the Master has moved from a line manager towards a staff specialist position while the Chief Engineer has moved in the opposite direction. A related notion concerns the commercial role of the shipmaster. So long as the Master was responsible for finding the best cargoes and fixing the highest possible freight rates he was a revenue maximiser but, as soon as the
Diagram 1.3:
Changes in ship-types and shipping company organization
1850 - 1970
cargo-finding and freight-negotiating activities were transferred to head office staff, the Master became a cost (or loss) minimizer; that is, in his present-day commercial role, his prime responsibility is to reduce or avoid loss of life, property and time. Personal experiences and observations made within many shipping companies in many countries have convinced me that some deck officers and Masters have not yet completely accepted that, in their commercial roles, they are cost minimizers and not revenue maximizers.

Economic features of the shipping industry.

It is probable that shipping has always been a capital-intensive industry, but the evidence suggests that its capital intensity is increasing. This is shown in Table 1.4.

Table 1.4: Costs and numbers of ships, together with numbers of seamen employed for selected years

<table>
<thead>
<tr>
<th>Year</th>
<th>Total UK ships at cost. (£millions)</th>
<th>Total number of UK ships</th>
<th>Total number of seamen in UK ships</th>
<th>Average cost per ship (£)</th>
<th>Average cost per seaman (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959</td>
<td>831</td>
<td>5,395</td>
<td>163,000</td>
<td>£154,000</td>
<td>£5,100</td>
</tr>
<tr>
<td>1964</td>
<td>1,103</td>
<td>4,538</td>
<td>138,000</td>
<td>£243,000</td>
<td>8,000</td>
</tr>
<tr>
<td>1969</td>
<td>1,173</td>
<td>3,858</td>
<td>113,000</td>
<td>£320,000</td>
<td>10,400</td>
</tr>
</tbody>
</table>

Sources: (1) Rochdale (1970) page 460  
(2) Lloyds Statistical Tables  
(3) From Table 1.3

An exceedingly long and detailed economic analysis would have to be made in order to determine what part of the rise in average costs (columns (1)/(2) and (1)/(3) in Table 1.4) was due to technical developments and what part was due to general rises in shipyard labour and steel costs. No attempt was made to separate out these elements for the issue is further clouded by the manner in which prices for new – and, more especially, second hand – ships move in sympathy with the freight market as shown in Table 1.5. on the following page.
There are two distinct methods of earning revenue in shipping:
The first, and most common, is by carrying cargo at rates of
freight (hopefully) above total costs. The second is by playing
the ship-sale-and-purchase market; that is, by anticipating
demand for certain ship-types, buying when prices are low and
selling when freight rates and ship prices rise. The magnitude
of possible profits and losses can be seen in Table 1.5.
It should be mentioned that the companies used in this research
programme adopt the first of the revenue earning methods.

As significant as the high capital costs of ships are the high
operating costs. The daily cost of operating a ship depends
upon the size and type of ship; upon the trade in which she
is engaged; and upon the clauses in her charter-party. An
indication of running costs are given in Table 1.6.

<table>
<thead>
<tr>
<th>18,000 dwt bulkcarrier (New)</th>
<th>18,000 dwt bulkcarrier (2nd hand)</th>
<th>87,000 dwt tanker (New)</th>
<th>87,000 dwt tanker (2nd hand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>18,000 dwt bulkcarrier (New)</td>
<td>1.8</td>
<td>1.9</td>
<td>2.6</td>
</tr>
<tr>
<td>18,000 dwt bulkcarrier (2nd hand)</td>
<td>0.9</td>
<td>0.9</td>
<td>1.2</td>
</tr>
<tr>
<td>87,000 dwt tanker (New)</td>
<td>3.9</td>
<td>4.2</td>
<td>7.1</td>
</tr>
<tr>
<td>87,000 dwt tanker (2nd hand)</td>
<td>3.7</td>
<td>4.2</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Sources: Prices from various shipbrokers' reports
Freight indices from Drewry's Shipping Statistics.
Dry-cargo: January 1967 = 100
Tanker: Worldscale

Table 1.6: Operating costs and capital charges for time-
chartered ships (May 1971)

<table>
<thead>
<tr>
<th>Daily</th>
<th>Daily</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>operating costs</td>
<td>capital</td>
<td>Daily</td>
</tr>
<tr>
<td>costs</td>
<td>charges</td>
<td>Costs</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>18,000 dwt bulkcarrier</td>
<td>£ 450</td>
<td>£ 300</td>
</tr>
<tr>
<td>87,000 dwt tanker</td>
<td>£1,300</td>
<td>£1,900</td>
</tr>
</tbody>
</table>

Sources: Various shipping journals

Notes: Daily operating costs cover wages, insurance, repairs,
and stores.
Daily capital charges cover capital repayments and
interest @ 8½%

Capital charges borne by the shipowner will, of course, depend
upon the initial price of the ship and upon the funding
method he adopts. It is rare, today, for a shipowner to pay
for a ship in cash drawn from reserves. For a new ship, it is more common for the shipowner to obtain relatively cheap credit from the shipyard (at about 8% interest) for 80% of the purchase price and to borrow the remaining 20% from a bank at about the market rate. No cheap credit is available for the purchase of second-hand ships and the buyer has to draw on his own reserves for about 40% of the ship while borrowing the remaining 60% from banks. Ship finance is becoming an exceedingly complex sector of the shipping industry. Banks offer to shipowners complicated financial packages composed of loan, lease and equity finance, (often including multi-currency clauses), which result in the banks getting >14% return on the money lent.

The main points being made in this sub-section are: Ships are costly to buy and operate; capital charges and interest rates may form the major proportion of overall costs; and freight rates fluctuate widely.

Under the Merchant Shipping Acts, a number of qualified officers are required aboard each ship. The number varies with the size of ship, horsepower of engines and trading area but, typically, aboard a deep-sea cargo ship there would be a certificated Master, First Mate, Second Mate, (Third Mate), Chief Engineer, Second Engineer, (Third Engineer), and Radio Officer. These men are recruited into the industry on leaving secondary school at ages 16 to 18. They have to be trained and, as shown in Table 1.7, training costs are relatively high.

Table 1.7: Training costs in the United Kingdom (1971)

<table>
<thead>
<tr>
<th>Cost of training a man from entering as a cadet (age 17) to gaining Master's certificate</th>
<th>TOTAL</th>
<th>Borne by</th>
<th>State</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Excluding wages foregone while under training:</td>
<td>£7,898</td>
<td>£1,060</td>
<td>£2,100</td>
<td>£4,738</td>
</tr>
<tr>
<td>(2) Including wages foregone:</td>
<td>£10,048</td>
<td>£3,210</td>
<td>£2,100</td>
<td>£4,738</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of training a man from entering as a cadet (age 17) to gaining Chief Engineer's certificate</th>
<th>TOTAL</th>
<th>Borne by</th>
<th>State</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Excluding wages foregone</td>
<td>£11,002</td>
<td>£854</td>
<td>£3,852</td>
<td>£6,298</td>
</tr>
<tr>
<td>(2) Including wages foregone</td>
<td>£13,122</td>
<td>£2,974</td>
<td>£3,852</td>
<td>£6,296</td>
</tr>
</tbody>
</table>

Source: Moreby (1968c) updated to 1971
There always has been — and always will be — argument on whether ships' officers are over- or under-paid. Although an industry-wide wage agreement exists within the National Maritime Board Agreements, the actual rates paid by companies depend upon the state of the labour market and upon the nature of the trade in which their ships are engaged. Most companies offer rates above those of the National Maritime Board and, historically, tanker owners have always paid higher rates than dry-cargo owners. So far as an individual officer is concerned, his total earnings over a given number of years will depend upon whether he is a navigating or engineer officer, the rate at which he passes through the series of certificate examinations, and upon the rate of promotional advancement in his company. (Rate of promotion is dependent upon the company's ship building or scrapping programmes and upon the rate of labour turnover). Typical wage rates prevailing at the time of the field work (1972) are shown in Table 1.8.

Table 1.8: Officer wages in British ships (1972)

<table>
<thead>
<tr>
<th>Annual wage</th>
<th>Rank</th>
<th>Age</th>
<th>Rank</th>
<th>Annual wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>£2,000+</td>
<td>3rd Mate</td>
<td>20+</td>
<td>Junior Engineer</td>
<td>£2,000+</td>
</tr>
<tr>
<td>£2,500 - £3,000</td>
<td>2nd Mate</td>
<td>22+</td>
<td>3rd Engineer</td>
<td>£2,500 - £3,000</td>
</tr>
<tr>
<td>£3,000 - £4,000</td>
<td>Chief Mate</td>
<td>24+</td>
<td>2nd Engineer</td>
<td>£3,000 - £4,000</td>
</tr>
<tr>
<td>£4,500 - £5,500+</td>
<td>Master</td>
<td>26+</td>
<td>Chief Engineer</td>
<td>£4,000 - £5,500</td>
</tr>
</tbody>
</table>

Source: Recruitment advertisements in shipping press 1972

It should be mentioned that, in British ships, at the time of the field work, officers were not paid any overtime. Ratings, however, were able to earn overtime.

At the time of the research, a Petty Officer (senior rating) could earn about £2,000+ per year (made up of basic wages plus overtime) while the remaining ratings could earn a total of about £1,600+. Depending on the trade and frequency of ports visited, a pumpman aboard a tanker could earn between £2,000 and £3,000+ in basic wage plus overtime — a level of earnings comparable with a Chief Mate.

All shipboard food and accommodation, plus some working clothes are supplied free of charge to the man; travel between the ship and the man's home before and after vacation, is paid for by the company. At the time of the research, officers got 140 days paid leave and ratings between 60 and 120 days for twelve months' service — although shorter leaves are granted every 4 to 6 months.
Selected characteristics of the seagoing labour force

Recruitment and training

In the early days, the father of any boy wishing to become a ship's officer arranged for his son to be indentured as an apprentice to a shipmaster - the father paying a premium for the training his son was to receive. A slight change was made in this arrangement when boys were indentured to shipping companies instead of to specific Masters. Most companies abolished the premium payment just before the Second World War, but the indentured apprenticeship system remained until the early 1960's.

Between the start of this present Century and the mid-1960's it was the various nautical colleges who conducted the drive to recruit secondary school-leavers into the Merchant Navy. These school-leavers were taken into pre-sea training courses - varying in length from a few weeks to 2 years - at the end of which they were put in touch with various shipping companies who had vacancies for apprentices. Today, however, young men (and women) wishing to become ship's officers are recruited directly by the shipping companies - sometimes via the British Shipping Federation which is the shipowners' industrial body - and are sent, on pay, to selected nautical colleges for training. The indentured apprenticeship system has been abolished and the young people are subject to a normal industrial agreement under which the company promises to train them for three or four years.

The length of training depends on the recruit's initial academic qualifications and the Department of Trade & Industry lays down minimum lengths of time which must be served aboard ship before the Cadet - as he is now called - may present himself for his first professional examination. Towards the end of the 1960's and during the early years of this present decade, educational courses were introduced to complement the vocational training courses and, nowadays, cadets may obtain Ordinary National Certificates and Diplomas in addition to their Second Mate's certificates of competency. Engineer cadets may obtain appropriate engineering ONC's and OMD's.

At the end of his cadetship, the young man is free to seek employment in any shipping company but, understandably, a company which has trained a cadet hopes that he will return to their service as an officer.
Nearly all British shipping companies today operate cadet training schemes - such schemes being seen as the primary source of young officers for their ships. The ex-cadet worked his way up the ranks of 3rd Mate, 2nd Mate and Chief Mate to Master or through 5th-, 4th-, 3rd- and 2nd-Engineer to Chief Engineer. Promotion was generally based on length of service in one company and any officer joining from another company was obliged to start at the lowest rank. More recently, things have changed, for the continuing shortage of ships' officers has forced companies to embark on recruitment drives for all grades of officers and, today, it is fairly common for officers to switch between companies with no loss of - and sometimes a gain in - rank. I found, during this research programme, that the older companies have a core of ex-cadets familiar with the company's ways of doing things while the newer companies, who have not yet had time to train up sufficient cadets, face severe problems when they recruit men of all ranks from other companies.

Labour turnover and wastage.

We can distinguish between 'turnover' and 'wastage' by defining labour turnover as mobility between companies and wastage as loss to the shipping industry. Rochdale (1970) states that labour turnover in merchant shipping is no higher than in comparable shore industries; unfortunately, because of the one-way nature of wastage from shipping and the two-way nature in shore industries, we cannot determine whether wastage from the Merchant Navy is higher or lower than from shore industries.

The survey of seafarers conducted during the Rochdale Inquiry into Shipping showed (in Board of Trade 1970 Vol II Table 5) that 66% of all seafarers switch between companies while 32% remain with the first company they joined. The survey also showed that 50% of deck officers switch companies compared with 60% of engineer officers. Among ratings, inter-company mobility is much higher: The proportions switching between companies being Deck Ratings (85%); Engine Ratings (96%); and Catering Ratings (88%). As I hope to show later in this report, inter-company mobility is one of the major barriers to change in shipboard working practices and it seems to me that, if the shipping industry is to introduce new working practices optimally matched to the specialized ships now in service, the first step which needs to be taken is to reduce inter-company mobility of personnel i.e. to stabilise the labour force in each company.
So far as shipping managers are concerned, wastage from the industry is a problem far more serious than inter-company mobility but, in view of the fact that many young men enter the industry with initial plans to stay at sea for only a limited number of years, I no longer know what is meant by the word 'wastage'. I am drawn to the conclusion that wastage is nothing more than the shortfall between when the recruiter imagined (or hoped) the recruitee would leave and when he actually does leave. The recruitment, training, promotion, pension and employment policies adopted by individual companies and by the industry as a whole suggest that shipping recruitment managers believe that all the young men they recruit Wall stay at sea for all their working lives. It was Hill (1972) who drew attention to the difference between short-term, medium-term and long-term stayers; he showed that the majority of seamen are medium-term stayers and that the industry had much to gain by attempting to increase, by only a year or two, the length of time these people stay at sea.

Although different in method and sample sizes, three separate studies (Moreby 1968c, Board of Trade 1970, and Hill 1972) show the relatively short length of time people spend at sea. The interviews of 400 former seafarers (Board of Trade 1970) gave the data in Table 1.9 which is simply the length of time between first going to sea and returning after the last voyage; it takes no account of occasional absences from the shipping industry while the men try shore jobs between spells at sea. Hill (1972) adopted a different approach to measuring wastage by simply tracing the whereabouts of people who first went to sea in selected years; he draws attention to the increasing absences from seagoing while men try out shore employment before making the final break from the sea. Moreby (1968c) tried to allow for people who switch in and out of seagoing employment by examining the monthly returns of the Registrar General of Shipping and Seamen from 1960 forward from which he was able to calculate the proportions of leavers who would probably return to sea after more than 1 year in shore employment. The results of these three studies are given on the following page.
Table 1.9: Length of time spent at sea.
(Time interval between first going to sea and returning after last voyage)

<table>
<thead>
<tr>
<th>Deck Officers</th>
<th>Engineer Officers</th>
<th>Total (including ratings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 1 year</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>1 - 3 years</td>
<td>22%</td>
<td>23%</td>
</tr>
<tr>
<td>3 - 5 years</td>
<td>9%</td>
<td>15%</td>
</tr>
<tr>
<td>5 - 8 years</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>8 - 10 years</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>10 - 15 years</td>
<td>20%</td>
<td>4%</td>
</tr>
<tr>
<td>15 - 20 years</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Over 20 years</td>
<td>6%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Board of Trade 1970 Vol III Table 4
(from interviews with former seafarers)

Table 1.10: Proportions of entrants remaining at sea

<table>
<thead>
<tr>
<th>At the end of:</th>
<th>%age remaining</th>
<th>%age remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>70%</td>
<td>68%</td>
</tr>
<tr>
<td>2nd year</td>
<td>60%</td>
<td>52%</td>
</tr>
<tr>
<td>3rd year</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>4th year</td>
<td>38%</td>
<td>31%</td>
</tr>
<tr>
<td>5th year</td>
<td>29%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Hill (1972)

Moreby (1968c) approached the problem slightly differently by letting:
- \( S = \) No of men in group at start of a year
- \( N = \) New entrants into that group
- \( R = \) Re-entrants (i.e., men returning to sea after working ashore for over 1 year)
- \( P = \) No. of men promoted into that group
- \( E = \) No. of men promoted out of that group
- \( T = S + N + R + P - E \) (the number who should have been in the group at the end of the year)
- \( A = \) Actual number of men in group at end of the year.

Then, raw percentage loss = \( r1\% = \frac{T - A}{T} \times 100 = \frac{L}{T} \times 100 \) (where \( L = T - A \))

Correction factor for re-entrants = \( F = \frac{R}{L} \times 100 \)

So that actual percentage loss = \( a1\% = \frac{r1\% \times 100 - F}{100} \)

So that average length of time spent at sea by men in one group (grade) of seafarers

\[
0 \int_{0}^{40} e^{-kt} \, dt \quad \text{for officers and ratings}
\]

where \( e^{-k} = \frac{100 - a1\%}{100} \)
Table 1.11: Average length of time spent in the shipping industry by grade of seafarer

<table>
<thead>
<tr>
<th>Length of time spent at sea (in years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deck officers</td>
</tr>
<tr>
<td>Engineer officers</td>
</tr>
<tr>
<td>Deck ratings</td>
</tr>
<tr>
<td>Engine ratings</td>
</tr>
<tr>
<td>Catering ratings</td>
</tr>
</tbody>
</table>

Source: Moreby 1968(c)

As most seafarers are recruited directly from secondary school and, on average, stay in the industry for less than seven years it may be said our merchant ships are manned by young people. This is illustrated in Diagram 1.4

Diagram 1.4: Age of officers serving aboard UK ships on 28th April 1971

Source: Census of Seamen, Dept. of Trade & Industry

As can be seen in Table on page the ages of the respondents in this research programme matched the age profiles above.
Summary of description of the shipping industry with industrial location of the research

There is a continually increasing demand for the services of merchant ships and, to meet this demand, the productivity of ships has had to be increased. Improved productivity, that is increased annual carrying capacity, has been achieved by developing more highly specialized and mechanized ships in order to reduce time in port.

Shipping is a highly capital-intensive industry and ships are becoming more expensive to buy and operate as they become more specialized.

Over the years there has been a shift of duties and responsibilities from the people aboard ship to people in head-office ashore; the organization of shipping companies has changed.

Aboard ship, new types of seafarers have been introduced when major technological changes have been introduced yet the overall shipboard organization — and especially its hierarchical characteristics — does not appear to have changed in step with changing technology and changing head-office organization. Remnants of the older shipboard organization are kept alive by the unchanged nature of the Merchant Shipping Acts.

Seafaring appears to be a relatively well paid career — especially for the younger officers when compared with their contemporaries ashore — and yet wastage is high. People who go to sea leave the industry after a relatively short time with the result that the majority of our seamen are young men.

Is there some conflict or mismatch between shipboard and head-office organizations, or between modern ship technologies and the remnants of the older shipboard organizations, or between the aspirations of individual ship's officers and the reality of going to sea at the present time? These are some of the questions I have tried to examine and answer in this research programme; the research is rooted in those problems which appear to emerging from the increasing specialization of ships.
CHAPTER 2: THE LITERATURE

One of the emerging themes of the last decade is the search for people and organizational structures which can cope with change. The forces causing change may arise from within the organization but, more frequently, they are imposed from without. I feel that a brief description of the changing external environment — in which both seafarers and shipping companies are imbedded — forms a suitable point of departure in this review of the literature.

Many writers, including Roggema et al (1970), point to the fact that the number of inventions is rapidly increasing while the time gaps between invention, first commercial application, general use and obsolescence are rapidly decreasing. As Moreby (1971c) shows, this means that one of the objectives of a shipping company is to avoid early technological obsolescence of its ships.

In addition to the shortened time span in the invention-obsolescence cycle, the issue of choice has to be faced as regards technology. In the past, technology was given priority in dictating the type of social system needed to operate it but developments have now reached a point where a range of different technologies can be provided for the accomplishment of a given objective. Some of the technological options are likely to be more congruent with the aspirations, demands and needs of those having to operate them while other options are likely to engender frustration and dissatisfaction resulting in increased difficulties to recruit and retain people. Some observers of the general industrial scene ashore suggest that, no matter how capital-intensive a particular industry may be, the cost of human resources accounts for an increasing proportion of total expenditure (a cost further increased by "wastage") and that many enterprises are prepared to pay greater attention to the kinds of impact different technologies will have on the people operating them and to take this into account when choosing between alternative forms of technology. After 25 years in the shipping industry I have yet to find a case when technological alternatives have truly been evaluated in terms of their human impact.

In most cases, the alternatives are evaluated in terms of cost, ship efficiency and in the economies of scale — for in shipping there is the all-embracing 'scape-goat' of the Merchant Shipping Acts. Furthermore, in gas carriers costing
£30 million each and in Ultra Large Crude Carriers costing £25+ million each, crew wages form so small a part of the overall costs that most managerial attention is given to the economic efficiency of the ships and any negative effects a particular technology or trading pattern has on the crews are compensated for by higher wages, more frequent vacations and better shipboard accommodation. My personal experience and observations in many shipping companies convince me that personnel managers responsible for the recruitment and retention of seafarers are put in almost impossible positions.

In addition to changes in technology, there are a number of identifiable changes taking place in the external social environment.

Maslow (1954) suggests that philosophies about Man have developed through the ages. He suggests that during the Middle Ages we had 'spiritual' Man; during the Renaissance there was 'intellectual' Man; in capitalism and Marxism we had 'economic' Man; in Fascism, 'heroic' Man; and today we see 'psychiatrically healthy' Man emerging. Herzberg (1966) does not go back as far as Maslow but he, too, suggests an evolving philosophy about Man at work. In the early days of the production line, the worker was seen as 'mechanistic' Man— one who wanted to be used as effectively as possible but with the minimum amount of effort on his part. 'Economic' Man was the worker whose only drives were economic while 'emotional' Man was derived from the Hawthorne studies and was assumed to be driven by social and group needs of belonging. We now see emerging 'instrumental' Man whose higher intellectual talents need to be organized in the same way as his motor abilities. At the present time (1973) we are passing through the environment fashion in which people are expressing deep concern about the environment but already we can detect signs of this fashion giving way to a broader set of ideas and aspirations concerning the quality of life in and out of the work-place. The Man I see emerging is one opposed to abuse— no matter whether it be abuse of himself as an employee, or as a householder or as a shareholder of limited global resources.

Roggema et al (1970) echo these changing philosophies about Man when they suggest that rising standards of education ashore are leading to people becoming more selective and demanding as
regards their work life resulting in a search for jobs which offer intellectual stimulation and challenge. Their view is supported by McGregor (1967) who reports that the more affluent a society becomes, the more significant do meaningful careers become to its members.

The search for satisfying careers is manifested in the much higher job- and career-mobility today, for rapid changes in technology are forcing people to learn new skills at various stages in their lives. Gellerman (1968) is one of many writers who stresses that it is going to be necessary to present the continuous learning process as an indispensable means to security, prestige and self-fulfillment.

Educational methods are changing in our primary and secondary schools. Years ago, pupils stayed seated at their desks for hours on end and were forbidden to talk to their classmates. Today we see children forming groups for project work; talking to and helping others; and moving freely around the classroom. People who passed through the 'sit still and don't talk' method accepted isolated work at restricted workbenches in later life, but the modern youngsters pass through an educational process which prepares them for participation in temporary task groups in later life. The changes within the classroom situation must have some effect on the acceptance or rejection of certain shipboard jobs; but such effects as there might be were not examined during this research programme.

Other changes in society which must be impinging on seafaring are the growing emancipation of women together with the shift from extended to nuclear families. While the wife/mother in an extended family could rely upon her mother or female relatives for support during her husband's absence, the woman in the nuclear family is left unsupported by relatives. The experience is exacerbated when the seafarer's wife compares her own with her neighbours' domestic situations in which husbands actively participate in domestic chores.

Finally, another social change which demands attention concerns participation in decision-making and in the distribution of rewards. Stinchcombe (1965) makes the important point that organizations must reflect the prevailing meaning-structures of their time in their internal patterns of social relations. Ashore we see young people participating in decision-making within their schools, colleges and universities while adult
workers participate in the management of their employing firms. The value that young people attach to participation must affect the degree of acceptance, by new recruits, of traditional hierarchical structures aboard ship.

Organizational changes
Simon (1959), Cyert (1959,1963) and Clarkson (1963) draw attention to the growing separation of ownership from management and they question the validity of the assumption that salaried, professional managers are motivated by (company) profit maximization. In fact the evidence they bring forward indicates that managers are more concerned with maintaining an acceptable and attainable level of profit than with maximizing the profits of their companies. The writers in this group describe the maintenance of an acceptable and attainable level of profit as 'satisficing' and the ship-shore relationships in many large, modern, shipping companies (owned by shareholders and managed by salaried, professional managers) can be understood in terms of satisficing managers attempting to control cost minimizing ships' officers.

Another change taking place within organizations is emphasised by Kahn et al (1964) who point out that the experience of individuals is largely invalidated during periods of rapid technological change and, as a manager's experience becomes irrelevant, so his dependence on expertise in others becomes almost infinite. This makes the holder of officially delegated power not know where he stands in relation to the professional experts on whom he has to rely. Is this happening between Masters and Chief Engineers?

Technical changes in shipping
The overall technical changes in shipping have already been described in the previous chapter of this report but a search of the literature draws attention to other significant changes. Moreby (1971b) groups technical changes in shipping under six general headings - new types of ships; new types of machinery; new methods of communication; new methods of ship operation; new shipboard control systems; and increases in size and speed of ships. Herbst (1968) takes this further and, in looking forward, suggests that there will frequent changes in ship design and operation in the direction of greater automation and more efficient data handling. At the time of writing he
expressed fear that growing mismatches would arise between the technical and social systems and made a plea for technical and social designers to work more closely together. Regretably, his fears have been borne out—especially in the engineroom.

It is quite possible to rank-order all the tasks in a ship's engineroom by degree of skill requirements or difficulty. At the top of such list one would find fault-finding within complicated, electronic control circuits while, towards the bottom, one would find wiping up oil spills on floor-plates. In the older, manually-operated engineroom there was an almost unbroken range of skill demands from bottom to top of the task list and it was perfectly possible to recruit a man for the lower tasks and, through formal and informal training, to allow him to progress upwards to the limits of his ability. Now that automation is with us we find that the range of tasks has been broken by the middle tasks being automated. There are still remaining the lower tasks of wiping floor-plates and the most difficult tasks of fault-finding and repair—but no longer can a man progress from bottom to top; two separate types of people have to be recruited. The serious consequences of engineroom automation are well reported by Roggema (1971b).

**Social changes in shipping.**

The overall social changes in shipping have already been described but additional changes emerged from the literature search and, in fact, became one of the foci of the research. Ashore we have seen a marked decrease in paternalism, for modern workers believe that their employing companies should not try to control their off-duty activities. At sea we see quite the reverse for, in an attempt to retain seafarers, owners of unattractive ships—for example, the large crude carriers trading between the Gulf and Europe around the Cape—are giving their seafarers more and more fringe benefits.

But probably the most important social change concerns the difficulty or impossibility of young recruits meeting their expectations about the sea. Modern ships and modern methods of operation are so vastly different from ships of the past that any young person who comes to sea with beliefs based on "Hornblower"-type novels and films is bound to be disappointed.
Personality

Personality is variously described in the literature. There are many different dimensions of personality some of which, it is claimed, can be measured by paper tests. As yet, there is insufficient evidence to determine whether seafaring (which is not simply another job, it is a different way of life) does or does not attract people who have one or more of their personality variables significantly away from the means of shore people in general.

Roe (1956) stresses that no two individuals are exactly alike - different environments are experienced in the early years, there are different hereditary factors, different rates of bodily development, intelligence, aptitudes and interests. Herbst (1970) takes this further by pointing out that each one of us carries around his own set of "meanings" against which he evaluates external events. No event or thing can be intrinsically good or bad, attractive or unattractive, until it has been subjectively evaluated by a person against his own, personal set of "meanings". For example, a tanker trading around the Cape may be experienced by one man as the most boring, unattractive trade in the world while to another man, keen on saving money, the same trade is highly attractive.

This subjective evaluation of things and events by individuals became one of the most difficult parts of the research programme. What is the reality of shipping? I came to the conclusion that there is no absolute reality but simply a set of relatives. Silverman (1970) takes the same view for he suggests that the key to understanding organizational behaviour lies in identifying the sets of meanings that people bring with them into the organization.

Argyle (1967), on the other hand, holds that self-image is the central core of bodily feelings where self-image is related to bodily image, sex, age, etcetera, and to some sub-identities which the individual holds in relation to particular activities or groups. In relation to these others he plays a number of roles in particular styles and the way he sees himself in each role is part of his ego-identity. Ego-ideal is the kind of person one would most like to be and one form of neuroticism is related to a high degree of conflict between self-image and ego-ideal; this may lead to low self-esteem.
Self-esteem is the extent to which a person accepts himself as worthy of praise, either absolutely or in comparison with others. We may need to pay particular attention to the self-esteem of "first-trippers" and to all junior grades of seafarers who may be thwarted in their efforts to attain greater self-esteem by the particular control and supervisory methods exercised by the senior officers. There is some evidence to suggest that this is an important factor among the causes of wastage of junior deck officers.

Harvey (1967) puts forward a very useful notion (for use during this period of rapid change) when he describes four self-systems:
1) Those who have strong positive ties with representatives of institutional authority and are dependent upon them. They have high identification with social roles and are highly conventional.
2) Those who reject social rules and avoid dependency upon institutional authority. However, they have no personally derived standards and are in somewhat of a vacuum.
3) Those whose main concern seems to be related to establishing friendships in order to avoid feeling helpless or isolated.
4) Those who are strongly oriented towards tasks, risk-taking, exploratory behaviour and independence.

Using two scales F (authoritarian) and D (dogmatism), Harvey found that
System 1 people had high F and high D scores
System 2 people had low F and high D scores
System 3 people had middle F and middle D scores
System 4 people had low F and low D scores

Harvey then found that, for System 1 people, an effective source of information and changes needs to be a person of high official status; System 2 people reject information coming from authority and, in fact, are more influenced by a low status source; System 3 people are most influenced by group attitudes and norms; while System 4 people completely ignore the status of the information giver and are more influenced by his expertese. If we are going to introduce a planned change into ships or shipping companies we may need to check sea and shore staffs against these F and D scales in order to determine the most effective sources of information and change for, in the absence of published information, it would be quite dangerous to assume that all deck officers are System 1 people while all engineer officers are System 4 people.

Neuroticism vs emotional stability is another personality dimension of some importance among seafarers and attention is drawn to it in the specific seafaring - as well as in the general- literature.
Kahn et al (1964) state that neurotic anxiety indicates extreme sensitivity to potentially stressful situations; proneness to feelings of tension and anxiety; unrealistic attitudes towards the self; guilt; fatigue; etc. People high on this dimension are less able to tolerate role stress and are less able to handle conflicting pressures from others. This inability increases tension and the neurotic's thoughts turn towards reducing the discomforts of the emotional stress rather than towards solving the problem. We should note, in DOT (1970) Vol II, Table 75, the high proportion of seafarers reporting that bad atmosphere on board makes them feel depressed.

One particular shipping company, reported by Moreby (1968a), rejects applicants who show high initial neurotic scores on the Maudsley Personality Inventory and confirming evidence of high neuroticism being a "danger sign" comes from the study by Brun Gulbrandsen & Irgens-Jensen (1964). These researchers developed a "handicap index" related to (i) abnormal home environment; (ii) low education; and (iii) high neurotic score. They found a steady and marked increase in alcohol abuse among seafarers with a high handicap index.

Another important personality dimension during this time of rapid change is flexibility vs rigidity. Kahn et al (1964) report on this trait and found that while flexibility is related to open-mindedness and to an emphasis on collegial relationships rather than on authoritarian relationships, the rigid person is dogmatic and authoritarian in his interpersonal relationships with others - the rigid person prefers his responsibilities to be well-defined and stable. Kelly (1955) puts forward the notion of the inner personal construct against which we view the outer world and points to the rigid person who is highly selective and rigid in the sort of information he is prepared to take in; he thinks in terms of black and white and cannot accept shades of grey. But as we undergo change in shipping we shall have to pay increasing attention to the grey areas and too many rigid people within the industry could form a bar to development.

Still another personality dimension which may have some importance for seafarers is introversion vs extraversion. Vroom (1964) found that there are significant differences in the response to praise and criticism - introverts, for example, improve their performance more readily after criticism than do extraverts. Some shipping companies are already paying attention to this personality dimension but a lot more work needs to be done on the relationship between this dimension and the different supervisory methods adopted by senior officers.
No description of the personality of seafarers would be complete without some reference to the "authoritarian personality", for it has been suggested - but not proven - that some men are attracted into the deck officer group because of this feature of their personalities.

Adorno et al (1950) suggest that authoritarian personalities develop during childhood when the parents' relationship with the child breeds a feeling of insecurity arising from an emphasis on power rather than on love. Such a person, as he grows up, sees the world as a jungle in which might is right, and authoritarian responses are brought into play whenever that person feels insecure or threatened.

In the working situation, the authoritarian accepts without question the instructions from his superiors and then adopts a "policeman's" role as he forces his subordinates to carry out these received orders. He cannot tolerate his subordinates questioning these orders for he, in turn, cannot and will not question his superiors. In such a situation he either brings forward some existing or hurriedly invented rules or he calls forth some mythology to answer his subordinates' questions.

Adorno et al take this further and describe authoritarianism as encompassing high conventionalism; over-concern with status and power; submission and aggression; and cynicism.

With hindsight, I now realise that I should have included the long or short "F" scales (which measure authoritarianism) among my survey instruments for high authoritarianism may have helped to explain some of the behaviour aboard some of the ships visited.

Himmelweit & Swift (1970), however, argue that we must differentiate between the different manifestations of authoritarianism just as we differentiate between different manifestations of neuroticism. They suggest four aspects of authoritarianism:-

1) an authoritarian view of society;
2) an authoritarian view of parental rule;
3) pro conformity and the status quo (with a feeling of powerlessness at work); and
4) a jaundiced view of life.
They found that authoritarianism is more prevalent among working class than among middle and upper class people, and that the school rather than the home has the greater causal effect. Among adolescents they found a strong correlation between a jaundiced view of life, intelligence quotient and type of school.

Kahn et al (1964) found that the rigid, authoritarian type of person usually shows wholehearted dedication to the organization and responsibilities assigned to him by officials of that organization. The authoritarian is a good subordinate and, when promoted to top rank, finds it relatively easy to switch roles and take charge. He has many features which make him appear attractive for employment in a merchant ship but, as Rokeach (1960), Harvey (1967) and Himmelweit & Swift (1970) stress, the main weakness of the authoritarian is his inability to assimilate new information and to change.

There are strong grounds for believing that personality development is intimately bound up with the early relationships between the child and his parents. Friend & Haggard (1948), for example, found a relationship between early life and later adjustment to work. They found that these men who were able to adjust to their working situations came from closely knit, strongly unified families; had more affection for their fathers; showed some independence; and had been satisfied with school life. The men who had difficulty in adjusting to work came from disorganized families; disliked their parents and siblings; had more deviant family members; and, through being their parents' "favourites", had been spoiled in early life.

The findings of Friend & Haggard are more easily understood in terms of Maslow (1954) who emphasises that deprivation and the thwarting of basic needs in early life have a direct bearing on the inability of the man to cope with similar deprivations in later life. Although work may be a satisfier of present needs, it cannot satisfy all the serious deficiencies of the early years, yet the degree to which a person makes special demands of his job or needs special appreciation and status is related to deprivations in his early years - in his work he tends to seek those satisfactions formerly denied to him. Thus,
if the special features of sea life make it impossible for certain needs to be satisfied then we had better reject applicants who are seeking the satisfaction of these specific needs. One of these basic needs is love or belongingness which simply cannot be satisfied in the modern ship and the boy who has not enjoyed a happy, loving, home life should not be recruited for life at sea.

There is a small but growing amount of evidence which suggests that engineer cadet applicants have a better relationship with their fathers than do the applicants for deck cadetships. One possible reason for this is found in Roe (1956) whose research shows that past experience is crucial in the development of individual interests and drives. She suggests that the family situation in which the child is adequately loved without making him the focus of intense personal relationships encourages the child to focus his attention on external objects in the environment rather than on people - himself or others. From this a set of interests seem to develop which manifest themselves in the mechanical and scientific fields and lead to the selection of occupations appropriate to these interests.

Further research will need to be done to determine the relationship, if any, between home background and choice of department and grade of work aboard ship, and the upward development of the man in his chosen department. We may need to take into account the work of Barnett et al (1952) who found that while the father's occupation is related to the field of occupational choice, the mother's background is a more important factor in determining the level of socio-economic aspiration.

The whole issue of occupational choice is dealt with later in this Chapter.

**Needs**

Maslow, Roe, Herzberg and others belong to what has been called the "self-actualising school" of psychologists and, as a sociologist, Silverman (1970) takes issue with this school by suggesting that "needs" are not real, cannot be validated and are nothing more than a useful tool for understanding behaviour. Silverman attaches importance to the "meanings" people develop within themselves and against which they evaluate external events.

However, Maslow (1954) did draw on a great deal of clinical research in developing his concept of a "hierarchy of needs" and the wealth of further research which has stemmed from this concept cannot be ignored.

In their original form, the hierarchy of needs started with the physiological needs for food and water; next above came the safety needs which include the needs for shelter and warmth; above that came
the need for belongingness and love; the need for esteem; the need for self-actualisation and self-fulfillment; and, finally, the aesthetic needs.

Roe (1956) drawing on discussions and correspondence with Maslow interprets the hierarchy of needs as follows:-

1) The physiological needs.
2) The safety needs.
3) The need for belongingness and love.
4) The need for importance, respect, self-esteem and independence.
5) The need for information.
6) The need for understanding.
7) The need for beauty.
8) The need for self-actualisation.

As a lower need is satisfied (not necessarily completely) so the next higher need emerges and the argument between supporters and opponents of this concept turns on whether the same order of needs applies to all people. There is some evidence to suggest that the order of the lower needs are generally applicable but, even then, we do see cases of impoverished artists going hungry in order to paint for the sake of beauty or their own self-actualisation.

Another part of the argument turns on whether a person can skip past some of his needs, no matter in what personal order he holds them. For example, it could be claimed that the physiological and safety needs are satisfied for most seafarers in modern ships. The love need cannot be satisfied aboard ship. The need for importance, respect etc can be satisfied for some but not all of the members of the ship's crew. To date there is no published information on the order of needs among seafarers and how they cope with the thwarting of the satisfaction of a higher need but there is some slight evidence to suggest that one need in the hierarchy can be held in abeyance until it can be satisfied. The best example is the love need; and the behaviour of some seafarers in their relations with animals, children and women can be understood in terms the emerging dominance of this need when it can be satisfied.

There is also a hunch that the need for importance etc is temporarily satisfied by telling yarns aboard ship and ashore. Quite often the yarn is based on the teller's sexual prowess or on his seamanlike skill which saved the ship from disaster.

It is very important for us to know how seafarers satisfy their needs for an unsatisfied need can become a motivator while the continual thwarting of a basic need can lead to mental sickness.

Now if we define a man who is basically thwarted as sick, and since
such thwarting can only come from forces outside the individual, then sickness (within this definition) can only come from social conditions surrounding the individual. This is important when considering the seafarer, for some research in total institutions and a little research aboard ship shows that friendships and interpersonal relations are at a very superficial level in ships. This means that during his time aboard ship the seafarer is thwarted in satisfying his need for love and belonging and, if he temporarily skips this and goes on to the next higher need, he will attach extra weight to the satisfaction of his esteem needs. But certain grades of shipboard jobs and the supervisory method and hierarchical structure may even prevent him from satisfying his esteem needs. The key to creating acceptable new manning structures may lie in creating conditions under which seafarers can satisfy most, if not all, of their basic needs and we can look forward eagerly to the results of the current research at Gothenburg University (under Hans-Erik Werthen) the aim of which is to check the Maslow hierarchy of needs among seafarers.

The work of Moreby & Trail (1971) points towards seafarers changing the importance they attach to certain needs and goals as satisfaction or achievement becomes more probable. Their work is in harmony with Herzberg's (1966) notions of 'motivators' and 'satisfiers'.

All people reported in the literature have pride, prefer to be liked, seek respect and status and try to avoid anxiety. We need to recognise that men at sea (as in all other walks of life) are whole, complete beings and not, simply, hands, eyeballs or brains. As Maslow points out, when it occurs, the whole man is being frustrated and not just a part of him. But frustration is best conceived in two separate ways:-

1) The deprivation of non-basic needs.
2) Threat to the personality i.e. to the basic needs and/or to the various coping systems associated with them.

Deprivation does not lead to mental illness while threat does. Humiliation, rejection, isolation and loss of prestige are all "threatening" under the above definitions. In order to understand a person's behaviour we need to know how he perceives his environment, what he needs, what he is missing and what he feels threatens him. More important than understanding the threat or conflict from an objective point of view is to understand the subjective feelings of conflict and threat within a person. Conflict is based on choice between two alternatives vital to the satisfaction of the person's basic needs but if neither is vital for the satisfaction of basic needs then the person is simply faced with a choice of priorities. We need
to ask whether seafarers, and particularly married seafarers, are faced with a choice of two vital alternatives when they go to sea — do they have to give up one of these vital goals, for example, the satisfaction of the love/belonging need obtained from their wives and children? Such conflict may be an inescapable choice in seafaring and is probably more easily coped with by the man who had sufficient love in his early childhood.

Before going on to the economic motivators, it may be worth returning to Maslow (1954) who reports clinical research to show that animals and humans when fed with love, safety and respect, work better; use their intelligence more fully; come to the correct solutions more often; and are less subject to various illnesses. It could be a fruitful line of research to investigate the psychological conditions surrounding the individuals involved in shipboard, collision and grounding accidents.

Vroom (1964) approaches the motivational aspects in a different manner to that adopted by the "self-actualising" school. He suggests that the motivational aspects of work roles are:

1) They provide wages to the member in return for his services.
2) They require from the member the expenditure of mental or physical energy.
3) They permit the man to contribute to the production of goods or services.
4) They permit or require the individual to experience social interactions with others.
5) They define, at least in part, the social status of the worker.

In the recruitment and, later in the retention, areas of employment we need to know to what degree a man feels these motivational implications are important and whether they shift over time. In shipping, for example, motives for going to sea can only be related to beliefs about the Merchant Navy while motives for staying must be related to personal experiences of specific parts of the shipping industry.

Gellerman (1968) describes "employment seekers" almost as Herzberg (1966) describes "hygiene seekers"; that is, these people come for the pay and security and not for the actual job as such. Later, they do not want to leave and expect the company to give them a label, an identity and a degree of prestige. If shipping companies engage many of these "employment seekers" will the industry be pressed by these men to supply them with status in society ashore?

There is one fundamental difference between employment in shipping and most jobs ashore; that is, the shipping company does provide a
home for its seagoing members and some men may be attracted to the sea simply for the home it provides. In this respect the Merchant Navy may be similar to the Armed Services.

We need to keep this difference between sea and shore employment before us while reading the work of Herzberg (1966) for his approach rests on the theory that satisfiers and dissatisfiers in the working situation are not the two ends of one continuum. Job satisfiers are what he calls "motivators" and are achievement, recognition, the work itself, responsibility and advancement. Job dissatisfiers are what he calls "hygiene factors" and are the company policy, supervision, salary, interpersonal relations, working conditions, status and security. He also puts forward the view that mental health and mental illness are on two different continua; that a person's mental health is related to the motivational factors while mental illness is related to the hygiene factors. Herzberg suggests that only a "sick" person would be positively motivated by hygiene factors for he equates these hygiene factors with animal needs (Maslow's lowest two) and the motivational factors with the needs for human growth.

But when people join a firm they strike a "psychological bargain" with the company; for example, they are expected not to run down the firm in conversation with outsiders and in return the firm will care for them in various ways. Unfortunately the terms of this psychological contract are more often than not left unexpressed on both sides with the result that conflict may later arise. One of the terms of the contract concerns the nature of the involvement and type of power to be applied. A man may join a firm for calculative reasons (after Etzioni 1961) and expect remunerative rewards yet, some time later, the firm may try to exercise normative power based on the assumption that he is morally involved in the well-being of the firm. Under certain conditions, some people accept this shift in type of control while others do not. The whole issue of the implied terms in the psychological contracts between shipping companies and seafarers needs to be explored in greater depth if we are to understand high wastage rates among seafarers who have spent less than a year at sea.
Occupational choice

In their search for better recruitment and selection methods, many employers within and without the shipping industry tend to neglect the importance of occupational choice. There are two halves to the engagement of recruits (i) choice of that industry or company by the recruit; and (ii) choice of particular individuals from among all the applicants. There is an obvious relationship between these two halves for, the greater the number of people choosing a particular company, the greater the degree of selectivity that company can exercise, (and vice versa) for there is some evidence to suggest that the higher the degree of selectivity, the greater the number of people who apply to join witnessed some of the more prestigious universities and clubs.

Occupational choice is based partly on a man's believed abilities and partly on his beliefs about certain jobs. What, then, are the beliefs or expectations held by young men applying to go to sea? Various investigations, one of which is E.O.T. (1970), show that applicants have a wide range of expectations about work and life at sea. No two applicants have precisely the same order of expectations but, on average, we find near the top of most individual lists, adventure; travel; seeing the world and experiencing life in foreign ports; getting away from the boring routine of shore life. Yet modern marine technology and operational methods make it almost impossible for these expectations to be realised. Other expectations are to do with getting a good training; security; working in a community spirit; good living and working conditions; upward mobility in terms of promotion, increased authority, increased status, and wage increments. These are the expectations which can, to greater or lesser extent, be met aboard modern ships.

White, S (1968) shows that occupational choice is an extended process which may begin at an age of 10 or 12. Ginzberg et al (1951) found that occupational choice follows three stages; phantasy choice, followed by tentative choice, followed by realistic choice. Choice before 10 is pure phantasy but the tentative choice made later is based partly on the boy's interests and on his assessment of his abilities. Some time after the age of 15 he enters a period of exploration to broaden and test himself. Some people, during this period, try out competing fields of interest while others assess for themselves whether they have the abilities required for success in the chosen occupation. Following the period of exploration comes crystalisation when the person gives up exploring and testing and makes plans for the future.
All this means that, in the Merchant Navy, we must be prepared for wastage among our younger recruits for, no matter how good the selection process, the young recruits will still be within their exploratory stages. Further, this exploratory stage all young people pass through lends support to the view that all recruits should be allowed to get off to sea after a short introductory training period ashore and casts doubts on the desirability of keeping young marine engineer cadets ashore for two or three years after recruitment before allowing them to go to sea.

Super (1957) states that career choice is, in part, an adolescent's attempt to develop and implement an idea he has of himself and of the kind of person he wants to be. This is supported by Roe (1956) who feels that, within limits, occupational choice can be taken as self-categorisation and as an indication of some aspects of the self-image. This is not discordant with an American study reported by White, S. (1968) who found that occupations may be chosen for the life-styles they lead to rather than for the actual work involved but does this, in turn, raise some doubts on the Herzberg notions of "sick" hygiene seekers? Do some seafarers choose to go to sea and to stay at sea for the life-style offered?

Rosenberg (1957 & 1968) found that an individual tends to select a goal or goals in accordance with his assessment of his qualities in order that he may maintain a favourable opinion of himself while Blocher & Shutz (1961) found that an individual tends either to choose an occupation on the basis of his estimate of his similarity to its members or that he tends to project his own characteristics on members of the occupation he has chosen.

Vroom (1964) takes this further when he says that choices among occupations are the result not only of preferences but also of the (subjective) probability and expected costs of attainment. So far as preferences are concerned, he says that people will choose occupations which they expect will permit them to use their talents and skills for believed possession of a skill is tantamount to a desire to use that skill. Thus people will choose an occupation which they believe will allow them to use a skill they believe they possess, and this desire to use a skill is higher when a man values that skill than when he is indifferent to it. This may help us to understand complaints received from cadets regarding their being abused aboard ship. If they believe they possess certain skills and if these beliefs are reinforced during the selection and pre-sea training processes, they will experience disillusionment when they find these skills are not required aboard ship or if they are barred from using them while sailing in a junior capacity.
Vroom (1964) also suggests (and in this he is supported by Roe) that, in general, a man chooses his occupation before he chooses his organisation. Do seafarers choose, firstly, to go to sea and then choose one department or another or do they choose to do certain work (related to one department or another) and then choose to go to sea? There is no published work on this question but interview experience among applicants leads to the view that the department is chosen before the choice is made to work at sea or ashore. At this time of change in manning systems it is important to get the real answer to this question.

Roe (1956) found that interests are more important determiners of the kind of occupations an individual will enjoy and succeed at than intellectual factors. If this is true of seafarers then we may need to reconsider the academic minima laid down for entry into the Merchant Navy, for support for Roe's view can be found in B.O.T. (1970) Vol II Table 8 where the highest proportion of men planning to stay at sea were those who "always wanted to go to sea" when asked their reasons for joining the shipping industry.

Recruitment and Selection

As motives for staying at sea are not the same as motives for going to sea it is important for those whose mission it is to recruit men to stay at sea to try to match initial expectations with the realities of life at sea. It is perfectly possible for a shipping company to identify the features of life and work in its ships and advertise these rather than adventure, travel, variety and automatic promotion up to the very highest ranks. In turn, such a shift in advertising and recruitment policy may bring forth applicants quite different in personality and aspirations to those men already in the ships and some degree of interpersonal conflict may result. The first step, however, is to decide what the applicants are being recruited for: Are they being recruited for a (hoped for) life at sea or for a period not exceeding, say, ten years?

In general, an organisation lets a member take what he wants from it in return for his services. Precious commodities such as wages and company property are controlled and shared according to some plan but other commodities may be had freely. Examples of the free commodities in ships are travel, time to write or pursue a hobby, (usually) sunshine, and collecting stamps by travelling to countries where they may be bought over the counter. Should companies try advertising these bonus plums? One of the trends we have witnessed for some years now is free travel for wives and soon pressure may come from unmarried men
to carry one or both parents and girl-friends. Could owners anticipate these trends by offering seafarers the right to carry friends on occasion and would this increase the status of a seafarer among his neighbours?

The importance of the "psychological contract" cannot be overemphasised particularly during and just after the recruitment period. If the recruit has been led to believe - from advertisements, brochures and interviews - that he will get adventure, live in a pleasant cabin, be offered tasty meals, and wear a clean uniform, he will feel that the company has broken its side of the contract if he experiences no adventure, is badly accommodated and wears working dungarees except when the vessel is arriving in port.

Etzioni (1961) hypothesises that the means employed by an organisation to acquire recruits from the outside environment must resemble the means that will be used to control them once they have joined. If money is held out as the means of recruitment then money must be used as the means of control. But if money is the means of recruitment, the organisation should not attempt to substitute normative or coercive means of control once the men have joined.

Etzioni also points out that compliance by members (i.e. the relationship between control and involvement) is related to recruitment in two ways: (i) the means and methods of recruitment determine the members' involvement and thus the type of power which can be exercised over them; and (ii) the means and methods of recruitment determine the amount and type of socialisation required. (Socialisation means the process of inculcation whereby the individual learns the values and norms of the social system he has joined). In turn, there is a relationship between socialisation and selection for, if the organisation is able to recruit men with the characteristics required for effective membership of the organisation, the amount of socialisation required is very small. But if it has to accept almost every applicant who comes along the amount of socialisation required must increase in order to produce the desired characteristics.

It is interesting to consider the implications of the reduction in pre-sea training for deck cadets made in 1970. Formerly these boys underwent a six, nine or twelve month pre-sea course. These have now been reduced to two weeks before the recruit makes his first voyage. Is this because owners and seafarers believe that the best place for socialisation to take place is aboard ship? If so does this not call for special "reception" ships where desired values and norms can be inculcated in the recruits?
Gellerman (1968) suggests four fallacies in selection:

1) The "hero" fallacy based on the assumption that there must be someone somewhere who will fit the specifications of the job and the whims of the manager.

2) The "descriptive" fallacy based on the notion that, provided we can measure a man's qualities precisely enough, he can be matched against the requirements of the job in a way that permits a reliable decision to be made on whether he will fit or not.

3) The "permanence" fallacy based on the assumption that once a man has been evaluated by the selectors, everything that may need to be known about him for the future has been obtained.

4) The fallacy of "determinism" based on the assumption that the man's success or failure in a job can be determined entirely by his possession of certain qualities assessed at the time of his initial selection.

Gellerman is not rejecting all scientific selection methods; he is simply raising warnings about some of the dangerous assumptions made during and after some selection processes.

Rochdale (1970) pointed out that too many young men, who are not suited to life at sea, are recruited and given costly training. He makes a plea for the development and general use of more scientific selection techniques. The problem lies in deciding what key characteristics to look for in applicants and how to measure them. Moreby (1968a) describes the selection method used by one shipping company but many other companies use different methods. Most rely on some form of intelligence or general reasoning test while some use, additionally, interest and preference questionnaires. A number of British companies are using the Maudsley Personality Inventory while one company is introducing the Cattell 16 PFQ as reported by Tobin (1968).

Hudson (1966) found that arts students were good at open-ended tests and relatively weak at standard IQ tests whereas the reverse held true for science students. Hudson goes on to distinguish between "divergent" and "convergent" thinkers. If Moreby (1967) is correct in suggesting that navigating officers need to be divergent thinkers and engineer officers convergent thinkers, and as these two types of thinkers perform differently on open-ended and IQ tests, and as there seems to be some correlation between performance on IQ tests and mathematics and science examinations, then we may need to reconsider our scientific "O" level entry requirements for deck cadets who are to man ships under traditional schemes. If, however, we see ahead the need for deck
officers to have a greater scientific understanding of their ships and equipment, then the entry requirements for scientific "O" levels is correct - but, then, we may have to be prepared for a different type of man standing watch on the bridge as a navigating officer.

Both Maslow (1954) and Roe (1956) point out that people who have had a particular need satisfied in early life are better able to withstand temporary deprivation of satisfaction of that need in later life. Care needs to be taken in rejecting any applicant who is seeking the satisfaction of a particular need which simply cannot be satisfied at sea. Herbst (1968) stresses this point when he says we should only select boys from basically loving homes in which the love need was adequately satisfied.

Case (1954) gave selectors a useful pointer when he found that the difference between true and pseudo-crystallised choice of occupation was that the "true" had gone to much more trouble to find out about the job while the "pseudo" had done nothing, or very little, in the way of getting information. Further, the "true" thought there would be much more difficulty in changing jobs if he found out later that he had made a mistake whereas the "pseudo" thought it would be easy to change.

Pre-sea and subsequent training

The whole issue of training is so large that it could not be covered in any meaningful way in this review of the literature. Most people recognise and accept the importance of proper training but there is some argument on precisely what training should be given to recruits before they go to sea and what should be given to them at later stages in their careers; there is also some argument on precisely what training can and should be given on board ship and what should be given ashore.

One of the problems emerging in the training field is that senior officers, who may have ended their general education and formal training 20 or 30 years earlier are expected to teach and train the young recruits who are the products of a vastly different educational and training system. There is evidence to suggest that, to greater or lesser degree, many of the older deck officers feel threatened by their "brighter" cadets. Rochdale (1970) recognised this problem when he recommended adequate training and retraining throughout seafarers' careers. It is interesting to note in a series of lectures and published articles, and in interviews, that senior persons within the marine engineering sector of shipping welcome, support and call
for more college training of young marine engineers while some senior people in the deck sector seem to oppose and denigrate the advanced training given to young deck officers in colleges.

Another point of debate concerns the desirability or undesirability of giving seafarers nationally recognised qualifications and training in skills which are in demand ashore. The opponents of the national qualification scheme suggest that these courses accelerate labour wastage while the supporters of the scheme believe that the key to continued recruitment in the future lies in giving seafarers skills and qualifications of use to them in shore employment; they point to the many analyses (one of which is BOT 1970) which show that, on average in Western Europe, seafarers stay at sea for no more than about 8 years and, therefore, spend the greater part of their lives working ashore.

A useful tool for identifying on- and off-job training was developed by the Gas Industry Training Board. Every task required for overall performance is listed and each task is scored in three columns – frequency at which the task is performed (1 for daily; 2 fortnightly; 3 monthly or longer); degree of difficulty to learn the task (1 if easily learned; 2 if slightly difficult; 3 if very difficult); effects of incompetence (1 if incompetence causes nothing more than annoyance; 3 if it could cause a disaster). The principle can be illustrated by using three tasks in the deck department.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Learning Difficulty</th>
<th>Effects of incompetence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing paintwork</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fighting an oil fire</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Using a sextant</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Such analysis shows that washing paintwork is a task which can and should be learned aboard ship; fighting an oil fire is a task which must be learned ashore, preferably by simulation; using a sextant is a task which can and should be learned aboard ship but, because incompetence could cause a disaster, some senior person should be specifically detailed to check on the trainee’s competence in this task.

If marine technology were static (meaning that tasks would remain static) such analysis could help rationalise training. But technology is changing so rapidly that a skill learned today may be irrelevant within a year or two. The most crucial question turns on the type and amount of general education seafarers should be given in order to be
able to cope with future changes. Hoel (1971) suggests that, in the future, we shall recruit only young adults who have had a general technical education ashore while others (e.g. Herbst 1968 & 1969; Thorsrud 1971) feel that the solution may lie in creating a "learning culture" aboard ship within which culture all crew members will teach, and learn from, each other. In a more general sense they are supported by Gellerman (1968) who suggests that continuous learning will be the indispensable means to future job satisfaction and to job security.

BOT (1970) Vol II Table 15 shows that, with the exception of engineer officers, the greater proportion of seafarers who received pre-sea training reported that it did not teach them what to expect at sea and, as those who find a mismatch between reality and expectancy are more likely to leave the sea, this particular finding in the survey has important implications for those responsible for the design and implementation of pre-sea training.

An interesting finding, in this connection, is the changing attitude on pre-sea training with age. The percentages reporting that pre-sea training did not teach them what to expect at sea are:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 21</td>
<td>44%</td>
</tr>
<tr>
<td>21-25</td>
<td>27%</td>
</tr>
<tr>
<td>26-30</td>
<td>22%</td>
</tr>
<tr>
<td>31-40</td>
<td>15%</td>
</tr>
</tbody>
</table>

This shift in response could be due to one or more of the following factors:

(i) The older men have had time to evaluate the relevance of their own pre-sea training;

(ii) The training years ago was matched to the demands of the job; or

(iii) Recent changes in pre-sea training are not congruent with the changes taking place aboard ship.

An important factor sometimes overlooked in pre-sea training concerns the development of "values". Lecky (1945), Vroom (1964) and many other researchers have found that job satisfaction is partly dependent upon the degree to which skills, valued by the individual worker, are used and demanded by the job; that is, a man derives some satisfaction out of using a skill which he, himself, values. For example, if it is known that a certain recruit is to be employed at painting and at using a pneumatic chipping hammer, it is essential that he is taught how to do these tasks and that he is encouraged to value (be proud of) these abilities. Then, when he joins his first ship and is given these tasks, he will experience some job satisfaction. If, on the other hand, his training led him to value climbing masts, sewing canvas and splicing (and to devalue painting and chipping) he will experience dissatisfaction while engaged on painting and chipping aboard ship.
A number of investigations—some of which are reported on the preceding pages—have been carried out aboard ship with the specific aim of improving ship efficiency by identifying the motor skills and mental processes required to carry out shipboard tasks and then designing appropriate training and educational courses. These investigations have been little more than Time-and-Motion or Work-Studies and have failed to take into account the value seafarers place upon their variously required skills. They have also failed to measure and define precisely that part of the officer's work usually described as 'leadership' or 'man-management' and yet most ship managers and senior officers feel that the 'complete' ship's officer is one who knows the technical tasks of his job and who gets the best out of his subordinates by caring for them and by properly directing their efforts.

Attempts have been—and are being—made to teach the rudiments of personnel management to officers attending industrially based short courses but, undesignedly, the major effort to instil 'leadership' skills in officers is applied during their training phases spent in Colleges ashore.

Etzioni (1961) bases his analysis of organizations on the goals of the organization, the types of power used, and the types of involvement on the part of members. He recognises the need for some degree of normative control to be used over the higher echelons of members and the need for some degree of moral involvement on their part. The Etzioni view lends some support to the normative type of training given to pre-sea cadets who wear uniforms and live in residential training establishments. Dornbusch (1933) describes the way in which normative control is exercised over students in residential colleges and the manner in which the role of the cadet must supersede all other roles he has been used to playing in the past. Goffman (1957) points to this and to many other features of the induction process.

One of the problems facing the modern shipping industry is that, among recruits over the past few years, there are signs of a growing rejection of the older forms of normative types of training—for example, they do not like wearing uniforms—and conflicts are starting to emerge between the values held by the older seafarers in traditionally manned ships and the values presently being imported by the younger recruits.
The individual's job and job satisfaction

Super (1957) shows that satisfaction in work and life depends on the extent to which a person finds outlets for his interests, abilities and values while Herzberg (1966) states that for a job to be rewarding it must be inherently interesting to the man, give him some sense of responsibility and purpose and allow for growth and advancement.

The clearest outline of basic psychological job demands or needs which have been formulated and tested is given by Thorsrud (1971):-

(i) the need for the content of the job to be reasonably demanding of the worker in terms other than sheer endurance and yet to provide optimum variety;

(ii) the need for being able to learn on the job and to go on learning;

(iii) the need for some minimal area of decision-making that the individual can call his own;

(iv) the need for some minimal degree of social support and recognition in the work-place;

(v) the need for the individual to be able to relate what he does and what he produces to his social life; and

(vi) the need to feel that the job leads to some sort of desirable future.

Vroom (1964) makes two important points related to job satisfaction and effective performance. In summarising the research literature he shows that job satisfaction cannot be determined in terms of the job alone but that individual personalities and aspirations must be taken into account (Herst 1970 and Silverman 1970 both support this view). If an individual has particular needs to be satisfied or particularly high aspirations, neither of which can be satisfied by his present job, he will not experience job satisfaction no matter what the intrinsic features of the job may be. Now if a particular job is unsatisfying to the present occupants, we can either (i) improve the job; or (ii) select people of lower aspiration levels who will be satisfied by the job. The second method is the easy way out and this may be adopted in British ships with the possible introduction of the "watchkeeper's certificate" for those men who cannot pass the whole range of deck officer examinations and who aspire to no higher level than that of watchkeeper. But such a solution has very important implications for future manning changes where advances in marine technology and further crew reductions may call for flexibly minded, intelligent men who can learn new and difficult skills.

All the trends point towards increased automation in ships of the
future and, as Jordan (1963) shows us, one of the most important characteristics of man in an automated system is his ability to degrade. We may well find that the men we require in technically advanced ships are those who know when - and to what extent - they may "bend the rules" safely.

Returning to Vroom, we find that he points to another important issue concerning job satisfaction and effectiveness. He shows that individuals perform effectively when they believe that effective performance leads to the attainment of what they desire. Now if, as in so many companies, travel, wages and promotion are not dependent upon effective performance, what possible reason can a seafarer have for performing effectively? Is it for self-esteem, or security, or acceptance by his shipmates? Why do some seafarers perform more effectively than others? We simply do not know.

Katz et al (1950) suggest that job satisfaction is best treated as a set of dimensions (a) intrinsic job satisfaction; (b) company involvement; (c) financial and status satisfaction; and (d) pride in group performance. Centers (1948) found that, in order of importance, white collar workers and professionals put self-expression, independence, interesting experiences, and social service as the four most important aspects of a job while manual workers valued, in order, security, independence, self-expression and social service.

There is conflicting evidence on the effect of participation in decision-making on job satisfaction. This may be due to the needs of different types of people - authoritarians and dependent people, for example, prefer strongly directive leadership and are not happy when given autonomy. In general, however, numerous studies show that those reporting high job satisfaction say that they have the opportunity to influence decisions affecting them.

Adams (1963) suggests that job satisfaction may be predicted as a function of a man's beliefs on the degree to which he possesses various skills; beliefs concerning the degree to which these abilities should result in rewarding outcomes; beliefs on the degree to which he receives these rewards; and beliefs on the comparison between his own abilities and rewards and those of others.

Herzberg (1966) propounds a theory that, in work, satisfiers and dissatisfiers are not at the two ends of the same continuum. He defines job satisfiers as "motivational factors" and dissatisfiers as "hygiene factors". Motivators are the intrinsic features of the job such as responsibility, challenge, advancement and achievement. Hygiene factors are the extrinsic features such as the personnel policy.
of the company, working conditions, wages, etc. He further suggests that mental health and mental illness are not on the same continuum; that mental health on the job is related to the extent to which the motivational factors exist in the job and are sought after by the worker while mental illness is related to the absence of hygiene factors.

Whether we agree with Herzberg's definitions or not, his theory nevertheless has some bearing on job satisfaction and job redesign aboard ship. Herzberg points out that when motivational factors are absent, workers become more sensitive to the quality of the hygiene factors and will continually demand improvements in these factors. Is this, in fact, what is happening in merchant ships? Are the continual demands for improvements in accommodation, leisure amenities and sports facilities the result of an absence of motivational factors in the jobs aboard modern ships? This may be the case for we do come across seafarers reporting satisfaction with their voyages aboard old ships where, although the accommodation is poor, the age of the ship and engines and the difficult trades in which many of these older ships are engaged make for more challenging jobs. In contradistinction, we get reports of dissatisfaction from seafarers in large, modern ships in which, they say, their cabins are "too big".

Moreby & Trail (1970) who based a small survey on Herzberg's theory and on Vroom's hypothesis regarding the increasing importance of a particular goal as it becomes more attainable, found that Herzberg's distinctions between hygiene and motivational factors cannot be applied to the seafaring job without some modification. Following Herzberg's definition, for example, travel and seeing the world should be classed as hygiene factors (for they are not inherent features of the tasks performed) yet many men say they were motivated to go to sea by the thought of travel and visiting foreign countries. Further work needs to be done in this area but we may find that we have to apply Herzberg's motivation and hygiene factors to the actual work aboard ship and, quite separately, modified versions of these factors to the life aboard ship.

Other writers, two of whom are Walker & Guest (1952) roughly equate Herzberg's "motivators" with job-content and "hygiene factors" with job context. Herzberg et al (1959) found that job-content was most frequently mentioned when subjects reported on their satisfaction or on the "good" periods while job-context was most frequently mentioned by the dissatisfied subjects. Walker & Guest found exactly the opposite in their study of assembly line workers and Vroom suggests
that whether a man connects job-content or job-context with periods of experienced job satisfaction is dependent upon the nature and level of his job and may also be dependent upon his personality.

It is interesting to note the manner in which seafarers report on "good" or "bad" ships. Leaving aside the fact that most seafarers look on their "last" ship as the paragon of all virtue, we find that ratings most frequently describe their best ships in terms of food, the Master and the Mate; engineer officers usually describe their best ships in terms of the engines (e.g. "she ran like a sewing machine"); while deck officers always describe their ships in terms of the Master (good or bad) and the crew (troublefree or troublesome). Thus, according to Herzberg's definitions, engineer officers report satisfaction in terms of job-content while deck officers and ratings report in terms of job-context. This bears two distinct interpretations:

- either (i) engineer officers get greater intrinsic satisfaction from their actual jobs while deck officers get no intrinsic satisfaction from theirs;
- or (ii) deck officers perceive their jobs as being concerned with establishing harmonious relations between all the people on board and are, therefore, reporting job-content when they refer to the Master and crew.

Likert (1961) suggests that the relationship between satisfaction and performance becomes more positive with increased level of skill required by the job while Kasl & French (1962) found that although job satisfaction is higher in jobs of higher status, the stability of this satisfaction tends to decrease owing to the upwardly mobile man using higher criteria for measuring his own satisfaction.

The degree to which interpersonal relationships at work affect job satisfaction depends on the particular needs of the individual, on the similarities of attitudes among the members of the group, and on the personalities involved. Some people attach great weight to working with pleasant co-workers while others tend to ignore their colleagues and seek satisfaction in the work itself or in the rewards it brings. The difference between individuals in this respect is well described by Dalton (in Whyte 1955) under the classifications of "Restricters" and "Rate-busters". This is an important issue in modern ships where, because of crew reductions being made within the traditional hierarchical and departmental structure, interpersonal relationships are hard to develop. (see Herbst 1968 & 1969).

There is little doubt that supervisory styles have some effect on performance but the relationship is not altogether clear. Argyle et al (1958) found that the amount of consideration shown by supervisors
correlated with effectiveness of the work unit and that different situations require different styles. The need for managers to change their styles to meet changing organisational, technological and individual needs is well covered in Reddin (1970).

Halpin (1957) found that the amount of consideration shown by a leader depends on his perception of the degree to which his subordinates accept him and are satisfied with him while Pelz (1951) found that the effects of leader consideration on job satisfaction depend on the amount of influence exercised by the leader on his own superiors. This is particularly true in the hierarchical organisation where it has been found that the degree to which a superior can satisfy the needs of his subordinates depends on the subordinates' perceptions of this superior's power in the organisation.

This last point is of key importance in ships for, if the Master is to have any effect on satisfying the needs of the crew, the crew must believe that the Master has power in the company and can influence those above him. If, for example, a Master has to subordinate himself to a very junior company official (or, worse still, if he subordinates himself even when not required to do so) he will be completely ineffective in any attempts to "care for" the crew. The same applies to the relationship between the Chief Officer, Chief Engineer and Master in "caring for" their departmental juniors and ratings.

Etzioni (1961) points out that the lower-ranking members of a bureaucracy reject and resent members of the lower elite but identify with the higher elite members. They feel that these middle managers are the "baddies" and, if only the top man knew what was going on, he would put things right. Gouldner (1955) also touches on this aspect of bureaucracies but with particular reference to the envy felt by these middle managers of the lower members who are less strictly controlled than they are. I expected to see these sets of envies operating in some shipping companies where the sea-staff see the lower managers and superintendents as the "baddies", the "bars to progress", the "distorters of facts" while these same lower managers see the seafarers as happy-go-lucky, foot-loose individuals free to go where they like, do what they like and drink what they like; but I did not.

Kahn et al (1964) describe in some detail the importance of roles when considering people working within an organisation. A role is defined as the activities to be performed by a person who occupies a particular "office" within the organisation. Their approach helps us to identify some of the problems inherent in most working situations. Role conflict
is experienced when a man comes under conflicting instructions or expectations while role ambiguity is experienced when a man does not know what is required of him. Role overload is experienced when a person cannot possibly perform all the tasks required or expected of him within the given time. Role conflict, ambiguity and overload can all be viewed as forms of conflict and the degree to which a man experiences such conflict, and his coping responses to it, depend upon his own personality, the objective and psychological environments surrounding him, and the personalities of the people causing the role conflict.

In all cases of role conflict the person experiences tension and frustration - to greater or lesser extent - but the methods used to deal with the situation depend on the man's personality. Some people try to deal with the objective situation, that is with the causes of the conflict, while others turn inwards and try to deal with the unpleasant feelings and emotions aroused by the conflict. In all cases, however, it has been found that persons experiencing role conflict are more worried and bothered about the work situation; suffer a reduction in job satisfaction; and, to some extent, lose confidence in their superiors and in the organisation. The worst form of conflict is experienced by a person whose role senders have power over him and, at the same time, are dependent upon him.

If we view life and work aboard ship from the perspective of roles we can understand some forms of coping behaviour when seafarers come under role conflict. Certain grades of seafarers can withdraw from those causing the conflict; for example, the deck ratings can, to certain extent, withdraw from the Mate. To some extent, the engineer officers can withdraw from the Chief Engineer or seek help from their fellow engineers. But the highest degree of conflict will undoubtedly be experienced by the deck officers under an unsuitable Master. Not only are they occupationally closer to him but their personal contacts with the Master are more frequent than for any other members of the crew - the Master visits the bridge frequently during the day and night. In addition the Master is dependent upon the deck officers for the security of his own job (certificate). In some cases, the deck officers may experience role conflict between the Master's instructions and their own expectations on what they are capable of doing; in other cases they may experience ambiguity through lack of clear instructions on what is required of them. In such cases, what can these deck officers do? They perceive that the Master has power over them which prevents them dealing with the objective cause of the conflict; they cannot
physically withdraw from the bridge and from the Master, so they tend
to withdraw inwardly and may relieve their tensions in phantasy or in
alcohol. One of the most urgent tasks in merchant shipping may be to
reduce potential role conflict and ambiguity and to improve role
clarity. Rizzo et al (1970) have updated the work on role conflict
and given, in their questionnaire, a useful tool for investigation in
this area.

Career development and personality changes.

Roe (1956) draws on several studies to show that interests change fairly
rapidly between the ages of 15 and 25 but very little after that. This
may help us to understand, in part, the wastage of younger seafarers.
Their interests at 16 or 18 may have led them to sea but subsequent
changes in interests may lead them away from the sea without there
being anything inherently wrong with their jobs. Vroom (1964) too shows
that the decision concerning one's future is not a single event
occurring at one instant of time but is a process continuing over time.

There is some debate on whether the type of job and changing interests
do, in some way, modify or change the personality; and much more work
needs to be done among seafarers before we know what effect the sea
life has on personality. David Winnicott (Tavistock Institute) intro­
duced the notion of the "false personality" in which certain people
are seen as becoming a set of competences instead of whole, rounded
beings. Depressive anxiety sets in when these competences fail or becom<|...|
type who is highly selective/restricted in what he takes in and who keeps such information within himself while diametrically opposite we have the "Commissar" or father-son (normal male adolescent) type. Emery hypothesises that both deck and engineer cadets start off as normal male adolescents but subsequent job experience may modify their development in different ways. In the case of the engineer who can and does act upon information received, he becomes more selective in the information received but, at least, he does act upon it. He develops into a normal male adult. If the deck officer is allowed and encouraged to act upon information received he, too, will develop in the same way. But if he is prevented from acting upon information received by having to call the Master for all navigational crises and the Mate for all cargo crises, he will develop in a different way. He will become either a "mother-type" taking in all the information around him and then worrying about it, or a Yogi-type - a "dreamy guy" - taking in only part of the information around him, keeping it within himself and not acting upon it. No work has yet been published in this area but if Emery is found to be correct then this personality change has important implications for ship safety. It means that if we wish to develop deck cadets into efficient and satisfied bridge watchkeepers, we may need to give the young deck officers more personal responsibility on the bridge than some have at present.

Roe (1956) maintains that the needs of self-respect and self-esteem are firmly based in reality and are related to the respect and esteem of others. A person desires self-confidence, and confidence in his abilities to cope with contingencies which may arise. The need for a sense of competence is also reported by White (1963) while Rosenberg (1968) suggests that we are all under pressure to protect one another's self esteem. One wonders who protects the self-esteem of cadets and "first-trippers" in merchant ships. Clinical research shows that the recognition of oneself as competent is based partly on the reactions of and acceptance by others as being so. If these needs (of being recognised by others as competent) are thwarted, this leads to feelings of inferiority and helplessness. These facts, tied in with Emery's notions about changes in the personality among people who are prevented from acting and, thus, displaying their competence, may lie at the root of the high wastage of young deck officers and cadets. Engineer officers, on the other hand, no matter how young or new they may be, are called upon to do specific jobs in the engineroom and are given ample opportunity to display their competence; they grow into more healthy adults as a result. Are these the factors which explain the
significant difference between deck and engineer officers when asked whether they would advise anyone else to go to sea? (BOT 1970 VolII Table 79)

<table>
<thead>
<tr>
<th></th>
<th>Deck Officers</th>
<th>Engineer Officers</th>
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</thead>
<tbody>
<tr>
<td>Would advise anyone to go to sea</td>
<td>23%</td>
<td>56%</td>
</tr>
<tr>
<td>Would advise anyone not to go to sea</td>
<td>38%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Roe (1956) reports on her own and on the research of others which show that feelings of personal worth and self-esteem are closely linked to the amount of responsibility the job entails. If the total quantity of responsibility in running a ship could be measured in some way, can we see the onboard responsibility in the engineering department increasing at such a rate that there are larger "shares" of responsibility for all the engineer officers; and that developments in marine communications, plus developments in mechanised cargo-handling plus over-control from the shore have caused the responsibility of the Master and deck officers to be whittled away until there is insufficient responsibility to be "shared" among all the deck officers with the Master (and, possibly, the Mate) holding on to what little responsibility is left? //

Many writers, including Kahn et al (1964) report that individuals differ in the way they accept and cope with hostile and anxious reactions. Some people will deal with the objective cause of stress and conflict but, if unable to do so, (and at sea possibly because the hierarchical nature of the social environment prevents them from doing so), individuals may adopt one or more defence mechanisms such as repression, projection or displacement or they may turn to phantasy, alcohol, drugs and self-indulgency of sensory pleasures. As one of the features of a bureaucracy is the requirement that subordinates accept and obey a superior until (if ever) he is replaced by institutional authority, and as ships are run on bureaucratic lines, we may have to give very careful attention to creating mechanisms through which men can deal with experiences of role ambiguity and stress in a healthy manner.

Finally, Vroom (1964) found that if men value promotion and believe that superior performance increases their chances of promotion they will work better than men who do not value promotion or who believe that promotion is not related to performance. In some shipping companies one wonders if promotion is sufficiently related to performance for, not infrequently, it is related to length of service or to being in the right place at the right time. Vroom also points out that non-promotion can be frustrating to men who expected promotion and one may doubt the wisdom of companies emphasising promotional opportunities to new recruits especially at this period when the number of ships is being reduced.
Marriage

Very little has been published on marriage and the seafarer although many reports (including BOT 1970) highlight marriage as a major cause of men leaving the sea. But a number of researchers are now questioning the validity of the statement that marriage is the major cause of wastage for (i) many of the men who leave are unmarried and not engaged and (ii) "marriage" is a very acceptable excuse which bars further questioning and which allows the departing seafarer and his former employer to hide the other causes of dissatisfaction.

Interviews and discussions lead to the "hunch" that whether or not a married seafarer leaves the sea depends on a number of factors among which are:-

a) His search for a continuous, stable relationship with someone. He does not get such stability aboard ship and thus seeks it in his wife and children.

b) The ages of the children. It appears that children need their father at home at about the time of starting school, 4 to 6, and again at the time of changing schools, 11 to 13.

c) The seafarer's perception of his wife's ability to cope with child upbringing and other domestic crises.

d) The availability of his wife's parents and relatives.

e) The trend in modern society away from "extended" families and toward more "nuclear" families.

f) With the possible exception of men from certain traditional seafaring communities, particularly if no other jobs are available in the neighbourhood, the married seafarer who leaves his wife and children to go to sea experiences feelings of guilt to greater or lesser degree.

g) The feared, perceived and actual changes taking place in his home during his absence.

h) The perceived social isolation of his wife while he is away at sea.

i) The severe problems to both wife and children of the changing role of "head of household" as the husband alternates between home and ship.

j) In some few cases there may be concern about the fidelity of the seafarer or his wife.
Richardson (1955) suggests that the main purpose of a merchant ship is to transport cargo and passengers. This demands three main areas of work: (1) loading/discharging cargo and passengers; (2) taking the ship safely from departure to destination; and (3) maintaining the ship throughout her life. The whole issue of goals, purposes, objectives and missions will be covered later in this Chapter but it is worth mentioning that Richardson's definition does not go far enough — he neglects the relationship between revenue and operational costs and, more importantly, he neglects the contribution which the crew need to make to the future existence of the company. As an object, the ship cannot influence the future of the company but the training and development of the crew has a crucial effect on whether the company can introduce more advanced ships thus avoiding being squeezed out of the shipping business by technological obsolescence.

In this Part the ship will be described from an organisational and human point of view.

Litwak (1961) points out that the classical bureaucracy is most efficient when the organisation has to deal with uniform events and where stress is laid on traditional skills. In one sense, developments in marine technology (e.g., weather routing) have led to an increase in the degree of uniformity and predictability of events in modern ships compared with the sailing ships and tramps half a century ago while, on the other hand, the explosive rate of change in marine technology has resulted in events being far less uniform and stable than they were in ships of the past. It is vitally important for us to know whether events at sea are becoming more or less uniform for Pelz (1960) found that, among workers dealing with non-uniform events, there was stronger motivation and more effective performance when they were free to make their own decisions. This research tried to determine whether or not changes in marine technology, changes within the shipboard organisation and changing values in society are in harmony or not.

One of the best descriptions of the factors affecting life aboard ship is given by Goffman (1957) who classes a ship as a "total institution" or "24 hour community". Reference to Porritt (1971) and Perry & Wilkie (1973) shows that there is some argument on whether these factors are absolutes or whether they are dimensions along which ships, hospitals, prisons, etc can be measured/plotted. Whether they are features or relative dimensions, Goffman lists them as:

1) All aspects of life are conducted in the same place and under the same single authority.
2) Each activity is carried out in the immediate company of a large group of other members, all of whom are treated alike and who are expected to do the same thing together.

3) All phases of the daily routine are tightly scheduled with each activity leading on, at a prearranged time, to the next; the whole schedule being enforced by a set of rules from higher authority.

4) The contents of all the activities are brought together as parts of a single overall plan which is supposed to fulfill the goals of the institution.

5) A two class structure emerges in most total institutions.

6) Whereas under ordinary arrangements of living and working people are free to spend their earnings how they like, in a total institution, the institution lays on all it feels is necessary for leisure time.

7) Instead of weekly or monthly payments, payments are made when the man leaves the institution. Thus money takes on a different significance owing to the nature of "forced" saving.

8) On entering the institution, a stripping process occurs when a deal of personal identity equipment is removed and the member becomes almost indistinguishable from all the other members.

9) In some institutions, expressive signs of respect for the staff are coercively and continuously demanded.

10) Authority becomes of the echelon kind with any member of one group having the power to discipline any member of the lower group.

11) Sanctions are directed towards a multitude of items concerning dress, deportment, etc.

12) Misbehaviour in one sphere of life is held against the member in other spheres of life.

13) It is difficult for a member to escape the enveloping web of constraint.

14) There is usually some form of initiation to ensure that the new entrant realises he is the lowest of the low. (In the case of cadet, does this initiation ceremony go on for 3 years?)

15) There is an institutional lingo or argot.

16) The staff develop a "theory of human nature" by which they rationalise the scene and defend their maintenance of social distance from members of the lower echelon.

17) One of the roles of the staff is to defend the institution and its standards in the eyes of the lower members and this puts them in a conflicting situation. Take, for examples, the deck officers aboard ship. They get their rank and position from the organisation and, thus, they do not want to hear grievances from the ratings when these grievances are perceived as an attack on the organisation.
At a conference of social scientists held at Plymouth during August 1970, further features of the ship (as a total institution) were identified:

18) Lack of choice.
19) Territoriality.
20) Superficiality of personnel contacts.
21) Avoidance of personal responsibility; the institution can be blamed for setting certain standards.
22) Uncertainty without (while the ship is at sea) calls for certainty within but as soon as the ship reaches port and there is certainty without there may be an explosive disintegration of discipline within.
23) A lack of personal knick-knacks.
24) The lower members are perceived as irresponsible and incompetent and, in some respects, may be abused. Years ago, in sailing ships, the crew were abused by "Ducko" Mates. This was stopped by union pressure and the abuse was transferred to the apprentices and cadets. But abuse of the cadets is being stopped by training officers and new training schemes and it may be found that the abuse is being transferred to the junior deck officers.
25) Identification and labelling of others by the work roles they fill.
26) Emotional undernourishment on board.
27) Rejection of the sick person seen as one causing work over-load on the remainder.
28) Irreversible nature of decisions. Once the Master or a senior officer has made public his decision, he is loth to change it for fear of "losing face".
29) Believed infallibility of decisions, particularly from the Master.
30) Greater tolerance of religious, political and sensitive views than among shore people.
31) Conformity.
32) Tendency for the insecure person in authority to infantilise his subordinates.
33) Temporary ganging up together against outsiders.
34) Phantasy and yarn-telling.

As was mentioned earlier these features are not absolutes found on all ships but many of them will be found, to some degree, on many ships.

Etzioni (1961) points to the relationship between scope, pervasiveness and compliance where organisations broad in scope are those in which members share many activities. The broader the scope, the greater the emotional significance of each member's "lot" for there are few or no alternatives for emotional investment and activities. This leads to
higher levels of tension being aroused and to the need for special mechanisms to be developed for the release of tension. On board ship at sea it is taboo to release hate and conflict openly which forces seafarers to release tension in port. Years ago this was achieved in various ways (relatively safely to the ship) while the ship was in port for many days or weeks; but in modern ships with very little time in port there is little or no opportunity for this tension release to take place. And in ships trading to isolated berths where a club has been provided at the end of the jetty, no tension release takes place for ranks and titles are simply transferred from the ship to the club. Somehow safe tension relief mechanisms have to be built into the ship which spends little or no time in port. One way may be in splitting the work and life areas under separate leadership (Porritt 1971 based on Etzioni 1965) so that men may move away from the work area during their off-duty hours.

Herbst (1968) is another researcher who draws attention to the crucial problem of tension aboard modern ships and goes on to point out that if the conventional hierarchical, departmental and watchkeeping structures are going to be retained while the size of the crew is reduced even further, then the results will be:

1) A large proportion of the crew will become isolated.
2) The possibility of collegial activities during work and leisure periods becomes minimised.
3) The ship will become split into private work and leisure territories thus limiting the effective living space for all crew members.

Herbst goes on to point out that ships' manning is based on an exchangeable component structure which allows any man in any position to be removed and replaced without altering the organisation. The basic assumption is that all work and interpersonal requirements can be built into each role and, over and above this, it is assumed that specific psychological attributes can be built into each role. Thus the men at the bottom (no matter who they may be) are perceived to be irresponsible and incompetent while the Master (no matter who he may be) is perceived to have almost superhuman and godlike attributes. He states that unless the men at the bottom are, in fact, irresponsible and incompetent there is no justification for the present hierarchical structure and, under the present structure, even if the ship were manned by all officers, the perception of irresponsibility and incompetence would be shifted to the lowest officers.

Herbst found that the most frequent reason given for distance maintenance between officers and ratings and, sometimes, between Master and
junior officers was that familiar relations lead to loss of respect. It is a feature of all authoritarian structures that respect is an attribute of the person who holds the role and Ramsay (1966), reporting on his personal experiences as a rating on British ships says that Masters and officers seemed to be more concerned with the ratings showing proper respect than with the ratings doing their work properly. To some extent, Ramsay is supported by Clark (1968).

Herbst (1968 & 1969) feels it possible that:-

1) The work role of some officers does not provide them with a feeling of competence; this may be the case for junior deck officers who are rarely called upon to exercise their professional skills.

2) Some officers may be given responsibility for operations for which, owing to technological and administrative changes, they have not had the requisite training.

3) Officers are not able to demonstrate the competence they do have.

At the same time, Herbst goes on:-

a) It is precisely the distance maintaining mechanism which makes it difficult to demonstrate competence and allows the superior to protect himself from the judgements of incompetence by his subordinates.

b) The higher the status position, the more the role content is looked upon as a kind of mystique by subordinates.

c) The tendency over time to transfer high level decisions to head office and to reduce crew sizes has reduced the effective authority of officers both upwards and downwards.

Herbst, reviewing the interview material collected on some ships, suggests that officers seek to defend themselves against feelings of loneliness by keeping themselves "busy" all day. Confirming evidence of this comes from a British oil company in which it was found that some deck officers and senior engineers did, in fact, take paper work unto themselves - a trend not discouraged by those shore officials whose status and advancement in the company seemed to be based, in part, on the number of forms and statistics they had to "analyse"; and so aptly described by MacCurdy (1943).

Richardson (1956) pointed to eating arrangements on board ship being used as a measure of social stratification. Served meals in the officers' saloon are a badge of rank and such officers would not take kindly to self-service/cafeteria methods perceived as a downgrading of status. Thus, if we plan to use self-service methods for officers we may have to replace this lost "badge of rank" with something else - or recruit people who do not value this particular badge.
Not only is the served meal a badge of rank but, in British ships, so is the seating position in the saloon. The rigid seating arrangement of Master, Mate, and Chief Engineer at the head of one table is defended on the grounds that these senior men need to get together to discuss the work of the ship. But, with the introduction of management committee meetings in many ships, rigid seating can no longer be defended and free seating could be introduced for the good of all and as a first step towards creating a "learning culture" on board ship.

Rosenberg (1968) points to the fact that people tend to associate with those who think well of them and to avoid those who despise them. This is the very basis of friendship patterns and is related to the reinforcement of self-esteem. One wonders what happens in the mind of a young deck cadet who may have received longer and more up-to-date training than his senior officers which officers may perceive him as a threat and despise him; he is forbidden to associate with the younger ratings and, in some rare cases, he may be discouraged from associating with the engineer officers. If engineer cadets are on board he may find that these engineer cadets have received more training and may be academically brighter than he is. Thus, on board, there may be no-one with whom he may associate and who may reinforce his self-esteem. This may lie at the very root of discontent and wastage among current deck cadets.

Blau (1955) stresses that if junior officials in any organisation are treated as subordinates whose sole duty is to carry out the detailed orders of their superior, they have neither the security nor the incentive to cope with problems encountered in their own work. In order to gain the confidence and motivation required for effective performance these juniors should be treated as collaborators of their seniors in the pursuit of common professional objectives.

Etzioni (1961) takes care to distinguish between coercive, remunerative and normative power and suggests that problems are bound to arise if we try to adopt a dual power structure. If we have to adopt two means of control, say normative and coercive, they must be segregated in time so as to avoid conflict between the two styles. He points out that in combat units, an officer is considered a poor leader if he uses coercive power too often and too soon; on the other hand if he relies too much on normative power he gets too involved with his men and things get out of hand.

On board ship, officers are controlled by normative and remunerative power while ratings are controlled by remunerative and coercive power. The officer may be told to do something because "it is expected of him.
as an officer and a gentleman" while the rating may be told to do
something under threat of being "logged" and fined for disobedience.
This raises the important question of to what degree do officers feel
morally involved in their ships and companies - for without moral
involvement there can be no normative control. Certain grades of
junior engineer officers reject any form of normative control while
many companies rely heavily on the normative control (and implied moral
involvement) of their deck officers. Is the level of moral involvement
increasing or decreasing among all officers? For, if we are to move
from a military to an industrial model of manning, we may need to be
prepared to rely less on the normative control of officers.

Etzioni (1965) states that groups tend to develop two kinds of leaders
one an expressive (socio-emotional) leader; the other an instrumental
(task) leader. These two forms of leadership may be provided by one
man - the "great man" - but more often by two separate leaders.

We could draw an analogy between a ship and a remote village in which
all the people are employed in a single neighbouring factory. The
factory would have a factory manager - the task leader; while the
village would have a mayor - the expressive leader of the community -
and a policeman to keep order. Aboard ship, what roles do we expect
the Master to fill? Do we expect him to be the "factory manager" - the
task leader? Or do we expect him to be factory manager and (expressive)
mayor? Or do we expect him to be factory manager and policeman? Or do
we expect him to be factory manager, mayor and policeman? In other
words, is the Master the downward-looking representative of the
company (keeping the men working and in order) or is he the upward-
looking representative of the total crew (expressing their needs to
shore management)? Conflict must arise if he is expected to fill both
roles. Should we - can we - introduce two separate leaders aboard ship,
one being the task leader, the other the expressive leader? If we do,
the whole efficiency and harmony of the ship will turn on the relations
between these two leaders but, in this age of rapid communications, it
would not be impossible to build in an appeals procedure in the shore
senior management should conflict arise between the two leaders aboard
ship.
SEAFARERS

The survey data contained in BOT (1970) highlights two very important facts:

1) So far as stated needs, priorities and attitudes are concerned, there are no such persons as "seafarers". There are deck officers, engineer officers, deck-, engine-, catering-ratings each group of which differs markedly from the others.

2) In the three classes of ships covered in the survey - cargo liners, tankers and tramps/bulk carriers - the men hold widely differing attitudes towards their living and working conditions, towards job satisfaction and towards the future. Further research will be required to show whether different personalities are attracted to the separate types of ships.

The one and only factor common to all seafarers is that, at one point of time, they made the common decision to leave home for a different way of life.

The personality, stated needs and priority differences among the seafarers in different types of ships - plus the increasing specialization of ships - must affect the inter-company mobility recommended by Rochdale (1970). Such mobility may be to the advantage of shipowners for the data [in Vol II Table 2C of BOT (1970)] clearly shows that those officers who change their companies are more likely to stay at sea longer than those who remain within one shipping company. On the other hand, this research programme has shown that one of the conditions for introducing change in shipboard practices is labour stability. To reap the benefits of both worlds, a shipping company would need to be able to offer some variety of ship-types and trades to a stable labour force.

Blauner (1960), shows that positive attitudes towards work are associated with the prestige of that occupation in the community from whence the man comes. This suggests that we should get greater satisfaction among seafarers who come from communities in which seafaring is respected than from communities where it is not. I failed to find any published reports on this aspect of seafaring except that Hill (1972) shows a greater likelihood for seafarers to be drawn from those born in traditional seafaring districts.

We may note with concern (Bot 1970 Vol II Table 80) that 80% of seafarers and 94% of all deck officers felt that shore people
do not appreciate the value of the work done by the Merchant Navy for Britain. One explanation for this may lie in the closed dock system in this country which means that, on arrival in a British port, the only people seen by the seafarer are dock officials enclosed within a high wall or fence while the only time the general public sees the seafarer is when he is ashore at play. It may be significant to note that, in BOT (1970) Table 82, Vol II, 65% of all seafarers felt that the docks should be opened to the public and, when asked what advantage this would have, 30% said it would let people see the importance of shipping for imports and exports while 46% said it would allow people to see their way of life. Only 10% said it would allow shore people to see the bad conditions on board. We may need to pay some attention to taking positive steps towards upgrading the prestige of seafaring in the country at large.

On what aspects of seafaring employment do personnel managers rely to control their maritime labour force? Do they rely on unemployment ashore; or on high wages; or on the chances of promotion; or on supplying a home and care for seafarers? The greatest harm can come from relying on money related to promotion where promotion is dependent upon the number of ships in one company for, then, seafarers become dependent (for increased rewards) on the vagaries of the freight market over which they have absolutely no control. So far as possible rewards should be based on those factors/variables over which workers can exercise some degree of control. And, so far as there is little or no connection between performance and rewards, there can be little or no relationship between performance and satisfaction.

It would be interesting to evaluate the effects on seafarers of the very high profits made by some independent tanker owners during 1970/71 when the tanker freight market soared to unprecedented levels. The profits made had nothing to do with the performance of the crews on those tankers. During this period, did employers experience increased pressure for increased "hygiene" factors/rewards on the grounds that such improvements could be afforded?

So long as the performance of a ship is measured in terms of number of voyages per year; or in terms of length of stay in port; or in terms of cargo carried, seafarers will wonder if extra effort on their part is worth while; for the number of voyages is controlled by the weather and planned schedules; the port time is, in many classes of ships, wholly dependent upon dock labour; and the amount of cargo carried is a function of the freight canvassers' expertise. Seafarers see their performance world invaded by outsiders and outside influences and we may need to tackle the very difficult problem of devising performance measurements of those parts of the total operation wholly controlled by the crew.
The degree to which decision making should be decentralised in a shipping company, and the degree of autonomy which should be created in the ship, are problems which can be solved after careful examination. The decentralised system must be compatible with environmental requirements and with the factors described by Lawrence & Lorsch (1967). These two writers have shown the bad effects of companies which recruit managers of too high standard and who then try to develop their managerial capabilities and interests by decentralising decision making when, in fact, the environmental factors do not need this decentralised form of decision making. The key to reducing labour wastage and training costs and to improving job satisfaction may lie in our firstly determining the decision making processes required by the nature of the shipping industry and environment and then recruiting accordingly. A dominant constraint in this area may lie in the "replaceable component" nature of our current manning systems.

The work of Adams (1963), mentioned elsewhere in this Part, shows that job satisfaction and (accepted) equitable rates of pay are related to the believed possession of certain skills demanded by the job and to comparison with others also believed to possess these same skills. Gellerman (1968) emphasises that equitable wages are based on comparison with others. We simply do not know who seafarers use as their reference groups. As shipping is international, do they use the seafarers of other countries? Attention may need to be given to this question; especially in the present time when more and more shipping companies are joining international consortia. We may need to acknowledge the stand taken by British airline pilots on the need for international standards of wages paid for flying the same types of aircraft.

Maslow (1954) points out that destructiveness is a symptom and not a motivation. Any threat to the defensive and coping system; any threat of thwarting the basic needs and any threat to the general way of life is likely to be reacted to with anxiety and hostility, and hostile, aggressive or destructive behaviour may result. This is reinforced by Clark (1960) who states that the power structure aboard ship leaves the seamen with no means of ventilating their feelings and with little sense of self-respect or standing in the hierarchy of the ship. Apparently senseless acts of destruction on board ship are simply the results, he says, of an unfair, arbitrary use of power over the ratings.

Hill & Trist (1953) suggest that accidents, like turnover and absences, are related to the strength of desire on the part of the individual to withdraw from his work situation, and they are led to the conclusion that dissatisfied workers are more likely to have accidents than are satisfied workers.
Officer-Rating differences

Quite apart from the distinctions made between officers and ratings in cabin size, availability of spirits, steward service, etc as outlined by Clark (1968), the most important difference between these two grades of seafarers is the manner in which they are controlled.

Both officers and ratings can, of course, be sacked (a form of remunerative control) but a rating who misbehaves can be "logged" and fined (a form of coercive control) while the misbehaving officer is either told to behave "as a gentleman" or is reported to the company (forms of normative control). Etzioni (1961) believes that there must be congruency between the goals of the organisation, its form of organisational structure, the control exercised over the members, the type of involvement by the members, and the methods of recruitment.

Now if Etzioni is correct then the differences in controlling officers and ratings shows an implied assumption that these men are involved in different ways. Both, of course, are calculatively involved (i.e. they work for monetary rewards) but, in addition, the methods of control imply that there is some degree of moral involvement on the part of the officers and some degree of alienative involvement on the part of the ratings. Alienated workers have to be coerced to do what is required of them.

Some officers may be morally involved just as some ratings may be alienated but it is dangerous to assume that all officers and ratings can be classified in this way. In fact, we are witnessing a change in the type of control and involvement with the offering of long-term contracts to petty officers and ratings. The specialism of ship technology is forcing companies to try to retain their trained ratings yet, once a petty officer or rating is "on contract" he experiences a change in the control over him - it shifts from coercive to normative for he is now assumed to be morally involved in the company. In turn, this is a conflict with Etzioni who predicts that organisations will move towards congruency between goals, involvement and control.

According to Etzioni's theory, the shipping company has economic goals and, therefore, we should expect it to move towards a utilitarian type of organisation with most members involved for calculative reasons and controlled by remunerative methods. To some degree we see support for Etzioni in recent changes in the Merchant Shipping Acts which have reduced the Master's powers to punish (coerce) the ratings but, if Etzioni is generally correct, we may have to plan now for the time, not too far distant, when the officers will not be morally involved and will not be controlled by normative means.
Following Etzioni on the necessary congruence between form of control/involvement and methods of recruitment we note that the different types of control used imply that the recruiters assume officers apply to go to sea because of some moral involvement in ships or in the officer's job while ratings are assumed to go to sea for calculative reasons. The coercive aspects of control over these ratings may be the remnants of the days of "press gangs" when some seafarers had to be forced to go to sea and did not want to stay there once signed on. There are, probably, many more factors than Etzioni takes into account in his theories of congruence and change.

Myers (1948) found that normative controls seem to play a more important role in the control of white collar workers than in the control of other grades of workers. Men controlled by normative means tend to attach some weight to prestige symbols for they are expected to share some if not all of the values of management. But these managerial attitudes are not shared by the lower grades of workers and, hence, prestige symbols are unlikely to be an effective means of controlling these lower grades.

We have already noted the differences in the rewards and prestige symbols among officers and ratings. But the value of these symbols may decline among future officers and may become meaningless as methods of rewarding superior performance.

Years ago, when there were frequent crises at sea and when the Master and officers individually controlled the performance and cargo (and, thus, the profitability of the ship) there was a real need for moral involvement on the part of the officers. In fact, individual shipowners with large personal fortunes at stake needed to believe that their Masters and officers were morally involved. But in these modern days of control from the shore and ships owned by companies staffed by salaried managers, one wonders about the extent of moral involvement required on the part of the officers. Would these salaried managers sleep less easily in their beds at night if they thought their officers were calculatively rather than morally involved in their jobs? Again, there may be special features of the ship and, particularly, of the "life" area on board which make it essential for the officers to be morally involved.

If moral involvement is essential on the part of the officers, then we must return to Etzioni (1961) for he points out that the higher the rank of a person the more morally involved he becomes and the more normative control is exercised over him. Thus, if we are to encourage moral involvement in the officers, we must ensure high rank in the
company. It is ridiculous to lower the perceived rank of Masters and officers within the company by requiring these officers to defer to relatively junior company (shore) officials and then to expect that they will be morally involved in the company and that normative means of control may be exercised over them. The lower the officer's perceived position in the company the less morally and the more calculatively will he be involved in the ship, and company.

Gouldner (1955) found that, in the mine the supervisor-miner gaps, and at the front the officer-soldier gaps, broke down when danger threatened them. Does this mean that, in days gone by when dangerous crises were more frequent at sea, officers and ratings were closer together than in modern, safe ships? And does it mean that officers and ratings will grow further apart as ships become still safer? The opposite seems to be happening for the most dominant force may be the needs of modern marine technology.

Roggema (1968), reporting observations made on board ship, found that both officers and ratings expressed the opinion that there needs to be some social distance between officers and ratings. Deck officers were somewhat higher than engineer officers in stressing the need for this social distance and Roggema found this apparently contradictory for the engineer officers work far more closely with their ratings than do the deck officers with theirs. Herbst (1968) in reinterpreting this data suggests that this difference in views between deck and engineer officers is because the deck officers get their power by delegation from the Master and, as the Master is socially distant from the rest of the crew, the deck officers remove themselves away from the others along with the Master. Further research needs to be done in this area for it may be found that the root cause in social distance lies in the demonstration of personal competence.

The different opinions on statements about life at sea held by the various grades of seafarers in British ships are found in BOT 1970 Vol II Table 32A:-

<table>
<thead>
<tr>
<th></th>
<th>Officers Cert.</th>
<th>Officers Uncert.</th>
<th>Ratings Deck</th>
<th>Ratings Engine</th>
<th>Ratings Catering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too many trifling restrictions</td>
<td>35%</td>
<td>39%</td>
<td>42%</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>Discipline too rigid</td>
<td>16</td>
<td>15</td>
<td>12</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>Too much division between officers and ratings</td>
<td>16</td>
<td>13</td>
<td>25</td>
<td>69</td>
<td>61</td>
</tr>
</tbody>
</table>
Deck - Engine differences

Hoel (1971) suggests that the differences between the two departments in conventionally manned ships are so great that such ships are manned not by one crew but by two. In such ships there is very little job overlap and certainly no occupational career overlap or transfer. But manning systems are changing and we are witnessing the emergence of "one" crew formed of men trained to work almost anywhere in the ship. Some people argue that traditional deck-engine divisions must give way to operations-maintenance divisions while Herbst (1968 & 1969) and Hoel (1971) put forward strong cases for having no such divisions but having all crew members involved in both the maintenance and operational aspects of the ship. They put forward the idea of "matrix manning" (also see Moreby 1971b) under which scheme each man is an expert in one field and an assistant in many others.

However, in this section, deck-engine differences will be viewed against conventional manning systems.

Group discussions with a number of young cadets held during 1970 and 1971 seemed to show that the differences between deck and engineer officers as perceived by these young men are:

<table>
<thead>
<tr>
<th>Deck Officers</th>
<th>Engineer Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparently deplore the higher qualifications currently being introduced.</td>
<td>Apparently welcome the higher qualifications for engineer cadet and call for standards to be raised still further.</td>
</tr>
<tr>
<td>Officers appear to reject their cadets.</td>
<td>Officers appear to accept their cadets.</td>
</tr>
<tr>
<td>Officers and cadets rarely work physically together.</td>
<td>Officers and cadets frequently work physically close together - this may be due to the nature of the job.</td>
</tr>
<tr>
<td>Never or rarely do officers and cadets spend their leisure time and coffee breaks together.</td>
<td>Often mix during leisure time and take coffee breaks together.</td>
</tr>
<tr>
<td>Decreasing number of jobs in which initiative can be displayed, therefore a struggle between the older and younger men for a share of this &quot;initiative and responsibility&quot; cake.</td>
<td>Increasing number of shipboard tasks calling for initiative, therefore no struggle between older and younger men.</td>
</tr>
</tbody>
</table>

In an earlier section of this Part, mention was made of job content and job context and how engineers usually describe their happiest ships in terms of the job content while deck officers describe their best ships in terms of job context, the people on board. The question was raised on whether these reports by deck officers indicate their belief that their real work is to do with maintaining harmonious human relations on board. French (1958) and Vroom (1964) have shown the relationship between knowledge of results, performance and motives of the group.
They show, for example, that performance improves when results are made known on those parts of the activities believed by the group members to be the "real" objective or work of the group. We may find, therefore, that engineer officers will perform better if told they are running a technically efficient ship while deck officers may improve their performance if told they are running a happy ship.

The key difference between deck and engineer officers lies in how they see themselves - as "line" or "staff" managers. Many writers, including Gouldner (1955), Homans (1950), Dalton (1950), and Etzioni (1964) define "line" and "staff" managers. In summary, line managers are the administrators concerned with the major goal activity of the company while staff people are the professional experts employed for their expertise. In many organisations, the line managers hold the greater amount of responsibility and staff people are kept in positions subordinate to the line managers. Until fairly recently, and still in some companies, the division between line and staff was so great that there was little or no switching of managers from staff to line or vice-versa. Today, however, we see staff and line as not as two separate entities but at the two ends of one continuum and, in fact, as a professional expert is promoted to greater administrative responsibility he moves along this continuum.

Nevertheless, there are still some differences between line and staff people remaining in modern organisations. Gouldner, for example, shows that the inferior position of staff experts was defended on the grounds that these experts were more mobile and were not wholly committed to the organisation - they had some commitment to their professional bodies. The line manager, on the other hand, is a "company's man" holding his present position as the result of years of faithful service within his company. Roe (1956) reinforces this definition when he shows that the promotion of administrators (line managers) often requires long service within one organisation.

In years gone by - before the advent of the telegraph and radio - there is no doubt that the Master was a "line" manager concerned with the achievement of the overall goals of the shipping company for it was he who found the cargoes and fixed the freight rates. Deck officers, as understudies of the Master, saw themselves in the same line of command within the company. But right from the very outset, engineer officers were, and saw themselves as, professional staff employed for their mechanical expertise. It is only within the last 35 years that these marine engineers have been promoted into positions of managerial (line) responsibility ashore. Still more recently, Chief and Second Engineers
have joined together with the Master and Mate to form the ship’s management committee.

Many of the characteristics of "staff" managers still obtain in the case of marine engineers. They have well established professional institutes and see themselves as mobile members of an occupational world which extends beyond the shipping industry to various professional engineering jobs ashore. Promotion (in the fullest meaning of the word) for most marine engineers depends more on qualifications and expertise than on length of service within one particular company. In the case of deck officers, however, many of the characteristics of "line" managers still remain. These officers, although not directly involved in achieving the economic goals of the company, are involved in administrative matters; their promotion is wholly dependent upon length of service in one company; their occupational world is almost wholly bound up within the shipping industry which, coupled with promotional methods, makes them immobile; their professional body - the Nautical Institute - has only recently been formed.

It is of crucial importance, during this time of change and while their professional body is being established, to know whether deck officers see themselves as line managers or as staff experts. Discussions reveal that many deck officers perceive themselves as line managers and their promotional system continually reinforces this belief. If this is generally true throughout the Merchant Navy, it can be predicted that these deck officers will probably reject changes in training and jobs which tie them more firmly to the seagoing sector of their companies while they will probably welcome changes in training and jobs which prepare them for promotion into the line managerial structure within their companies ashore. We also need to know how shore staff perceive deck officers. Do the shore people see them as line managers or as professional staff employed for their expertise in navigation etc?

The reluctance of so many companies to promote their deck officers to shore managerial positions (see Rochdale 1970) and the fact that seagoing experience as a navigator is not a prerequisite of appointment of shore people to line managerial posts in shipping companies seem to indicate that deck officers are seen, by shore staff, as professional experts (staff) and not as line managers. This must be at the root of some conflict between sea and shore staffs of a shipping company.

Moreby (1967) suggests that one difference between the work of the deck and engineer officer is that, on the bridge, the deck officer has to evaluate and act upon external variables over which he has little or no control while, in the engine room, the engineer officer has to
evaluate internal variables over which, in nearly all cases, he has complete control.

Perrow (1967) puts forward a framework for the comparative analysis of organisations which enables us to distinguish between the jobs of deck and engineer officers in a manner similar to Moreby. Perrow uses the frequency of exceptions in the job and the nature of the "search" process employed when exceptions arise. He puts forward two types of search process - at one extreme the search can be conducted on a logical and systematic basis while at the other extreme the problem is so difficult to analyse that no formal search is undertaken and the individual has to draw on experience and intuition. Following Perrow's definitions, some of the deck officers' tasks concern unanalyzable problems calling for the use of experience or intuition; the number of exceptions being dependent upon the nature of the ship, trade and geographical area. On the other hand, with growing knowledge and increasing reliability of marine engines, the engineer's work consists of few exceptions and, when they do arise, the search can follow logical and systematic steps. Perrow goes on to point out that the aim of all organisations (except pure research organisations) and technologies is to move away from where exceptions are many and search processes based on intuition to areas where exceptions are few and where search can be conducted on logical grounds. This is happening in shipping and in the deck officer's job for, as computers, radio aids, and weather facsimile recorders are introduced a lot of the "black magic" and unpredictability of the deck officer's job is removed.

*Work aboard ship.*

Vroom (1964) states that there is conflicting evidence on the relationship between supervision and morale. While the Hawthorne experiments pointed to the extreme importance of supervisory styles, Herzberg et al (1959) found this factor of less importance. The best supervisory style probably depends on the circumstances and personalities involved. Vroom described the effects of supervision on performance when he compared insurance clerks with railroad workers. In the insurance company where jobs were highly standardised, continual checking by supervisors gave no technical support and productivity fell. In the railroad where the work was non-standard, supervision was technically supportive in nature and production improved.
Vroom also points out that people work more effectively when effective performance leads to the attainment of what they desire. What this means is that, instead of thinking that job satisfaction leads to higher productivity, we should make higher productivity the means towards achieving job satisfaction.

Blauner (1960) reports that control over one's own work is positively correlated with job satisfaction when the job is particularly challenging in a technological or environmental sense. Evidence to support this may be found in merchant shipping where job satisfaction of engineer officers seems to be higher in tankers and tramps than in cargo liners. In the former two classes of ships, continual absence from the United Kingdom gives the engineer officers more control over their work whereas, in cargo liners which return frequently to home ports, control of the more challenging engineering work is taken away from the ship's engineers by visiting engineer superintendents.

Revans (1964) reports research which may be of some importance in merchant ships. His investigation was into morale and turnover rates of nursing staff in hospitals. He found that high turnover rates were associated with communication flows which moved mainly downwards. In these hospitals, student nurses were given instructions without explanations and were discouraged from asking questions. These students learned little about nursing except how to defer unquestioningly to instructions from above.

In contrast, in the hospitals where labour turnover was low, senior staff had developed a learning culture under which juniors and trainees were encouraged to ask questions, and information flowed in both directions. These findings may give us a valuable pointer in shipping.

To greater or lesser degree, the effects of work alienation are manifested in various ways in many work situations. Work alienation is experienced as feelings of:

(i) Isolation (separation anxiety)
(ii) Powerlessness.
(iii) Meaninglessness.
(iv) Self-estrangement (alienation of the job from oneself)

Alienation, as a concept, can be handled by the following questions:

a) What control does the worker have over his job?
b) Can he see any sense in what he is doing?
c) Is he isolated in conditions of variable stress where he can neither expose his difficulties to, nor get support from, others?
d) Can he express anything of himself in his job?

It is worth applying these questions to the various grades of seafarers aboard ship - and the answers may go some way to explaining some of the behavioural characteristics of some seafarers.
Etzioni (1961) suggests that alienated workers develop a powerful ideology counter to the factory and usually based on socialism. They try to reduce the control the organisation has over them by developing their own control systems. Now, if Herbst (1969) is correct in saying that aboard ship we see the problem of alienation in its most fundamental form, why do we not see attempts made by the ratings to set up their own control systems as suggested by Etzioni? Maybe we do see such attempts to set up their own control systems in port when, in some conventional ships, the crew almost decide when they will and when they will not work — loggings and fines are accepted as the price they have to pay for this element of control. On a lighter note, it may be worth reporting the Irish able-seaman who had sorted out his private finances. "Basic wages," he said, "should be used for allotments to the wife; overtime earnings for buying enjoyment in port; and "Sundays at sea" bonuses should be set aside for meeting loggings and fines"! On a more serious note, Herbst (1969) suggests that the problem of alienation among some officers is countered by compulsive overwork. Their personal work and life spaces are so empty of meaning that they combat feelings of isolation by keeping "busy".
THE SHIPPING COMPANY AS AN ORGANIZATION

As no-one has ever seen an organization, severe difficulties are encountered by anyone who draws on selected, relevant pieces from the literature in order to describe an organization. While ships and shipping are the subjects of this whole report, the descriptive difficulties can be explained by drawing an analogy between an organization and a ship.

Let us imagine a group of men, none of whom had ever seen a ship or a picture of a ship, setting out to describe a ship by reviewing sound text books on navigation, cargo-handling and marine engineering. The one who read the navigation books would probably describe a ship as a mobile platform equipped with navigational instruments whose prime purpose was to move across the ocean; he might acknowledge the existence of cargo (to the extent that steel cargoes affect the magnetic compasses) and engines (to the extent that something is needed to move the ship in order that it might be navigated). Meantime, the one who had studied the books on cargo-handling would probably describe the ship in terms of its cargo carrying capabilities and would almost ignore its navigational and propulsion characteristics. Another man, having read the engineering books, would probably describe the ship as a platform primarily designed to support complicated machinery. These three men would engage in long argument if they tried to put their various views together in an attempt to describe the reality of a ship. Other men, however, may not be interested in describing specific ships but prefer to search for the general formulae which relate the floating and rolling characteristics of any ship to its weight, design and size; i.e., naval architects.

A review of the literature on organizations shows that a number of writers have tried to describe organizations in terms of specific characteristics e.g. in terms of power and compliance (Etzioni); decision-making processes (Cyert & March); exceptions and search processes (Perrow); adaptability of the technology (Thompson & Bates); and in terms of roles (Kahn et al); etc. These writers may be equated to the navigation, cargo and engineering describers of ships in the analogy above; while those writers trying to find general principles and theories applicable to all organizations may be equated to the naval architects mentioned above.
The fundamental argument between organisational analysts, as shown by Silverman (1970), concerns the reification of the organisation. The work of many writers is based on the assumption that organisations "exist" while Silverman denies the existence of organisations. He holds that organisations cannot "act" or "behave" or move in response to environmental forces; that such acts, behaviours and movements can only be carried out by the people who make up the organisation. It is almost as though he is saying that the ship can have no meaning or motion until people board and operate her. But technology has reached a stage where a ship can be moved and operated without people; and, thus, the continued existence of organisations (made up of different people at different times) make it simpler for us to assume that organisations have an existence, a being.

Organisational goals

Many modern writers state that the company's goals (objectives, missions) must be clearly defined in order to measure performance and in order to organise the company for optimum effectiveness. This latter reason, when translated into day-to-day activities, means that goals legitimise power; that is, people can be told to do certain things on the grounds that such activity or behaviour is required for the achievement of company goals.

Johnson et al (1963) point to the need for broad, general goals to be translated into specific operating goals if there is to be any systematic planning. They also point out that goals are subject to development and change for, as they and many other writers point out, the goals of the present organisation are rarely precisely the same as the goals of the original founder of the company.

Classical economists have, for many years, held that the goal (mission, objective) of any commercial company must be profit maximisation but, as shown by Simon (1959), the growing separation of ownership and management should make us question the validity of this assumption. That professional managers are motivated by profit maximisation. In fact as Cyert et al (1959), Cyert & March (1963) and Clarkson (1963) show, the evidence seems to suggest that professional managers are more concerned with maintaining an acceptable and attainable level of profit than in maximising the profits of their companies. This is their concept of "satisficing".

Moreby (1971c) asks the key question related to the goals of shipping company when he asks "Does the shipping company exist to make money or does it make money to exist?". If the former were the correct answer then, when freight rates were low, companies would sell their ships
and move into more profitable enterprises. Most shipping companies, however, do not speculate on the ship sale and purchase market - they try to keep their ships running at acceptable and reasonable levels of profit. The prime goal of a shipping company is, therefore, to make enough money to exist. This is a goal which should be acceptable to most people within the company for they will see their future security and career development as being wholly bound up within the future existence of the company.

But this view of existence leads to the recognition of another prime goal in shipping companies; that is, each company has to avoid being squeezed out of shipping by technological obsolescence where "technology encompasses both the machines and the skills/knowledge needed to operate them. This, in turn, emphasises the need for a shipping company to develop both its organisational structure and its members to cope with change.

McGregor (1967) is another writer who comments on the goals of the organisation and suggests that the most common goal is not maximisation of profit but the avoidance of loss. Many, many writers draw attention to the fact that profit maximisation has disappeared as a goal and, in its place, we see the prime goal as "future existence".

But organisations usually have more than one goal and the interaction between the various goals produces a different value framework for each member (or groups of members) of the organisation. Bennis (1966) points out that, not only are goals rarely defined, but it is rare to find criteria for measuring performance or advance towards the identified goals.

Etzioni (1960) takes a somewhat different view to that of Bennis for he says that goals are cultural entities while organisations are (real) social systems and that, if we compare an organisation with its goals, we are making the fundamental error of comparing the real with the ideal or an existing social system with a cultural entity. Such comparisons usually result in attention being focussed on the ineffectiveness of the organisation with many suggestions being made for change. There is the further danger, in using the goal model to analyse an organisation, of the observer projecting his utopian ideas on the ideal goal(s).

Eisenstadt (1959), supported by van Beinum (1965), points out that goals are of crucial importance in determining the special form of interdependence between the organisation and its environment. And Emery suggests that the continued existence of a company may depend on the unique form of competence it offers to the environment.
Returning to the goal of avoiding technological obsolescence, it is interesting to note the relationship between the emerging importance of this goal and the shift of technical experts along the "staff" - "line" continuum. As was mentioned earlier, line managers are those primarily concerned with the achievement of the overall aims of the company and, as goals related to technological obsolescence increase in importance so, we may find, technical experts move towards the "line" end of the continuum.

Finally, some writers suggest that the goals of the company are used to regulate and legitimise the allocation of resources. Many examinations of the operational costs of ships show that, of his controllable costs (i.e. excluding capital costs, fuel and cargo-handling), the shipowner spends twice as much on maintaining his ship as he does on operating it. Does this, in turn, point to the implied acceptance of the future operating efficiency and existence of the ship as a prime goal within shipping companies? We also note, in Moreby (1963b), and in Rochdale (1970) that it costs 30% more to train a Chief Engineer than it does to train a Master - and Chief Engineers are primarily concerned with long-term maintenance while Masters are concerned with short term operating efficiency.

Some researchers suggest that rationalisation of work aboard ship, reallocation of shipboard tasks and the creation of a "learning culture" cannot progress any further until each ship has a "goal" commonly accepted by all on board. This raises the very difficult problem of time perspectives. We find, for example, that in conventionally manned ships where the Mate gives the Bosun the day's tasks each morning, the time perspective under which many of the ratings work does not exceed one day and may even be as short as three hours. The navigational officers, on the other hand, have time perspectives of two to three weeks, depending on the length of time to get the ship from port of departure to destination. The Mate, primarily concerned with cargo care, may have a time perspective of one to two months, depending on the length of time one cargo is in the ship and the hold preparation required for the next cargo; while the engineer officers may have a time perspective equal to their stays aboard that ship and, in the case of senior engineers, they may work under time perspectives as long as four years - the length of time between special surveys.
Schein (1965) defines an organisation as "the rational co-ordination of the activities of people for the achievement of some common explicit purpose or goal, through the division of labour and function and through a hierarchy of authority and responsibility". The object of co-ordination, in the formal organisation, is activities, not people. Only some of the abilities of each person are required by the formal organisation; thus, from an organisational point of view, it is sufficient to spell out activities and roles.

Brown (1960), however, says there are four concepts of organisation:

1) The one seen on the organisation chart.
2) The one individual members perceive as the organisation.
3) The situation revealed by the organisational analyst.
4) The organisation which would exist if it were in accord with the real properties of the field in which it is imbedded.

The ideal situation, of course, is when all four forms of the organisation are as close as possible together.

A key paper in the field is that by Thompson & Bates (1957) who point out that the types of technology suitable for particular types of goals set limits on the type of organisational structure and on the process of administration. They suggest that the key variables affecting policy formulation are:

(i) The degree of "concreteness" of the goal; and
(ii) The adaptibility of the technology.

They suggest that if the product is concrete and the technology unadaptable (e.g. in mining), the major concern over policy will be that the environment may reject or dispense with the product.

If the product is concrete and the technology adaptable (e.g. manufacturing) the major concern will be when to switch to a new product.

If the product is abstract and the technology adaptable (e.g. Universities), the main concern will be to get agreement among members on goals.

If the product is abstract and the technology unadaptable (e.g. hospitals), the main concern will be to persuade relevant parts of the external environment to accept particular products.

Thompson & Bates take their comparative analysis further when examining organisations along the dimensions of ratio of mechanisation to professionalism and degree of adaptability. They point out that if the technology of an organisation has a high ratio of mechanisation to professionalisation and is not adaptable, the key problem will lie in avoiding technological obsolescence. Shipping falls clearly into this description.
MacKenzie points out that if a firm is operating a technology which is known and static it can have an organisational chart and text-book rules. But if the firm is operating within technological change, strain will result if members are forced to stick by the chart and rules. He goes on to point out that the highest status goes to the man filling the most vital role in the organisation. Seeing shipping is capital intensive, does most status in shipping companies go to those who control the financial resources; or, accepting that shipping companies have to avoid technological obsolescence, should we give the highest status to those concerned with technological innovation in the machine, operational and training fields?

Bennis (1966) described the development of management thinking as moving from the "scientific management school" (which viewed organisations as though they existed without people) towards the "human relations school" which regarded people and groups as though they existed without the organisation. Neither view was wholly effective for both ignored the totality of the situation; that is, the relation between the inside organisation and the external environment and between individual and organisational needs.

Van Beinum (1965) follows a similar line when he compares the two schools of thought on work organisation. The traditional, mechanical type of thinking tries to reduce the human component in the organisation to a constant and regards people as a constraint; it tries to minimise the dependence of the organisation on the individual. Organisational norms are expressed in terms of discipline and efficiency and much attention is given to span of control, divisions between line and staff areas, etc. Man is thought of in terms of engineering principles and as having only economic motives for work. The other way of thinking about work organisation has been called the "human relations" school and, in its extreme form, regards industrial organisations as social organisations - it considers the actual job and the technology as extraneous factors.

A better way, followed by a number of researchers within the Tavistock Institute, is to combine the two schools of thought into a socio-technical approach to the problem of organisational analysis.

Davis (1966) supports van Beinum when he describes four models of individual-organisational relationships:

1) The oldest is the minimum interaction model in which there is minimal connection between the skills, training and involvement of the individual, and the flexibility required by the organisation. The organisation tries to reduce its dependence on the availability, abilities and motivation of individuals.
2) The welfare model. Without disturbing job and organisational structures, it attempts to build extra-role and extra-job associations and, hopefully, greater loyalty to the organisation.

3) Leadership and groups arising out of the Hawthorne experiments. It is based on the social standards and norms in groups and tries to harness informal leaders and informal groupings for organisational needs.

4) The latest model is attempting to develop congruent relationships and compatibility between the technological, organisational and individual needs.

Bureaucracies are distinguished by the definition and distribution of official duties and powers. Furthermore, a bureaucracy ensures permanence by keeping files and records - the "know-how" stays in the organisation and not in the people who may leave. Bureaucracies have attracted the attention of many researchers and writers and, because ships and shipping companies have so many features of bureaucracy (in the classical, not the pejorative sense), it may be worth drawing on the literature in this particular field.

Etzioni (1964) describes the bureaucratic organisation as:

(i) a continuous organisation of official functions bounded by rules;
(ii) specific spheres of competence related to obligations to perform, required authority to carry out the job, and the necessary means of compelling subordinates to do their jobs;
(iii) offices are organised in a hierarchy with each lower office under the direct control and supervision of a higher one;
(iv) administrative acts, decisions and rules are formulated and recorded in writing; and
(v) commitments are to the office or position and not to the incumbent.

Bennis (1966) feels that the characteristics of bureaucracy can be dimensionalised and specific organisations checked on each dimension:

a) A division of labour based on functional specialisms.
b) The hierarchy of authority.
c) The system of rules covering the rights and duties of employees.
d) The system of procedures for dealing with work situations.
e) The impersonality of interpersonal relations.

Bennis and many other writers point to the weaknesses and inadequacies of bureaucracies within this modern world of rapid change. These writers attack bureaucracies for not adequately allowing for personal growth; for developing conformity and "group-think"; for using out-dated systems of controls; for being unable to assimilate new
technologies and scientists; for having no means of resolving conflict between ranks and functional groups; and for holding to hierarchical structures which distort communications.

Merton (1957) and Bennis (1966) are two of many writers who point out that bureaucracies may be ideal systems for coping with uniform tasks in a stable environment but they are unable to cope with change internally or externally. There are a number of features of the ship and shipping company which make a bureaucratic structure desirable; in particular, we can think of the "replaceable component structure" of ships' manning systems with members of the crew in any one ship turning over fairly frequently. Such frequent replacement makes it necessary to have some recording and rule system to ensure continuity of the venture. But there may be other factors which make the bureaucracy wholly unacceptable to recruits now coming into the shipping industry and here one can think of the general value in society of participation in decision-making and rewards. So far as the needs of the technology are concerned, the degree of bureaucracy within the shipboard and company organisations will depend on the rate of change of tasks and skill demands. In turn, this rate of change will have to be viewed against the rate of labour turnover.

In other words, if, on average, men stay at sea for about eight years we need to know whether their tasks will remain stable for that length of time or whether their tasks will change drastically within a time span as short as eight years. For if, marine tasks are changing relatively slowly, it is theoretically possible to bring in new recruits to meet the demands of the new technology; a wasteful solution if it makes men redundant before the end of their eight year stay at sea.

This whole issue is further complicated by current fleet manning methods under which men are switched from ship to ship within a fleet which itself is changing with the introduction of new ship types.

There is still a further point regarding bureaucracies which needs to be considered. Litwak (1961) shows that while bureaucracies may be ideal for controlling tasks in which traditional occupational skills are required, they are ineffective for tasks requiring social skills. Bennis (1966) distinguishes between mechanistic (bureaucratic) and organismic organisations. Mechanistic organisations, he says, stress centralised decision-making, authority-obedience relationships, and conflict resolution through suppression and warfare. Organismic organisations, in contrast, stress mutual confidence and trust, wide sharing of control and responsibility, interdependence, and conflict resolution through bargaining and problem solving.
The efficient control of a ship depends on appropriate skills and styles being used in the work (task) and life areas. A bureaucratic structure may be ideal for controlling shipboard work but it may not be able to cope with shipboard life. We may need to develop an organismic type of structure for controlling the life area and, already in merchant ships we see this structure emerging in the "bar committees". Military ships have had "wardroom committees" effecting some degree of control over the "life" area for many, many years.

Blau (1955) in considering the dynamics of bureaucracy focuses attention on some of the effects of hierarchical authority one of which may be of crucial importance in merchant shipping; in fact, this particular feature may be one of the main weaknesses in shipping companies as presently structured. Blau shows that, within a bureaucracy with strict hierarchical structure of authority, members need to have access to a source of information and help other than their immediate superiors. When faced with a problem in such an organisation people find it easier and better to turn to a colleague for informal advice rather than expose their weaknesses to their superiors. Ashore, this is achieved by informal chats with colleagues but, within most shipping companies there is no machinery by which ships' senior/officers can seek advice on a collegial basis from other people within the company. All communications move from ship to shore and none or very few from ship to ship within the same company (except informal chats on the radio telephone when two ships are within radio distance of each other). All knowledge and expertise is perceived as lying within the company's shore office and, at the same time, the keepers of this information - the marine and engineer superintendents - are perceived as the superiors of the ships' Masters and officers. This means that a Master, for example, has no way of seeking advice without exposing his doubts or weaknesses to his perceived superiors. One particular shipping company has tackled this problem by stressing that the superintendents and ships' officers are colleagues jointly charged with the efficient operation of the ships. Some other companies however, stress (explicitly or implicitly), the superior/subordinate relationships between shore superintendents and sea staff.
Leaving bureaucracies aside, we can turn to other models developed for organisational analysis purposes.

Likert (1967), for example, examines organisations through "variables" which he groups in three classes:

- Causal variables such as policies, decisions, leadership strategies, etc, all of which can be directly controlled by management.

- Intervening variables such as loyalties, attitudes, motivations, etc, all of which reflect the internal state and health of the organisation.

- End result variables such as productivity, costs, etc which are dependent upon the two previous sets of variables.

Likert holds that all the activities of any enterprise are initiated and determined by the people who make up that organisation and, therefore, we should concentrate on the intervening variables as the most crucial factors affecting organisational effectiveness. He develops four systems of management from the highly mechanistic, bureaucratic System 1 to the more supportive, organic System 4 and suggests that all organisations should move to System 4.

Likert holds that money is not the only nor is it the prime resource in an organisation - attitudes, motivations and skills of the people are another important resource and all too often, he claims, managers obtain their short-term production goals by liquidating their human resources. Because people are of such importance he suggests that companies measure, control and record the level of human resources just as financial resources are measured and recorded. In the absence of such human resource balance sheets he claims that top management makes decisions on financial balance sheets which reflect half or less of the company's total resources.

March & Simon (1958) base their theory on organisational equilibrium stemming from motivation:

1) An organisation is a system of inter-related behaviours of the participants.

2) Each participant and group of participants receives inducements in return for their contribution to the organisation.

3) Each participant will remain in the organisation so long as the inducement he receives is as great or greater (measured in his terms) than the contributions he is expected to make. Torgersen (1969) bases his concept of organisations on this same point.

4) The contributions from the participants are the sources from which the organisation manufactures the inducements.

5) Hence an organisation can survive only so long as the contributions are sufficient to provide sufficient inducements.
Roles

A very useful model for organisational purposes (and for understanding individual behaviour within organisations) stems from the work of Kahn et al (1964) who view the organisation as a set of inter-related "offices" and the behaviour of the office occupant as his "role".

An "office" defines one position in terms of its relationship to other offices and to the system as a whole. Associated with each office is a set of activities which are defined as potential behaviours. These activities constitute the role to be performed by the office occupant.

An individual's role set are the occupants of other offices with whom he is associated, usually adjacent to him in the work flow or in the hierarchical structure but, so far as they affect his job, his wife and close friends could be members of his role set.

All members in a person's role set depend on his performance in some way; they develop a set of beliefs and attitudes about what he should and should not do as part of his role. These are his role expectations. His "sent role" are the communicated expectations of how he should perform his role and are sent to him either directly or indirectly. The acts of role sending are not merely informational, they are attempts to influence behaviour and the role pressures thus caused may vary in strength, sign and intensity.

Role force is aroused in a person when he converts the sent role into a received role and depends upon his expectations and perceptions. Role forces and role pressures are not the only determinants of behaviour for each person has his own internal sources of motivation and his own occupational self-identity.

Role conflict is when his role senders exert pressures on him towards different (and conflicting) types of behaviour; role overload is experienced when it is virtually impossible for the person to carry out all that is required of him in the time allocated; while role ambiguity can arise from lack of agreement between his role senders or from insufficient information on how he is expected to perform.

The greater the ambiguity and conflict, the greater the tension experienced, but personality differences must be taken into account. The identified effects of role conflict are:- increased tension; increased feeling of futility; reduction in self-confidence; decrease in job satisfaction; reduced trust in and respect for senders; and reduced liking for and communication with role senders.

Rizzo et al (1970) report further research into the effects of role conflict and ambiguity and, in general, confirm and quantify Kahn's dimensions and features.
Effectiveness versus Survival

There is some confusion in the literature of organisations on the precise meanings of "effectiveness" and "survival". In some cases one finds effectiveness equated to efficiency and measured either in terms of costs or in ratios of inputs to outputs. The word "survival" means continued existence and, yet, this is not the meaning implied by some of the writers. Thus, for purposes of this review, we shall take "effectiveness" to mean those actions related to the optimum use of resources and contributing to the long-term existence of the firm. "Survival" actions we shall take as those related to the short-term achievement of some goal or other which actions may, in certain circumstances, threaten the continued existence of the firm. Good distinctions between "survival" and "effectiveness" can be found in Reddin (1970) and, reinterpreting his work within a shipping context, we would find a "survival" Master saying to himself "I am responsible for getting this ship and cargo from A to B" whereas the "effective" Master would say "I am responsible for improving the efficiency of this ship in carrying that cargo from A to B".

This last example – of improving efficiency – leads on to Likert (1967) who feels that better than interpersonal competition for rewards is internal group competition with its past record or with a goal it has set itself. This approach, in turn, leads to the currently fashionable "Management by Objectives", a control and reward system which has not, to date, been effectively applied to shipping and seafarers. Supporters of M.B.O. schemes believe that objectives can be related to the previous performance of the ship while opponents say that the high number of uncontrollable, external variables (e.g. weather, dock labour unrest, etc) make such objectives impossible at sea.

Likert (1961) laid down some of the properties of highly effective groups:-

1) The members are skilled in the various leadership and membership roles.

2) The group has been in existence long enough for relaxed working relationships to develop between the members.

3) The members are attracted to the group and to its leader.

4) The members have a high degree of trust and confidence in each other.

5) The values and goals of the group have been shaped by the members of the group and express an integrated view.

6) Members performing "linking" functions between various groups are able to keep the values of the linked groups in harmony.

7) The members of the group are highly motivated to abide by the major values and to achieve the important goals of the group.
8) All interaction, problem-solving, and decision-making takes place in a supportive atmosphere.

9) The group is eager to help each member develop to his full potential.

10) Each member accepts willingly the goals and expectations that he and the group established for themselves.

11) There are strong motivations to communicate freely with each other, and to receive information.

12) A feeling of security is experienced by each member and by the whole group.

The list is rather utopian but its use may lie in dimensionalising each feature and then checking the features of any particular organisation along each dimension. Such work may highlight where change effort ought to be directed.

Johnson et al (1963) describe the characteristics of effective organisational systems in terms of simplicity, flexibility, reliability, economy and acceptability. The final point has some importance in shipping (and in all other industries, for that matter) for it is worthless devising a system which is unacceptable to the people who have to operate it. For example, was any preparatory research done on the degree of acceptability of general-purpose manning systems before they were introduced into ships?

McGregor (1967), van Heurn (1965) and Davis (1966) are in general agreement when they set the conditions for improving organisational effectiveness:

1) In each sub-system there needs to be meaningful tasks for individual and for the group together with opportunities for learning, developing and building cohesive teams.

2) There needs to be self-control and self-regulation in each sub-system within the limits set by the technology or nature of work.

3) Leadership should be varied according to the technology and nature of the task but with supportive rather than directive supervision.

4) Conditions should be such that each member can achieve his own goals.

Various writers suggest that managerial effectiveness is related to proper use of time and that, for the future, managers will need to develop a scientific rather than a business ethos i.e. to question and be questioned, to investigate, and to defend scientifically.

Finally, the survival-effectiveness issue has a bearing on the types of people we need to recruit for the future. From a "survival" aspect we would continue to recruit authoritarian types, for such personalities are matched to the roles within conventionally manned ships. But as Harvey (1967) has shown, authoritarianism is associated with cognitive rigidity and, thus, from an "effective" (long-term) aspect we may need to reject such authoritarian types and recruit men more able to cope with change.
Power and Compliance

Although it has been faulted by other analysts on the grounds that many important features (e.g., the technology and the effects of the external environment) have been omitted, Etzioni (1961) puts forward a model for the comparative analysis of organisations based on the power/compliance structure.

Compliance is the relationship between power and involvement i.e. it is the relationship between the manner in which a person behaves under a directive supported by another person's power and his orientation to the form of power applied. There are three forms of power - coercive, remunerative and normative - and three types of involvement - alienative, calculative and moral.

Organisations can be grouped according to their predominant compliance patterns:-
1) Predominantly coercive e.g. prisons, concentration camps, etc.
2) Predominantly utilitarian e.g. industries, unions, etc.
3) Predominantly normative e.g. religious institutions, universities, etc.
4) Dual structures:-
   Normative - coercive: combat units.
   Utilitarian - normative: trade unions.
   Utilitarian - coercive: some farms, ships, company towns.

Goals are future states of affairs towards which the organisation is oriented. Such goals may be order, economic or cultural. Organisations with order goals tend to have coercive compliance structures; those with economic goals have utilitarian compliance structures; and those with cultural goals have normative compliance structures.

In coercive organisations there tends to be a split between higher and lower elites with sharp boundaries between the two whereas, in normative organisations, there are few boundaries between higher and lower elites and the organisation tends to be highly integrated. In utilitarian organisations, alienated employees move away from the upper elite and develop their own expressive leadership while committed employees are less segregated from the higher elites.

Consensus is highest in normative and lowest in coercive organisations. Many inter-rank communication blocks exist in coercive organisations while few exist in normative organisations. Horizontal expressive communications are emphasised in coercive organisations while vertical instrumental communication is essential for effective operation in utilitarian organisations.

No socialisation can be achieved by the organisation within the coercive organisation; internal socialisation is highest in the normative organisation; and utilitarian organisations rely on outside
<table>
<thead>
<tr>
<th>Type of Organisation</th>
<th>Goals</th>
<th>Socialisation</th>
<th>Recruitment</th>
<th>Compliance</th>
<th>Involvement</th>
<th>Power</th>
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<tr>
<td>Normative</td>
<td>Order</td>
<td>Limited</td>
<td>Coercive</td>
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The table shows that the degree of socialisation decreases as we move from normative to coercive organisations. This is because coercive organisations require high compliance, whereas normative organisations require lower compliance. Therefore, coercive organisations do not require commitment from members, whereas normative organisations do.

Over time, the lower the socialisation, the lower the socialisation and any incongruence with the organisation's goals. Therefore, the higher the socialisation, the higher the socialisation and any incongruence with the organisation's goals. Therefore, coercive organisations require high compliance, whereas normative organisations do not require commitment from members.
The Organisation as an "Open System"

Jordan (1968) defines a system as a set of elements that are connected to each other by at least one discriminable, distinguishing principle. Using structural to mean that the system can be seen, measured or drawn on a map; mechanical to mean that one part can be cut, altered or removed without affecting the relationship between the rest of the system and organismic to mean that if one part is removed or altered the relationship between the remaining parts will be changed, Jordan classifies systems as follows:

1) Structural, purposive, mechanical e.g. a road network
2) Structural, purposive, organismic e.g. a suspension bridge
3) Structural, non-purposive, mechanical e.g. a mountain range
4) Structural, non-purposive, organismic e.g. a bubble.
5) Functional, purposive, mechanical e.g. a production line
6) Functional, purposive, organismic e.g. a living organism
7) Functional, non-purposive, mechanical e.g. flowing water in a river.
8) Functional, non-purposive, organismic e.g. an atom.

Johnson et al (1963) take a different view and put forward a hierarchy of systems:

1) The static structure - the inanimate object or structure.
2) The simple, dynamic system with predetermined, necessary motions e.g. at the level of clockwork, precise and predictable.
3) The control of cybernetic system e.g. the thermostat which, in addition to having the characteristics of system 2), must be able to interpret and act upon information from the environment.
4) The open system or self-maintaining structure e.g. the simple living cell.
5) The genetic-societal level of the living plant.
6) The animal level with increased mobility, behavioural patterns and self-awareness.
7) The human level which has, in addition to the animal characteristics, self-consciousness and self-reflective properties.
8) The level of social organisations, value systems, culture, etc.
9) The unknowables.

Although Silverman (1970) and others reject the systems approach on the grounds that reification and holism are invalid concepts, the systems approach nevertheless has strong supporters and helps us to develop general theories about organisations and organisational behaviour.

One of the many reasons for supporting the systems approach comes from an examination of the relationship between organisations (e.g. companies) and the environment in which they are imbedded. Many writers, including McGregor (1967), view industrial organisations as open, organic socio-technical systems which engage in transactions with larger systems.
Years ago when there may have been more stability than there is today and when organisations may have been able to regulate, to some degree, their transactions with the environment, a systems approach may not have been necessary for the understanding of organisational behaviour. But, today, the environment is changing so rapidly that a systems approach which assumes the organisation can exist in itself (reification) and that the whole is greater than the sum of its parts (holism) is required. Emery & Trist (1965) draw attention to the four types of causal texture (fields) in which organisations are imbedded:

1) The placid, randomised environment.
2) The placid, clustered environment where survival becomes critically linked with what the enterprise knows of its environment.
3) The disturbed, reactive environment where the existence of a number of similar organisations in the field raises the problem of competitors to be affected and affecting oneself.
4) Turbulent fields where there is a gross increase in the area of relative uncertainty. To meet this problem, there must be the emergence of values which have an over-riding significance for all members of the field. Turbulent fields require organisational matrices rather than hierarchies.

Johnson et al (1963) define the organisation as an assemblage of people, materials and machines and other resources geared to task accomplishment through a series of interactions and integrated into a social system. They claim that the three major systems of paramount importance for any business organisation are:

1) The environmental system - the broad social, cultural, political and economic parameters within which the business must operate.
2) The competitive system - the industrial structure, competitive relationships and producer-customer relationships.
3) The internal organisational system - the structure, objectives, policies and functional relationships.

Katz & Kahn (1966) state that all social systems need energetic input, transformation within the system, and a resultant output. Our basic criteria for identifying social systems are (i) tracing the pattern of energy exchange or activities as they result in some output; and (ii) ascertaining how the output is translated into energy which reactivates the pattern. Thus, the open-system approach begins by identifying and mapping repeated cycles of input, transformation, output and renewed input.

The characteristics of open systems (after Katz & Kahn) are:

1) Importation of energy.
2) Throughput or transformation.
3) Output.
4) Systems as cycles of events.
5) Negative entropy; for open systems must acquire negative entropy to survive.
6) Information input; for, in addition to energy, open systems must also import informative signals about the environment.
7) The stead state and dynamic homeostasis.
8) Differentiation - open systems move in the direction of differentiation and elaboration.
9) Equifinality - a system can reach the same final state from differing initial conditions and by a variety of paths.
As all organisations have particular relationships with the social, technological, economic and political environments in which they are imbedded any change with any or all of these external environments will affect the organisation to greater or lesser degree. Thus, one of the determinants of organisational change will be change in the external environment. Other determinants of change may be internal to the organisation e.g. a merger, a switch in methods of operation, a switch in products. Even these apparently internal forces may, in fact, be rooted in external changes.

Beckhard (1969) feels that one of the emerging themes of the 1970's is the search for organisational excellence and that managerial strategies will be aimed at developing flexible proactive organisations. (Proactive organisations are those which can and do influence the external environment in contrast with reactive organisations which have to bend and adapt to external forces impinging on them). Many shipping companies are reactive but we are starting to see the emergence of proactive shipping organisations in the form of the large container and bulk-carrier consortia.

A number of external changes affecting shipping were described in the beginning of this Chapter and do not bear repeating at this stage. The fact of the matter is that shipping is operating within a changing environment and this has resulted in certain managers "hurting"; that is, they feel that one thing or another is not quite right and they set out to make organisational changes in an attempt to make things feel right. Katz & Kahn (1966) suggest that the men at the boundaries of the company are the ones most exposed to changes in the environment and, therefore, changes will flow through them.

A shipping company imports raw materials such as money, machines and manpower and exports a transport service. Have one or more departmental heads within shipping companies felt the need for change in order to secure or improve the importation of raw materials? It is likely, but not yet proven, that the men responsible for recruiting manpower and those who have to "sell" the transport service were the ones who felt the need for change and that the changes they felt were required have been somewhat modified by the changing technology. It is precisely this effect of technology on change which was examined in detail in this research programme.
Kahn et al (1964) identify three kinds of organisational change:

(i) that related to growth;

(ii) that related to the demands of a changing technology and specialisation; and

(iii) that related to personnel mobility in the organisation and between organisations.

Beckhard (1970) takes this further and suggests that change programmes may be needed in order to:

(iv) change the organisation's culture;

(v) change the managerial strategy;

(vi) change the way the work is done;

(vii) create adaptation to a new environment; and

(viii) change the communication and influence patterns.

Goldthorpe (1966) and Silverman (1970) who feel that people come into organisations with preconceived notions and attitudes would indicate that still another reason for change may be to cope with the changed set of meanings and values brought into the organisation from the outside. In fact, if these writers are correct in believing that the norms and values imported into the organisation dominate the type of structure more than does the technology, we may need to pay special attention to values and attitudes of new recruits in order to determine which organisational structures will be acceptable to, and which will be rejected by, these new recruits. But, as McGregor (1967) points out, managers will reject any training and information which they perceive as threatening to their particular managerial styles which means that we shall have to pay attention to the existing managers and managerial styles within the organisation.

Osgood & Tannenbaum (1967) point to a very important feature in the acceptance of change when they state that changes in evaluation are always in the direction of increased congruity with the existing frame of reference. This means, for example, that if deck officers already perceive themselves within the "line" of authority in their company, they will gauge any proposed changes against their perception of whether the proposed change will move them towards or away from the company's line management.

Revans (1964) holds that people resist change only when it makes for unintelligibility. They seek intelligibility in work for unintelligibility threatens the position of the whole person in a meaningful world. Johnson et al (1963) however, suggest that human resistance to change is based on (i) economic security; (ii) job status; (iii) uncertainty; (iv) increased complexity; (v) changed group relations; and (vi) disruption of the superior-subordinate relationships.
Likert (1967) and a number of other writers argue that management systems must be internally consistent and management systems of component parts have to be compatible. This means, in shipping, that we may have to change both the ship and shore structures in step with each other. The shore organisation needs to be organismic in order to cope with change and we do not know, yet, whether ships organised as bureaucracies can operate effectively within organismic companies.

Marrow et al (1967) suggest that, in developing strategies and tactics for organisational change, we need information on (i) the nature of the present system; and (ii) the state of the present system. Furthermore, they say, it is only worth measuring the causal and intervening variables (after Likert) and not the end products.

Actual examples of change programmes are given in Beckhard (1970) while types of change programmes are listed by Bennis (1966):

1) Change by exposition and propogation.
2) An elite-corps programme aimed at getting the right man for the job.
3) Human relations training.
4) Consultations.
5) Circulation of new ideas to the elite.
6) Development research.
7) Action research.

Bennis goes on to state that there is some evidence to suggest that internal and external change agents working in concert are more effective than either internal or external change agents working alone.

Herbst (1968 & 1969) suggests that the basic design variable in shipping is the allocation of tasks between ship and shore. It is fairly straightforward to define the total tasks required to operate a ship effectively, but we have some choice when it comes to allocating these tasks, in whole or part, between ship and shore. The decision on task allocation will determine the level of skills required on board and whether the ship is to have a continuous full-complement crew or a smaller permanent crew supported by either transient maintenance teams or by port crews. He suggests that these decisions have a direct bearing on:

1) The extent to which the shipboard tasks provide conditions for autonomy and self-regulation.
2) The communication requirements between ship and shore.
3) The possible alternative work roles and social structures.
4) The possible alternative career structures for individuals.
5) The hierarchical and departmental structure on board.
Key issues

It would not be possible to give a comprehensive list of all the issues which may need some attention within the shipping industry, nor would it be possible to allocate any order of priority. But some of the more important points which emerge from the literature are:-

1) The realistic redefinition of the goals of shipping companies in terms of continued existence while avoiding technological obsolescence.
2) The need to move away from the military model of manning towards one more in line with current industrial practice.
3) An examination of the possibilities of separating the work and life areas aboard ship. (That such separation has been achieved in at least one ship is described later in this report).
4) The re-allocation of tasks aboard ship in order to reduce work alienation and to allow the demonstration of personal competence.
5) The need to improve the status of seafaring in the community at large.
6) Upgrading the perceived status of shipmasters within their companies in order that they may better support their crews.
7) A determination of the real reasons for change in manning structures aboard ship and for change within organizational structures in head-office.
8) The need to examine the compatibility of shipboard and shore organizational structures, especially where there is a wide age-mix of ships within the fleet.
9) The determination of whether ships' officers are 'staff' or 'line' managers.
10) The need to extend the occupational worlds in which seafarers perceive themselves to be located i.e., matching ship and shore jobs (so far as possible) in order to create two-way mobility of labour.
11) The need for safe tension-relieving mechanisms aboard modern ships which spend so little time in port.
12) An examination of the effects that a rapidly changing technology is having on organizational structures, and on the adaptive and coping mechanisms of individuals.

This research programme focuses on point 12) above.
During the literature search, which began in September 1970, I came under the influence of many writers (only some of whom are reviewed in the previous chapter) whose notions and statements seemed to reinforce various fragments of my own experiences in British and foreign shipping companies gained over a period of 24 years.

A strong source of influence came from Maslow (1954) and Roe (1956) who stress that the key to understanding the behaviour and motivation of people within organizations lies in identifying the extent to which the basic needs of individuals may be met. My own experiences had shown me that certain basic needs could not be satisfied at sea - in particular, the needs for love and belongingness and for self-actualization - and an objective of the survey and shipboard observations was to try to determine whether the (Maslow) hierarchy of needs was distorted in some way among seafarers. The influences of Maslow and Roe can be seen in the design of the survey questionnaire.

I did not feel that Maslow and Roe could stand alone and I saw complementary notions in Jordan (1968). Although Jordan does not specifically draw on Maslow, I think he extends Maslow's ideas by suggesting that people will behave in a manner which maximises their freedom of movement within their own, particular, worlds. This theme of Jordan's emerged significantly in the field work when I found that those younger officers (in the 23 to 28 year age group) who do switch from one company to another do so, as they say, to get away from the rules, regulations, organizational style and restrictions of their previous companies. Jordan might say these mobile officers are seeking greater personal freedom while Maslow may describe the same mobility as a search for conditions in which basic needs may be satisfied. What I found, however, was that in moving from one company to another each man carries along with him his own personal 'prison' the iron bars of which are his own beliefs on the way ships should be operated and on the way officers and ratings should behave. These beliefs originate from the way ships were operated.
in his last company, or previous companies, and personal beliefs on the "proper way to run a ship" seem to harden and strengthen when they are tested by a different way of running a ship (experienced by the individual as an "opposing" way). It appeared to me that the men who had switched companies more than once held the strongest and most inflexible beliefs on the proper way of running ships for they had been able to test out, and harden, their beliefs during periods spent in intervening companies. This notion about seafarers carrying around their personal "prisons" points to the need for the greatest care to be given to designing the right conditions aboard the recruit's first ship but, so far as this research programme was concerned, the notion of personal prisons highlighted the need for me to pay special attention to the historical development of individuals within the shipping industry. The findings in this area of attention are reported later.

The notion of people carrying around their own, perceived, behavioural worlds is not new. One of the writers who report on this is Herbst (1970); I came under his influence from personal contacts and through studying most of what he had written. As mentioned elsewhere in this report, Herbst argues that no event or thing can have the attributes of good or bad until it has been subjectively evaluated by a person against his own, personal, yardsticks. That people do evaluate events and things in their own ways emerged time and time again during the field work until I could no longer understand the meaning (if there is one) of the reality of shipping. I came to the conclusion that there are no sets of absolutes to describe the total shipping industry; a description can be given only in terms of relatives and, to escape from this difficulty, I took the position that the closest approximation to the reality of shipping is the consensus of views held by people in that industry.

Related to the 'behavioural worlds' of Herbst is the problem of whether people act in accordance with their stated views or whether they bring their opinions into line with their actions. In the search for a path out of this difficulty I came under the influence of Osgood & Tannenbaum (1955), Fishbein (1967) and Emery (1958). Emery suggests that a disposition to evaluate is not the same as a disposition or tendency to act but, rather, the evaluation of an object,
action or situation is one condition of a tendency to act. Fishbein points out that there is little, if any, consistent evidence to support the hypothesis that knowledge of a person's attitude towards some object will allow one to predict the way he will behave with respect towards that object; instead, what little evidence there is tends to show that a person will more likely bring his attitude into line with his behaviour rather than allow his behaviour to be determined by his attitude. The expositions of Emery and Fishbein created in me the strongest doubts about the worth of attitude surveys as predictors of behaviour, which doubts I still hold. But, as the research progressed, the relationship between attitude and behaviour emerged as an important issue and I adopted the view that where, in a person, attitude and behaviour are not congruent, that person will behave in some compromise manner; he will experience this compromise behavioural pattern as conflict and, in return, he will want some reward (payment), not necessarily monetary.

Before commencing the field work, I believed that obedience to rules and regulations was one cause of incongruence between a person's behaviour and his attitude and, following Jordan's notions about people wanting to expand their freedom of movement within their own 'worlds', I believed that rules and regulations would be experienced as repugnant by those expected to obey them because of their restrictive nature. I came under the influence of Gouldner (1955) who so aptly describes the use of rules and regulations within organizations and who reinforced my own past experiences of the way in which shipboard regulations act against the best interests of individuals by supressing the display of initiative. In fact, the reverse was found to be true, among the people interviewed and observed during the field work - a clear understanding of the company's rules appeared to be a prerequisite of social change aboard ship. Furthermore, the people observed aboard ship held the most positive attitudes towards the rules, for general obedience of the rules was believed to be the best form of defence against criticism from shore managers should an accident have occured. Also, it appeared that, in order to obtain the highest level of job satisfaction aboard ship, individuals need to know the rules well enough to know when they may safely break or 'bend' them.
It is an observable fact aboard ships that the number, scope and specificity of regulations have been increasing over the years. The increase in rules and regulations could be a consequence of the growth in size and bureaucracy of companies (as found in most industries) or it could be the consequence of greater shipboard mechanization and associated measuring instruments. I believed that the increasing specificity of the rules could only have come from the authors of the rules having access to more precisely quantified information on shipboard activities out of which, I believed, it should be possible to detect a relationship between increased mechanization (with associated increased instrumentation) and increased specificity of the rules. In fact, this line of thought led me up a blind alley.

A more promising line of approach (towards understanding the increasing number of regulations aboard ship) seemed to lie in the descriptions and dimensions of bureaucracies. So much of the literature on organizations - from Weber (1922) onwards - is based upon bureaucracies that it was an easy and fertile line to follow, I have now learnt that the easiest path is not necessarily the best one.

The characteristics of bureaucracies are too well known to be listed here - they embrace divisions of labour, the hierarchy of authority, all-pervading rules and regulations, the recording of all acts and decisions on paper, and the impersonality of interpersonal relations. Superficially, there is much in British shipping which lends itself to identification within the definition of a classical bureaucracy - most British ships are owned by large, old companies; the shipping industry as a whole is constrained by tradition; and a mass of legislation plus company regulations govern the actions of individuals and groups. As the data shows, the use of bureaucratic dimensions proved to be highly successful in helping to identify some of the key characteristics of compromise patterns among ships' officers; but the pejorative meaning of "bureaucracy" is so strongly held by members of the public, including seafarers, that the use of this word in the survey questionnaire harmed the relationships between me and the respondents. I can understand now - with hindsight - that my readiness to absorb all the descriptions
and criticisms of bureaucracy and apply them so readily to shipping companies was a reflection of the relatively young age when I left the sea — that is, at an age when I would have been at the peak of my bureaucratic awareness and orientation. I now wonder if the majority of research reports and books criticising bureaucracies have been written by people between 32 and 38 years of age.

A writer who cannot be ignored is Goffman (1957 & 1961) and, like many other researchers into seafaring, I came under his influence. Goffman describes the characteristics of total institutions; that is, institutions in which a number of people live (and possibly work) together for long periods. As examples, Goffman uses prisons, religious houses, lumber camps, hospitals, and ships. The full list of the characteristics of total institutions, identified by Goffman and others, is given in the previous chapter of this report but whether these characteristics are absolutes or relatives and whether or not they may be applied to merchant ships is currently a matter of public debate e.g. Perry & Wilkie (1973). However, Aubert (1965), Roggema (1968, 1969 & 1971a) and Herbst (1968 & 1960) base some of their ideas and results on the application of Goffman's characteristics to merchant ships and I adopted the same position. Part of the survey questionnaire and part of the field observations are directly related to Goffman's characteristics being applicable to shipboard life.

Through personal friendships and through their writings, I allowed myself to become strongly influenced by Thorsrud (1966), Roggema and Herbst — all of whose work I admire — but, with hindsight, I realise that I may not have safeguarded sufficiently against cultural differences of both researchers and respondents in the design of my survey questionnaire. I would warn readers that their and my findings may not be wholly compatible for, in Norwegian ships, there are no cadet-officers (everyone aspiring to be an officer in Norwegian ships enters as a rating) while in British ships, over 90% of all deck officers are recruited directly into a cadet-officer grade. Also, I am not sure that I hold the same personal orientations as the Norwegian researchers.
A writer who had a small influence on my work was Etzioni (1961). Threads of Etzioni's ideas on power and compliance appear in the survey questionnaire but the most useful notion that I drew from Etzioni concerns the difficulty people experience when they move from one compliance pattern to another — this proved to be a useful tool while observing behavioural patterns in a company formed entirely of people who had switched from other companies.

Over-riding all that I have described to date is my strongly held opinion that no research into work and life at sea can be effective without special attention being given to the inter-relationships between the technical, social and economic systems. In this area, I came under the influence of the Tavistock writers on socio-technical systems (Emery 1959; Emery & Trist 1960; etc) but nowhere in the literature could I find anything about economic-socio-technical systems and, in so capital-intensive an industry as shipping, the socio-technical approach is insufficient to explain the overall nature and structure of the organization aboard ship and ashore.

In brief, I can say that I entered the field believing that:—

a) each man has his own, personal yardsticks against which he evaluates external things and events;

b) large, old shipping companies are bureaucratic and that some of the features of bureaucracy operate against the development of the individual;

c) people who spend all their working lives within one shipping company and who reach senior positions aboard ship or ashore are traditionalist, bureaucratic and resistant to change, while those who frequently switch between companies indicate — by their mobility — their willingness to change;

d) the small, new shipping company with progressively minded managers and with a mixture of people recruited from other companies would have the best chance of effecting change in traditional working practices;

e) when men go to sea they make a number of payments (e.g. absence from home), in addition to their physical and mental effort, for which payments they seek certain rewards; and

f) growing mechanization and specialization of ship-types is unilaterally changing the payment-reward patterns experienced by individual seafarers.
CHAPTER 4: RESEARCH PHASES, BLIND ALLEYS AND PERSONAL RELATIONSHIPS

The programme started in September 1970 with a literature search under the supervision of Geoffrey Hutton, Reader at the School of Management, University of Bath. The literature search continued right through the programme.

By March 1971, I had developed a two-dimensional theoretical framework upon which all ships could be plotted by degree of specialization and degree of mechanization. Quantification of the dimensions proved to be difficult, but not impossible. For degree of specialization, I used the product of (the number of types of cargo the ship could carry) \( \times \) (the number of ports she could enter) i.e. the lower the numerical product, the higher the degree of specialization. The degree of mechanization was a little more difficult to quantify but this was taken as a function of (number of closed control loops in the total technical system), (deadweight tonnage per crewmember), (tons of cargo handled per man involved).

I believed that the higher the degree of mechanization, the greater the amount of instrumentation and, therefore, the greater the amount of quantified operational data measured and recorded. I felt that most of this data would be transmitted to shore where it would be used and analysed within an expanded technical department. I also believed that this greater amount of quantified data would be transmuted into a greater number of more specific regulations and operating instructions; that is, I believed that the seafarers' work aboard ship was being codified and that we were witnessing the shipping industry changing from an 'experienced-based' to a 'knowledge-based' industry.

I approached colleagues within the Tavistock and Oslo Work Research Institutes for advice and the British Shipowners' Associations for access to an industry-wide sample of ships and shipping companies. The first reactions came from the shipowners' associations who rejected my request on the grounds that sufficient research into seafaring matters was already being carried out. Some time later, my Tavistock and Oslo friends advised me to abandon my proposals on the grounds that, even if the research were successful, nothing of great value could emerge.

However, before the Tavistock/Oslo advice arrived, I approached a British shipping company for research facilities. This
particular company was selected for two reasons — (i) some years ago I had completed a small piece of consultancy for this company as a result of which I enjoyed friendly relations with top management; and (ii) shortly before my approach, the company had made a major switch in its technical system by replacing some of its traditional cargo-liners by container ships. Lengthy discussions with senior managers of this company led me to believe that the most pressing problems faced by these managers were essentially economic in nature; that technical design problems were the concern of shore managers and superintendents, and that the shipboard technical systems had been designed to be operable by their existing seafarers; that documentation and data flows were of little consequence; and that, if any problems did exist they lay clearly in the personnel field. For years this company had had a very stable labour force but, once the new container ships were introduced, the greater proportion of their old employees had left, and the company had had to recruit officers and ratings from other companies. The biggest turnover had occurred among their deck officers and, repeatedly, top managers expressed their inability to understand the resignation of so many deck officers. The new container ships appeared to answer many of the complaints expressed by seafarers over many years: The container ships had superior accommodation and were on a regular schedule between the United States and the Continent/U.K. which allowed seafarers to predict with almost absolute certainty when they would get home on leave. (The leave system adopted by this company in the container ships was two trips — 6 weeks — on and one trip off). In the older ships of the company, accommodation was relatively poor and voyages were anything between two and four months in duration — the men in these ships were never able to predict with certainty when they would get home leave.

The managers, unable to explain the recent, high resignation rate, concluded that seafarers — and deck officers in particular — did not know what they wanted and that they were too traditionalist in their outlook to accept this recent technical change. My own interpretation was that management had unilaterally changed the accepted reward-payment pattern. In the older ships both accommodation and leave were bad but the deck officers derived a great deal
of job satisfaction from loading and discharging general cargo. This is a job which calls for organizational ability, judgement and skill whereas, in the container trades the deck officers simply accept the 'tin boxes' as they come down to the ship and fit them into their guide-slots - a job which requires neither judgement nor skill (on the part of the officers).

It seemed to me that high job satisfaction had been unilaterally removed and had been replaced by better accommodation and leave patterns - and the officers concerned would not accept this alteration. Further discussions with five officers who had resigned from the company confirmed this hunch. I therefore changed the direction of the research from mechanization and data flows towards the notions of harmony and conflict existing within the social, technical and economic systems in shipping companies.

Between May and July 1971, I held group discussions with 93 serving ships' officers out of which I started to tabulate the apparent characteristics of the social, technical and economic systems. Between August and October 1971, I selected and developed the research instruments i.e. the survey questionnaire and the Work Environment Preference Schedule (the WEPS test). Both instruments were applied to a pilot sample of 23 officers studying at Plymouth Polytechnic and the instruments refined.

I misjudged the importance of the existence or non-existence of personal relationships between researcher and respondents. In the Plymouth pilot study, I knew the respondents and they knew me. The mutual positive feelings between us were probably one factor which caused them to complete the questionnaire; I paid insufficient attention to these feelings and fell into the trap of thinking that all respondents would be equally diligent in answering all the questions in the long survey questionnaire. The ultimate effect was that my final sample size was reduced, for I rejected incompletely answered questionnaires and I had to make an excessive number of follow-up interviews to collect the missing data. With hindsight I now know that I should have used a shorter questionnaire.

In November 1971, I commenced negotiations for research access into two companies which I have renamed Gem Tankers and Polychem Tankers. Gem Tankers is a large, long-established tanker section of a major British oil company while Polychem
Tankers is a small, young (4 years old) chemical tanker company. Head offices of both are in London.

My interpretations of the negotiations are: Gem Tankers is so large that my penetration into a limited number of ships was not perceived as a potential threat or upsetting force; the top managers recognised the extensive amount of preparatory work I had done up to the time of the negotiations; and, most important of all, the top managers of Gem were confident that they had been following the right personnel policies for their seafarers and, in line with their generally positive attitudes towards outside organizations and investigators, they felt that granting me research access was another example of their general exercise of social responsibility. I felt that the reasons for getting research access into Polychem were somewhat different: In Polychem, I found the same positive attitudes towards responsible research workers as I found in Gem but, with only three ships in their fleet, top management of Polychem was taking a much bigger risk in granting me research access — an irresponsible approach could have upset their total social system; but, most important of all, I think that the real reason for getting research access into Polychem was that top management had deliberately embarked on a policy of trying to improve shipboard organizational structures and working practices, and management was a little disappointed that things had not worked out exactly as they had wished. An outside researcher was perceived as one who might identify any errors in the new practices.

Having gained access to two companies, I prepared for the voyages I was to make by surveying and interviewing randomly chosen officers outside Gem and Polychem. Between December 1971 and March 1972, survey questionnaires and WEPS tests were applied to randomly chosen officers studying at nautical colleges i.e. 25 deck officers at Plymouth; 25 engineer officers at Southampton; and 25 catering officers at Liverpool. After a preliminary analysis of returns, follow-up interviews were held where necessary. The response rates (i.e. completed forms returned) were 25 returned from Plymouth; 21 from Southampton; and 16 from Liverpool.

Between April 1972 and June 1972, survey questionnaires and WEPS tests were sent to 14 shore managers — 7 in Gem and 7 in
Polychem. The response rates were 100% in both companies for I was able to visit the head-offices to collect the completed instruments and to interview and observe the respondents.

The interviews with the randomly chosen officers and the shore managers showed that I had not been careful enough in my choice of terminology in the questionnaire. The essence of interviews with the officers was clarification - I had used words and phrases from the behavioural sciences with which the officers were not totally familiar but, after explanation, they were able to respond. Interviews with the shore managers were quite different; very little or no explanation was required but, instead, I was called upon to defend my use of particular phrases which had been perceived, by the Gem managers, as an attack on shore managers in general. In general, the Gem managers disliked my excessive use of the word "bureaucracy" while the Polychem managers wholly approved of my use of this word.

The Gem managers disapproved of my (perceived) attack on traditional methods while the Polychem managers approved. Gem managers strongly disapproved of my statement that shore managers were seen, by seafarers, as "policemen" while Polychem managers agreed that this perception was common in other companies. Overall, the Gem managers subjectively interpreted my statements in the questionnaire as being applied to Gem and their responses fell into the general categories of "No, these features do not exist in Gem" or "Yes, these features used to exist but we have now corrected them" - and the subsequent field work aboard their ships brought forth data which supported their responses. In contrast, the Polychem managers interpreted the statements objectively and their responses fell into the one general category of "Yes, these features do exist in other companies and we are doing all we can to improve matters in this company".

The people with whom I experienced some difficulty were the Personnel Managers in both Gem and Polychem. The Gem personnel manager expressed supreme confidence in the changes he had made and in the policies Gem was pursuing; he may have felt the research programme - conducted by a solo researcher - could not throw up any new facts about Gem Tankers. On the
other hand, the personnel manager in Polychem was in the process of introducing and trying out new personnel policies and I think he saw me as an unwanted, potential threat to the developmental progress of the company and, possibly, to his own position within Polychem.

During the visits to the head-offices, two ships in each company were selected for the seagoing phase of the field work and the research instruments were posted out to the officers at their ships' last ports of call before returning to the United Kingdom.

All four ships were visited between July and September 1972. During the visits and voyages I collected the completed questionnaires and WEPS tests, interviewed the respondents, entered into general discussions at informal social gatherings and generally observed behaviour of individuals and groups on each ship. As was to be expected, I was treated with an initial degree of suspicion on each ship for I was perceived as a mixture of "someone from the office" and a social scientist with his head lost in academic clouds. Again, as was to be expected and as has been reported by other social researchers who have visited ships, I was tested out over a bottle of whisky within minutes of boarding each ship. My seafaring background stood me in good stead and once I was recognised as an ex-seafarer who fully adopted the language, mores and values of seafarers, the most positive relationships developed. My one hope, in writing this report, is that I have not abused the kindness and friendship extended to me by the seafarers on all four ships.

In November and December 1972 I prepared three interim reports covering the overall observations, the technical system and the economic system. These were sent to all respondents in Gem and Polychem with the aim of eliciting further responses. These responses were valuable for, now, both the Gem and Polychem people evaluated all I said subjectively and, in letters, telephone calls, interviews with respondents on leave and during further visits to the head-offices, I was given an insight into individually perceived "realities" of their companies; that is, each man evaluated what I said about his company against his own personal yardstick. It was at this point that I became convinced that there are no absolutes by which one may describe the reality of a shipping company - there are only relatives.
In my haste to get out the interim reports (in order to get the subjective responses) I committed a blunder which severely damaged my relationship with Polychem. I gave too much weight to the stated views of the seafarers and, in becoming emotionally involved with them (instead of remaining clinically objective), I implied in one of my interim reports that shore management had unilaterally broken the psychological contracts they had entered into with their seafarers. Later, and more detailed, analysis of the collected data revealed that, in advertising that "Polychem is better because it is different", the Polychem managers had taken on an impossible task, for each one of their seafarers wanted different things to be different and some things to remain the same as in their previous companies. Polychem managers were hurt by what I wrote and there is probably nothing I can do to redress the situation.

Detailed analysis of the collected data and report writing have occupied the time from March 1973 to date.
CHAPTER 5: THE RESEARCH FIELD

Important note. The phrases "technical soundness" and "technical fragility" used in this report are in no way to be taken as my comments on the seaworthiness or cargoworthiness of particular ships. "Technical fragility" has been used to describe ships which have certain pieces of equipment out of commission or which frequently experience breakdowns. Technical soundness lies at the opposite end of the scale to technical fragility.

Definitions

The unit of analysis in this programme was the officer group aboard individual ships; attention was paid to the relationships between the group and managers ashore in head-office, and to the interpersonal relationships between individual members of each group of officers.

A behavioural system is a conceptual or physical entity consisting of inter-dependent parts which together can display activity. (Ackoff 1960).

The parts of a behavioural system may consist of physical objects, individuals, groups and "offices". "Offices" are organizational positions occupied by individuals, examples being "Master", "Bosun", "Personnel Manager", etc.

Physical objects, individuals, groups and offices may have features which are the (usually) measurable characteristics of the thing, individual, group or office. For example, if a ship can carry 12,000 tons of cargo and steam at 14 knots, these are the features of that ship; or if a man has been at sea for 20 years and holds a Master's certificate, these are the features of that man. Together, all the features of all the things and other people make up the Objective Environment of a person (Kahn et al 1964).

Kahn and his co-workers also drew attention to the Psychological Environment of a person. This consists of the conscious and unconscious representations of the Objective Environment. This is in line with the notions put forward by Herbst and others about each person's behavioural world. Attributes are subjective qualities given to a thing, an event or to another person and, because they are subjective, they may change over time. Furthermore, the same thing may be given quite different attributes by
different people. For example, if a ship is old and frequently breaks down, she may be described by one man as "a bloody wreck" and by another as "the happiest ship I've ever been on". Both are attributes ascribed to the same ship. No judgements of 'right' and 'wrong' may be ascribed to these attributes by an outside observer - for these are the qualities as perceived and experienced by individuals.

Both features and attributes may change over time and the effects of historical development cannot be ignored in any attempt to explain system behaviour.

When features and attributes match, harmony may exist (within the individual) but conflict is experienced when features and attributes do not match or when an individual gives - or needs to give - two opposing attributes to the same thing or person.

In order to preserve anonymity, fictitious names have been given to the companies, ships and individuals involved in this research programme.

The field observations were conducted in:

(1) The GEM TANKER FLEET (which was the tanker section of the Gem Oil Company) within which were the two Gem ships visited - the m.v. "MICA" and the m.v. "QUARTZ"

(2) The POLYCHEM TANKER COMPANY within which were the two Polychem ships visited - m.v. "JOAN" and m.v. "NADIA"

In the pages which follow, a summarised description is given of the features and attributes of the companies and ships involved in this programme.
Table 5.1: Predominant Features of the two companies

<table>
<thead>
<tr>
<th>Technical features</th>
<th>GEM TANKERS</th>
<th>POLYCHEM TANKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company size</td>
<td>Very large</td>
<td>Very small</td>
</tr>
<tr>
<td>Company age</td>
<td>Over 50 years</td>
<td>Under 5 years</td>
</tr>
<tr>
<td>Number of ships</td>
<td>Over 100 owned plus 200 chartered</td>
<td>3</td>
</tr>
<tr>
<td>Degree of diversification of ships - by type</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>- by size</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>- by age</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Commodities carried</td>
<td>Mineral oils</td>
<td>Edible oils &amp; chemicals</td>
</tr>
<tr>
<td>Planned fleet expansion</td>
<td>Small &amp; slow</td>
<td>Large &amp; rapid</td>
</tr>
<tr>
<td>Technical service produced</td>
<td>a) Carriage of crude from wells to refineries. b) Distribution of refined products to depots. All port terminals are Gem owned or Gem controlled.</td>
<td>Carriage of many types of liquids between many different ports none of which are owned or controlled by Polychem.</td>
</tr>
<tr>
<td>Types of voyages</td>
<td>Nearly always alternate loaded and ballast passages; tanks cleaned at sea by crew.</td>
<td>Nearly always loaded passages; tanks often cleaned in port by shore labour.</td>
</tr>
<tr>
<td>Economic features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate customer of the technical service produced by ships.</td>
<td>Various divisions of the parent oil company</td>
<td>Many different shippers and receivers (all external).</td>
</tr>
<tr>
<td>Source of finance</td>
<td>From parent oil company but ultimately from sale of refined products to oil users (external)</td>
<td>From freights paid by users of the sea transport service, and bank loans.</td>
</tr>
<tr>
<td>Financial strength in terms of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- total assets</td>
<td>Very high</td>
<td>Very low</td>
</tr>
<tr>
<td>- commercial success over many years</td>
<td>Very high</td>
<td>Low: Company still very young</td>
</tr>
<tr>
<td>- ability to influence product prices</td>
<td>Fairly high</td>
<td>Zero: Free market forces.</td>
</tr>
<tr>
<td>Economic features (contd)</td>
<td>GEN TANKERS</td>
<td>POLYCHEM TANKERS</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Competitors in the field of ultimate product sold</td>
<td>Other oil companies</td>
<td>Other shipping companies</td>
</tr>
<tr>
<td>Competitive environment of ultimate product sold</td>
<td>Fairly stable</td>
<td>Turbulent and rapidly changing.</td>
</tr>
<tr>
<td>Competitors in the sea transport service produced</td>
<td>Ships on charter to Gem Oil</td>
<td>Other shipping companies</td>
</tr>
<tr>
<td>Degree to which tanker fleet is exposed to external commodity fluctuations</td>
<td>Low: The voyage chartered ships act as a first-line buffer.</td>
<td>Very high</td>
</tr>
<tr>
<td>Social features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of seafarers</td>
<td>Over 2,000</td>
<td>Under 200</td>
</tr>
<tr>
<td>Officers</td>
<td>European</td>
<td>European</td>
</tr>
<tr>
<td>Ratings</td>
<td>European &amp; Asian</td>
<td>All Asian</td>
</tr>
<tr>
<td>Number of shore staff associated with the tanker fleet</td>
<td>Over 200</td>
<td>Under 20</td>
</tr>
<tr>
<td>Source of officers</td>
<td>Mainly cadets recruited directly from secondary schools; few experienced men from other companies.</td>
<td>All experienced men recruited from other companies</td>
</tr>
<tr>
<td>Company training resources in terms of:</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>- training budget</td>
<td>Many</td>
<td>One</td>
</tr>
<tr>
<td>- training personnel</td>
<td>Well developed</td>
<td>Partly developed</td>
</tr>
<tr>
<td>- career development programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total welfare - pension funds, social clubs, etc.</td>
<td>Very highly developed</td>
<td>Not yet developed</td>
</tr>
<tr>
<td>Company reputation in schools and other areas of recruitment.</td>
<td>Very high</td>
<td>Not yet developed</td>
</tr>
<tr>
<td>Control features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning integrated movements &amp; scheduling of ships.</td>
<td>Exceedingly high demands placed on planners operating so large a fleet</td>
<td>Low level of voyage integration between the 3 ships; each voyage seen as separate unit</td>
</tr>
<tr>
<td>Planning horizon for new-buildings &amp; scrappings</td>
<td>Very long</td>
<td>Relatively short</td>
</tr>
<tr>
<td>Planning horizon for staff development and promotions.</td>
<td>Long term</td>
<td>Immediate and long term.</td>
</tr>
</tbody>
</table>
Table 5.1 (contd)

<table>
<thead>
<tr>
<th>Control features (contd)</th>
<th>GEM TANKERS</th>
<th>POLYCHEM TANKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking sea staff for reasons of limitation of liability</td>
<td>Effected</td>
<td>Effected</td>
</tr>
<tr>
<td>Monitoring of ships' technical performance</td>
<td>Highly developed</td>
<td>Not yet fully developed.</td>
</tr>
<tr>
<td>Head-office decision making processes on day-to-day operations and corporate policy</td>
<td>Rapid</td>
<td>Rapid</td>
</tr>
<tr>
<td>Monitoring of ships' technical performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall authorization from</td>
<td>Parent oil company</td>
<td>2 parent liner companies</td>
</tr>
<tr>
<td>Stage of organizational development (Bos 1969)</td>
<td>Emerging from the 'scientific management into the 'integration' phase</td>
<td>Still in the 'pioneering' phase.</td>
</tr>
<tr>
<td>Organizational stability</td>
<td>Very stable</td>
<td>Settling down</td>
</tr>
<tr>
<td>Type of organization</td>
<td>Mechanistic overall but with those parts concerned with daily operations more organismic</td>
<td>Highly organismic but about to enter mechanistic style.</td>
</tr>
<tr>
<td>Career prospects of individual sea and shore personnel</td>
<td>Partly dependent on institutional performance and partly on length of service; avenues open to develop specialist or generalist managerial skills</td>
<td>Wholly dependent on commercial success of whole company and on fleet expansion; avenues for generalist skills only.</td>
</tr>
<tr>
<td>Job security of shore managers</td>
<td>Almost independent of performance of individual seafarers; more dependent on policy of parent oil company</td>
<td>Highly dependent on performance of sea staff and on commercial success of company.</td>
</tr>
<tr>
<td>Job security of sea staff</td>
<td>Highly dependent on policy of parent oil company; almost independent of performance of shore staff</td>
<td>Highly dependent on performance of commercial managers in getting cargoes; partly dependent on performance of shore operational staff</td>
</tr>
<tr>
<td>Effects of colleagues on individual's job security.</td>
<td>Almost independent of performance of individual colleagues</td>
<td>Highly dependent on performance of individual colleagues</td>
</tr>
<tr>
<td>Organizational Features (continued)</td>
<td>GEM TANKERS</td>
<td>POLYCHEM TANKERS</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Promotion of shore staff dependent upon performance of sea staff</td>
<td>Almost independent; individual ability is main promotional consideration among shore staff.</td>
<td>Highly dependent; team success takes precedence over individual abilities.</td>
</tr>
<tr>
<td>Promotion of sea staff dependent upon performance of shore staff</td>
<td>Almost independent</td>
<td>Highly dependent</td>
</tr>
<tr>
<td>Relationships between shore staff and senior ships' officers</td>
<td>a) In day-to-day fleet management, highly collegial. b) Non-collegial between sea staff and specialist departments dealing with long-term affairs.</td>
<td>Highly collegial in both short-and long-term affairs.</td>
</tr>
<tr>
<td>Length of service in shipping</td>
<td>13 - 30 years</td>
<td>10 - 30 years</td>
</tr>
<tr>
<td>- of shore staff</td>
<td>0 - 40 years</td>
<td>3 - 30 years</td>
</tr>
<tr>
<td>- of sea staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of service in present company</td>
<td>13 - 30 years</td>
<td>2 - 4 years</td>
</tr>
<tr>
<td>- of shore staff</td>
<td>0 - 30 years</td>
<td>½ - 3 years</td>
</tr>
<tr>
<td>- of sea staff</td>
<td>(A high proportion of sea and shore staff have been in Gem Tankers for all their working lives).</td>
<td></td>
</tr>
<tr>
<td>Company's Rules and Regulations.</td>
<td>Extensive and comprehensive; an old, well-tested codified body of tanker knowledge.</td>
<td>Extensive and comprehensive; but, as yet, a new and untested set of rules and regulations.</td>
</tr>
<tr>
<td>Cost and revenue information given to ships' officers</td>
<td>Almost nil, or out of date.</td>
<td>Complete and up-to-date figures given to officers at end of each voyage.</td>
</tr>
<tr>
<td>Predominant performance criterion</td>
<td>Comparison with 'replacement cost per day' (see footnote)</td>
<td>Profit - from revenue maximization and cost minimization.</td>
</tr>
</tbody>
</table>

Footnote: 'Replacement cost per day' is an abstract notion used by major oil companies; it has nothing to do with actual operating costs. It is the daily charter rate the oil company would have to pay for a voyage chartered ship of equivalent size to the ship in question. Thus, owing to fluctuations in the voyage charter market, the replacement cost per day may be well above or well below the actual running costs of the owned ship. Abuse of this notion of replacement costs emerged as a point of significance during the field work.
ATTRIBUTES

As was mentioned earlier, individual and group behaviour is determined partly by the actual features of objects and other people, and partly by the subjective attributes given to these objects and others.

The consensus of attributes collected during the field work may be summarised as follows:—

TECHNICAL ATTRIBUTES (GEM)

Gem shore staff see the Gem fleet as a large number of ships which vary in size, class and age but which, in general, are adequately designed and maintained to meet the sea transport demands of the parent oil company. They perceive different degrees of challenge in the various trades and types of ships; for example, they see the VLCC's as very important units of the fleet which hold out more challenge to the engineer- than to the deck-officers. The hardest working ships are seen as those engaged in the distribution of refined products, especially in the short sea trades. These shore managers see the technical support services supplied by them to the ships as being adequate to meet the demands of the trade. The sea staff in Gem generally hold the same perceptions of the overall technical system as held by the shore managers, but the sea staff add a number of attributes which are important to them as the people who have to sail in the ships: Among the people interviewed, the VLCC's were seen as highly unattractive ships. Technical soundness versus technical fragility are further important attributes given to specific ships by seafarers. Within one class of sister ships, one ship may be attributed with soundness for, it is believed, she never breaks down while another ship in the same class is seen as a 'wreck' which frequently breaks down. The soundness-fragility label given to other ships is more often explained in terms of its history, right from the time of build, than in terms of the people currently serving in them. The sea staff do not attribute total adequacy to the technical support given to them by the shore staff; and they attribute the computerised performance monitoring of ships at head-office with a total inability to make adequate allowance for the natural degradation of technical performance as the ships grow older.
ECONOMIC ATTRIBUTES (GEM)

The Gem shore staff perceive their parent oil company as financially strong but under potential threat from political forces in both the oil producing and consuming countries. They recognise that the parent company has to make a profit and, so far as the parent's profit level may be reduced by excessive tanker costs, they see the biggest threat to the survival of Gem Tankers as coming from the inability to hold tanker operating costs down to a reasonable level. (Note: The field work was conducted during a period when repair costs had risen by 43% and wages by 30%; it was a time of depressed charter rates with the result that 'replacement costs per day' were well below actual running costs).

The Gem sea staff are buffered from the commercial realities of the outside world and perceive the continued financial strength of Gem Oil as almost the manifestation of a natural law; they know that Gem Oil must make a profit but they take all exhortations from shore staff to reduce costs with a pinch of salt. In modern jargon, the credibility gap between sea and shore staffs is very wide in all matters related to costs and profits; this gap is probably due to (i) the ships' officers rarely being given full details of costs; and (ii) abuse of the 'replacement cost per day' (Explanation: When the charter market is depressed and an outside ship may be chartered in at a daily rate much lower than the actual running costs of an equivalent sized tanker owned by the oil company, ships' officers are told that it would be cheaper to charter than to operate owned ships with the suggested threat that, unless running costs are lowered, the parent oil company may decide to sell all its owned ships and charter in outsiders. When, however, the charter market is high - and the replacement cost per day is very much higher than actual running costs - the higher figure is used in statements from shore staff on how much it is costing the company when ships incur unnecessary delays in port.)

SOCIAL ATTRIBUTES (GEM)

Shore staff see Gem Oil as a good company to work for and as much better than the other oil majors; they refer to many past incidents to show that Gem looks after its employees well. Long-term service has allowed many friendships to develop and Gem Tankers is perceived as a very friendly company. Shore staff
see the sea staff as a highly responsible, reliable and professionally competent group of men who are able to cope with present and future demands made upon them. On the other hand, the sea staff do not recognise - or, at least, do not openly acknowledge - the high esteem in which they are held by the shore staff.

In general, the sea staff give to Gem Tankers the same attributes as those given by shore staff - friendliness, good employment policies and benefits etc. Individual officers perceive individual managers ashore as their friends and, more importantly, as their 'defenders' should something go wrong aboard ship. The sea staff give negative attributes to the sheer size of the total fleet personnel and to the appointment method whereby they may be switched to any ship in the 100+ fleet at any time - they express a strong desire to be attached to one sub-fleet or another. Job security is believed to be high but promotional prospects are seen as being dependent upon satisfying a series of "bosses", that is, Masters and Heads of Shipboard Departments. Owing to home leave being granted every 4½ months, and owing to the method of staggering officer changes, most seafarers serve under one 'boss' for only a few weeks or months at a time. Each time an officer or his boss leave the ship, a written report on the officer's ability and conduct is sent to head-office; the junior officers are confused over the identity of the person who actually controls their promotional rate with the result that they attach an inordinate amount of weight to these written reports.

CONTROL ATTRIBUTES (GEM)

Shore staff see the fleet as a large number of units at sea all of which need to be properly controlled and scheduled. The shore managers do not believe that they check the ships' officers to an excessive degree; checking is seen to be necessary for 'limitation of liability' purposes (see Appendix A) and for anti-pollution reasons. Shore staff are highly aware of the danger to the company's public image should one of its ship spill oil - the sheer size of Gem Oil makes it particularly vulnerable to attacks in the press should one of its ships pollute the environment. Among the shore staff, there is recognition that Gem Tankers used to be a "comfy club" and increased monitoring of ships' performances is seen as
a necessary part of the drive towards greater efficiency and continued survival of the company.

The complexity of scheduling the ships of the total Gem fleet is not recognised by ships' officers; voyage orders are seen as instructions to that particular ship and not as part of an overall plan.

Whether checking by shore staff is perceived as excessive or not appears to depend upon the believed success of that ship: Officers in a successful ship derive satisfaction out of telling head-office how efficient they have been and experience no hardship in completing performance records, but officers in an unsuccessful ship see the completion of performance records as excessively onerous tasks.

The checking of sea staff by shore managers is seen - and accepted - as a necessary part of ship operation; although in a ship with a self-relieving team of officers permanently attached to that ship there is a growing belief that the officers know the ship far better than the managers sent to check up on them.

ORGANIZATIONAL ATTRIBUTES (GEM)

The operational managers see their relationships with senior ships' officers as essentially collegial in nature but they do not give the same attribute to their relationships with members of specialist departments in head office; there is some confusion on exactly who supports and who controls whom.

(Note: Gem Tankers is experiencing all the organizational problems identified by Likert (1961 & 1967), Dalton (1950) and others when organismic groups are imbedded within an overall bureaucratic organization and when organismic groups have to collaborate with mechanistic groups).

The shore staff see the company's rules and regulations as a sensible set of operating instruction based on years of experience in operating tankers and providing support to sea staff, especially during this period of rapid technical change.

Two very important attributes were detected among the sea staff:

1. The company's rules and regulations are not perceived as a form of control but rather as a form of support, guidance and defence. For example: "Provided I abide by the company's rules and regs, I know they will back me up if anything goes wrong" (A Gem Master)
(2) Long service in Gem coupled with long-standing friendships with individual shore managers are seen, by officers, as the surest ways of defending themselves against condemnatory judgement of a mistake or accident. For example: "If I make a mistake, the company isn't going to hammer me over that one incident; they'll look up my records and see that I've always done O.K. in the past. And, in any case, I know old --- in the office and I know he'll back me up if anything goes wrong; mind you, he'll want all the facts and he'll ball me out if I did anything stupid" (A Gem Chief Engineer).

The comments on "backing me up" show that some, if not all, ships' officers need to feel that, back at head office is someone who will stand up for them during their absences at sea. The need for a defender back at home base during temporary absences has already been reported in the literature, as have been the attitudes of workers to different levels of management. It is reported that, in many organizations, the man at the very top is perceived as 'good'; as someone who can deal with the outside world; and as one who would put things right if only he got to hear of the workers' real complaints. Middle and lower management are often seen as the root cause of frustration and who distort communications coming up from worker level.

These types of attributes are clearly visible in Gem Tankers. Very positive attributes are given to the General Manager by the sea staff; he is seen as good and as the one responsible for all the recent favourable changes in the company. Positive attributes are also given to the operational managers and superintendents who are clearly seen, by sea staff, as their colleagues and defenders. But mainly negative attributes are given to the more junior personnel in head office (usually referred to as "bloody clerks") and to some of the heads of specialist departments (referred to as 'Hitler', Mac-the-Knife' and the 'Hatchetmen'). Of course, the actual features of the General Manager, the managers and specialist heads set the nature of Gem Tankers - but the attributes have a determinant effect on the acceptance, distortion or rejection of communications received by the ships' officer.
TECHNICAL ATTRIBUTES (POLYCHEM)

Shore staff recognise the fleet as being composed of a small number of ships, all of which were bought second-hand and none of which comes up to the standards they would like. Two of the ships are recognised as old and technically fragile but are perceived (by shore staff) as a great challenge to the crews who man them. Shore staff believe that the technical support they give to the ships is the best that is humanly possible within the present pioneering phase of the company and within present budgetary limitations.

Sea staff also see their ships as technically fragile either through age or inappropriate design. Particularly among the engineers, work is experienced as a series of "patch-up jobs" with consequent reduction in job satisfaction. On the other hand, cargo-work is experienced as physically hard but challenging. Accommodation and amenities are seen as poor.

ECONOMIC ATTRIBUTES (POLYCHEM)

Shore staff are highly aware of the need for Polychem to make a profit within the highly competitive market it is trying to penetrate. The pioneering phase is clearly visible in the economic system for, although they are not what they would like, the three old ships (presently forming the total fleet) are seen as necessary instruments for penetrating the market and establishing customer relations before the specially designed ship* (presently under construction) come into service. Financial limitations are seen as the main constraints against making desirable changes to the shipboard accommodation - what money there is has to be spent on keeping the ships seaworthy and cargoworthy. The main criteria of performance are actual costs incurred and actual revenues earned on each voyage, and full details are communicated to sea staff for these officers are seen, by the shore staff, as people who want to be involved in the commercial activities of the company.

Nearly all of the sea staff appreciate the need for Polychem to make a profit if it is to survive but the strength of views on this point appears to depend upon the past experiences of individuals: Those who had joined Polychem through being declared redundant in their last companies (where redundancy had been caused by commercial failure of those companies)
agree with shore staff giving first priority to spending available money on the propulsion and cargo systems while those who joined Polychem for some other reason (e.g. for promotion or for the advertised claims that 'Polychem is different') do not fully agree with the money allocation patterns of the company.

SOCIAL ATTRIBUTES (POLYCHEM)

Shore staff experience Polychem as a friendly and challenging company. A degree of self-selection had existed during the formation of the shore management group and this, together with the small size of the group and daily face-to-face contacts, has resulted in a strong and friendly team spirit. Hierarchical divisions are almost non-existent and the common value shared by all is "we all sink or swim together".

On the other hand, the sea staff do not experience Polychem as a very happy company - "It'll be alright once we settle down" being one of the more positive statements. The unhappiness experienced may be due to lack of group history and loss of individual identity which is probably inevitable when a number of individuals, all from different companies and backgrounds, come together in a ship. Each had joined for his own reason and each wanted a different set of rewards from Polychem, and, as a group, they have no commonly shared incidents within their joint experience to act as identification points. Some try to forget their past companies and adopt a Polychem identity but all find that they can only be recognised and recognise others in yarns about previous ships and companies. Former ships and companies feature strongly in most conversations and this leads to continual comparisons being made between Polychem and other companies; in turn, this appears to create in the Polychem sea staff a heightened awareness of the actual or perceived faults of Polychem.

Another important attribute given to the social system of Polychem is 'there is no chance of escape from a man disliked'. (Every company has individuals who are liked or disliked by others and personality clashes between pairs. In a large company, such as Gem, personal dislikes may be placed in temporary suspension for there is only the remotest chance of two people in conflict on one ship ever sailing together again). In Polychem, with only three ships, each man knows
that, sooner or later, he will sail again with some or all of the people in his present ship. A man currently in conflict with another, experiences this 'non-escape' attribute negatively.

CONTROL ATTRIBUTES (POLYCHEM)

Owing to the small number of ships in the Polychem fleet there are no problems of integrated scheduling (such as in Gem); the shore staff see each voyage as a separate venture. This was the first sign I got that the Polychem ships were being traded as cargo-liners.

As the field work progressed, further signs emerged to indicate that, although the Polychem ships resembled tankers and carried liquids in bulk, they were being traded AND CONTROLLED as cargo-liners. Supporting signs were:

(i) Each Polychem ship carries many parcels of different products (each of which requires special tank-coatings, special pumps and special heating arrangements) in a manner very similar to the stowage and care of blocks of cargo in a cargo-liner.

(ii) The parcels are loaded in many different ports and are consigned to many different receivers — unlike the tanker which usually loads a full cargo in one port and discharges the whole cargo into one receiver's tanks.

(iii) Some parcels are discharged directly into road tankers drawn up alongside the ship in precisely the same way as a cargo-liner may discharge into waiting lorries — and quite unlike a tanker which usually discharges at high speed into remote tanks ashore.

(iv) The Polychem ships berth right inside industrial dock areas — unlike most tankers which load and discharge at remote terminals.

(v) There is frequent face-to-face contact between Polychem Chief Officers and receivers, a situation very similar to that in cargo-liners and quite unlike tankers where the Chief Officer deals with only one terminal manager at each port.

Most of the shore managers and ships' officers were recruited into Polychem from liner companies and thus brought with them cargo-liner values and attitudes towards control. If Etzioni (1961) is correct in saying that newly recruited managers can
be effective in an organization only if it uses a control system similar to that used in their last organizations, and if the control system for cargo-liners differs from that for tankers, then one should expect that ex-cargo liner men are in harmony — and ex-tanker men are in conflict — with the values and control methods of Polychem. Observations and the statistical evidence have borne this out.

Among the sea staff, conflicting perceptions of the Polychem ships are clearly visible. Ex-cargo liner men perceive their Polychem ship as a cargo-liner e.g. "She's nothing but a lot of deep-tanks joined together" (an ex-liner Chief Officer) while ex-tanker men see their Polychem ships as tankers e.g. "What this company needs is a couple of good tanker superintendents to tell them (the shore managers) what tankers are all about" (an ex-tanker Master). Tankers usually berth at remote terminals, well away from the public's eyes; they have less time in port for overside painting and, in general, look rustier and dirtier than cargo-liners. Cargo liners usually berth close to towns in full view of the public and customers; they have ample time in port for overside painting and, in general, look much smarter than tankers. It should also be mentioned that tankers load more deeply into the water than cargo-liners — a condition which contributes to the generally rusty appearance of tankers. Polychem ships load as deeply into the water as tankers.

The appearance of Polychem ships worries the ex-liner officers in Polychem e.g. "Polychem carries cargo well, but what must shippers and receivers think when they see their cargo being carried in such dirty ships?" (an ex-liner Chief Officer). "It's happening all the time. We've got these new funnel markings which people haven't seen before so, whenever we pass another ship at sea, they call us up (on the Aldis signalling lamp) to ask the name of our company. I don't like telling them — in fact I sometimes go to the other side of the bridge and pretend I haven't seen them trying to call us up — for how is Polychem going to get people to join when the ships look like this?" (an ex-liner 2nd Mate). Not once, in all the field work, did ex-tanker men in Polychem mention the appearance of their ships.

* see Appendix A
ORGANIZATIONAL ATTRIBUTES (POLYCHEM)

The shore staff see Polychem as a highly organismic organization with no departmental divisions, no rigid task divisions and no traditionalism; they see it as a company in which each individual can and does contribute to the success of the enterprise, and they see a high degree of interdependence between individual members and between sea and shore staffs. They experience a high degree of challenge in getting the company started and in preparing the way for rapid fleet expansion once their new ships come into service - the challenge stems from the pioneering phase of the company and from the unexpected incidents which arise in the technical and social systems. A team spirit pervades most behavioural patterns among the shore staff, for team success is seen as the key to job security and promotional prospects. They see, as one of their primary tasks, the need to build up an equally strong team spirit among the sea staff and, to this end, they forbid new recruits to mention the names of their previous companies at informal social gatherings - but this veto is experienced negatively by many recruits, for they need past incidents in order to identify each other.

The sea staff have not yet had time to settle down in Polychem and, although they see the shore staff as a friendly team, they do not yet identify any specific shore manager as being a particular friend or 'defender'.

From past experience, the Polychem officers realise that every shipping company has to have a comprehensive set of rules and regulations. The shore managers perceive these rules and regulations as a sensible set of operating instructions for people unfamiliar with the chemical and edible oil trades but the officers wonder how these rules are going to stand in service for they were written before Polychem bought its first ship. In Gem Tankers, company rules were perceived as supportive and defensive for the individual simply because many past incidents in Gem afforded the officers a very clear understanding of the rules and they could predict with certainty how any one rule would be interpreted in the future. Quite the opposite situation prevails in Polychem: The company is as yet too young for there to have been sufficient past incidents or commonly shared experiences to allow the Polychem
officers to give real meaning to the rules and no-one knows how any one rule will be interpreted in the future. Worse still, each man weighs the rules from the way in which similar rules were interpreted in his own, last company with the result that each member of an officer group aboard one ship has a different idea of what Polychem rules require him to do. This varied - and sometimes opposing - interpretation of the rules is a potent source of conflict within Polychem during its early years.
Table 5.2: Predominant features of the ships visited.

<table>
<thead>
<tr>
<th>Technical features</th>
<th>GEM TANKERS</th>
<th>POLYCHEM TANKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MICA</td>
<td>QUARTZ</td>
</tr>
<tr>
<td>Approx. deadweight</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Approximate age</td>
<td>13 years</td>
<td>13 years</td>
</tr>
<tr>
<td>Cargoes carried</td>
<td>Black oil products</td>
<td>Black oil products</td>
</tr>
<tr>
<td>Voyages</td>
<td>N.W. Europe</td>
<td>N.W. Europe</td>
</tr>
<tr>
<td>Designed by present company</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obtained</td>
<td>New</td>
<td>New</td>
</tr>
<tr>
<td>Technically</td>
<td>Sound</td>
<td>Fragile</td>
</tr>
<tr>
<td>Overside &amp; overall appearance</td>
<td>Poor</td>
<td>Good</td>
</tr>
<tr>
<td>Accommodation by modern standards</td>
<td>Average/poor</td>
<td>Average/poor</td>
</tr>
<tr>
<td>Economic features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>Gem Oil</td>
<td>Gem Oil</td>
</tr>
<tr>
<td>Office monitoring of technical performance</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Budget restrictions on propulsion and cargo equipment</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Budget restrictions on improvements to living amenities</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Social features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Deck Officers</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Engineer Officers</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Catering Officer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Radio Officer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Deck Cadets</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Engineer Cadets</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Ratings</td>
<td>European</td>
<td>European</td>
</tr>
<tr>
<td>Manning system</td>
<td>Conventional</td>
<td>Conventional</td>
</tr>
<tr>
<td>Senior Officer group</td>
<td>Permanent</td>
<td>Changing</td>
</tr>
<tr>
<td>Officers' service in company (in years)</td>
<td>1 - 30</td>
<td>1 - 40</td>
</tr>
<tr>
<td>Social features (cntd)</td>
<td>GEM TANKERS</td>
<td>POLYCHEM TANKERS</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Wives on board</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bar</td>
<td>Self-built</td>
<td>Self-built</td>
</tr>
<tr>
<td>Bar hours</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Bar a continuous social centre</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>First names used between officers</td>
<td>Yes</td>
<td>Partly</td>
</tr>
<tr>
<td>Ratings on cargowork in port</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control features</th>
<th>GEM TANKERS</th>
<th>POLYCHEM TANKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master-Senior Officers</td>
<td>Highly</td>
<td>Highly</td>
</tr>
<tr>
<td></td>
<td>democratic</td>
<td>democratic</td>
</tr>
<tr>
<td>Senior Officers - Junior Officers</td>
<td>Fairly</td>
<td>Fairly</td>
</tr>
<tr>
<td></td>
<td>democratic</td>
<td>autocratic</td>
</tr>
<tr>
<td>Management meetings</td>
<td>Not held</td>
<td>Held</td>
</tr>
<tr>
<td>Planned maintenance</td>
<td>Used</td>
<td>Not used</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organizational features</th>
<th>GEM TANKERS</th>
<th>POLYCHEM TANKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability among senior officers</td>
<td>Well</td>
<td>Unsettled</td>
</tr>
<tr>
<td></td>
<td>settled</td>
<td>settling down</td>
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<tr>
<td>Style</td>
<td>Organismic</td>
<td>Mechanistic</td>
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<td></td>
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<td>Fairly organ-</td>
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<td></td>
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<td>ismic</td>
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<td></td>
<td>GEM TANKERS</td>
<td>POLYCHEM TANKERS</td>
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</tr>
<tr>
<td><strong>Technical attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical soundness</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Technical efficiency</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>in cargo-handling</td>
<td>Adequate</td>
<td>Not good enough</td>
</tr>
<tr>
<td>Technical support</td>
<td>Fair</td>
<td>Fair</td>
</tr>
<tr>
<td>from shore staff</td>
<td>Adequate</td>
<td>Not good enough</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Fair</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>Economic attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship believed to be</td>
<td>Believe we</td>
<td>Actual figures</td>
</tr>
<tr>
<td>making a profit</td>
<td>are but told</td>
<td>given</td>
</tr>
<tr>
<td>Given adequate</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>cost information</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sale of ship</td>
<td>Not imminent</td>
<td>Not imminent</td>
</tr>
<tr>
<td>believed to be</td>
<td>Not imminent</td>
<td>Not imminent</td>
</tr>
<tr>
<td>Budget seen as</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>adequate for improve-</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>ments to amenities</td>
<td>No</td>
<td>No</td>
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<tr>
<td><strong>Control attributes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control from shore</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>seen as excessive</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Paperwork seen as</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>excessive</td>
<td>No</td>
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</tr>
<tr>
<td>Seniors seen as a</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>team by junior Offs.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Shore terminal</td>
<td>Friends</td>
<td>Enemies</td>
</tr>
<tr>
<td>operators seen as</td>
<td>Neutral</td>
<td>Friends</td>
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<tr>
<td><strong>Organizational</strong></td>
<td></td>
<td></td>
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<tr>
<td>attributes</td>
<td></td>
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<tr>
<td>By seniors, ship</td>
<td>Happy</td>
<td>Happy</td>
</tr>
<tr>
<td>experienced as</td>
<td>Happy</td>
<td>Unhappy</td>
</tr>
<tr>
<td>By juniors, ship</td>
<td>Fairly happy</td>
<td>Happy</td>
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<tr>
<td>experienced as</td>
<td>Happy</td>
<td>Unhappy</td>
</tr>
<tr>
<td>Head-office staff</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>seen as</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>- friendly</td>
<td>Yes</td>
<td>Neutral</td>
</tr>
<tr>
<td>- as defenders of</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>sea staff</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Company's rules &amp;</td>
<td>Yes</td>
<td>Neutral</td>
</tr>
<tr>
<td>regulations</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>perceived as</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>supportive</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yarns about</td>
<td>Never</td>
<td>Frequent</td>
</tr>
<tr>
<td>previous ships</td>
<td>Frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Table 5.3 (contd)</td>
<td>GEM TANKERS</td>
<td>POLYCHEM TANKERS</td>
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<tr>
<td>------------------</td>
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<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>NICA</td>
<td>QUARTZ</td>
</tr>
<tr>
<td><strong>Organizational attributes (contd)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior officers oriented to</td>
<td>Ship</td>
<td>Company</td>
</tr>
<tr>
<td>Major fault of company seen to be</td>
<td>Reluctance of shore to give more real control to ship's officers</td>
<td>Never-ending urging to give more efficiency</td>
</tr>
<tr>
<td>Most attractive ships seen, by seniors, as</td>
<td>This ship &quot;Mica&quot;</td>
<td>All ships in this class except &quot;Quartz&quot;</td>
</tr>
<tr>
<td>Least attractive company ships seen as</td>
<td>VLCC's</td>
<td>VLCC's</td>
</tr>
<tr>
<td>Future career prospects seen as</td>
<td>Secure</td>
<td>Secure</td>
</tr>
<tr>
<td>Promotional prospects seen as</td>
<td>Slow</td>
<td>Slow</td>
</tr>
</tbody>
</table>
Some of the behavioural patterns observed and the attitudes expressed become more easily understood if they are viewed against the historical background of individuals, groups and companies - an aspect which does not appear to have been well documented in the literature. History - or lack of history - appears to affect the social, technical and economic systems.

In the technical system, a piece of machinery or a ship designed by a particular company - and operated and maintained by that company's personnel over many years - is better understood than a new piece of machinery, or a ship bought second-hand. The second-hand ship may not be perfectly matched, in design, to her new trade; more importantly, present defects and inefficiencies are blamed on poor maintenance done by strangers in the past.

History affects rules and the meaning people give to rules. In an old company which has had years of experience in operating particular types of machinery or ships, the company's rules, regulations and operating instructions are modified over time; the past experiences of individuals are absorbed into the rules and current operators perceive the rules as practical instructions based on experience. Operators of new pieces of machinery or ships do not see the same practical basis for the rules. More importantly, in the older company various incidents have happened in the past which have resulted in individuals being rewarded or punished and, by drawing on these incidents and results, current individuals can give meaning and relative weights to the various rules. A new company - with no backlog of past incidents - has a set of rules without meaning or relative weights; present members simply do not know how each rule is to be interpreted or weighted by those in authority in that company.

A long organizational history makes 'the world' more intelligible to present members. Each person has his own reference group against which he judges the behaviour of himself and others. In a long established company with long serving members, the present members use common reference groups. If a newcomer (carrying with him his own reference group) joins the long established company, the stability and strength of the common norms and values in that company allows the newcomer to alter his reference group from his past to his present fellows - a
socialization process which is well documented in the literature. In a very new company, however, each individual brings with him his own norms and values, and he holds onto these simply because there is no other stable reference group to which he can change. That is, in its formative years, a new company does not have a clearly recognisable corporate identity. On the other hand, the absence of an old, traditional corporate identity is highly attractive to individuals who want to improve the world as they see it; they feel that they can inject what is good and reject what is bad. The real problem, however, is reaching common agreement on precisely which organizational features are bad and should be ejected and which are good and should be retained.

History affects the economic system. Over the years a company may build up a series of economic successes which are perceived by the present members as corporate financial strength, and the individual seeking job security would probably be attracted to such a company. In a new company which has not had time to build up a series of commercial successes, the members simply cannot see their company as being financially strong - such a company may be highly attractive to pioneering individuals who feel they can contribute to the company's growth but highly repugnant to people seeking job security.

History affects the predictability of the world as seen by an individual and, in turn, this affects his behaviour and job efficiency. As stated by Kahn et al (1964) "... efficient goal-directed behaviour is based on predictability of future events. A person has only limited control over future outcomes but, to the extent he can realistically anticipate events beyond his control, he can direct his behaviour towards producing more rather than less favourable outcomes". This state of predictability is clearly visible in Gem Tankers and absent in Polychem Tankers. Polychem is still too young to be predictable and the situation is further complicated by each of the new members bringing along with him his own ideas on what most needed to be changed in his last company and, by implication, what most needs to be done in Polychem.

History also determines individual feelings of job security. The long-service member in an old company feels that he has built up a back-log of good service in that company; he knows
individuals in head office and he believes that these individuals will take into account his backlog of good deeds should they have to judge his performance after an accident. But, in a new company, the men at sea do not yet know individuals in head office and, no matter how good their past service with previous employers, they know that they do not have a stock of good deeds to fall back upon should they make a mistake in their new company. They feel exposed and vulnerable especially if, owing to rank or special skills, they are relatively occupationally immobile.

In shipping, history also has a marked effect on the acceptance or rejection of authority. As Thompson & Bates (1957) state "in mining, as in other dangerous occupations, authority at the work face is vested in the most experienced member". Shipping could be included in that statement. In old shipping companies, the shipmaster is clearly seen as the most experienced man in the types of ships operated by that company. In Gem Tankers, for example, the Masters are men who have served aboard Gem tankers at all ranks - they are seen to have experienced all the snags and dangers of the trade and are accepted as the rightful holders of authority. But in a new company - especially if it is operating new types of ships or carrying new types of cargoes - a junior member can rightly claim to have had just as much experience in that type of ship as has had the Master; and on this ground, the Master's authority may be questioned.

Quite apart from rules, regulations and authority, individuals need to know how they will be evaluated by others. A senior officer needs to know how his juniors will evaluate him just as much as the juniors need to know how they are to be evaluated by their seniors. Only time, and a series of events shared together, will allow one man to guess how he is to be evaluated by another.
The word "system" is so widely used today that whatever definition is given in this report, such definition will probably be rejected by many readers.

Ackoff (1960) defines a system as 'any entity, conceptual or physical, which consists of interdependent parts' but he goes on to say that we are interested only in those systems which can display activity; that is, behavioural systems. Recognising that, for activity of any sort, energy is required, Katz & Kahn (1966) extend the concept of the behavioural system by stating that all such systems need energetic input, transformation within the system, and a resultant output. But, if energy is being imported it must come from somewhere outside the system under consideration; equally, the output must go somewhere - otherwise it would not be an output. The 'somewhere' from which energy is imported and to which the output is exported may be designated 'the external environment of the system under consideration'. For a continued inflow from and an output to this environment, the system must enjoy some special relationship with the controllers (of inputs and outputs) in that environment. Emery & Trist (1960 & 1965) draw attention to the nature of the external environment and show that, for continued existence, the system must display some distinctive competence to the relevant parts of its external environment in order to secure a continued flow of inputs and outputs which are used to energise the system.

Some writers suggest that, between the system and its environment, a bartering activity takes place in which the outputs are exchanged for further supplies of inputs; and they support this notion by drawing examples from commercial enterprises which import raw materials, convert these into marketable goods, sell the goods and, with the money received, buy further supplies of raw materials. Rice (1965) and Miller & Rice (1967) suggest that a system is characterised by the cyclical nature of its activities and that a researcher, trying to identify the boundaries between one system and another, should first identify the cycles which take place in the whole enterprise or operation.

In merchant shipping, the overall economic system of each company is fairly easy to detect. Typically, a shipping
company borrows money from a bank (the system input); with the borrowed money it buys and operates ships in carrying goods between various ports, for which it receives payment in the form of freight (the transformation process); and, out of the received freights it repays the bank loan (the output). For continued existence, the shipping company has to demonstrate its competence to the bank(s) by properly repaying its loan; or, put another way, continued existence of a shipping company is wholly dependent upon it 'satisfying its source of finance'. This gross economic system, here described, is clearly visible in Polychem Tankers and in Gem Oil - but not in Gem Tankers.

Within the overall, gross economic system, smaller economic systems should be detectable. A manager fixes a contract for his ship to go to a specific port and there load a particular cargo which is owned by the shipper. The ship takes the cargo to its destination, discharges it and receives freight money from the consignee (receiver). At first glance, it may be thought that this represents a behavioural system with the loading designated as the 'input'; the ocean transport as the 'transformation process'; and the discharge of the cargo as the 'output'. But, within our definition, this is not a system - the shipper and consignee are different people (or firms); and no cycle exists, for that particular ship may never again carry cargo for that same shipper or that same consignee. Something else must exist within the system and environment which will allow us to identify the real behavioural sub-systems forming part of the overall, gross economic system of the shipping company.

The field work was conducted in two companies which appeared to have quite different system-environment relationships. Polychem Tanker Company had three ships which carried, in the course of a year, dozens of separate parcels of cargo for hundreds of separate shippers and consignees. Each voyage was similar to that described in the last paragraph; that is, the ship would go to a port and there load a number of different parcels of cargo belonging to separate shippers, carry these parcels to their destinations and discharge to separate consignees. After completion of discharge a similar but not identical cycle commenced (of load, carry, discharge). What special relationships existed
between Polychem and its external environment to enable the company to continue trading its ships?

Gem Tankers had over a hundred ships carrying oil for the parent Gem Oil Company. The voyage of a Gem ship was very similar to that of a Polychem - or any other - ship; that is, the ship would go to one port, load a cargo of oil, transport the oil to its destination and discharge it into shore tanks. In the great majority of voyages, the oil cargo, the loading terminal and the discharging terminal were all owned by the parent Gem Oil. But Gem Oil did not - and does not - pay Gem Tankers cash for carrying Gem Oil cargoes. Freight payments, as such, were nothing more than 'paper transactions' between Gem Oil and Gem Tankers. When the open tanker market is depressed, Gem Oil would find it much cheaper to charter in outside-owned ships than to operate its own ships - although when the open tanker market is buoyant, Gem Oil does find it cheaper to use its own Gem Tanker ships. What special relationships existed between Gem Tankers and its external environment (Gem Oil) to enable the company to continue trading its ships? Are these relationships similar to those allowing the continued trading of Polychem ships?

The continued existence of the whole company has already been described as being dependent upon the satisfaction of the company's source of finance; but the continued trading of a company's ships appears to be determined by the reputation those ships hold in the customer environment (ignoring, for purposes of this argument, fluctuations in the amount of cargo moving along one route).

In the case of Polychem, each voyage successfully completed with safe delivery of uncontaminated cargo adds to the stock of knowledge shippers in that trade have of Polychem ships. The shippers (i.e., exporters) use this knowledge to reduce their own uncertainties about how best to deliver their exports to buyers overseas. Each time a shipper reserves space on a future Polychem voyage for the transport of his cargo, he is, in fact, authorizing Polychem to continue to trade. Thus, the real behavioural system which exists in the trading of Polychem ships this: The system input is the authorization to continue to trade; the output is increments to the company's reputation; and the transformation process is the proper performance of the sea transport service. And precisely the same cycle can be seen
in the relationships between Gem Tankers and its customer, Gem Oil — authorization, proper performance, enhanced reputation, authorization.

Objections to this notion may be raised on the grounds that it is too abstract. Physical objects (the ships) move across the sea carrying physical cargoes and, on entering port, the dock and pilot authorities demand cash payments for the services they provide. 'Real things, real money and real people must be the constituents of a real ship-trading system' is an argument objectors may put forward against the reputation-authorization system. Counter-arguments can be put forward on the basis that if a ship, a crew and some running expenses were brought together such a combination would not automatically result in the ship being offered cargoes to carry.

One interpretation which can be placed on the field observations is that there is no such thing as an economic system nor a technical system. The birth of the whole economic-socio-technical system can only have taken place at the instant when a group of people with varied skills were brought together — some with the wit to raise finance and buy the ships, others with knowledge and experience to operate the ships and still others with the skill to negotiate cargo contracts. It could be argued that there is no system but the social system, for the continued existence of the shipping company is wholly and totally dependent upon the skills of its human members.

If we return to the notion that the genesis of a economic-socio-technical system lies in the assembling of people we can, once again, see the determinant effects of history. No banker ever lends money without firstly checking on the 'track record' of the borrower; no-one could safely navigate a ship from one port to another without some past experience at sea; and no cargo-manager could sell space in his ships without forming contacts with potential shippers over a period of time.

Although it was not investigated during this programme, there probably exists a relationship between the stock of reputation a company has among its customers and the return it gets (or can reasonably expect) on its financial investments. In order to penetrate a new market (i.e., enter a new field with
absolutely no reputation) it is possible that a company will have to undercut its competitors and, in undercutting, it will have to be content with a return on investments lower than it will enjoy once it has established a reputation and good customer relationships.

If the economic system is redefined as the financial system, it is possible to trace the flow of money through both Polychem and Gem Tankers. In Polychem, the company collects freight money from consignees at the end of each voyage. Some of this money goes to repay bank loans while some is used to pay wages, repair the ships, supply the ships with fuel and stores etc — any surplus, now retitled 'profit', is paid to the company's shareholders or is put into reserve.

The financial system is slightly different in Gem. Before the start of each financial year, departmental heads in Gem Tankers draw up a budget of expected expenses during the forthcoming year. The total of all the budgets is submitted to the Board of Directors of the parent Gem Oil who, after making some modifications (usually downwards!) authorize Gem Tankers to spend money on operating the fleet of ships.

Each time a Gem Tanker carries a cargo of Gem Oil, a notional 'freight due' is calculated and 'payment' is demanded from Gem Oil. In fact, no money is actually paid but, by using this method, the management of Gem Tankers are able to determine whether they have made a 'profit' or a 'loss'. As the notional freight due is based on replacement costs per day which, in turn, are based on prevailing voyage charter rates on the open market, the resultant level of profit or loss is governed by forces quite outside the control of anyone within Gem Tankers, whether ashore or afloat.

In Polychem, managerial performance is judged in terms of the real profit and loss account whereas in Gem Tankers managers are judged by their degree of success in staying within budgetary forecasts.

No matter how managers are rated, each company bears a feature of financial strength or weakness. The present financial strength of a company is determined partly by the present external commercial environment and partly by past commercial successes or failures. This is shown in Diagram 6.1.
In diagram 6.1, an attempt has been made to show the complex arrangement of organizational and social forces which impinge upon the individual aboard ship. Each element enclosed in a block is, itself, a complex arrangement of sub-elements and forces.

Some writers rightly argue for the technical, social and economic systems to be jointly optimised but, in so capital-intensive an industry as shipping, the social and technical systems are dominated by the economic system. It would not be stretching the truth too far to say that the traditional pecking order of systems in shipping has been from economic down to technical down to social.

The solid lines and arrows in Diagram 6.1 indicate the direction of organizational forces emanating from the features of the enterprise and from the features of the individual. The external commercial environment and past commercial successes or failures do determine the present financial strength of the company; the present financial strength does determine the present gross technical system which, in turn, does partly determine the present control system; and so on.

However, the way in which an individual experiences work and life aboard his ship is determined partly by the actual features of his company and partly by his perceptions of the various elements i.e., by the attributes he gives to these elements.

The officers interviewed during the field voyages attached great importance to the financial strength of their companies. Those in Gem Tankers felt that Gem Oil was so strong financially, that the continued existence of Gem Tankers was perceived as almost the manifestation of a natural law of the universe. Those in Polychem realised that their company was, at the time, still far too young to be financially strong and every scrap of information about profit levels (issued at the end of each voyage) was rapidly and widely discussed among all the officers in terms of its effect on the financial strength of the company.
The subjective evaluation of the financial strength of the company appears to depend upon the individual's past experiences, his present family responsibilities, his qualifications and occupational mobility, his aspirations and his personality. The relationships between these features and the man's mechanism for subjectively evaluating the company's financial strength are illustrated in Diagram 6.1.

For example, one of the Polychem Chief Engineers interviewed was over 50 years of age; he held a First Class Engineer's certificate but, after a lifetime at sea, felt that he was too old to seek shore employment; on four separate occasions in the past his employing companies had failed commercially and, in fact, he had recently joined Polychem through being declared redundant by his last company; he was married with no children; above all else he sought job security. He saw Polychem as financially frail and believed that it was the first duty of every member to help Polychem gain financial strength. He saw himself as a cost-minimizer and behaved accordingly in the work he did and the stores he ordered; he ignored personality quirks and defects in others and gauged the task performance of all others in terms of whether their actions assisted or hindered Polychem in its movement towards financial strength - as measured by his own, personal yardsticks.

On the other hand, one of the Polychem Engineer Officers interviewed was in his early twenties; he was unqualified; he had tried certain jobs ashore in a search, as he said, for job satisfaction; he was unmarried; and he had joined Polychem for the variety and satisfaction he believed a seagoing job offered. He attributed the financial system with neither strength nor weakness for he was not bothered about job security - he felt occupationally mobile and said he could easily move to another job at sea or ashore if he became dissatisfied with Polychem. He attributed the people controlling the finances of the company with the power to determine the level of his job satisfaction; these controllers, he felt, were the ones who decided whether all the stores ordered would be supplied and whether all the necessary repairs would be executed by shore labour or by him and his fellow engineers. To this Junior Engineer, a
technical task was experienced as satisfying only when he had the right tools, ample stores and spare parts, and sufficient time to finish the task properly. At the time of the interviews the Chief Engineer described in the last paragraph and this Junior were serving in the same ship. The Junior neither understood nor accepted the cost-minimising efforts of his superior and, at the end of the voyage, he resigned from Polychem. This is an example of conflict, not between personalities nor, strictly, between an individual and a financial system, but between an individual (the Junior) and the interpretation of the financial system (by the Chief Engineer).

A significant difference observed between Polychem and Gem officers was the precision with which Polychem officers could discuss their company's financial matters compared with the hazy notions Gem officers had about Gem financial affairs. I must report that the Polychem officers appeared to derive some enhanced satisfaction out of knowing the profit and loss position at the end of each voyage while Gem officers repeatedly expressed the wish for more information on the financial position of their ships. None of the Gem officers interviewed expressed a wish for additional details of the overall financial position of Gem Oil—the officers received Gem's Annual Accounts—but, as all the gross items in these Accounts were in hundreds or thousands of millions of pounds, the figures meant nothing other than great financial strength. The specific information requested by the officers were profit and loss figures for each ship and they interpreted the absence of such information as being caused by the specialist departments ashore (accounts department) trying to cover up waste in head office. In the words of one Chief Officer interviewed (but echoed by others) "They (the head-office people) are scared to give us exact figures about the ship for this will show that the ships are working efficiently and they won't be able to use their big sticks any longer of always telling us that we're making a loss"; and, in the words of an Engineer Officer "They keep on telling us that we're making a loss but no-one has ever proved it by showing us the figures"; and, finally, in the words of a Chief Engineer "Every year since I joined this company I've been told that the ships are losing money. Well, how the hell can a company keep going if it makes a loss
every single year for twenty years? No, I'll tell you
the trouble: We in the ships slog our guts out, we
don't get any increase in crew; look at this ship, we've
the same size crew as when she first came out yet we're
working a bloody sight harder these days. But look at the
shore staff; look how they've increased in numbers - and
that's why we never get exact figures about costs and profits
and losses in Gem Tankers; we'd all be able to see that the
profits are made by the ships and the losses by the shore"

In fact the real cause of the absence of precise financial
information being sent to Gem ships is that the Gem accounting
system simply does not produce such information - nor could
it produce such information for the relationship between
the only customer (Gem Oil) and the ships (Gem Tankers) is
quite different from the normal relationships between
commercial shipping companies and their customers (shippers
and consignees imbedded in the external environment).

The incidents and conversations recorded above have been
introduced in order to draw attention to the actual features
and attributes of the economic system and to illustrate the
manner in which real and imaginary forces impinge on the
individual aboard ship. In certain conditions, features
and attributes are in harmony while under other conditions
they may be in conflict, and parts of the survey questionnaire
and interviews were aimed at detecting where harmonies and
conflicts were experienced.

For example, before entering the field, I believed that
within shipping companies a greater drive for economic
efficiency had caused the newer ships to be designed and
operated to achieve minimum time in port, and that the
minimization of port time would be in conflict with the
aspirations of seafarers to travel, see the world and to
relax ashore while their ships were in port. In fact, I
found that while this conflict is experienced by the younger
seafarers, it is not experienced by the older men. These
older men - most of whom are married with children - prefer
the reward of more frequent home leave offered by companies
today (even though they can no longer go ashore in port for
relaxation) to the less frequent leaves, but with more free
time in port, of yesteryear.
CHAPTER 7: THE TECHNICAL SYSTEM

Although the ship, the cargo and the port terminals meet Ackoff's description of a system by being the interdependent parts of an overall technical entity, these elements together do not form a behavioural system. The collection of interdependent technical elements may be designated as the Static Technical System and, after being energised by people and/or money, it becomes the Dynamic Technical System. As a Dynamic Technical System it can meet the conditions of the import-conversion-export model of systems.

Within the import-conversion-export model, there are no behavioural technical systems in shipping; there may be socio-technical systems but, more commonly, there are economic-socio-technical systems.

At first sight it may be thought that the cargo forms the raw material and the voyage the conversion process but deeper investigation shows this is not the case. In shipping, the raw material is the geographical separation between where some cargo now lies and where the cargo-owner wants it delivered; the conversion process is the carriage of this cargo aboard ship; and the export is the safe delivery of the cargo. If there were a purely technical behavioural system in shipping then the export would immediately and physically be convertible into both raw material and energy for the next cycle.

In the transactions between the system and its external environment money is, of course, used to convert the export into energy for the next cycle but it is not used to buy further supplies of raw material - the raw material of geographical separation does not have to be made, mined or bought, it is just simply there. Thus, it is argued that just as there is no purely technical behavioural system in shipping neither is there a purely economic-technical behavioural system. Knowledge and human skill is required to position the ship at her next loading port for the commencement of her next cycle of load-carry-discharge.

To help the lay reader, it may be worth mentioning that a great degree of skill and experience is required in the open charter market if a ship - for example, a Polychem ship - is to be directed to the right port where cargo awaits.
It is therefore argued that the only system which embraces the totality of actions and behavioural patterns in shipping is an economic-socio-technical system.

The gross, static, technical system consists of all the physical objects used by the enterprise together with its physical raw materials, its finished products and the physical features of the terrestrial environment in which it operates. An object need not be owned by a company to be part of that company's technical system but, to bring an externally owned object temporarily into the technical system, the company usually has to pay a charge to the external owner, e.g. port charges in return for using a dock terminal, or tug hire for using tugs.

The gross, dynamic, technical system is the static technical system plus effective energy, which energy may be in various forms:

(i) **Physical energy.** In ships this is fuel oil which is converted into other useful forms of energy to propel and guide the ship along a chosen course, to load and discharge cargo, to provide warmth, washing and cooking facilities for the crew, and to communicate with the outside world by radio.

(ii) **Human energy.** This may be used in the two, self-explanatory, forms of human mental energy and human muscular energy.

(iii) **Financial energy.** The company needs — and uses — money to buy physical and human energy and to pay for temporary extensions to its technical and/or social systems.

An important part of organizational analysis lies in determining the nature of these various forms of energy and the points at which these energies are controlled. In some of the earlier studies of shipping, for example A. Trist (1968), the researchers concentrated on the source and control of the primary physical source of energy aboard ship. This, they quite rightly say, lies in the engineer room and is under the direct control of the Chief Engineer. Their implied conclusion is that, as the Chief Engineer controls the prime source of all (sic) energy, he should be the man placed in control of the whole ship. I take issue with these researchers for, in my opinion, they ignored the sources and
points of control of the human and financial energies.

The point of control of financial energy clearly lies outside the ship; all expenditures and revenues are controlled at head office. Fuel oil, ships' stores and all temporary extensions to the technical system (e.g. tugs) are supplied under contracts negotiated and paid for by appropriate departmental managers in head office. Aboard ship there is no control whatsoever (in the organizational sense) of the company's financial energy. All that people on board can do - so far as finance is concerned - is check that the money (financial energy) allocated to them is effectively used and not wasted.

Earlier in this report, the ships' officer was defined as a 'cost-minimiser' but this can be rephrased to define the ships' officer as "one who is required to make effective use of the financial energy allocated to his ship". (Note: Not allocated to him).

Within the flow of human energy there are three or four levels of control. Leaving aside, for a moment, that part of the mental energy best described as codified knowledge, one can identify four levels of control of human energy:

Level 1: The head of the personnel department; the one who hires and fires; the one responsible for recruiting sufficient people of the right calibre to man the ships.

Level 2: The ship's Master; the one who co-ordinates human efforts aboard ship. He very rarely recruits a man from outside the company (he submits his needs for personnel replacements to head-office), and his powers to fire a man are, today, very restricted.

Level 3: The sentient group on board to which the man belongs; the group of officers or ratings which imposes its commonly accepted norms and values upon the individual. This group has no formal authority for hiring or firing a member but it may try to force a member to resign from the ship by ostracizing him.

Level 4: The individual himself; to great extent he controls the amount of muscular and mental energy he gives to the ship.

Harmonies and conflicts were observed to exist between these levels of control but I would now like to report on one
aspect of the mental energy needed to convert the static into the dynamic technical system.

Part of the mental energy required to operate a ship is knowledge borne of past experience. Some of the requisite knowledge is imbedded within the individuals forming the total crew while some is imbedded within the company's operational departments in the form of records of past experiences. The greater part of this operational knowledge is transmitted to the crew in the form of company rules and regulations, circular letters to all ships, and operational handbooks. Because of its size and age, Gem Tankers has a large stock of this codified shipping knowledge and the chance of a Gem ship meeting an unexpected circumstance (never before experienced by one Gem ship or another) is very small indeed.

Polychem, on the other hand, is as yet too small and too young to have been able to build up a stock of operational knowledge and, almost daily, unexpected circumstances and exceptions are experienced by the Polychem ships.

An approach to the analysis of organizations made by Perrow (1967) is helpful in understanding significant differences between Gem and Polychem. Perrow suggests that attention should be given to two aspects of the technical system:

(1) The actual and perceived nature of the raw material which has to be processed; and
(2) The nature of the 'search' processes which are adopted when exceptions arise.

He suggests that the raw material may be uniform and well understood or variable and poorly understood; that companies may operate in such a manner as to encounter many exceptions or few exceptions; and that, when exceptions (problems) arise, they may be analyzable (in terms of the principles which have emerged from the codified stock of operational knowledge) or unanalyzable (in which case people have to fall back on intuition or past experience).

Gem Tankers, as has already been mentioned, is a large old company which has operated ships in the crude-oil and oil-products trades for over 50 years. Within Perrow's definitions, their raw material is well understood, their
ships encounter very few exceptions and, even when they do, the problems are analyzable in terms of their knowledge of tankers.

Polychem Tankers lie towards the opposite end of each dimension. Almost monthly, new types of chemical cargoes appear in the sea transport scene and this feature of the chemical industry, plus the fact that Polychem is new to the chemical tanker business, means that, in Polychem, the raw material is (relatively) poorly understood; Polychem ships frequently encounter exceptions and, owing to the absence of a stock of operational knowledge, the problems presented are usually unanalyzable with the result that the individuals involved fall back on their own past experiences. The dimensional positions of Gem and Polychem are illustrated in Diagram 7.1

Diagram 7.1: Dimensional positions of Gem and Polychem by nature of raw material and search processes

The total stock of knowledge in Gem Tankers is so complete and all embracing that, by and large, the specific individual in charge of a particular operation has relatively little effect on the eventual outcome; the company's stock of knowledge enables, within a wide spread of capabilities to conduct certain operations at a reasonable level of efficiency although, clearly, some individuals perform certain tasks better than do others.
The stock of knowledge in Polychem is, as yet, so small that specific individuals have a large effect on the outcome of certain operations, particularly when exceptions arise. When the exceptions encountered are many and generally unanalyzable, the man with the right degree of intuition and appropriate past experience is usually better able to make a correct decision than the man with poor intuition and past experience. The people in Polychem feel that they are needed as individuals and that each can make major contributions to the company's success. Many Polychem people, particularly among the shore staff, find this a highly challenging and satisfying climate within which to work.

Polychem is still passing through the first stage of rapid change when each incident which occurs makes a relatively massive contribution to the company's stock of knowledge. Gem Tankers passed through the phase of rapid learning many years ago and is now at the stage where any further increments to the company's stock of knowledge will be expensive (in terms of human effort) and marginal. Those individuals who are satisfied with a medium level of performance find the company's omniscience repugnant and feel that, as individuals, they have little to contribute. But those individuals who, for one reason or another, feel inwardly driven to demonstrate really superb levels of performance find that they can draw on the company's stock of knowledge and resources to improve their performance levels still further. Gem Tankers offers challenge and satisfaction to the 'high flyers' but a lower level of satisfaction and challenge to the 'medium performers'.

As mentioned earlier in this report, when I embarked on this research programme, I believed that the growing mechanization of ships was facilitating the collection of greater amounts of quantified performance data which, in turn, was being translated into a greater number of more specific operating instructions; that is, I felt that the knowledge needed to operate ships was being codified and that such codification and issuance of specific operating instructions would be experienced negatively by the individualist type of seafarer wishing to exercise discretion and judgement in his job. That I did not find these negative feelings in the field can be explained by (i) ships' officers find the operating instructions supportive and helpful; (ii) the 'high flyers' in Gem were using the codified knowledge to develop themselves further; and (iii) the Polychem people were in their rapid learning phase.
CHAPTER 8: THE SOCIAL SYSTEM

It is probable that very few objections would be raised if I were to describe the total set of sea and shore employees as the social system of the shipping company, or the total crew as the social system of the ship, for the indivuals so grouped are in fact the interdependent parts of a social entity — and this relationship meets Ackoff's description of a system.

But, since entering the field, I am no longer persuaded that the simple assemblage of persons is a social system for, as a simple assemblage, they are incapable of systemic behaviour and their behavioural activities are not necessarily of a cyclical nature. If one applies the import-conversion-export model to a group of people one may find that as some leave others move in to take their places; this occurs, for example, aboard a ship — as one or more crew members leave so others are appointed to take their places. But what conversion process takes place while they are in the 'system'?

I am now persuaded that a social system is an abstract concept and that the imports and exports are not people but that imports are attractions and exports are reputations. The conversion process within the system, as I see it, is socialization.

Let me put it another way: At first sight, a company appears to import (recruit) people from outside society into its labour force to replace those who have left (exported) but, unless there is some transaction between the 'system' and its external environment whereby exports are exchanged for further imports, no system can be said to exist within the definitions used here. Furthermore, the import and export of actual people cannot explain the continued existence of a social system. On deeper investigation, it appears that the company has to import authorization from society at large and occupational choice from individuals; that is, the import is the attraction an applicant has for that company plus the permission from society to engage him. Once he has joined the company he enters a conversion process which, to be successful, must persuade the man that this is a good company to work for. When he leaves that company, the company is, in fact, exporting back into the environment its reputation. The leaver carries with him evidence, in various forms, of the merits and virtues of the social system through
which he has passed and, in the external environment, this evidence - or reputation - is converted into further authorization from society for the system to continue and into positive attractions towards the company in potential applicants.

The value of this model - of authorization and positive attractions being the imports, socialization being the conversion process, and reputation being the export - is that it clarifies the significant differences observed between old Gem and young Polychem; it enables general societal values and individual motivations to be blended into the features and attributes of organizations; and it highlights those activities demanding the closest attention from the personnel managers of shipping companies. The model may be used to explain the current shortage of people in Britain applying to go to sea. It certainly highlights, once again, the importance of organizational history.

When I examine the social system of Gem (i.e., the conceptual system, not the assemblage of people), I find that over the years it has established a good reputation in the relevant parts of its external (recruiting) environment and that society generally authorizes Gem to continue recruiting young people. By offering wages, home leave and family welfare conditions generally above the majority of British shipping companies, the longer serving members become persuaded that Gem is a good company to work for and, when these members leave Gem, they carry with them stories which enhance the reputation of Gem in society ashore.

Polychem, on the other hand, is still too young to have been able to establish a reputation in society; in fact it is highly probable that the great majority of shore people, and most seafarers, have never heard of Polychem. Thus Polychem is at the stage of having to import without yet being able to export. Polychem has to base its recruiting adverts upon features (but, more likely, managerial attributes) which it believes it possesses and which it believes will create positive attitudes towards the company in potential...

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*This statement is not entirely true. For many years, Gem had a very poor reputation among the total rating labour force of the Merchant Navy and, although society did not expressly forbid people to join Gem, normative values among the rating group dissuaded ratings from applying to Gem as their first choice of seagoing employment.*
recruits.
So far, in this chapter, the implied assumption has been that the social system of the company continues to exist by exporting a reputation generally evaluated as "good" by the relevant parts of the external society. But it is equally possible for the opposite to occur: The socialization process through which members pass may be so mismatched to general societal values, (it may have features which are evaluated by society as 'bad' and shipboard conditions may be experienced negatively by members), that the company exports a bad reputation. In turn this causes a reduction in the amount of authorization given by society and a reduction in the number of people applying to join.

A shipping company could have features in its working conditions which would be evaluated by the greater majority of society as bad. For example, if a company so arranged its voyages and home leave methods that a man returned home to his family at intervals of two or three years, it is most probable that society would evaluate this as bad and that company would experience great difficulty in recruiting and retaining people. But, when I first went to sea, home leave was only granted at intervals of two years and both seagoing and shore society accepted this feature.

During the last 15 years, something has changed within or without the overall social system of the shipping industry. The intervals of service between home leaves has been successively reduced from 2 years, to 1 year, to 9 months, to 6 months and, today, some companies are offering leave after 4½ months service while one particular company is granting home leave every 3 months. This change cannot have been caused by the economic system for it need hardly be pointed out that the cost of flying people to and from ships every 4½ months is much higher than relieving them every two years. The change cannot have taken place to meet the needs of the technical system for people who spend no more than 4½ months in a ship hardly get to understand her technical quirks and features before they are taken out, sent on home leave and then appointed to another ship. The change must have taken place in the social system. At superficial level some shipping managers say that the lowered intervals of service between leaves is nothing
more than a reflection of conditions offered by their competitors for seagoing labour while other managers, interviewed during the programme, said that the more frequent leaves were granted as compensation for the absence of free time for relaxation in port. But, by applying systems thinking to the prevailing situation, the real cause of the reduction in periods can be seen to be the social system's need to export a "good" reputation back into the environment in order to survive.

When a sum of money is borrowed or a piece of equipment purchased, the precise features of that money or equipment are known and, furthermore, neither the money nor the equipment possesses an "attribute-giving" mechanism. Provided the loan or equipment is properly serviced, it behaves in exactly the way intended by the borrower or purchaser. The same degree of precision in the identification of features and the predictability of behaviour is not enjoyed when a person is recruited to the labour force: An individual has many features which are neither recognised nor measured during the recruitment process and, furthermore, the individual carries in with him his own behavioural world against which he subjectively evaluates external events, and the subjective evaluation he gives to other things is one of the determinants of his behaviour.

If social values are defined as the consensus of common characteristics of the behavioural worlds of a group of individuals, it can be said that the young men currently being recruited to the shipping industry are importing some social values which differ markedly from the values held by the people ten or twenty years ago.

In Gem - and in most other shipping companies - the officer-cadets pass through an induction and rapid socialization process aimed at modifying their values and aligning them (so far as possible) with people already in the social system. Those cadets who cannot or will not alter their values soon resign so that those who remain generally accept the social values prevailing in the social system. The field observations generally confirmed that all age groups within Gem Tankers held similar social values.
In Polychem, the situation is somewhat different. Polychem does not yet have a cadet recruitment method. All officers are recruited as already qualified or experienced people from other companies. Soon after being recruited, groups of newcomers are sent on a chemical tanker familiarization course lasting for two weeks. Polychem managers lay before the recruits the features of the Polychem economic, technical and social systems and, more importantly, the attributes of these systems as seen by the shore managers. The managers hope that the recruits will understand most of the features and accept some of the attributes explained to them. Needless to say, a two week course is not sufficiently long properly to socialize the recruits (modify their own social values) so that, for the first year or two in the company, each individual is passing through a rapid socialization process. However, seeing that all the seagoing staff have spent less than 3 years within Polychem - and many have had less than 2 years in the company - there is no stable set of social values which can be identified as "Polychem values" and to which individuals may adhere. All the shore managers and most of the ships' officers are ex-cargo liner men and, during the field work, it was patently clear to me that liner values had been imported into the company in sufficient quantity to dominate the company's value system. In fact, harmony was observed to exist between liner values and the trading features of the technical system; conflict, however, was observed to exist between the values held by the liner people (the majority) and the ex-tanker people (the minority) and, whenever arguments arose on a proposed course of action, the tanker men drew attention to the physical resemblance between the Polychem ships and the generality of tankers to support their argument that they knew best.

Returning to the overall social system; I would like to draw attention to the role of the personnel manager. He is responsible for keeping the ships manned and he would be severely censured by his superiors if ever a ship were prevented from sailing by lack of crew. While subordinates in the personnel department may be specifically concerned with recruitment or training or appointments or welfare, the personnel manager has to concern himself with the long-term survival of the social system by ensuring that it exports a good reputation. The reputation exported will be
determined partly by the features of the working and living conditions aboard ship and partly by the attributes given to these same conditions by the people employed. The personnel manager has the difficult task of determining which features of the shipboard conditions need to be altered in order that the new conditions may be given positive attributes by the recruits entering the social system carrying with them subjective 'yardsticks' which are partly determined by prevailing societal values; in other words, he must try to match shipboard conditions with the values held by shore society, or with the values held by that part of the external society from which he recruits people. The matching may be effected by an imposed programme of planned change or it may be effected by the personnel manager creating conditions aboard ship in which those already in the social system may respond positively to the values being imported by the new recruits. Polychem appeared to have adopted the former method and Gem the latter — not from choice but from force of circumstance. In Gem the stability of the labour force and the strength of commonly accepted values were such that a programme of planned change would have met with severe resistance; while in Polychem, the absence of labour stability and common values would have resulted in chaos had no planned change programme been introduced.

The method adopted by the company to bring about change within its social system will be designated its change style. The extreme forms of change style are at either end of a continuum, as shown in Diagram 8.1. Neither Gem nor Polychem was at an extreme end of the continuum and their approximate positions are shown in the diagram.

Diagram 8.1: Change styles and positions of Gem and Polychem

In both companies conflict situations were observed when, for specific reasons, managers temporarily altered their change styles. On one of the Gem ships "Mica" a high degree of resentment was engendered among the senior officers when the Gem personnel manager ordered them to alter the traditional task allocations of the pumpman and an engineer trainee aboard that ship. And in one of the Polychem ships,
"Joan", a high degree of inter-personal tensions and social turbulence had been caused by the Master unilaterally modifying the planned change programme injected into the ship by the shore managers.

Within the four ships visited, only one behavioural social system was found which met the definitions of the import-conversion-export model. This was in "MICA", the only one of the four ships to have a team of senior officers permanently appointed to the ship on a self-relieving basis.

In "MICA", the Master, Chief Engineer and Chief Mate formed a very tight triad; all were long-serving members of Gem and shared common values. Each was inwardly driven to display superb levels of performance. They felt that superb technical performance would result in (i) increased, individual job security; and (ii) permission to remain together as a team. The three of them were mutually supportive; each needed the other two in order to demonstrate to senior managers ashore their individual, superb levels of performance e.g. the Chief Mate needed the Chief Engineer to give him full power on the pumps so that he (the Chief Mate) could display port-time minimization skills while the Chief Engineer needed the Chief Mate to plan the cargo-discharge and tank-cleaning operations so that he (the Chief Engineer) could demonstrate his technical skill in keeping the machinery running at full power. The three members of the triad experienced other benefits of staying together in the "MICA"—the ship was permanently employed in UK and North-West European waters so that they could telephone home every few days; they knew they were at the forefront of managers' minds in head-office; and, by staying in "MICA", they could escape being appointed to the company's Very Large Crude Carriers to which ships they gave only negative attributes.

When systems thinking is applied to the Mica triad, it becomes easy to identify the import-conversion-export process of their social system. They imported authorization and resources from Gem Tankers, converted these imports into the minimization of costs by the maximization of ship and cargo movement, and exported back to Gem Tankers their reputation as exceedingly efficient ship operators.
In the remaining three ships studied, no social system could be identified which met the conditions of the import-conversion-export model. In these other ships, the individuals on board saw themselves as being temporarily attached to one particular ship or another and that their permanent attachment was to the Personnel Department of one company or the other. Each individual imported resources from the company (wages for his personal use and tools for conducting his required tasks), converted these resources into the completion of a series of tasks, and exported back to Gem his personal reputation. However, an individual does not make a system within the definitions used here.

Qualitative, rather than quantitative, observations recorded during the field work indicate that the characteristics of the overall, gross social system of a shipping company are partly determined by the following features, each one of which could be dimensionalised:

1) **The age of the company**, which is a partial determinant of
   - the present reward methods;
   - the existence and strength of a common culture;
   - the bureaucratic nature of the organization
   - the extent of operational knowledge held by the company; and
   - the meaningfulness of the company's rules and regulations to individual members.

2) **The numerical size of the shore staff**, which partly determines
   - the existence and strength of divisions between operational and service departments;
   - career opportunities for individual managers;
   - the extent of influence exercised by individuals; and
   - the proportion who have had sea experience and understand work and life aboard ship.

3) **The numerical size of the sea staff**, which partly determines
   - promotional prospects for individuals;
   - the degree to which an individual feels that he can or cannot escape from another person perceived as unpleasant; and
   - the extent of influence exercised by individuals.

4) **The permanance of appointments to particular ships**. This partly determines
   - the extent of individual loyalty to ship or company;
   - relationships between operational managers responsible for those ships and senior officers;
   - the perceptions of specific operational managers as 'defenders';
   - task and sentient groupings among senior officers; and job satisfaction of seniors and juniors.
5) The advertised attractions of the company, which partly determine:
- expectations held by individuals and the extent to which they match reality;
- the acceptable reward and control methods;
- the level of labour turnover;
- perceptions of broken psychological contracts; and
- the performance levels of individuals.

6) Individual histories of key shore managers (in particular the path followed to their present positions) which partly determine:
- the practised control system;
- the reward and promotional methods adopted by the company;
- perceptions, by seafarers, of these managers as defenders or attackers; and
- perceptions, by seafarers, of the extent to which these managers really understand the problems of work and life aboard ship.

7) The manning method aboard ship which partly determines:
- levels of job satisfaction;
- performance appraisal methods and the perceived equity of such methods;
- promotional and career development opportunities;
- training needs;
- shipboard communications; and
- the extent of participation in planning by members of various levels.

8) The degree of separation between the work and life areas aboard ship which partly determines, and is sometimes determined by:
- the extent to which uniforms are work on and off duty;
- the use of first names upwards and downwards;
- the satisfaction of basic human needs, particularly among juniors;
- the performance level of the ship;
- the performance levels of individuals;
- the shipboard 'atmosphere';
- the degree of individual satisfaction with the style of life in the company; and
- the level of wastage among recruits.

9) The personality and individual history of the Master, which, to great extent, determines:
- the 'atmosphere' on board;
- the degree of separation between the work and life areas;
- practical interpretations of the company's rules;
- the shipboard control and disciplinary methods;
- the degree of participation and involvement experienced by individuals; and
- levels of job satisfaction, particularly among deck officers.
CHAPTER 9: METHODOLOGY AND STATISTICS

1) Following pilot discussions with the managers of a container-ship company and a pilot study among deck officers at Plymouth Polytechnic, a survey instrument was designed to elicit data in three sub-sections:

a) **Personal details**
- serving rank
- age
- length of time in the shipping industry and time at sea
- number of shipping companies served in
- length of time in present company
- type of ship currently or last served in.

In the random sample of 75 officers (described later) respondents were not required to give their own names nor the names of their companies but all except two gave these details.

b) **Work Environment Preference Schedule (WEPS test)**
(Copy of test given in Appendix D)

This test was developed and reported by Gordon (1970). It consists of 24 statements about organizations with which the respondent may agree or disagree on a 5 point scale. The test is designed to measure "bureaucratic orientation" along four behavioural categories (after Weber):

- **Self-subordination**, or a willingness to comply fully with the stated wishes of a superior and to have decisions made for one by higher authority;

- **Impersonalization**, or a preference for impersonal or formal relationships with others on the job, particularly with individuals at different organizational levels;

- **Rule conformity**, or a desire for security that the following of rules, regulations and standard operating procedures affords; and

- **Traditionalism**, or a need for the security provided by organizational identification and conformity to the in-group norms.

The test was chosen because earlier work done by Gordon and others in relating the WEPS test to other measures showed that individuals who score high on the WEPS test are inclined to place a high value on conformist behaviour and on being systematic and orderly, and a low value on having personal independence of action and on engaging in new or varied activities. These characteristics matched part of my stereotype of the modern ships' officer, and I wanted to examine how this type of officer was coping with technological and organizational change in shipping. Furthermore, the
the characteristics which the WEPS test was designed to measure - in particular, self-subordination, rule conformity, and traditionalism - appeared to exist among ship's officers in conflict with opposing characteristics among the young ashore.

The WEPS test proved to be easy to apply and score.

c) Attitudes towards existing conditions and current changes in merchant shipping. (Full instrument in Appendix B)

By drawing on my own experience at sea, on the literature of seafaring, and on the pilot discussions, I drew up a list of statements concerning the needs of individuals, groups and shipping companies and concerning current changes ashore and at sea. Against each statement, I listed a number of aspects of seafaring with which the item appeared to harmonise or conflict. Respondents were asked to state whether they agreed or disagreed with the statements and to write their own comments.

Of the 97 respondents in the total sample, six had difficulty in completing this part of the survey instrument.

2) The survey instrument (i.e. 1a), b) & c) above) was applied to randomly selected serving officers attending courses at various nautical colleges in Britain: The returns came from:

- 4 Masters
- 21 Deck Officers
- 21 Engineer Officers
- 16 Catering Officers

Follow-up interviews were held where necessary and possible. A preliminary analysis showed a high degree of agreement with the harmony/conflict statements.

The purpose of this random survey was to collect data on current attitudes and WEPS scores in the British Merchant Navy before commencing the field work in two shipping companies. I wanted to detect those aspects common and unique to the two companies.

3) The survey instrument was sent to seven managers in each of two companies and to six officers in each of four ships (Two ships in each company). Later I visited the ships and offices to collect the completed instruments, and to interview and observe the respondents.
The first sets of interviews and observations involved shore managers only. Each interview commenced with a discussion over points arising from the questionnaire after which it ranged freely over any aspects of the company chosen by the respondent. The questionnaire proved invaluable in focussing attention on organizational issues for each of the free discussion periods stayed within the areas of company organization, departmental relationships and ship-shore relationships.

4) The preliminary analysis and discussions showed that all respondents to date acknowledged the existence of many conflicts between the needs of individuals and some of the emerging trends in shipping.

Thus, before joining the first ship for a voyage, I developed a further instrument to measure specific compromise patterns.

5) After completing the office interviews and the voyages aboard and visits to the ships, I prepared three preliminary reports and sent copies to each respondent. They were designed and phrased to elicit further information and reactions; and resulted in further visits to offices, further interviews with some of the officers, and many letters and telephone calls - each one of which gave more specific information on aspects of the individuals and companies.

6) After the completion of all the field work, the survey data was punched onto cards and analysed, initially by cross-groupings and, later, by relationships between attitudes and WEPS scores.

7) Table 9.1 on the following page gives the composition of groups used in the questionnaire analysis in Appendix B.

By referring to the histogram of ages in Diagram 1.4 page 23, it can be seen that, although my total sample was very small, the age profile of respondents corresponds to the overall age profile of officers serving on all UK ships.
Table 9.1
COMPOSITION OF GROUPS IN QUESTIONNAIRE ANALYSIS

The groups shown below, which may include shore managers, correspond to the vertical columns in the questionnaire analysis. In the table below, those groups marked ex-SM are identical with the groups immediately above except that shore manager data has been excluded.

<table>
<thead>
<tr>
<th>BY AGE</th>
<th>Number in group</th>
<th>Average age in years</th>
<th>Standard deviation of age</th>
<th>Average WEPS score</th>
<th>Standard deviation of WEPS score</th>
<th>Years at sea or in shipping industry</th>
<th>Standard deviation of time in shipping</th>
<th>Average No. of shipping companies worked for</th>
<th>Ex-SM</th>
<th>Ex-SM</th>
<th>Ex-SM</th>
<th>Ex-SM</th>
<th>Catering Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 26</td>
<td>23</td>
<td>23.0</td>
<td>1.8</td>
<td>28.6</td>
<td>6.9</td>
<td>4.9</td>
<td>2.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>26 - 30</td>
<td>27</td>
<td>27.9</td>
<td>1.1</td>
<td>29.3</td>
<td>5.3</td>
<td>9.4</td>
<td>2.3</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>12</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>31 - 35</td>
<td>18</td>
<td>32.3</td>
<td>1.5</td>
<td>31.8</td>
<td>6.5</td>
<td>13.7</td>
<td>4.2</td>
<td>2.8</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Over 40</td>
<td>19</td>
<td>47.4</td>
<td>4.8</td>
<td>28.5</td>
<td>8.3</td>
<td>28.3</td>
<td>5.9</td>
<td>2.2</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Ex-SM</td>
<td>9</td>
<td>48.8</td>
<td>6.1</td>
<td>32.0</td>
<td>9.0</td>
<td>28.9</td>
<td>7.3</td>
<td>2.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BY WEPS</th>
<th>Number in group</th>
<th>Average age in years</th>
<th>Standard deviation of age</th>
<th>Average WEPS score</th>
<th>Standard deviation of WEPS score</th>
<th>Years at sea or in shipping industry</th>
<th>Standard deviation of time in shipping</th>
<th>Average No. of shipping companies worked for</th>
<th>Catering Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 26</td>
<td>24</td>
<td>33.2</td>
<td>9.6</td>
<td>20.6</td>
<td>4.1</td>
<td>14.5</td>
<td>10.1</td>
<td>2.1</td>
<td>7</td>
</tr>
<tr>
<td>Ex-SM</td>
<td>17</td>
<td>29.1</td>
<td>7.7</td>
<td>20.9</td>
<td>4.1</td>
<td>10.1</td>
<td>7.2</td>
<td>2.2</td>
<td>-</td>
</tr>
<tr>
<td>26 - 33</td>
<td>47</td>
<td>31.5</td>
<td>8.7</td>
<td>29.5</td>
<td>2.4</td>
<td>13.1</td>
<td>9.1</td>
<td>2.4</td>
<td>7</td>
</tr>
<tr>
<td>Ex-SM</td>
<td>40</td>
<td>29.5</td>
<td>7.2</td>
<td>29.5</td>
<td>2.3</td>
<td>10.9</td>
<td>8.4</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td>Over 33</td>
<td>26</td>
<td>33.2</td>
<td>9.0</td>
<td>38.2</td>
<td>2.7</td>
<td>14.6</td>
<td>7.5</td>
<td>2.3</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BY JOB</th>
<th>Number in group</th>
<th>Average age in years</th>
<th>Standard deviation of age</th>
<th>Average WEPS score</th>
<th>Standard deviation of WEPS score</th>
<th>Years at sea or in shipping industry</th>
<th>Standard deviation of time in shipping</th>
<th>Average No. of shipping companies worked for</th>
<th>Catering Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td>14</td>
<td>43.2</td>
<td>5.7</td>
<td>24.7</td>
<td>7.4</td>
<td>25.5</td>
<td>6.6</td>
<td>1.8</td>
<td>14</td>
</tr>
<tr>
<td>Master</td>
<td>8</td>
<td>43.1</td>
<td>7.1</td>
<td>32.1</td>
<td>10.5</td>
<td>26.9</td>
<td>9.6</td>
<td>3.3</td>
<td>8</td>
</tr>
<tr>
<td>Deck Off.</td>
<td>26</td>
<td>26.2</td>
<td>3.1</td>
<td>28.5</td>
<td>7.4</td>
<td>8.8</td>
<td>2.9</td>
<td>1.5</td>
<td>26</td>
</tr>
<tr>
<td>Eng. Off.</td>
<td>29</td>
<td>31.2</td>
<td>6.9</td>
<td>32.7</td>
<td>6.0</td>
<td>11.1</td>
<td>6.3</td>
<td>2.7</td>
<td>29</td>
</tr>
<tr>
<td>Cat. Off.</td>
<td>20</td>
<td>30.2</td>
<td>8.2</td>
<td>29.5</td>
<td>6.3</td>
<td>10.9</td>
<td>8.2</td>
<td>2.8</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BY COMPANY</th>
<th>Number in group</th>
<th>Average age in years</th>
<th>Standard deviation of age</th>
<th>Average WEPS score</th>
<th>Standard deviation of WEPS score</th>
<th>Years at sea or in shipping industry</th>
<th>Standard deviation of time in shipping</th>
<th>Average No. of shipping companies worked for</th>
<th>Catering Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gem Shore</td>
<td>7</td>
<td>44.0</td>
<td>6.6</td>
<td>25.2</td>
<td>7.1</td>
<td>27.4</td>
<td>5.8</td>
<td>1.0</td>
<td>7</td>
</tr>
<tr>
<td>Poly. Shore</td>
<td>7</td>
<td>42.4</td>
<td>5.0</td>
<td>24.3</td>
<td>8.1</td>
<td>23.6</td>
<td>8.0</td>
<td>2.6</td>
<td>7</td>
</tr>
<tr>
<td>Gem Sea</td>
<td>11</td>
<td>35.5</td>
<td>11.6</td>
<td>32.2</td>
<td>6.4</td>
<td>17.7</td>
<td>12.1</td>
<td>1.6</td>
<td>2</td>
</tr>
<tr>
<td>Total Gcm</td>
<td>18</td>
<td>38.8</td>
<td>10.6</td>
<td>29.5</td>
<td>6.1</td>
<td>21.5</td>
<td>11.0</td>
<td>1.4</td>
<td>7</td>
</tr>
<tr>
<td>Total Poly.</td>
<td>17</td>
<td>36.6</td>
<td>8.7</td>
<td>29.6</td>
<td>8.7</td>
<td>17.5</td>
<td>8.0</td>
<td>2.8</td>
<td>7</td>
</tr>
<tr>
<td>Poly. Sea</td>
<td>10</td>
<td>32.5</td>
<td>8.6</td>
<td>33.4</td>
<td>8.0</td>
<td>13.2</td>
<td>7.3</td>
<td>2.9</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHIP_TYPE</th>
<th>Number in group</th>
<th>Average age in years</th>
<th>Standard deviation of age</th>
<th>Average WEPS score</th>
<th>Standard deviation of WEPS score</th>
<th>Years at sea or in shipping industry</th>
<th>Standard deviation of time in shipping</th>
<th>Average No. of shipping companies worked for</th>
<th>Catering Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tankers</td>
<td>40</td>
<td>34.2</td>
<td>9.9</td>
<td>30.1</td>
<td>6.6</td>
<td>16.5</td>
<td>10.4</td>
<td>2.1</td>
<td>7</td>
</tr>
<tr>
<td>Ex-SM</td>
<td>33</td>
<td>32.1</td>
<td>9.0</td>
<td>31.2</td>
<td>6.1</td>
<td>14.5</td>
<td>9.7</td>
<td>2.2</td>
<td>11</td>
</tr>
<tr>
<td>Liners</td>
<td>36</td>
<td>23.8</td>
<td>6.4</td>
<td>29.5</td>
<td>6.6</td>
<td>11.0</td>
<td>6.2</td>
<td>2.2</td>
<td>11</td>
</tr>
</tbody>
</table>
Commentary on Table 9.1: Composition of Groups

As a preliminary step in the analysis of survey responses the respondents were grouped by age, WEPS score, job, company and type of ship. In the commentary below, attention is drawn to any significant differences or distortions within these groups.

Age Groups

As the focus of this survey was on serving officers and managers, cadets and young officers who had recently joined the shipping industry were excluded. The incremental differences between the groups is about 5 years, except for the over-40's who are about 10 years older than the previous group.

By inspection it can be seen that no significant differences in WEPS scores exist across the age groups.

Years at sea or in the shipping industry are obviously related to age.

The average number of companies worked for is not significantly related to age; but the number of companies in the 36 - 40 age group is significantly higher than in the other age groups.

The age groups are distorted so far as types of jobs are concerned; those under 30 years contain serving officers but no Masters and managers while the over-40 age group contains a predominance of shore managers.

WEPS Groups

The average WEPS score of the total sample was 29.5. The three groups chosen have an incremental difference of 9 points between successive groups.

It may be remarked that the over-33 WEPS group contains no shore managers.

Job Groups

The managers and masters are significantly older than the deck, engine and catering officers.

No significant differences exist in WEPS scores across job groupings. The 7.4 points difference between managers and masters is not significant at the 95% level.

The deck officers form the group with the lowest sea time and number of companies; the difference between deck officers and masters in numbers of companies is significant at the 92% level.
COMPANY GROUPS

While Polychem sea staff are slightly younger, on average, than Gem sea staff, the difference is not significant.

All Polychem people have served in more companies than have the Gem people - most of the latter having served in Gem for all their working lives.

SHIP TYPE GROUPS

So far as average age, WEPS score and time at sea are concerned, no significant differences exist between liner and tanker people.

The tanker group contains managers and masters which the liner group does not.

8) Appendix B (pages 193-214) shows the proportions of respondents in each group agreeing with the questionnaire statement that the stated aspect was in harmony or in conflict with the particular need or change in the shipping industry (or the need of the individual or company where relevant).

Where differences exist at the 95% level of confidence they are highlighted by underlining to facilitate rapid visual inspection of the data presented.

The significant differences were derived as follows:-

Example: Age groups - $G_1$, $G_2$, $G_3$ . . . $G_n$

In age group $G_1$ : number in group $= n_1$ Proportion agreeing $= A_1$
In age group $G_2$ : number in group $= n_2$ Proportion agreeing $= A_2$

$$SD_1 = \sqrt{\frac{A_1(1-A_1)}{n_1}}$$
$$SD_2 = \sqrt{\frac{A_2(1-A_2)}{n_2}}$$

$$F_c = \frac{SD_1^2}{SD_2^2}$$

and $F_c$ compared with tabulated $F_{0.05}$ to determine variance not significantly different.

Then, $\text{Estimated weighted variance} = SD_c$

$$Z_c = \frac{\bar{A}_1 - \bar{A}_2}{SD_c} = Z_c$$

$Z_c$ compared with $Z = 1.96$ SD , two tailed
to determine whether a significant difference does or does not exist between the groups at the 95% level.

If $Z_c > 1.96$ significant difference exists.
9) ANALYSIS OF WEPS TEST

The WEPS test is designed to measure self-subordination, impersonalization, rule conformity, and traditionalism.

Although traditionalism may be thought to be associated with age, there is no clear indication that the total WEPS score obtained by an individual is related to age. Hence,

**Hypothesis 1** "There is no association between age of seafarers and WEPS scores obtained"

This hypothesis may be tested by constructing a contingency table and applying a chi-square test ($\chi^2$).

<table>
<thead>
<tr>
<th>WEPS score</th>
<th>Age (years) 30 and under</th>
<th>Age (years) 31 and over</th>
<th>Observed row totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 and under</td>
<td>Observed 31</td>
<td>Observed 11</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Expected 25.8</td>
<td>Expected 16.2</td>
<td></td>
</tr>
<tr>
<td>31 and over</td>
<td>Observed 20</td>
<td>Observed 21</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Expected 25.2</td>
<td>Expected 15.8</td>
<td></td>
</tr>
<tr>
<td>Observed column totals</td>
<td>51</td>
<td>32</td>
<td>83</td>
</tr>
</tbody>
</table>

\[
\chi^2_{(calc)} = \frac{5.2^2}{25.8} + \frac{5.2^2}{16.2} + \frac{5.2^2}{25.2} + \frac{5.2^2}{15.8} = 5.50
\]

Degrees of freedom = (No. rows - 1)(No. columns - 1) = 1

From tables, $\chi^2 = 3.84$ for probability 0.05 and 1 d.f.

If null hypothesis 1 is true $\chi^2 (0.05) > \chi^2 (calc)$

but $3.84 < 5.50$

Thus the null hypothesis 1 may be rejected and its alternative stated "THERE IS AN ASSOCIATION BETWEEN AGE OF SEAFARERS AND THE WEPS SCORES OBTAINED".

Inspection of the contingency table, above, gives an indication that WEPS scores increase with age of respondents.

Note: In the pages that follow, the whole procedure of constructing the contingency table and applying the chi-square test will not be repeated in full; reference may be made to the procedure given above.

I should have shown that, for any one box, the expected frequency is obtained from: $E = \frac{(\text{Row total})(\text{Column total})}{\text{Grand Total}}$. 

\[
E = \frac{(\text{Row total})(\text{Column total})}{\text{Grand Total}}
\]
By inspection of Table 9.1, (page 165) a clear relationship can be seen to exist between age and number of years spent at sea. The relevant parts of Table 9.1 (excluding shore managers) being:

<table>
<thead>
<tr>
<th>Average age of age groups</th>
<th>Average number of years spent at sea</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.0 years</td>
<td>4.9</td>
</tr>
<tr>
<td>27.9</td>
<td>9.4</td>
</tr>
<tr>
<td>32.4</td>
<td>13.3</td>
</tr>
<tr>
<td>37.6</td>
<td>19.1</td>
</tr>
<tr>
<td>48.8</td>
<td>28.9</td>
</tr>
</tbody>
</table>

Thus, following the testing of hypothesis 1, the next hypothesis may be stated as

**Hypothesis 2** "There is an association between length of time spent at sea and WEPS scores obtained"

\[
\begin{array}{|c|c|c|}
\hline
\text{YEARS SPENT AT SEA} & \text{30 \& UNDER} & \text{31 \& OVER} \\
\hline
\text{WEPS score} & \text{Observed} & \text{Expected} & \text{Observed} & \text{Expected} \\
\text{30 \& UNDER} & 37 & 31 & 9 & 14.9 \\
\text{31 \& OVER} & 19 & 24.8 & 18 & 12.1 \\
\hline
\end{array}
\]

\[
\chi^2(\text{calc}) = \frac{6.0^2}{31.0} + \frac{5.9^2}{14.9} + \frac{5.8^2}{24.8} + \frac{5.9^2}{12.1} = 7.74
\]

\[
\chi^2(0.05) = 3.84 \text{ for 1 d.f.} \quad < \chi^2(\text{calc})
\]

Therefore "THERE IS AN ASSOCIATION BETWEEN LENGTH OF TIME SPENT AT SEA AND WEPS SCORES OBTAINED"

I embarked on this research programme believing that those people who worked for many years in one shipping company would be more oriented to rule conformity and traditionalism than those who moved from company to company. Out of this belief I formulated

**Hypothesis 3** "There is an association between the number of shipping companies worked for and WEPS scores obtained"

The contingency table and chi-square test is shown on the next page
<table>
<thead>
<tr>
<th>Number of companies worked for</th>
<th>One only</th>
<th>Two or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEPS score 30 and under</td>
<td>Observed 21</td>
<td>Expected 21.7</td>
</tr>
<tr>
<td>WEPS score 31 and over</td>
<td>Observed 20</td>
<td>Expected 19.3</td>
</tr>
</tbody>
</table>

\[
X^2 (\text{calc}) = \frac{0.7^2}{21.7} + \frac{0.7^2}{22.3} + \frac{0.7^2}{19.3} + \frac{0.7^2}{19.7} = 0.094
\]

\[
X^2 (0.05) = 3.84 \quad \text{for 1 d.f.} \quad > X^2 (\text{calc})
\]

Therefore, in the overall sample used, **THERE IS NO APPARENT ASSOCIATION BETWEEN NUMBER OF COMPANIES WORKED FOR AND WEPS SCORES OBTAINED** (but see below).

Observing from hypotheses 1 and 2 that associations existed between WEPS scores and age/sea-time, I formulated additional hypotheses to test whether an association existed between WEPS scores and a combination of sea-time and number of companies. I needed a definite separation between those who had been at sea for a relatively few number of years and those who had been at sea much longer.

The two hypotheses formulated were:

**Hypothesis 4:** "Among those who have been at sea for seven years or less an association exists between the number of companies worked for and WEPS score obtained"

**Hypothesis 5:** "Among those who have been at sea for ten years or more an association exists between the number of companies worked for and WEPS scores obtained"

The contingency tables given on the following page and the manner in which the discovered association changed in direction show why attempts to discover the association in hypothesis 3 failed and why I needed the definite gap of some years between one group and another; the three year gap chosen was done purely arbitrarily.
In the two contingency tables below, Expected Frequencies are abbreviated as \((E = \ldots\)) The reason is to draw visual attention to the changing direction of the associations.

<table>
<thead>
<tr>
<th>MEN WHO HAVE SPENT 7 YEARS OR LESS AT SEA</th>
<th>Number of companies worked for</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One only</td>
<td>Two or more</td>
</tr>
<tr>
<td>WEPS score 25 and under</td>
<td>Observed 2</td>
<td>Observed 6</td>
</tr>
<tr>
<td></td>
<td>((E = 4.4))</td>
<td>((E = 3.6))</td>
</tr>
<tr>
<td>WEPS score 25 and over</td>
<td>Observed 14</td>
<td>Observed 7</td>
</tr>
<tr>
<td></td>
<td>((E = 11.6))</td>
<td>((E = 9.4))</td>
</tr>
</tbody>
</table>

\[
\chi^2 (\text{calc}) = \frac{2.4^2}{4.4} + \frac{2.4^2}{3.6} + \frac{2.4^2}{11.6} + \frac{2.4^2}{9.4} = 4.0
\]

\[
\chi^2 (0.05) = 3.84 \text{ for } 1 \text{ d.f.} \quad \chi^2 (\text{calc})
\]

Admitting that the observed and expected frequencies are small, the indications are that **THERE IS AN ASSOCIATION BETWEEN NUMBER OF COMPANIES WORKED FOR AND WEPS SCORES OBTAINED AMONG THOSE WHO HAVE SPENT 7 YEARS OR LESS AT SEA.**

<table>
<thead>
<tr>
<th>MEN WHO HAVE SPENT 10 YEARS OR MORE AT SEA</th>
<th>Number of companies worked for</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One only</td>
<td>Two or more</td>
</tr>
<tr>
<td>WEPS score 31 and under</td>
<td>Observed 11</td>
<td>Observed 8</td>
</tr>
<tr>
<td></td>
<td>((E = 7.7))</td>
<td>((E = 11.3))</td>
</tr>
<tr>
<td>WEPS score 32 and over</td>
<td>Observed 6</td>
<td>Observed 17</td>
</tr>
<tr>
<td></td>
<td>((E = 9.3))</td>
<td>((E = 13.7))</td>
</tr>
</tbody>
</table>

\[
\chi^2 (\text{calc}) = \frac{3.3^2}{9.5} + \frac{3.3^2}{13.7} + \frac{3.3^2}{7.7} + \frac{3.3^2}{11.3} = 4.34
\]

\[
\chi^2 (0.05) = 3.84 \text{ for } 1 \text{ d.f.} \quad \chi^2 (\text{calc})
\]

Thus, **THERE IS AN ASSOCIATION BETWEEN NUMBER OF COMPANIES WORKED FOR AND WEPS SCORES OBTAINED AMONG THOSE WHO HAVE SPENT TEN YEARS OR MORE AT SEA.**

But, even more important than supporting hypotheses 4 and 5, the two contingency tables and observed frequencies give an indication that **THE DIRECTION OF ASSOCIATION CHANGES:**

- **AMONG THOSE WHO HAVE SPENT LESS THAN 7 YEARS AT SEA, ONE COMPANY MEN HAVE HIGHER WEPS SCORES THAN MULTI-COMPANY MEN**
- **WHILE AMONG THOSE WHO HAVE SPENT MORE THAN 10 YEARS AT SEA, ONE-COMPANY MEN HAVE LOWER WEPS SCORES THAN MULTI-COMPANY MEN**

**IN THE SAMPLE GROUPS USED.**
The sample groups used are far too small to support any claim that the differences between one-company and multi-company (i.e. occupationally mobile) men apply to the whole of the British Merchant Navy but they do help to explain the behavioural differences observed in the Gem and Polychem ships.

Regression analyses were performed on the data and the regression curves of best fit were found to be:

**FOR MEN WHO HAD STAYED WITHIN ONE COMPANY ONLY:**

\[
\text{WEPS score} = 23.21 + 1.26(\text{Years at sea}) - 0.04(\text{Years at sea})^2
\]

Coefficient of correlation = 0.783

**FOR MEN WHO HAD WORKED FOR TWO OR MORE COMPANIES:**

\[
\text{WEPS score} = 6.03 + 7.41(\text{Years at sea} \times \text{Log No. of companies}) - 0.365(\text{Years at sea} \times \text{Log No. of companies})^2
\]

Coefficient of correlation = 0.700

The regression curves are shown in Diagram 9.1 below.

![Diagram 9.1: Regression curves of WEPS score against years at sea and number of companies served in](image-url)
The X axis of Diagram 9.1 - number of years at sea - may mislead readers into imagining that an individual's WEPS score alters as he spends longer at sea and as he moves from one company to another. This was NOT a longitudinal study under which individuals are tested over a number of years and, until such a study is conducted, no claim can be made that WEPS scores do increase with sea-time and intercompany mobility. The higher scores obtained by the older, mobile people in this study may reflect nothing more than the older mobile people with low WEPS scores had already left the sea or had moved to companies not sampled. However, as one stage of the survey involved a random sample of people from over 20 companies, the indications exist that those officers who stay at sea and who move across companies either enter with higher WEPS scores or develop higher bureaucratic orientation (as measured by the WEPS test) the longer they stay and the more they move.

The interviews and observations left me with the distinct impression that lower WEPS scores are found in people who enjoy inner security and support while higher WEPS scores are found in those who need external support and security.

I have already shown that, among those who have had less than 8 years at sea, the WEPS scores of one-company men are significantly higher than those of multi-company men. In their working and living conditions, seafarers experience a high degree of total care by their employers (far higher than is found ashore in commercial enterprises) and the officer with a high initial WEPS score and who needs externally granted support and security may find that the large, long-established, financially strong shipping company is more appealing than the smaller, weaker company. Once he has joined the large, strong company and finds that his needs are being met he may find it extremely difficult, if not impossible, to switch from his present to another company. On the other hand, the officer with a low initial WEPS score who enjoys inner security and support may not wish to pay the price on self-subordination and lack of variety and may find it relatively easy to switch from one company to another.
However, with advancing years at sea and with promotion up the ranks, the one-company man feels more secure—especially if he has built up a back-log of good service and if he knows that he has a friendly 'defender' back at head-office—and becomes more willing to experiment with change in that same company. On the other hand, the highly mobile man who, as already mentioned, does not need external support, nevertheless needs a degree of certainty and familiarity with the working situation (and, therefore, with what skills he uses and how he uses them) as he moves from one company to another and he develops resistances to changes in traditional working practices. This explanation was confirmed during the field work.

The regression curves in Diagram 9.1 (page 172) show peaks around 15 to 20 years of time at sea for both one-company and multi-company men. These peaks may be explained in terms of the promotional system for it is between 15 and 20 years of first going to sea when the deck officer is promoted to Master and the engineer officer is promoted to Chief Engineer. Thus, the highest WEPS scores at this age (and as will be shown, the highest resistance to change) may indicate that either (i) having waited for so long to gain the top positions, potential Masters and Chief Engineers do not want any change made to the organizational roles and positions of these ranks; or (ii) men in this peak range may only recently have been promoted to the top ranks and could not tolerate any great change in their roles and positions while still feeling their ways. It may be worth mentioning that the Master of the Polychem ship "Joan" had only just been promoted to command—in fact, this was the reason for his leaving his last company, an oil major in which, until then, he had spent his whole working life.

By differentiating the regression curves, the turning points have been calculated as:

One-company men  Peak WEPS score at 15.75 years of sea time
Two-company men  Peak WEPS score at 33.65 years of sea time
10) RELATIONSHIPS BETWEEN WEPS AND THE SURVEY QUESTIONNAIRE

Parts of the survey questionnaire were designed specifically to relate certain measurements of the WEPS test with changes in the stripping industry and, for this purpose, three indices were constructed. The questions relating to each index were spread through the questionnaire in an attempt to prevent respondents seeing that WEPS and the questionnaire were related and, possibly, trying to match their answers to each instrument.

a) The anti-traditional index in which a high score indicates that the respondent holds negative attitudes towards traditional practices and in which a low score indicates attitudinal defence of traditional practices.

Statements 7a,b,c; 8d; 9a,b,c,d; 26c; 32c; 33b; 42d,e; (Appendix B) 46c; 48e,f; 52g; 60h; 61h; 63a,b,c,d,e; & 64d all concerned traditional practices and were so phrased that agreement with the questionnaire statement indicated that the respondent held negative attitudes towards traditional practices and was positively inclined to have these practices changed. See Appendix B.

A simple scoring system was adopted under which an agreement with a questionnaire statement received +1; a disagreement -1; and an undecided or neutral 0.

Maximum score for total agreement = 25.

Hypothesis 6: "A negative relationship exists between an officer's WEPS score and his anti-traditional index" (that is, the lower his WEPS score, the higher his anti-traditional index).

<table>
<thead>
<tr>
<th>WEPS score</th>
<th>Anti-trad. score</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 and under</td>
<td>9 and under.</td>
</tr>
<tr>
<td></td>
<td>Observed 16</td>
</tr>
<tr>
<td></td>
<td>(E = 21.9)</td>
</tr>
<tr>
<td>31 and above</td>
<td>10 and above.</td>
</tr>
<tr>
<td></td>
<td>Observed 22</td>
</tr>
<tr>
<td></td>
<td>(E = 16.07)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEPS score</th>
<th>Anti-trad. score</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 and under</td>
<td>9 and under.</td>
</tr>
<tr>
<td></td>
<td>Observed 29</td>
</tr>
<tr>
<td></td>
<td>(E = 23.07)</td>
</tr>
<tr>
<td>31 and above</td>
<td>10 and above.</td>
</tr>
<tr>
<td></td>
<td>Observed 11</td>
</tr>
<tr>
<td></td>
<td>(E = 16.9)</td>
</tr>
</tbody>
</table>

\[
\chi^2 (calc) = \frac{5.9^2}{21.9} + \frac{5.9^2}{16.07} + \frac{5.9^2}{23.07} + \frac{5.9^2}{16.9} = 7.32
\]

\[
\chi^2 (0.05) = 3.84 \text{ for } 1 \text{ d.f.} < \chi^2 (calc)
\]

THUS, THERE IS AN ASSOCIATION BETWEEN WEPS SCORE AND THE ANTI-TRADITION INDEX

* Only those officers who had completed all statements are included, hence 78 instead of 83.
Diagram 9.2: Relationship between WEPS score and anti-traditional index

Line of best fit: \( y = 64.14 - 1.325(\text{WEPS score}) \)

Coeff. of Determination = 0.618

Coeff. of Correlation = 0.786

Thus, from hypothesis 6 and the preceding calculations, it can be said that **the lower a man's WEPS score the higher his anti-traditional index in shipping**.
10) b) The self-assertive index in which a high score indicates that the respondent holds self-assertive attitudes within his shipboard situation; or, conversely, the lower his score the more are his attitudes in line with self-subordination.

In Appendix B, statements 3b;e; 4e; 14b; 15a,c,d,e,g; 16c,d; 17b,c; 18b,d; 20a,b,e,f; 21a,b,d,e; 39a,b,c,d,e,f; 40a,b,c,d,e,f,g,h; & 47f all concerned self-subordination whether manifested in total care of the individual by the company or in promotion based on length of service instead of on merit. The scoring method was similar to that used for the anti-tradition index, but with a possible maximum of 38.

Hypothesis 7: "A negative relationship exists between an officer's WEPS score and his self-assertive index" (i.e. the lower his WEPS score, the higher his self-assertive index)

<table>
<thead>
<tr>
<th>WEPS score 30 and under</th>
<th>WEPS score 31 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-assert score 17 and under</td>
<td>Observed 14 (E = 20.23)</td>
</tr>
<tr>
<td>Self-assert score 18 and above</td>
<td>Observed 33 (E = 26.77)</td>
</tr>
<tr>
<td></td>
<td>47</td>
</tr>
</tbody>
</table>

$X^2_{(calc)} = 8.316 > X^2_{(0.05)} = 3.84$ for 1 d.f.

Thus, THERE IS AN ASSOCIATION BETWEEN WEPS SCORE AND THE SELF-ASSERTIVE INDEX

Diagram 9.3: Relationship between WEPS and self-assertive index

Line of best fit: $y = 84.45 - 2.259$ (WEPS score)

Coeff. of Determination = 0.603; Coeff of correlation = 0.776

Thus, from hypothesis 7 and the above calculations, it can be said that THE LOWER A MAN'S WEPS SCORE THE HIGHER HIS SELF-ASSERTIVE INDEX IN SHIPPING.
10) c) The variety index in which a high score indicates that the respondent holds attitudes consistent with a "search for variety" in ships, trades and ports visited. In Appendix B, statements 2d; 3c; d; 14e; 19b; 53c; & 55d concerned variety in ships, trades and ports visited. The scoring method was similar to the other two indices but the possible maximum was 7.

Hypothesis 8: "A negative relationship exists between an officer's WEPS score and his variety index"

| Variety index score 3 and under | WEPS score 30 and under | Observed 17 (E = 20.675) |
| Variety index score 4 and above | WEPS score 31 and above | Observed 12 (E = 15.675) |

\[ \chi^2 (\text{calc}) = 3.082 \]

Thus, at .05 probability, no association can be claimed to exist between WEPS score and the variety index.

But an association may exist for, at 0.10 probability:

\[ \chi^2 (\text{calc}) = 3.082 > \chi^2 (0.10) = 2.706 \] for 1 d.f.

The observed frequencies in the contingency table above indicate that the lower an officer's WEPS score the higher may be his Variety Index (28 observations in high variety/low WEPS box)

Thus, AMONG THE RESPONDENTS IN THE SAMPLE USED, :-

(1) A low WEPS score indicates attitudes which are against traditional practices; against self-subordination; and possibly against uniformity of ships, trades and ports visited.

(2) A high WEPS score indicates attitudes which favour traditional practices; favour self-subordination; and possibly favour uniformity of ships, trades and ports visited.
11) Rule conformity

The WEPS test is designed to measure rule conformity and I expected to find a relationship between acceptance of company's rules and regulations and the WEPS scores. A "rule conformity index" was constructed from statements 5a,b,c,d,e; 8e; 9c,e; 15e; 24a; 37b,c; 38c; 42e; 61d; & 70b all of which concerned rules and regulations.

Chi-square tests and other analyses failed to find an association between WEPS scores and the rule conformity index; the two appear to be independent and, in fact, those with low WEPS scores appeared to be marginally more in favour of the rules than those with high WEPS scores.

As discussed elsewhere in this report, the interviews and observations made aboard ship showed clearly that, among the officers involved in this programme, company's rules and regulations serve a very useful purpose in expanding and not restricting an individual's perceived freedom of movement; provided the rules are meaningful.

In actual quantity and pervasiveness of the rules, Gem Tankers has far more rules and regulations than does Polychem yet the GEM officers experience the rules as supportive rather than restrictive. All the Gem officers interviewed, agreed with the GEM rules and they drew on numerous examples of past incidents within Gem to explain to me why certain rules had been framed.

The situation in Polychem is markedly different from that in Gem. Polychem officers have not yet shared enough incidents to understand precisely what interpretation should be put on each rule and many of the Polychem officers interviewed commented that the rule book had been written before the first Polychem ship came into service. Not only was there an absence of commonly shared incidents but, as shown in Table 9.1, the average WEPS score of the Polychem sea staff was 33.4 (significantly higher than the overall average obtained of 30.2) and as shown in Diagram 9.2 (the relationship between high WEPS score and traditionalism) which, together, indicate the high probability of newly engaged Polychem people giving traditional interpretations to the rules. This might have been functional had all Polychem people have come from the same previous company; unfortunately (for the rule interpretations) they came from many different companies.
12) The measurement of individual reward and payment patterns

Owing to the complexity of this instrument, it was not used as a postal survey but was applied personally by the researcher. The instrument (scored for one particular respondent) is shown in Diagram 9.4 on the following page (181).

24 possible reasons for switching companies were listed. In series—and treating each reason in isolation from the remainder—the respondent was asked if he would consider switching from his present to another company for that reason and that reason only.

After all the reasons for switching had been elicited, it was suggested to the respondent that other features of his potential new company might not be as attractive as similar features of his present company. It was suggested that, while switching would satisfy the particular reason, he might have to accept reductions in some of the attractive features of his present company. These "reductions" or "payments" are shown at the head of the vertical columns in Diagram 9.4 and are 14 in number. The interview was conducted in a manner which forced the respondent to consider each 'payment' in isolation from the remaining payments—no man was asked to make all 14 payments in return for satisfying specific reasons for switching.

Attention was given to the stated reasons for switching and to the number of payments a man was prepared to make to satisfy that reason; but even more attention was given to the payments a man would NOT make for it is through these non-payments (i.e. the features in which the respondent would not be prepared to accept a reduction) that one can glimpse those features of the present company most important to the respondent.

The scoring is relatively simple and is based on a number of arguments which will be more easily understood by the reader after he has inspected the instrument on the next page.
INSTRUCTIONS

Men may switch from one shipping company to another for a variety of reasons which may include gaining some improvement or reducing some of the less pleasant aspects of seafaring.

Would you please look down the left-hand column and place a ring around the word "Yes" if you would consider changing from your present company for that reason and that reason only - or place a ring around the word "No" if you would not consider changing from your present company for that particular reason.

After you have ringed the yes's and no's in the left hand column, please look at the features listed along the top of the questionnaire.

Now take ONLY those reasons for changing where you have ringed the "Yes" and place a tick under any feature you would be willing to accept in your new company in order to gain that particular improvement.

When completing this questionnaire, please treat each reason for change as a separate issue.

---

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Features Listed Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In order to gain the improvements marked in Column 1, I would be willing to accept the following features in my new company.</td>
</tr>
<tr>
<td>2</td>
<td>Yes/No for higher wages</td>
</tr>
<tr>
<td>3</td>
<td>Yes/No for greater security</td>
</tr>
<tr>
<td>4</td>
<td>Yes/No for faster promotion</td>
</tr>
<tr>
<td>5</td>
<td>Yes/No for better leaves</td>
</tr>
<tr>
<td>6</td>
<td>Yes/No for better training</td>
</tr>
<tr>
<td>7</td>
<td>Yes/No for better living conditions aboard</td>
</tr>
<tr>
<td>8</td>
<td>Yes/No for more time ashore in port</td>
</tr>
<tr>
<td>9</td>
<td>Yes/No for more assistance from shore labour</td>
</tr>
<tr>
<td>10</td>
<td>Yes/No for better stores and spares system</td>
</tr>
<tr>
<td>11</td>
<td>Yes/No for a job where I can exercise my own judgement</td>
</tr>
<tr>
<td>12</td>
<td>Yes/No to gain a feeling of real responsibility</td>
</tr>
<tr>
<td>13</td>
<td>Yes/No to gain information on company's activities</td>
</tr>
<tr>
<td>14</td>
<td>Yes/No for better behaved ratings</td>
</tr>
<tr>
<td>15</td>
<td>Yes/No for longer ship-to-shore relationships</td>
</tr>
<tr>
<td>16</td>
<td>Yes/No to travel and see the sights</td>
</tr>
<tr>
<td>17</td>
<td>Yes/No to reduce periods of separation from family and friends</td>
</tr>
<tr>
<td>18</td>
<td>Yes/No to ensure long passage</td>
</tr>
<tr>
<td>19</td>
<td>Yes/No to reduce loneliness</td>
</tr>
<tr>
<td>20</td>
<td>Yes/No to rest on berths</td>
</tr>
<tr>
<td>21</td>
<td>Yes/No to reduce feeling of unimportance in the company</td>
</tr>
<tr>
<td>22</td>
<td>Yes/No to avoid excessive work load in port</td>
</tr>
<tr>
<td>23</td>
<td>Yes/No to avoid simmer and manager's personal interpretation of rules</td>
</tr>
<tr>
<td>24</td>
<td>Yes/No for less rules and regulations</td>
</tr>
<tr>
<td>25</td>
<td>Yes/No for less control from shore staff</td>
</tr>
</tbody>
</table>

---

n=7.
The number of payments a man is willing to make in order to gain a certain improvement, may be taken as indicative of the importance he attaches to that improvement. But, in making a 'payment' he shows that he is willing to forego some or all of a certain, present 'reward'; and, if he is willing to make this payment, it could be argued that he must be experiencing a surfeit of that particular reward.

In other words, if a man is prepared to accept a 5% to 10% reduction in his wages it may be that (i) wage levels do not mean much to him; or (ii) that the improvements he wants are more important to him than are wages; or (iii) he is currently enjoying a wage level more than sufficient to meet his needs i.e. a 'surfeit'.

In order to determine which of (i) to (iii) in the previous paragraph apply to specific individuals, a scoring method was devised upon the following arguments:-

Argument 1: If a certain characteristic does not mean much to a man, he would not switch companies to increase or reduce that particular characteristic. Thus, in column 1 of the instrument, only those reasons marked "Yes" are taken to indicate characteristics of the present company about which the respondent felt some concern.

Argument 2: If a certain characteristic does concern a man, he may state that he would switch companies to increase that characteristic (if it is desirable) or to reduce it (if it is undesirable); but, if it is a desirable characteristic, he would not be prepared to accept a reduction in that characteristic - in exchange for an improvement in a second characteristic - unless the latter characteristic were more important to him than the former.

Argument 3: If a certain characteristic does not concern a man, or if he is already enjoying a surfeit of that characteristic, then he is not making any real sacrifice or payment by stating that he would accept a reduction in that characteristic in return for some other desirable improvement.
### Scoring

Sum the number of "Yes's" in column 1 \((\text{Sum of yes's} = n)\)

Sum each of the vertical columns \((\text{Sum of payments} = y)\)

For each vertical column, subtract that column's `y` from `n` to get `z` for the column \((\text{i.e. } z = n - y)\)

Weight each tick in the horizontal rows with the `z` score for its column.

Thus, the sum of `z`'s in each horizontal row = the weighted score for that reason for change thus indicating the current characteristics of concern to the respondent.

In order to simplify the explanation, the responses of Eric Palmer, Chief Engineer of the Gem tanker "Mica" have been inserted in Diagram 9.4 from which:

Sum of yes's: \(n = 7\)

<table>
<thead>
<tr>
<th>(payments he is willing to make)</th>
<th>(n - y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly lower wages</td>
<td>4</td>
</tr>
<tr>
<td>Risk of new company packing up</td>
<td>0</td>
</tr>
<tr>
<td>Slightly slower promotion</td>
<td>0</td>
</tr>
<tr>
<td>Longer periods between leaves</td>
<td>1</td>
</tr>
<tr>
<td>Less training</td>
<td>6</td>
</tr>
<tr>
<td>Worse living conditions</td>
<td>0</td>
</tr>
<tr>
<td>Less time off in port</td>
<td>7</td>
</tr>
<tr>
<td>More rules</td>
<td>7</td>
</tr>
<tr>
<td>More control from shore</td>
<td>5</td>
</tr>
<tr>
<td>Less assistance from shore</td>
<td>1</td>
</tr>
<tr>
<td>Worse stores and spares</td>
<td>0</td>
</tr>
<tr>
<td>Less challenging job</td>
<td>6</td>
</tr>
<tr>
<td>Worse behaved ratings</td>
<td>0</td>
</tr>
<tr>
<td>Less happy ship-shore relations</td>
<td>7</td>
</tr>
</tbody>
</table>

Thus, in order of priority, the characteristics concerning Eric Palmer are:

1. Security                       \( (13) \)
2. Periods of separation from family \( (13) \)
3. Long ocean passages            \( (7) \)
4. Assistance from shore labour.  \( (5) \)
5. Better leaves                  \( (4) \)
6. Better training                \( (2) \)
6. Better stores and spares       \( (2) \)

He appears to be satisfied, or not concerned with, or experiencing a surfeit of:- wages, time off in port, rules, shore control, job challenge and ship-shore relationships.

Note: This method does nothing more than rank order the characteristics of concern to people; no absolute scores are obtained by which one man may be compared with another.
### Table 9.2: Rank order of company features as measured by short questionnaire

(Derived from combination of individual rank orders)

<table>
<thead>
<tr>
<th>GEM TANKERS</th>
<th>QUARTZ</th>
<th>POLYCHEM</th>
<th>TANKERS</th>
<th>NADIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Challenge</td>
<td>Challenge</td>
<td>Challenge</td>
<td>Challenge</td>
<td>Challenge</td>
</tr>
<tr>
<td>2. Ratings</td>
<td>Security</td>
<td>Living conditions</td>
<td>Security</td>
<td>Security</td>
</tr>
<tr>
<td>3. Leave</td>
<td>Wages</td>
<td>Shore leave</td>
<td>Shore leave</td>
<td>Shore leave</td>
</tr>
<tr>
<td>4. Security</td>
<td>Promotion</td>
<td>Leave</td>
<td>Leave</td>
<td>Shore leave</td>
</tr>
<tr>
<td>5. Promotion</td>
<td>Leave</td>
<td>Training</td>
<td>Training</td>
<td>Training</td>
</tr>
<tr>
<td>6. Wages</td>
<td>Shore control</td>
<td>Ship-shore</td>
<td>Ship-shore</td>
<td>Ship-shore</td>
</tr>
<tr>
<td>7. Living conditions</td>
<td>Training</td>
<td>Wages</td>
<td>Wages</td>
<td>Promotion</td>
</tr>
<tr>
<td>8. Shore control</td>
<td>Stores</td>
<td>Shore labour</td>
<td>Shore labour</td>
<td>Shore labour</td>
</tr>
<tr>
<td>10. Shore labour</td>
<td>Shore labour</td>
<td>Shore control</td>
<td>Shore control</td>
<td>Shore control</td>
</tr>
<tr>
<td>11. Training</td>
<td>Living conditions</td>
<td>Ratings</td>
<td>Ratings</td>
<td>Ratings</td>
</tr>
<tr>
<td>12. Ship-shore</td>
<td>Living conditions</td>
<td>Stores</td>
<td>Ship-shore</td>
<td>Ship-shore</td>
</tr>
</tbody>
</table>

Abbreviations used in the above table:

- **Challenge** = wanting a more challenging job; exercise of discretion, feeling of responsibility.
- **Ratings** = wanting better behaved ratings.
- **Leave** = wanting more frequent or longer home leave.
- **Living conditions** = living conditions and amenities aboard ship.
- **Shore control** = wanting less control from shore staff.
- **Stores** = the supply of stores and spare parts to the ship.
- **Shore labour** = wanting more assistance from shore labour.
- **Ship-shore** = relationships between ships' officers and shore staff to be happy or less restrictive.
- **Shore leave** = shore leave while ship is in port.

In the above table, THOSE ITEMS ABOVE THE DOTTED LINE ARE THOSE FEATURES BOTHERING PEOPLE IN THE SHIPS: FEATURES OF CONCERN WHICH MIGHT CAUSE THEM TO SWITCH COMPANIES. Those items below the dotted line are features with which they are satisfied or about which they are not concerned.
Valuable similarities and differences may be drawn from Table 9.2. The rank orders were borne out by observation and provided the basis for my description of the ships in the main body of the report and in Appendix C.

For example, MICA officers place rating behaviour very high on their list of concerns in Table 9.2 and, in fact, they were concerned about the behaviour of ratings aboard their ship. QUARTZ officers, on the other hand, are well satisfied with their ratings - as shown in Table 9.2 and as found by observation. The MICA ratings were unhappy and called MICA and "Officers' ship" (i.e. where the needs of officers are placed above those of the ratings) while the QUARTZ ratings stated that they liked the ship. Quote "The Old Man here is a bloody good type; what I like about this ship is that she isn't an Officers Ship" (2nd Steward)

The officers on both Gem ships place security fairly high in their list of concerns; but security does not appear to bother the people in JOAN.

The long-experienced tanker officers in MICA and QUARTZ are well satisfied with shore leave; in contrast to the liner men who form the majority of Polychem - they place shore leave very high on their list of concerns.

Other similarities and differences may be drawn from the Table but the one striking aspect is that the officers in all four ships put, right at the forefront of their concerns, the desire for a more challenging job where they can exercise their discretion and gain a feeling of real responsibility. This same plea is echoed in the long questionnaire Appendix B. Both companies appear to be trying to inject more challenging jobs into the ships but without the success that has met their development of comprehensive rules and, in Gem, a high degree of job security. Is this because Society is not terribly bothered about the job challenge experienced by individuals while the same Society is concerned about job security and the prevention of pollution by oil or chemicals spilling into the sea after an accident? If we are going to get more challenging jobs aboard ship, do we have to wait until Society becomes concerned about the drab lives faced by some people at their work-places? I think so.
CONCLUSIONS: JOINT OPTIMIZATION OF SYSTEMS AND CHANGE METHODS

As mentioned in Chapter 7, there does not appear to be a technical system in shipping which meets fully the definition of a behavioural system but, to simplify the first part of this chapter, it will be assumed that a technical system does exist.

Some of the statements about the systems set out below may appear to be too obvious to warrant being mentioned, but they are used to set the argument for the joint optimization of all three systems.

Optimization of the economic system will occur when the borrowed money is used to purchase the correct types of ships for the trade in question at the correct price, which ships are required to earn the correct level of freight so that loans may be repaid and the ships properly supplied for their next voyages.

Optimization of the technical system will occur when the ships are of the correct design, size and speed for the routes and cargoes in question; correctly equipped for the safe carriage of cargo; and correctly integrated with shore terminal equipment for the safe delivery of cargo.

But, as was mentioned in Chapter 7, the technical system does not exist and the closest one can get to it is to see it as part of the economic-technical system. Joint optimization of the economic and technical systems may be achieved by matching the amount of money borrowed to the amount required for the purchase and operation of ships optimally designed and operated for the trade (distance and cargoes) on which the ship is to be used. The level of freight receipts is, of course, a function of the state of the open, competitive market but the level of freight receipts is also partially governed by the amount of cargo carried per year and the condition in which it is delivered. The amount of cargo carried per year is partly a function of route length but it is also partially determined by the length of stay in port and engine breakdowns i.e. for given route length, the less the time spent in port and the less the frequency of engine breakdowns, the more the annual carrying capacity of a ship. Thus, the economic and technical systems require the ship's officer to be a movement-maximizer.
Even if one approaches the definition from a different starting point, one comes up with the same description. Apart from some small increases through burning more fuel, the daily cost to an owner remains the same no matter whether she be in port or under way at sea. Ships are designed and equipped to move themselves at sea or their cargo in port; movement of cargo is all that the customer pays for. So long as a ship is moving at sea (loaded) she is earning money but so long as she lies in port she is consuming financial energy without earning any revenues whatsoever. Thus the shipowner, having paid or having committed himself to pay daily running costs wants the maximum amount of movement out of the ship. If we consider the annual costs of a ship we can see that, the more miles she steams per year in a loaded condition, the less the cost per mile to the shipowner. Therefore, we can extend the definition of a ship's officer and describe him as a cost minimizer. This is a more suitable definition for it embraces all officers instead of being restricted to those directly concerned with the movement of the ship and cargo. (I have in mind the Catering Officer whose expenditure on food is not obviously related to maximising movement of the ship).

The economic, technical and social systems are illustrated in Diagram 10.1. The diagram is intended as a summary of Chapters 6, 7 & 8 on the separate systems.

The social system was the one which lay at the focus of this research programme. Optimization of this system is achieved when society grants authorization for people to join the company and pushes forward recruits of the correct calibre and attitudes. Provided the life and work aboard ship is experienced positively by both the individual and his friends/relatives ashore, he emerges from the system carrying with him into society evidence that the company is good to work for. Thus the key to optimization of the social system lies in matching shipboard experiences with societal values and norms.

But the social system does not exist in isolation from the other two systems — features and attributes of the economic and technical systems impinge on the individual — and we have to consider the joint optimization of the economic-socio-technical system of the shipping company.
Diagram 10.1: The economic, technical and social systems in shipping
The economic-technical system requires the man to be a cost-minimizer but if Gem Tankers were to place advertisements reading "Join Gem Tankers and help us reduce costs" I do not think they would be overwhelmed by applicants!

This is the heart of the problem facing personnel managers of shipping companies: They have to attract young people by advertising the travel opportunities, responsibilities and glamour of the sea-going job - or by advertising high wages, rapid promotion and frequent home leaves - and then subtly and imperceptibly change the values and expectations held by these recruits away from travel and adventure and towards valuing the activity of cost-minimization or movement-maximization. In other words, the recruit has to be converted from an adventure-seeking boy into a cost-minimizing man.

This was, in fact, the very focus of the research programme. I knew that technical and economic forces in the shipping industry were forcing movement-maximization on the ships and upon the people who manned them. This appeared to me to be the short-term goal of shipping companies while the long-term goal of the personnel managers is surely the recruitment and retention of sufficient people to man the ships. There appeared, to me, to be conflict between the short-term and long-term goals and the long survey questionnaire was designed to measure the extent (or existence) of this conflict, how it was being experienced, and how it was being resolved by companies and by individuals.

In summary: The joint optimization of all three systems in shipping may be achieved by creating economic, technical and social conditions under which the company can export a reputation for sound commercial management to its bankers, a reputation for expeditious and safe carriage of cargo to its shipper-customers, and a reputation as a good employer to society.

This is easier said than done and guidelines may be obtained by examining the specific cases of the ships MICA, QUARTZ, JOAN and NADIA.
The conditions in and surrounding MICA appear to be the closest of all four ships to the optimum. Being old and already paid for, she bore no high capital charges (i.e., capital repayments plus interest to bankers). She was technically sound as a result of years of adequate maintenance executed by Gem people who fully understood the ship and her equipment. Her engines were sound enough to allow the Master to arrive off ports when estimated with the result that pilots and terminal facilities could be prepared in advance of her arrival. Her boilers and pumps were sound enough to give the chief mate the technical capacity to pump cargo as fast as the shore could receive it. But, most important of all, her social system was nearly at optimum level: The conditions were right for the senior officers to gain personal satisfaction out of being movement-maximizers.

These officers were technically provided to maximise movement; they were sufficiently familiar with the rules to understand when they could 'bend' them safely; they were sufficiently friendly with terminal operators to have these operators as collaborators in maximising movement; and they were individually motivated to aim towards superb levels of performance for they perceived superb performance as one sure method of staying as a close-knit team aboard a ship which was always relatively close to home, thus avoiding being appointed to the dreaded Very Large Crude Carriers.

However, the tightness of the senior officer triad and the urgency with which they dealt personally with most technical matters resulted in the junior officers feeling somewhat squeezed out of the social system, and the ratings feeling that they were of little importance.

In QUARTZ, the economic system was similar to that of MICA — she was old and already paid for — but the technical system was markedly different: She was technically fragile. She seemed to go from one technical crisis to another and her pumping capacity was not as high as terminal operators required. Furthermore, the officers had one or two arguments with terminal operators in some of their regular ports of call with the result that neither officers nor operators would permit the slightest 'bending' of the rules.
The senior officers were not individually motivated to achieve superb levels of performance for they perceived no additional rewards or satisfaction out of doing their utmost: QUARTZ was simply a ship to which they had been individually appointed for 4 ½ months after which time they would go on leave before being appointed to another ship.

On the other hand, no really tight triad or dyad existed among the seniors so that neither junior officers nor ratings felt squeezed out of the system. While MICA exported a reputation for technical efficiency to the Gem Tanker environment, QUARTZ probably exported to the external environment of Society ashore a reputation for being a happy ship.

In both GEM ships, a pattern of self-evolving change was clearly visible and it manifested itself most clearly in the complete separation of work and life areas - in neither ship did ranks, titles and uniforms penetrate from the work into the life areas and, in general, all the people concerned felt happier for this splitting of the work and life areas; they had individual identities when off duty.

In both GEM ships, the officers attached great importance to job security. There was a high degree of harmony between the first attractions they felt towards Gem (large, old and financially strong) and the continued perceived attractions of a high degree of job security. But there was conflict experienced between the individual perceptions of the company's financial strength and messages from head-office urging sea staff towards greater economies. If Gem is to continue recruiting and retaining people by its FEATURE of size and financial strength, it cannot use endangered financial strength as a control method for there must be harmony between the attractions for recruits, the attractions for people to remain, the exports back into the external social environment AND the control methods used. In Gem, the most effective way for management to reduce overall costs is by creating, in their ships, conditions whereby people may gain satisfaction out of becoming movement-maximisers - as has been created in MICA.

One final point about the conditions in Gem is that the shore managers concerned with day-to-day operations are individually identified and are seen as the friendly 'defenders' of sea staff.
The economic situation of the POLYCHEM ships differs from that of the Gem ships for, although one was old, both ships visited had recently been purchased by Polychem with the result that each carried a relatively high annual overhead to cover capital repayments and interest charges. In turn, these capital charges reduced the amount of money available for the luxuries of improving accommodation and shipboard amenities.

One of the Polychem ships was comparatively young and technically sound while the other was old and fragile; but the technical performance of both suffered from an absence of clear historical knowledge about these ships within the company. NAUIA was old and fragile and all members perceived her as a temporary unit of the fleet and repair work was experienced as temporary 'patch-up jobs'. The feature of the repair work was that it was perfectly adequate for seaworthiness and cargoworthiness purposes but it was attributed with being temporary and this, consequently, reduced experienced job satisfaction.

The most visible differences between the Gem and Polychem ships were detected in the social system. No-one clearly understood how the rules would be interpreted. Each man brought with him, into Polychem, his own ideas of the rules and how shipboard tasks should be organized and performed. There was a complete absence of a Polychem culture to which newcomers could adhere. In addition, the people interviewed were, in general, people with high WEPS scores highly resistant to change and wanting to subordinate themselves. Such people understandably experience a high degree of confusion and conflict when immersed in a situation which management is trying to make different from other companies with conditions suitable for self-assertion instead of self-subordination.

There was a high degree of harmony between the attractions used by Polychem to recruit people and the control methods adopted by shore management (i.e. we in Polychem are different) but the very methods chosen conflicted with the type of people who switch from one company to another - they simply did not want to be different. It is difficult to predict what sort of reputation Polychem will export back to the social environment when these people leave. The signs are that, until
Polychem has settled down and has developed its own culture with commonly accepted interpretations of the rules, its exported reputation may be negative.

Both companies are changing — in Gem the change is evolving naturally while in Polychem it is being planned. Within their unique circumstances, both companies are pursuing the correct and only courses open to them. And, if I have correctly interpreted all I have observed, I must suggest that the most effective change programme adopted by a shipping company MUST be determined by its corporate history and by the history of its individual members. Furthermore, the nature of the change programme must be in harmony with the attractions used by that company to recruit and retain people, and it must have, as its objective, the export of enhanced reputations to its bankers, shippers and to its external social environment.
APPENDIX A: GLOSSARY OF SHIPPING TERMS USED IN THIS REPORT

Ballast
Ballast trip, ballast voyage - voyages when ship has no cargo on board; often water is pumped into the ship's tanks to make her manageable.

Barge carriers
L.A.S.H; SeaBee's etc. Ships which carry barges preloaded with cargo; each barge holds about 250 tons of cargo.

Blocks of cargo
Groups of boxes, bales or bags of general cargo owned by one shipper or destined to one port; less than ship or hold load.

Bosun
The senior deck petty officer; often seen as the most senior of all the ratings.

British Shipping Federation; B.S.F. The Association of all British shipowners; provides joint voice of owners in industrial negotiations; recruits, trains ratings, provides medical inspection services in UK ports.

Bulk-carrier
A single-decked ship with long engine room and bridge towards stern; carries dry commodities, usually raw materials, in bulk.

Cadet
Trainee navigating or engineer officer; aged between 17 and 22; cadet service varies between 3 and 4 years.

"Call us up"
Common phrase to describe one ship passing message by morse lamp or by radio to another when within visual distance.

Car carriers
Vehicle carriers; specialized bulk-carrier which carries cars, lorries etc as cargo.

Cargo liners
Any dry cargo ship on a regular, scheduled service between a limited number of ports at either end of an oceanic crossing.

Cargoworthiness
A legal phrase used by some maritime lawyers to describe vessel's ability to carry the cargo in question within the terms of contract and statutes.

Certificate of Competency. Sometimes referred to as a "Ticket". Issued under statute to persons qualified for various officer ranks aboard ship.

Charter, charter rates, charter party: The charter party is a contract of hire under which one firm has full use of a ship owned by another company. The charter rate is the money paid per unit - this rate may be based upon tons of cargo carried (voyage charter) or per deadweight ton per month (time charter).

Chartered ships
The ships hired out (from the owner) or hired in by the temporary user. Applies mainly to the tramp and tanker trades.

Chemical carriers
Technically similar to tankers in outward appearance but inwardly fitted with many more specialised pumps, pipelines and tank coatings than the normal tanker. Used to carry wide range of chemicals and/or edible oils in bulk.
Appendix A (continued)

Chief Mate
Chief Officer; the Mate; the most senior deck officer immediately below the Master. Assists with navigation at sea but primary responsibility is for the cargo; in conventionally manned ships, also responsible for all deck and hull maintenance and appearances.

Chipping
Removal of rust from steel plates either by use of hand hammer or by pneumatic devices.

Combination ships
OBO's; O/O's, etc. Bulk ships designed to carry oil, ore or bulk raw materials.

Container ships
Modern cargo liners in which all cargo is preloaded into large steel containers - each holding 20 to 40 tons of dry manufactured goods.

Consignee
The receiver of the cargo at its destination; the importer.

Deadweight
Total amount of cargo, bunkers and stores in tons weight which a ship can carry.

Deck Officer
Synonymous with Navigating Officer and Mate.

Deep-tanks
Tanks fitted within a dry-cargo liner for the occasional carriage of liquid cargoes in small quantities.


"First-trippers"
Young crew-members - officer cadets or ratings - making their first voyages to sea.

Freight, freight rate: Freight is the money earned by a ship for carrying cargo; freight rate is the rate per unit cargo carried (usually per ton). Note: In the USA, freight is used to describe the cargo actually carried while in the UK, freight is money earned.

General cargo
Mixed, dry cargo nearly always manufactured or partly processed goods and foodstuffs.

General Purpose Ratings: Ratings from the deck and engine departments, and sometimes also from the catering department, trained to work in any section of the ship.

Gross tons
A notional measurement of the size of a ship; nothing to do with weight or carrying capacity; one gross ton = 100 cubic feet.

Limitation of Liability. A principle of international maritime law under which the owner of a ship liable for damages to a third party after a collision or any accident may seek permission from the Court to put an upper ceiling on his third party liabilities. If personal injuries have occurred, the limitation is about £33 per gross ton plus the tonnage of the engineroom. Thus, if a small coaster of 400 tons sank a Gas Tanker worth, say, £32 million, the coaster owner would only be liable to pay 400 X £33 = £33,200 provided he can prove that his ship was properly manned/equipped.
Liners Any cargo or passenger ships on regular, scheduled voyages between limited numbers of ports.

L.N.G's Liquid Natural Gas Carriers; typical present values - over £50 million each.

Logging Phrase to describe the procedure followed by the Master when fining a man for an offence against discipline committed aboard ship.

Master Shipmaster; Captain; the 'Old Man'; the person in command of the ship. In British ships only deck officers may be appointed to Master.

the Mate The Chief Officer; the deck officer immediately below the Master. (see Chief Mate)

National Maritime Board, N.M.B. In the UK, the industrial negotiating committee for wages, working conditions etc; equal representation from employers (the BSF) and employees (seafarers' unions)

OBO, O/O (see Combination ships)

Officers Collective term to describe Master, Mates, Engineers, Radio officer and Chief Steward or Catering Officer; in passenger ships, includes the Doctor and Pursers. Traditionally they wear uniform.

Ore carriers Bulk carriers especially strengthened to carry ore in bulk.

Overside The area of hull plating above the waterline visible to the eye.

Pallet ships Ships designed to carry all cargo preloaded onto wooden, metal or plastic trays (pallets).

Parcels Distinguishable sections of the cargo; may be parcelled by port of discharge, or by physical characteristics; or by cargo ownership.

Products tankers Tankers (usually smaller than 60,000 tons) which carry refined oil products; they operate between refineries and distribution depots.

Pumpman One of the key men in a tanker; the petty officer in charge of the cargo pumps; highly involved in all cargo and tank-cleaning operations.

Receiver The person or firm which receives the cargo at the port of discharge; the consignee.

Roll-on/Roll-off; Ro/ro Ships designed to carry wheeled vehicles - cars, lorries, trailers, etc - preloaded with the cargo.
Appendix A (continued)

Seaworthiness  Legal phrase to describe that vessel is fit in all respects to encounter the normal stresses of the voyage in question.

Sextant    Navigational instrument used by deck officers to measure angle of celestial bodies above the horizon.

Shipbroker  The intermediary between shipowner and cargo-owner in the tramp and tanker trades; and between sellers and buyers of second-hand ships.

Shipmaster  (see Master)

Shipper  The exporter; the cargo-owner who sends his goods by sea.

Special Survey  The quadrennial inspection of the ship conducted by the surveyors of one of the classification societies to check on vessel's strength, maintenance and seaworthiness.

Stevedores  Historically, the men engaged in manually loading and discharging dry general cargoes.

"Sundays at Sea"  The additional money paid to ratings for each Sunday the ship spends at sea; presently under modification.

Superintendents  Marine Superintendents, usually ex-Masters or ex-Chief Mates, in managerial positions ashore. Engineer Superintendents, usually ex-Chief Engineers in managerial positions ashore. Superintendents nearly always concerned with day-to-day operational matters of the ships.

Tankers  Ships constructed to carry only oil in bulk - usually mineral oils, crude and refined. Engine room, and usually bridge, towards stern of ship.

Timber carriers  Forest-product carriers; ships designed to carry timber and sometimes paper and chips.

"Tin boxes"  Containers.

Tramps  Dry cargo ships not on regular, scheduled voyages; usually employed under charter to cargo-owners or other shipowners.

Ultra Large Crude Carriers; U.L.C.C. Tankers over 350,000 tons

Very Large Crude Carriers; V.L.C.C's Tankers over 100,000 tons; usual size just over 220,000 tons.

Voyage charter party: Contract of hire for the use of a ship on one voyage only.
(Company Needs Continued)

3. Job advancement limited.
   a. Conflicts with individual desires for exercise of discretion, and...

5. Inadequate pay.
   a. Unattractive salaries.
   b. Conflicts with present assumptions that salaries are attractive mainly by economic motives.

6. Inadequate pay.
   a. Inadequate pay.
   b. Conflicts with rigid officer-rating policies.

8. Inadequate pay.
   a. Inadequate pay.
   b. Conflicts with rigid officer-rating policies.

9. Ability to exploit existing technical, managerial, and environmental conditions.
   a. Inadequate pay.
   b. Conflicts with rigid officer-rating policies.

(Note: Column headings on this and all following pages coincide with headings on first page; that is, Under Age = the average age of each group is given. Under WPE - the average WPE score for each group Under JOB = the average number of officers, supervisors, and employees Under COMPANY = the average number of employees Under TYPE = the average number of employees.)
### Company Needs Continued

10. Operational and maintenance

- "Compromise" for our future?
  - a. Harmonises with training.
  - b. With the greater use of quantified data on ship performance.
  - c. With the development of a "qualified body of shipbuilding knowledge".
  - d. With the abolition of traditional superior-subordinate relationships between shore superintendents and ship officers.
  - e. With the present rate of labour turnover.
  - f. With present distortion of records.

11. Food and water

- Harmonises with present utilisation.

12. Safety

- Harmonises with present accommodation and equipment.

13. Education

- Harmonises with stable crews.

14. Morale

- Harmonises with self-selection by members.

15. Productivity, self-service, self-esteem and independence

- Harmonises with individuals being given greater responsibility.

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<td>&quot;Compromise&quot; for our future?</td>
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<tr>
<td>a. Harmonises with training.</td>
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<td>b. With the greater use of quantified data on ship performance.</td>
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<td>c. With the development of a &quot;qualified body of shipbuilding knowledge&quot;.</td>
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<td>d. With the abolition of traditional superior-subordinate relationships between shore superintendents and ship officers.</td>
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<td>e. With the present rate of labour turnover.</td>
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<td>15. Productivity, self-service, self-esteem and independence</td>
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16. Information:
   a. Harmonizes with internal company courses, and
   b. with shipboard management committees.
   c. Conflicts with traditional hierarchies, and
   d. with traditional routing of all communications via the Master.

17. Understanding:
   a. Harmonizes with special attention given to cadets & young recruits,
   b. Conflicts with traditional training, and with traditional abuse of juniors.
   c. With present lack of choice
   d. With early commitment to one.
   e. With present high degree

18. Self-actualization:
   b. Conflicts with non-delegation of responsibility,
   c. With the unreal or empty content of some jobs,
   d. With over-control from the shore.

19. A rewarding and enriching experience at sea:
   a. Harmonizes with satisfying tasks and life at sea, and
   b. With the facility to try various ships and trades.
   c. Conflicts with growing mechanization and specialization of ships,
   d. With early commitment to one company, and
   e. With little time in port.

20. Rotation and personal development including the handling of inter-personal tensions:
   a. Harmonizes with increased personal responsibility in work & life,
   b. With reduction in "total care" by the Company, and
   c. With the creation of conditions for exercising choice.
   d. Conflicts with traditional training and responsibility patterns,
   e. With present lack of choice aboard ship,
   f. With the present high degree of "total care", and
   g. With isolation from family and shore friends.

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(Needs of Individuals continued)
(Needs of individuals continued)

21. Demonstration of personal competence:
   a. Harmonises with real delegation of responsibility, and
      0.78  0.85  0.72  0.90  0.95  0.92  0.83  0.77
      0.78  0.85  0.72  0.90  1.00  0.88  0.92  0.86  0.65  0.10  0.86  0.88  0.53
   b. With promotion by merit.
      0.95  0.78  0.78  0.72  0.90  0.92  0.83  0.77
      0.95  0.88  0.92  0.86  0.65  0.10  0.86  0.88  0.53
   c. Conflicts with bureaucratic features of ship & company, and
      0.85  0.70  0.72  0.50  0.53  0.75  0.77  0.66  0.50  0.43  0.57  0.46  0.44  0.59  0.60  0.58  0.60
   d. Seniority having to summon seniors for all "crises".
      0.57  0.63  0.50  0.30  0.47  0.62  0.49  0.50
      0.50  0.63  0.73  0.41  0.40
   e. Conflicts with the rigidity of roles which stem from "replaceable part" manning.
      0.86  0.70  0.70  0.74  0.79  0.68  0.73
      0.75  0.63  0.84  0.62  0.60
      0.86  0.88  0.64  0.72  0.65  0.50
      0.75  0.72

22. To learn on the job and develop:
   a. Harmonises with learning traditional task allocations, and
      0.65  0.78  0.72  0.70  0.74  0.79  0.68  0.73
      0.57  0.73  0.72  0.70  0.50
      0.57  0.73  0.67  0.53  0.50
      0.70  0.69
   b. With greater shipboard training.
      0.65  0.74  0.78  0.80  0.79  0.79  0.68  0.81
      0.70  0.80  0.85  0.59  0.65
      0.86  0.80  0.90  0.72  0.62  0.70
      0.70  0.78
   c. Conflicts with the rigidity of rules which stem from "replaceable part" manning.
      0.52  0.58  0.65  0.50  0.42  0.54  0.51  0.50  0.36  0.63  0.58  0.48  0.55  0.43  0.29  0.46  0.44  0.35  0.40  0.18  0.66

23. Future occupational prospects:
   a. Harmonises with matching ship and shore jobs.
      0.65  0.78  0.44  0.60  0.79  0.62  0.70  0.65
      0.57  0.78  0.73  0.72  0.50
      0.57  0.73  0.67  0.53  0.50
      0.70  0.69
   b. Conflicts with traditional manning systems, and
      0.65  0.78  0.55  0.40  0.47  0.62  0.64  0.54
      0.50  0.63  0.77  0.55  0.55
      0.57  0.63  0.55  0.41  0.40
      0.63  0.67
   c. With need for company to retain people.
      0.65  0.70  0.50  0.40  0.47  0.62  0.64  0.65
      0.57  0.75  0.73  0.62  0.55
      0.86  0.72  0.64  0.42  0.50
      0.68  0.69

24. Role clarity:
   a. Harmonises with present rules and practices.
      0.70  0.67  0.67  0.40  0.56  0.75  0.62  0.62
      0.50  0.68  0.88  0.48  0.60
      0.57  0.78  0.72  0.41  0.40
      0.70  0.72
   b. Conflicts with flexibility, and
      0.61  0.56  0.44  0.40  0.63  0.54  0.53  0.54
      0.43  0.45  0.53  0.30  0.21  0.40  0.53  0.64
      0.57  0.55  0.55  0.41  0.40
      0.55  0.50
   c. With future changes.
      0.57  0.56  0.50  0.40  0.53  0.46  0.55  0.54
      0.36  0.55  0.53  0.42  0.35
      0.43  0.29  0.46  0.44  0.35  0.40  0.48  0.67

25. Not to feel a social outcast:
   a. Harmonises with improving the status of the Merchant Navy.
      0.78  0.89  0.78  0.70  0.65  0.88  0.83  0.81
      0.96  0.89  1.00  0.79  0.85
      0.10  0.82  0.89  0.76  0.60
      0.85  0.83
   b. With frequent leaves, and
      0.78  0.85  0.78  0.70  0.60  0.88  0.83  0.61
      0.96  0.89  1.00  0.76  0.63
      0.86  0.80  0.82  0.83  0.82  0.80
      0.85  0.81
   c. With opening docks to the public.
      0.65  0.70  0.55  0.50  0.42  0.50  0.56  0.54
      0.29  0.30  0.77  0.69  0.45
      0.43  0.45  0.53  0.30  0.21  0.40  0.53  0.64
      0.55  0.50
   d. Conflicts with beliefs in society of the sailor as a thirsty, happy wanderer.
      0.70  0.74  0.50  0.60  0.53  0.85  0.37  0.54
      0.50  0.75  0.82  0.40
      0.57  0.43  0.82  0.72  0.53  0.60
      0.68  0.61
   e. With the British closed-dock system, and
      0.52  0.70  0.50  0.30  0.53  0.54  0.57  0.50
      0.43  0.50  0.68  0.55  0.45
      0.71  0.14  0.73  0.55  0.41  0.60  0.53
      0.55  0.50
   f. With the construction of new terminals remote from towns.
      0.65  0.74  0.67  0.70  0.50  0.67  0.66  0.58
      0.50  1.00  0.85  0.52  0.50
      0.71  0.29  0.64  0.67  0.53  0.70  0.64  0.64
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<tr>
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<th>COMPANY</th>
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<tr>
<td>26</td>
<td>Safe containment and reduction of tension;</td>
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<tr>
<td>a. Harmonises with many traditional attitudes, norms and ritualized conflicts (e.g. deck-engine arguments), and</td>
<td>0.52 0.59 0.61 0.70 0.58</td>
<td>0.67 0.57 0.56</td>
<td>0.64 0.63 0.62 0.55 0.55</td>
<td>0.71 0.57 0.55 0.61 0.41 0.30</td>
<td>0.60 0.64</td>
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<tr>
<td>b. With splitting the work and life areas abord to allow role-switching,</td>
<td>0.70 0.70 0.61 0.60 0.74</td>
<td>0.75 0.68 0.65</td>
<td>0.79 0.63 0.77 0.66 0.55</td>
<td>0.86 0.71 0.66 0.71 0.70</td>
<td>0.60 0.75</td>
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<tr>
<td>c. Conflicts with traditional manning with its hierarchical and leisure group membership, particularly on long voyages with little time in port.</td>
<td>0.65 0.70 0.55 0.40 0.58</td>
<td>0.75 0.60 0.50</td>
<td>0.57 0.75 0.81 0.48 0.50</td>
<td>0.29 0.86 0.55 0.44 0.65 0.50</td>
<td>0.50 0.69</td>
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<tr>
<td>27</td>
<td>From faces by continually changing responsibilities;</td>
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<tr>
<td>a. Harmonises with present system,</td>
<td>0.70 0.67 0.61 0.80 0.74</td>
<td>0.67 0.66 0.77</td>
<td>0.71 1.00 0.85 0.52 0.60</td>
<td>0.87 0.86 0.73 0.67 0.71 0.60</td>
<td>0.75 0.61</td>
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<tr>
<td>b. Conflicts with attempts to stabilize crews.</td>
<td>0.65 0.70 0.64 0.60 0.90</td>
<td>0.79 0.64 0.62</td>
<td>0.93 0.75 0.85 0.52 0.46</td>
<td>1.00 0.86 0.64 0.78 0.65 0.50</td>
<td>0.70 0.64</td>
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<td>28</td>
<td>Role conformity by members;</td>
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<tr>
<td>a. Harmonises with present system,</td>
<td>0.57 0.74 0.67 0.80 0.79</td>
<td>0.84 0.68 0.62</td>
<td>0.93 0.75 0.81 0.55 0.60</td>
<td>0.86 1.00 0.73 0.78 0.60 0.40</td>
<td>0.70 0.72</td>
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<tr>
<td>b. Conflicts with needs to introduce new types of specialists as marine technology advances.</td>
<td>0.57 0.63 0.67 0.50 0.63</td>
<td>0.62 0.51 0.69</td>
<td>0.43 0.50 0.73 0.62 0.50</td>
<td>0.57 0.29 0.55 0.47 0.60 0.55 0.67</td>
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<tr>
<td>29</td>
<td>Satisfactory leisure time;</td>
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<tr>
<td>a. Harmonises with splitting the work and life areas to allow the formation of leisure groups independent of rank,</td>
<td>0.70 0.70 0.61 0.60 0.79</td>
<td>0.79 0.68 0.62</td>
<td>0.86 0.75 0.85 0.58 0.50</td>
<td>0.71 1.00 0.46 0.55 0.82 0.70</td>
<td>0.63 0.72</td>
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<tr>
<td>b. Conflicts with the retention of traditional officer-rating divisions as crews get smaller, &amp;</td>
<td>0.57 0.63 0.55 0.60 0.63</td>
<td>0.75 0.51 0.02</td>
<td>0.71 0.63 0.81 0.45 0.45</td>
<td>0.71 0.71 0.46 0.55 0.76 0.80</td>
<td>0.58 0.56</td>
</tr>
<tr>
<td>c. With beliefs about officers having to remain apart from ratings to retain respect.</td>
<td>0.48 0.52 0.61 0.60 0.42</td>
<td>0.71 0.43 0.50</td>
<td>0.64 0.50 0.65 0.38 0.45</td>
<td>0.57 0.71 0.18 0.33 0.71 0.70</td>
<td>0.43 0.53</td>
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<tr>
<td>32</td>
<td>Greater self-realization;</td>
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<tr>
<td>a. Harmonises with social trends ashore, and</td>
<td>0.57 0.67 0.67 0.80 0.66</td>
<td>0.38 0.70 0.63</td>
<td>0.79 0.63 0.77 0.62 0.50</td>
<td>0.57 1.00 0.64 0.61 0.88 0.60</td>
<td>0.53 0.75</td>
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<tr>
<td>b. With shipboard disciplinary committees,</td>
<td>0.44 0.56 0.67 0.40 0.63</td>
<td>0.50 0.58 0.56</td>
<td>0.64 0.58 0.65 0.48 0.50</td>
<td>0.57 0.71 0.55 0.55 0.65 0.60</td>
<td>0.45 0.64</td>
</tr>
<tr>
<td>c. Conflicts with traditional hierarchical and disciplinary systems.</td>
<td>0.39 0.59 0.50 0.50 0.47</td>
<td>0.58 0.45 0.50</td>
<td>0.64 0.58 0.65 0.45 0.30</td>
<td>0.57 0.71 0.46 0.50 0.59 0.50</td>
<td>0.40 0.58</td>
</tr>
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<td>33</td>
<td>Aspects affecting the life aboard to become &quot;rights&quot; instead of being subject to Master's discretion (e.g. shoreleave, sub);</td>
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<tr>
<td>a. Harmonises with splitting work &amp; life areas under separate leaders.</td>
<td>0.57 0.59 0.50 0.40 0.42</td>
<td>0.67 0.43 0.50</td>
<td>0.36 0.38 0.58 0.58 0.50</td>
<td>0.14 0.57 0.64 0.44 0.59 0.60</td>
<td>0.40 0.64</td>
</tr>
<tr>
<td>b. Conflicts with traditional methods.</td>
<td>0.48 0.67 0.39 0.50 0.63</td>
<td>0.75 0.45 0.50</td>
<td>0.84 0.63 0.65 0.45 0.45</td>
<td>0.37 0.71 0.62 0.67 0.66 0.50</td>
<td>0.55 0.56</td>
</tr>
<tr>
<td>c. And with primary need to keep the ship and cargo moving.</td>
<td>0.39 0.52 0.72 0.60 0.74</td>
<td>0.51 0.53 0.62</td>
<td>0.64 0.53 0.50 0.52 0.60</td>
<td>0.66 0.42 0.73 0.79 0.65 0.60</td>
<td>0.58 0.53</td>
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</table>
### Technical Changes Aboard

<table>
<thead>
<tr>
<th>35. Increasing number of inventions:</th>
<th>23 29 32 36 46</th>
<th>21 30 33</th>
<th>SH NA DO EC CT</th>
<th>COMPANY PM GS CT PT FS</th>
<th>TYPE T L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Implies there will be increasing mechanization and automation of ships</td>
<td>.70 .89 .67 .80 .95</td>
<td>.88 .81 .73</td>
<td>1.00 1.00 .89 .76 .55</td>
<td>1.00 1.00 .64 .78 .42</td>
<td>.70 .63 .81</td>
</tr>
<tr>
<td>b. Harmonizes with increased technical training</td>
<td>.70 .85 .67 .80 .95</td>
<td>.79 .83 .73</td>
<td>1.00 1.00 .89 .72 .55</td>
<td>1.00 1.00 .64 .78 .76 .60</td>
<td>.83 .81</td>
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<tr>
<td>c. Which conflicts with traditional training and manning systems</td>
<td>.61 .78 .67 .40 .58</td>
<td>.67 .64 .62</td>
<td>.64 .75 .81 .55</td>
<td>.50</td>
<td>.57 .71 .36 .44 .59 .50</td>
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</tbody>
</table>

### Social Changes Aboard

<table>
<thead>
<tr>
<th>36. Decreasing time gaps between invention, general use and observance:</th>
<th>23 29 32 36 46</th>
<th>21 30 33</th>
<th>SH NA DO EC CT</th>
<th>COMPANY PM GS CT PT FS</th>
<th>TYPE T L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Implies rapidly changing ship types and equipment</td>
<td>.57 .85 .55 .80 .84</td>
<td>.84 .60 .73</td>
<td>.93 .88 .81 .66 .50</td>
<td>1.00 .66 .46 .67 .76 .70</td>
<td>.68 .78</td>
</tr>
<tr>
<td>b. Harmonizes with higher educational levels, and</td>
<td>.61 .85 .55 .70 .58</td>
<td>.67 .64 .65</td>
<td>.57 .75 .81 .69</td>
<td>.50</td>
<td>.71 .43 .46 .55 .53 .60</td>
</tr>
<tr>
<td>c. Greater personal adaptability</td>
<td>.65 .82 .61 .70 .50</td>
<td>.84 .72 .69</td>
<td>.71 .73 .81 .69</td>
<td>.55</td>
<td>1.00 .66 .67 .76</td>
</tr>
<tr>
<td>d. Conflicts with low educational levels, and</td>
<td>.57 .76 .60 .50 .47</td>
<td>.67 .57 .50</td>
<td>.50 .50 .73 .55</td>
<td>.45</td>
<td>.43 .57 .46 .44 .53</td>
</tr>
<tr>
<td>e. With inflexible manning systems</td>
<td>.57 .67 .50 .50 .53</td>
<td>.67 .51 .56</td>
<td>.57 .70 .73 .49</td>
<td>.45</td>
<td>.43 .71 .46 .44 .53</td>
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</table>

### Greater "Social Awareness" About the Use of Resources and the Activities of Large Corporations

<table>
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<tr>
<th>37. Greater &quot;social awareness&quot; about the use of resources and the activities of large corporations:</th>
<th>23 29 32 36 46</th>
<th>21 30 33</th>
<th>SH NA DO EC CT</th>
<th>COMPANY PM GS CT PT FS</th>
<th>TYPE T L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Implies careful consideration of corporate activities</td>
<td>.70 .74 .61 .60 .90</td>
<td>.79 .77 .58</td>
<td>1.00 .75 .85 .62</td>
<td>.50</td>
<td>1.00 1.00 .64 .78 .71 .50</td>
</tr>
<tr>
<td>b. Harmonizes with increased rules about ship operation</td>
<td>.65 .74 .61 .60 .90</td>
<td>.75 .74 .62</td>
<td>.93 .68 .81 .58</td>
<td>.55</td>
<td>1.00 .66 .64 .78</td>
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<tr>
<td>c. Conflicts with individuals' desires for less rules/regulations</td>
<td>.44 .52 .44 .40 .58</td>
<td>.54 .57 .27</td>
<td>.04 .03 .54 .34</td>
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<td>.43 .86 .55 .82</td>
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### Declining Sense of Duty to Job and Employees

<table>
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<tr>
<th>38. Declining sense of duty to job and employees:</th>
<th>23 29 32 36 46</th>
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<th>SH NA DO EC CT</th>
<th>COMPANY PM GS CT PT FS</th>
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<tr>
<td>a. Requires the development of an alternative code of ethical behaviour</td>
<td>.57 .70 .33 .80 .74</td>
<td>.67 .62 .58</td>
<td>.71 .75 .77 .52</td>
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<td>.71 .71 .64 .67</td>
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<tr>
<td>b. Harmonizes in the acceptance of a code of conduct set by fellow members of a professional Institute</td>
<td>.57 .78 .59 .60 .74</td>
<td>.54 .70 .58</td>
<td>.57 .48 .81 .52</td>
<td>.50</td>
<td>.57 .57 .64 .61</td>
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<tr>
<td>c. With more rules &amp; regulations</td>
<td>.35 .44 .39 .40 .68</td>
<td>.46 .47 .42</td>
<td>.64 .50 .48 .51</td>
<td>.50</td>
<td>.71 .57 .64 .67</td>
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<tr>
<td>d. With training schemes primarily designed to develop a sense of social values</td>
<td>.61 .70 .39 .60 .84</td>
<td>.67 .66 .42</td>
<td>.71 .89 .73 .55</td>
<td>.50</td>
<td>.71 .71 .64 .67</td>
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<tr>
<td>e. Conflicts with employers' assumptions that all employees are committed to the company's goals</td>
<td>.35 .59 .33 .40 .47</td>
<td>.38 .40 .42</td>
<td>.36 .63 .62</td>
<td>.38 .30</td>
<td>.43 .59 .50</td>
</tr>
</tbody>
</table>
39. Search by people for "psychiatrically healthy" working and living conditions:
   a. Release, in shipping, satisfactory working and living conditions.
   b. Satisfaction of men's psychological needs, and
   c. Challenge and personal development at work.
   d. Harmonization with improved shipboard living conditions, and
   e. With the redesign of jobs to give more challenge.
   f. Conflicts with the current reduction in challenge and exercise of discretion on board by over-control and checking by shore staff.

40. Worked decrease in paternalism by shore engineers:
   a. Implied in reduction in the "total care" of seafarers by companies, and
   b. And the creation of shipboard conditions which allow exercise of choice and responsibility in the "life areas".
   c. Harmonization with shipboard bars, and
   d. With payment by cheque.
   e. With the abolition of allotments, and
   f. With choosing and paying for food, and
   g. Putting the "work" and "life" areas under separate leadership.
   h. Conflicts with the present "total care" of seafarers by companies.

41. Rising educational standards:
   a. Require greater educational demands in the (shipboard) job.
   b. Harmonization with increased mechanization, and
   c. With the transfer of some jobs back from shore to ship.
   d. Conflicts with insistence on obedience to rules, planned maintenance and instruction manuals.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>AGE 23</th>
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<th>32</th>
<th>36</th>
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### (Social Changes Ashore Continued)

#### 42. Democracy and increasing demands for participation in decision-making and in the distribution of rewards:

- a. Implies the need for conditions at sea for individuals, groups and crews to become more self-regulating.  
  
- b. Harmonises with shipboard management committees, and

- c. With shipboard disciplinary committees.

- d. Conflicts with traditional ranking system.

- e. With traditional rules and regulations.

- f. With frequently changing crews.

#### 43. Professionalising:

- a. Implies the need to accept that more employees will become members of professional institutes.

- b. Harmonises with the professional institutes for engine and deck officers.

- c. Conflicts with the need for senior officers to be highly committed to the company's goals.

#### 44. Change from "extended" to "nuclear" family:

- a. Requires the creation of conditions for men to participate more in family life possibly leading to an end of seagoing on marriage or on birth of children.

- b. Harmonises with more frequent and longer leaves, and

- c. With the carriage of wives aboard.

- d. Conflicts with seafaring.

#### 45. Changing role of women:

- a. Requires the creation of conditions for the employment of women at sea.

- b. Harmonises with current experiments.

- c. Conflicts with the traditional rejection of women as "leaders of men", and

- d. With traditional officer-rating divisions.
### Current Changes in Some Shipping

**Company/organizational**

46. Increasing size and power of technical departments:
   - Implies acceptance that ships are essentially highly complex machines.
   - Harmonises with the growing mechanization of ships and most shipboard functions, and
   - With the growing power and complexity of marine machinery.
   - Conflicts with traditional beliefs and with attempts to reduce labour turnover.
   - With the position of the Master on board being a desk man.

47. Increased checking of seafarers by shore staff, by records, etc:
   - Implies assumption of the responsibility of modern seafarers.
   - Harmonises with the greater frequency with which crews change and get leave,
   - With the need for companies to meet increasing legal requirements.
   - With the need for ships to maintain schedules, and
   - With changing relationships between bankers, shipowners and shippers (customers).
   - Conflicts with individual desires to exercise discretion and to demonstrate competence on the job,
   - And with attempts to reduce labour turnover and frustration.

48. Shift of control from ship to shore staff:
   - Implies more extensive knowledge & more specialized skills held by shore staff.
   - Harmonises with frequency of crew changes.
   - With inter-company turnover, and
   - With increasing rate of labour wastage and replacement in M.N.
   - Conflicts with traditional beliefs on decision-making powers of Master and senior officers, and
   - With the perceived power of the Master (by the crew).

<table>
<thead>
<tr>
<th>AGE</th>
<th>WEPS</th>
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<td>48</td>
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</table>

**Notes:**
- The table above summarizes current changes in some aspects of shipping, focusing on the shifts in control from ships to shore staff, increased technical departments, and the implications of these changes on seafarers and companies.
54. Longer voyages:
   a. Requires special attention to be given to the "life" situation and to the relief of tension on board.
   b. Longer voyages result in build up of tension on board.
   c. Causes lower crew morale.

55. Shorter time in port:
   a. Means less time for relaxation away from the ship, and
   b. Increased personal work-loads in cargo-handling and maintenance.
   c. Harmonises with improved commercial efficiency.
   d. Conflicts with recruits meeting their expectations to "see the world", and
   e. with the safe release of tension.

56. Improved radio communications:
   a. Means immediate access to head-office by ship & vice-versa, and
   b. Rapid communication between seafarers and families.
   c. Which results in greater control from the shore, and
   d. Increased commercial efficiency.
   e. Causes conflicts with traditional beliefs about power and role of the Master.

57. Unmanned engine-rooms:
   a. Means that the only group remaining as watchkeepers are deck officers and ratings with further isolation from rest of crew.
   b. Harmonises with individual desires by engineers to get on with the "real" job of mechanical maintenance.
   c. Conflicts with U.T.I. requirements for engineers to obtain watch-keeping time, and
   d. With aspirations of some engineer-officers to become administrators/managers.
### 50. Repairs and maintenance by engineer corps
- Requires access to large, costly stock of spare parts.
- Occurs with short time in port.
- Conflicts with individual desires to in-service personal craft competence, and
- With career development.

### 51. Planned maintenance
- Requires need to keep ship maintained across very rapid crew changes.
- Incidents with operational efficiency by isolating delay, and
- With the growing complexity of machinery.
- Conflicts with individual desires to exercise discretion and to demonstrate competence gained from experience.

### 52. Advanced and complex maintenance

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<th>AGE</th>
<th>25</th>
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<td>61</td>
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</table>

### 60. Smaller areas
- Requires higher skills in maintenance, and
- Requires knowledge on and off duty.
- Handling with commercial efficiency, and
- With current recruiting difficulties.
- Conflicts with group leisure activities.
- With traditional officer-rating divisions.

### 61. Younger, less-experienced

<table>
<thead>
<tr>
<th>AGE</th>
<th>25</th>
<th>20</th>
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### 70. Long sea duty
- Requires long experience on a large ship.
- Requires high skills on a large ship.
- Requires understanding of ship's machinery.
- With current recruiting difficulties.
- Conflicts with group leisure activities.
- With traditional officer-rating divisions.

### 71. Younger, less-experienced

<table>
<thead>
<tr>
<th>AGE</th>
<th>25</th>
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</table>
### 62. Longer shore training:

- a. implies higher training costs and a greater number of men needed.
- b. implies with coping with future changes in shipping, and
- c. with career development ashore.
- d. implies with current rapid labour turnover.

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<thead>
<tr>
<th>Type</th>
<th>AGZ</th>
<th>38</th>
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### 63. Bars and leisure activities control

- Points to ultimate splitting of work and leisure ashore.

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<th>Type</th>
<th>AGZ</th>
<th>38</th>
<th>20</th>
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</table>
67. Rejection of work for purely economic motives:
   a. Implies need to reallocate tasks to make shipboard jobs more challenging.
   b. Harmonises with growing mechanization of ships.
   c. Conflicts with traditional job responsibilities, and with the positions of junior deck and engineer officers.

68. Growing uncertainty and emptiness of some shipboard jobs (e.g. deck officers in ships where all cargo handling is mechanized or done by shore staff and where all deck maintenance is done by engineers):
   a. Implies need to consider real (as opposed to legal) requirements of new work roles, and need to reconsider allocation of shipboard tasks.
   b. Results in increased distance-maintenance (i.e. by Muster from officers and by deck officers from rest of crew).

69. Introduction of General Purposes Officers:
   a. Needs greater training.
   b. Harmonises with growing mechanization of ships.
   c. With new fabric coatings, and with less deck work.
   d. Conflicts with traditional job responsibilities, and with the positions of junior deck and engineer officers.

70. More frequent leaves:
   a. Confirms "replaceable part" meaning system with rigid rules and traditional jobs.
   b. Results in increasing rules.
   c. Harmonises with individual desires to lead near normal lives ashore, and with tension relief in modern ships.
   d. Conflicts with attempts to reduce rules.
   e. With attempts to involve officers in budgeting & long-term planning, and with the formation of stable friendships.
### 72. The military-type manning system:

- **a.** Harmonises with the need for complete obedience in crises.
  
  -61 .48 .50 .80 .84 .79 .55 .58 .86 .88 .77 .45 .40 .86 .86 .73 .78 .71 .60 .58 .64

- **b.** With the assumed irresponsibility of ratings & junior officers.
  
  -63 .37 .50 .60 .65 .71 .49 .55 .71 .63 .65 .38 .35 .57 .86 .48 .40 .65 .50 .38 .58

- **c.** With the recruitment of men with ambitions to be officers, and
  
  -57 .55 .50 .70 .79 .84 .53 .54 .86 .100 .33 .45 .35 .71 .100 .64 .67 .62 .70 .53 .58

- **d.** With shipping really being the "Merchant Service".
  
  -67 .37 .55 .60 .68 .79 .45 .46 .89 .63 .65 .38 .35 .86 .85 .46 .61 .71 .60 .48 .53

- **e.** Conflicts with the commercial reality of shipping.
  
  -68 .37 .55 .50 .55 .71 .47 .42 .57 .75 .65 .41 .35 .29 .86 .46 .50 .60 .50 .10 .56

- **f.** With the recruitment of modern youth who reject military systems,
  
  -61 .52 .53 .70 .58 .73 .43 .53 .50 .68 .73 .32 .40 .14 .86 .50 .38 .76 .70 .10 .67

- **g.** With the infrequency of accidents and crises.
  
  -48 .26 .50 .50 .32 .67 .26 .38 .76 .63 .64 .34 .25 .22 .43 .27 .28 .17 .50 .28 .44

- **h.** With the formation of leisure groups in small-crowded ships, and
  
  -61 .41 .55 .40 .63 .71 .45 .50 .56 .75 .62 .52 .35 .43 .57 .50 .59 .60 .15 .56

- **i.** With the possible future splitting of the work and life areas.
  
  -57 .41 .50 .50 .63 .71 .45 .59 .71 .50 .58 .48 .35 .43 .71 .36 .39 .59 .50 .35 .54

### 73. Beliefs that the only "real seamen"

- are the deck officers and deck ratings:

  - **a.** Harmonises with the greater occupational mobility of the engineer, radio and catering officers and ratings.
  
  -65 .63 .50 .70 .63 .71 .60 .58 .71 .100 .81 .55 .25 .71 .71 .55 .61 .71 .70 .60 .61

  - **b.** Conflicts with the reality of turnover (deck people stay at sea only marginally longer than others).
  
  -65 .54 .44 .70 .58 .62 .51 .50 .64 .63 .54 .62 .30 .43 .86 .46 .44 .59 .40 .43 .64

  - **c.** With attempts to increase the technical skills of deck officers,
  
  -52 .50 .44 .60 .74 .62 .55 .58 .64 .88 .62 .62 .30 .43 .86 .55 .50 .71 .60 .48 .64

  - **d.** Conflicts with the potential future attempts to combine deck and engineering officers.
  
  -57 .52 .50 .50 .58 .62 .51 .58 .64 .75 .65 .55 .30 .57 .71 .36 .44 .66 .60 .48 .64

### 74. Only deck officers may be promoted to command:

- **a.** Harmonises with tradition.
  
  -61 .70 .50 .50 .90 .84 .64 .54 .93 .75 .89 .62 .55 .86 .100 .73 .78 .26 .60 .68 .58

  - **b.** With the company's need to have, in charge of the ship, a man highly committed to the company's goals - such high commitment being more easily obtained from an occupationally restricted deck officer than from a more mobile engineer officer.
  
  -57 .62 .44 .50 .42 .54 .49 .46 .38 .88 .77 .31 .35 .29 .43 .64 .47 .50 .60 .48 .53

  - **c.** With the deck officer's greater concern for welfare of the crew.
  
  -48 .53 .59 .50 .26 .50 .53 .35 .38 .63 .69 .17 .15 .44 .18 .15 .60 .29 .30 .60 .43 .33

  - **d.** Conflicts with growing mechanization.
  
  -48 .59 .59 .50 .60 .62 .51 .50 .71 .63 .54 .52 .25 .71 .71 .46 .55 .65 .60 .50 .50

  - **e.** With the aspirations of long-serving engineer and catering officers.
  
  -52 .74 .44 .56 .42 .62 .35 .31 .74 .62 .32 .35 .43 .43 .44 .64 .53 .60 .43 .64

  - **f.** With the aspirations of long-serving engineer and catering officers.
  
  -48 .48 .44 .50 .58 .62 .40 .25 .79 .25 .58 .52 .25 .57 .40 .36 .44 .74 .60 .35 .50
75. Specific qualities of the Master:
   a. Harmonizes with isolation of the ship.
   b. Conflicts with the reality of the situation with modern radio.
   c. With the Master’s lack of engineering knowledge, and
   d. With the mental health of the Master.

76. Mistrust, by seafarers, of anyone “from the office”:
   a. Reinforces the seafarers’ identity,
   b. And provides a safe release of tension with expressions of blame,
   c. Conflicts with the need for crew and shore personnel to work more closely together.

77. Rígidity of roles, titles, cabin allocation and uniform seating:
   a. Harmonizes with frequently changing crews and the need for men to be able to join a ship and pick up their jobs without causing delay,
   b. And with the unreality of certain jobs being transferred to reality of fine gradations in ranks, titles, and earnings.
   c. Conflicts with coping with future social and technical changes,
   d. With attempts to split the work and life areas,
   e. With leisure activities, and
   f. With the need for seafarers to exercise more choice in the “life” area aboard ship.

78. Complete absence of a “novitiate” scheme whereby a boy could taste the sea life before committing himself:
   a. Harmonizes with beliefs that many boys wish “come for a look”.
   b. Conflicts with all attempts to reduce wastage and training costs,
   c. And with the reality that many recruits base their choice of the sea on boyhood fantasies.

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<tr>
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</table>

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APPENDIX C: SUMMARY OF OBSERVATIONS MADE WITHIN THE SOCIAL SYSTEMS

As an introduction to this section of the report and in order to help lay readers to understand all that follows, it may be as well to outline conventional manning systems and managerial positions in head offices of shipping companies.

In the conventionally manned, British tanker or cargo ship, the total crew is divided along two dimensions – by department (shown horizontally) and by rank (shown vertically) e.g.

<table>
<thead>
<tr>
<th>Deck Cadets</th>
<th>2nd Mate</th>
<th>3rd Mate</th>
<th>4th Engineer</th>
<th>3 Junior Engineers (Electrician)</th>
<th>2nd Engineer</th>
<th>3rd Engineer</th>
<th>4th Engineer</th>
<th>3 Junior Engineers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosun</td>
<td>Chief Steward</td>
<td>Radio Officer</td>
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<tr>
<td>Storekeeper (Carpenter)</td>
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<tr>
<td>0 Ableseamen</td>
<td>6 Firemen/Greasers</td>
<td>3 Assistant Stewards</td>
<td>1 Catering Boy</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>1 Deck Boy</td>
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Variations of the above manning scheme may be found in particular ships e.g. some ships carry Petty Officer Mechanics in place of the 3 Junior Engineers; some carry Electricians; tankers carry pumpmen; and some carry trainee ratings. The most significant variation is when the ratings are combined into one "General Purpose" group.

The manning schemes in use aboard the ships visited in this study are:

"MICA" - In addition to the above, she carried one extra Chief Mate and one Petty Officer trainee mechanic. All Officers and Ratings were Europeans. As with all ships in this study, she carried a pumpman.

"QUARTZ" - As above, except no Deck Cadets but, in addition, she carried one trainee mechanic and four trainee engineering ratings plus their engineer training officer. The whole crew was European.

"NADIA" & "JOAN" - These ships each carried an additional 2nd Mate; Petty Officer mechanics were carried in place of the Junior Engineers; the officers were Europeans and the ratings Chinese.

Traditionally, the Master comes only from the ranks of the deck officers; engineer, catering and radio officers cannot be promoted to command. Within the officer groups it is virtually impossible for a man to change departments after he has been recruited i.e. departmental choice on recruitment is almost irreversible. There is a little departmental switching among the ratings – a move which is actively encouraged under the new "general purpose" schemes. Petty Officers do not switch departments outside the general purpose schemes.
The Radio Officer may be employed directly by the shipping company but, more commonly, he is employed by the owners of the radio equipment and is temporarily appointed to one company or another. Both Gem and Polychem are direct employers of Radio Officers.

The greatest majority of entrants to the British Merchant Navy are school-leavers between 16 and 18 years of age; in fact it is almost impossible to enter as a deck cadet after the age of 20. Most entrants to the rating groups undergo a pre-sea course of between 8 and 14 weeks' duration at one of the National Sea Training Schools. All deck and engineer cadet entrants undergo 3 or 4 year phased training schemes (the length depending on academic qualifications) involving training at Colleges and aboard ship.

The facility does exist for deck ratings to take various courses and examinations to enter the deck officer group but the number doing so is very, very small. Some engineer ratings may attend courses and enter the engineer officer group but, although slightly higher than the deck ratings, the number who do so is very small.

While almost 100% deck officers commence their careers as deck cadets, less than half the engineer officers start in this way; the more common entry is by first serving an apprenticeship within the mechanical engineering trades ashore and then applying for direct entry as an engineer officer.

Although cadet schemes for catering officers have recently been introduced, the overwhelming majority of Chief Stewards have advanced from the chief cook or 2nd steward groups. Radio Officers commence their sea careers at a 2½ year college course.

In order to gain higher rank, all deck and engineer officers have to pass examinations set by the U.K. Department of Trade and Industry (formerly the Board of Trade); Radio Officers' examinations are set by the Postmaster-General's department; Chief Stewards do not have to take any statutory examinations although they do take examinations set by Colleges and by the City & Guilds.

Although attempts have been made to introduce a method of promotion based on merit, the traditional - and still most common - method of promotion is by length of service. Rate of promotional advancement varies with deficits or surpluses of officers holding qualifications. In general - and not, necessarily in Gem and Polychem - the age & wage profile of officers is:

<table>
<thead>
<tr>
<th>Wage</th>
<th>Rank</th>
<th>Age</th>
<th>Rank</th>
<th>Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>£2,000+</td>
<td>3rd Mate</td>
<td>20+</td>
<td>Junior Eng.</td>
<td>£2,000+</td>
</tr>
<tr>
<td>£2,500 - £3,000</td>
<td>2nd Mate</td>
<td>22+</td>
<td>3rd Engineer</td>
<td>£2,500 - £3,000</td>
</tr>
<tr>
<td>£3,000 - £4,000</td>
<td>Chief Mate</td>
<td>24+</td>
<td>2nd Engineer</td>
<td>£3,000 - £4,000</td>
</tr>
<tr>
<td>£4,500 - £5,500+Master</td>
<td>28+</td>
<td>Chief Engineer</td>
<td>£4,000 - £5,500</td>
<td></td>
</tr>
</tbody>
</table>

Depending on the trade and frequency of port visits, a pumpman may earn between £2,000 and £3,000+ (i.e. basic wage plus overtime).

Including overtime, the remaining Petty Officers may earn £2,000+ and the ratings £1,600+.

All shipboard food and accommodation, plus some working clothes, are supplied free of charge. Officers get about 140 days paid leave per year; ratings' leave varies between 60 and 120 days per year.
The traditional allocation of tasks and responsibilities are:-

The Master
In overall charge of the ship with particular regard to safety of the ship, lives and cargo.

Chief Mate
In charge of all deck ratings; responsible for all cargo operations and for the maintenance of cargo equipment (except in tankers where pump-maintenance falls under the Chief Engineer); responsible for general hull and deck maintenance i.e. for the general appearance of the ship; keeps a bridge watch at sea, usually 4-8 a.m. and 4-8 p.m.

2nd & 3rd Mates
Keep bridge watches at sea and assist with cargo operations in port; the 2nd Mate usually cares for all navigational equipment.

Chief Engineer
In overall charge of all machinery and mechanical equipment on board with particular regard to avoiding breakdowns and delays.

2nd Engineer
In charge of all engine ratings; responsible to the Chief Engineer for all maintenance in the engine room - both fabric and equipment. Keeps an engine room watch at sea, usually 4 - 8 a.m. and 4-8 p.m. In port, carries out maintenance on machinery which cannot be immobilised at sea.

3rd & 4th Engineers
Keep engine room watches at sea; carry out maintenance of mechanical and electrical equipment at sea and in port.

Junior Engineers
Act as assistant engine room watchkeepers at sea and in port; engage in maintenance work.

Chief Steward
In overall charge of all 'hotel' services i.e. food, accommodation, sales of tobacco and alcohol (under Master's permission), posting mail, and often all medical services.

Radio Officer
Keeps radio watches at sea i.e. 2 hours on/4 hours off. No watches in port. Sometimes assists Master with paperwork and accounts.

Bosun
Petty Officer who supervises deck ratings.

Storekeeper/Carpenter - assists Bosun but with specific tasks to do.

9 Ableseamen
Depending on degree of bridge automation, 3, 6 or all 9 may be on watches at sea; if not on watch, carry out deck and cargo maintenance work.

Pumpman
One of the key men in a tanker; carries out all cargo duties in port under Chief Mate; at sea either helps in engine room or maintains pumps and valves.

Donkeyman
Petty Officer who supervises engine ratings.

Storekeeper
Cares for engine room stores and assists donkeyman.

6 Firemen/greasers
3 keep boiler watches in port and, depending on type of engine, at sea; the remainder on maintenance work in the engine room.

Chief & 2nd Cooks
Prepare all meals

Assistant Stewards
Serve meals; clean and care for accommodation etc.

2nd Steward
Assists Chief Steward; issues stores; etc.
Variations in the previous list of tasks and activities may be found in particular ships. In the two Gem ships visited - Mica and Quartz - neither the Chief Mates nor 2nd Engineers kept watches at sea. Also, the amount of additional work done by engineers during their supposed off-duty hours depends to great extent on the technical fragility of the ship.

In Polychem, a decision had been taken when the company first commenced operations to make drastic alterations to the traditional task allocations. In Joan and Nadia, the Chief Engineers are responsible for all deck and hull maintenance and are in charge of all the ratings (including former deck ratings); furthermore, the engineer officers perform cargo watches in port i.e. they play an active part in cargo operations. It may be seen, from the list of traditional activities, that Polychem has made significant and fundamental changes in the manning system and responsibilities.

Excepting the physical work performed by tanker officers during cargo operations, the distinctions between the deck and engine departments may be summarised as follows:

(i) The engineers produce energy and the mates use it, i.e. within the engineroom, fuel oil is converted into propulsion, steam, and electrical energy and the mates use this energy to guide the ship to her destination and there load or discharge cargo.

(ii) The mates either carry out their various tasks alone (e.g. taking a 'sight' of sun or stars to calculate the ship's position) or they direct the activities of the ratings; the engineers always carry out their tasks in collaboration with others, their work is nearly always physical and dirty; they work side-by-side with their ratings.

Finally - so far as this basic introduction is concerned - comes the traditional methods of enforcing discipline on board. It is in this area that we can see the clearest distinctions between officers and ratings.

Every British shipping company uses reporting systems whereby, whenever a Master or Officer leaves a ship (or at 6 monthly intervals), the Master and/or Chief Engineer submits a written report on the officer to the personnel department at head office. Should there be serious misbehaviour, the Master may report the subordinate at any time. On receiving a "bad report" on an officer, the personnel manager may either reprimand the officer on his next visit to head office or he may report this misconduct to the Merchant Navy Establishment (this is a joint employer-union institution which controls merchant navy manpower. In exceedingly serious cases, the Master may enter details of the officer's offence in the Official Log Book and, at the end of the voyage, the whole matter will be investigated by the Department of Trade and Industry who have the power to cancel or suspend that Officer's certificate of competency. It is very rare for officers to be reported to the M.N.E. Establishment or D.T.I. - the most common method of punishing an officer is reprimand by or firing from the company.

A number of Petty Officers and a few ratings serve under 'Company Service Contracts' whereby they agree to work for that company and no other without giving three months' notice. Masters submit written reports to the head office on these company service men in precisely the same way as they report on officers. However, the overwhelming majority of ratings are not on such contracts; most have a general contract with the M.N.E. Establishment while some have no contract at all (except for the ship's articles of agreement). When a rating misbehaves or refuses to obey an order, the traditional form of punishment is for the Master to enter the details in the Official Log Book and deduct
one or two days' pay from the offender's wages due. In cases of serious misconduct, no fine is imposed on board and, instead, the man may be taken before a Magistrate and fined up to £20 or £50. (At the time of writing, however, there is a move by certain pressure groups to have these 'penal' clauses removed from the Merchant Shipping Act). The common jargon for this entry in the Log and fining on board is "logging" and a poor report in the man's record of service was known as a "bad discharge" - from 1st January 1973, men no longer carry records of the reports they received from previous ships.

There is no one typical form of organization in the head offices of shipping companies so that it is impossible to describe the office situation in as much detail as the ship. However, there are certain functional positions common to most shipping companies and these will be briefly described.

All shipping companies have Boards of Directors formed of executive and non-executive directors. On an organizational chart there would probably be a general manager and a financial manager then, depending on the nature of the company's trade, a chartering or cargo-traffic manager, a claims manager, and a general office administrator. There may be an operations manager beneath whom may come the marine, engineer and personnel superintendents or these three superintendents or managers may head departments in their own right.

Titles may differ from company to company - and, in fact, some positions may not exist in very small companies - but in every medium to large shipping company there will be, in head office:-

The Marine Superintendent usually an ex-Master from that company's ships who is responsible for the general operations and safety of the company's ships; he always has a say in which Chief Mates will be promoted to Master; he investigates accidents on the company's ships. He probably has ex-deck officers as subordinates within his department.

The Engineer Superintendent usually an ex-Chief Engineer from that company's ships who is responsible for the technical performance of the company's ships; he always has a say in which 2nd Engineers are promoted to Chief Engineer; he deals with all repairs and overhauls and may deal with new designs. He probably has ex-engineers as subordinates within his department but he may also have engineering experts who have never been to sea.

The Personnel Superintendent sometimes an ex-seafarer from the company's ships but, just as often, one of the shore staff who has never been to sea. His primary task is to direct the movement of sea staff to ships or on leave. He may have subordinates to concentrate on recruitment and training.

A Catering or Stores Superintendent. If a large company, there may be both a catering and a stores superintendent; in smaller companies the positions are combined. Catering superintendents are usually ex-Chief Stewards from the company's ships.
Although in the two companies visited during this research, ex-seafarers had been promoted to Board level, such high promotion is very rare in British shipping companies. The highest level reached by some ex-seafarers is operations or technical manager but most never rise above superintendent level. As will be shown later, these superintendents perform a very important function which goes beyond their formal job descriptions.

It is hoped that the basic description given in this introduction will be sufficient for the non-seafaring reader to appreciate the significance of all that follows.

Social characteristics of the ship

Some of these characteristics are right on the surface and are there for all to see but the detection of other characteristics calls for closer and deeper investigation.

Two of the characteristics most easily identified are:

1) Authority Structure. This permeates the whole ship and all shipboard activities. The physical signs of a military-type structure may be seen in the raising and lowering of the national flag; in the officers' uniforms, buttons and braid which are almost identical with Royal Navy uniforms; in the issue and obedience of orders; and in the frequent use of the word "Sir".

Quite apart from these physical signs, the authority system manifests itself in many inter-personal relationships both on and off duty. On duty, the authority system is seen in the way the navigating officer instructs the rating to steer a certain course and in the way the rating reports to the officer before leaving the bridge. Off duty, the authority system may be seen in the way a senior officer instructs a watchkeeping junior officer to leave a social gathering and get some sleep.

2) The 24-hour Community. This characteristic may appear to be too obvious to be worth discussing for everyone knows that seafarers work and live together for 24 hours a day for weeks or months on end.

However, this total containment of people within limited boundaries for long periods has many important effects on human behaviour and part of the research was aimed at determining the degree to which the reported effects of 'total institutions' apply to modern ships; the results of the observations are reported later.

The two characteristics mentioned above are unique to shipping and are not found in any shore-based, commercial enterprises. Those mentioned below are found, to greater or lesser degree, in shore industries and can only be detected aboard ship by close observation.

3) Role ambiguity and Role conflict. One way of analysing any organization is by means of identifying the "offices" or organizational positions occupied by people and then by identifying the behaviour expected of each occupant. Each "office" is connected to other "offices" in the organization; the office-holders may be connected in a superior-subordinate relationship or in a peer (equals) relationship but, to greater or lesser degree, connected office-holders depend on one another. Each office-occupant expects each other occupant, with whom he is connected, to act and behave in a certain manner; the occupant himself has his own ideas on what is expected of him and how he should behave. This expected behavioural
pattern is his "role".

When an office-holder does not know how he should behave, he experiences "role-ambiguity" and when he comes under conflicting expectations of how he should behave, he experiences "role conflict". Both role-ambiguity and role-conflict result in role stress and the manner in which an occupant copes with such role stress depends upon a number of factors including his personality, his career aspirations, and on the avenues of escape open to him.

It is doubtful if there is any other commercial activity in the world which has as much built-in role conflict as merchant shipping with the most naked form of role conflict being found in the position of ship-master. Two examples may suffice at this stage.

(a) The Master is told that he is totally responsible for the safety of ship, lives and cargo at all times and there are hundreds of court cases (in which Masters have had their certificates cancelled) to prove that this is a fact of life. On entering any port, local by-laws make it mandatory for each ship to take a pilot; the by-laws and Merchant Shipping Laws make it clear that the pilot is nothing more than advisor to the Master. The Master has no choice in which pilot is sent to his ship.

Thus, on entering or leaving port, the Master is faced with a situation in which a complete stranger (of whose skill and competence the Master has no knowledge) boards his ship and, by common practice, issues orders to tugs, officers and crew. The transiting of dock and harbour entrances can be an extremely difficult operation and the Master has to accept that the pilot has the skill to conduct the operation safely. In law, the Master can - and should - countermand any instruction from the pilot which the Master deems to be hazardous; but, in practice, the Master knows that such interference with the pilot leads, at best, to unpleasantness or, at worst, to even greater hazards. The Master is, thus, in a position of extreme role conflict; older, more experienced Masters, draw on hundreds of previous, successful pilotages to allay their fears but the young, "first-trip" Master experiences this as an extremely stressful situation.

(b) As has already been said, the Master is told (in the law and company's regulations) that he is responsible for everything that happens aboard his ship. For many reasons, it has become the practice in many British companies to hold regular management committee meetings on board. Both the companies visited in this research had adopted this method, the reasons given (by shore managers) encompassed the need to build up a team spirit on board; the need to make officers feel that they could participate in planning and decision-making; and the need for sound work planning in highly sophisticated ships with small crews.

Under this new system, the Master is again faced with role conflict at a high level. One section of the company's regulations states that the Master is responsible for everything while another section of the same set of rules states that the Master must engage in group decision-making activities. During this research, it was found that all four Masters of the ships visited experienced role conflict and stress of varying levels and the manner in which each coped with this situation had a significant effect on the atmosphere on board. As will be shown later, the manner in which Masters cope with autocracy-democracy problems is a significant variable when comparing one ship with another.
4) Task groups and Sentient groups. Task groups are groups of people brought together because of the nature, location or timing of their job patterns while sentient groups are those to which people feel they belong because of shared interests, friendships, mutual liking of each other or professional pride and identification. Miller and Rice (1967) report on harmony resulting from the match of task and sentient groups and conflict resulting from mismatch.

The pattern of sentient grouping is distorted aboard ship owing to the nature of the watchkeeping routine. For example, one of the "natural" sentient groups on board is composed of the three or four mates but, because of watchkeeping, one is always on watch, another is probably sleeping resulting in the third (or remaining two) being the only ones free for social mixing at any one time of the day. The one off-duty mate seeks the company and friendship of officers from other departments and thus, during the ocean passage, we can observe "forced" sentient groups and temporary friendships which disintegrate as soon as the ship reaches port and all the mates are off-duty at the same time.

The two groups which show the greatest degree of match between task and sentient groupings are the engineer officers and the catering ratings. The engineers are sufficient in number to be able to collaborate on tasks together and to be free for social activities at the same time; the catering ratings are in a similar position.

Another group who do a certain amount of work together and who are off-duty at the same times are the Master, Chief Engineer and a day-working Chief Mate. In many ships they form a sentient group bound together, not by common professional discipline but by an almost common level of rank.

As will be shown later, another significant variable to be considered when comparing ships, is the membership and cohesion of sentient groups.

At this point, it is worth reporting on the position of ratings and cadets vis-a-vis these task and sentient groups.

While on watch, deck officers work with deck ratings and engineer officers with engine ratings yet, during off-duty hours, social mixing between officers and ratings is minimal or non-existent. The reasons put forward by officers in defence of the officer-rating gap are well reported by Herbst (1968 & 1969) and by Roggema (1968) and will not be repeated here.

On most ships, cadets are placed in highly ambiguous and conflicting positions. The engineer cadet works closely with the engineer officers and becomes a member of their task group; off-duty, it is the rule rather than the exception for the engineer cadet also to be a member of the engineer sentient group.

The deck cadet finds himself in a position quite unlike that of the engineer cadet. During the first 12 to 18 months of his training, the deck cadet works on deck alongside the deck ratings and under the supervision of the bosun; he becomes a member of the deck rating task group. At the same time, he is told very clearly that, as a potential officer, he must never mix socially with the ratings (Madigan 1973). He tries to gain membership of the deck officer sentient group but, in many, if not most, ships he is firmly rejected on the grounds that he is but still a boy. He either enjoys the limited company of the other deck cadet or he experiences extreme loneliness.

In "Mica", the deck cadets were fully accepted members of the deck officer sentient group - a fact which was patently obvious to the researcher during observations made during the voyage but which was repeatedly stressed by the cadets during interview e.g. "Life's great on this ship"; "If only I had done my first trip to sea on this ship"; "I can go into the bar at any time and say what I like"; "You must have seen, the Old Man always calls me by my Christian Name"; "I feel a different person on this ship", etc.
5) Promotional prospects. Another striking characteristic of the total officer body is the importance attached to promotion. It would not be stretching the truth too far to state that, with the exception of the Master, Chief Engineer, Chief Steward and Radio Officer (all of whom have reached the top of their seagoing careers), the remaining members of the officer group live for promotion – and home vacations, of course.

The reasons for wanting promotion vary from person to person but, as will be shown, the dominant reason is a desire for a more challenging job. The increased challenge in the next rank up is perceived mainly as increased opportunity to exercise discretion and judgement.

When invited to describe the degree of satisfaction in his job, the ship's officer nearly always introduces statements on whether his superior does or does not "leave him alone to get on with the job". A man rates his own job, and his superior, as 'good' if his superior does not interfere and 'bad' if his superior does interfere.

When exploring the issue of promotion, junior engineers state they want to become "Fourths" or "Thirds" so that they may in full charge of engine watches and have the power to decide which items of machinery are to be overhauled and in what manner. Third and Fourth engineers want to become Second engineers in order that they may plan and organize the total maintenance work in the engine-room; and Second engineers want to become Chief Engineers in order to plan and co-ordinate all technical maintenance and operational activities aboard the ship.

On the deck side, Third Mates (who keep the 8-12 watches when the Captain is awake and "around somewhere") want to become Second Mates in order to gain more freedom by keeping the 12-4 watches when the Captain is usually asleep. Second Mates want to become Chief Mates in order to be able to direct the deck ratings in sprucing up the ship and in order to direct cargo operations. Chief Mates want to become Masters in order to run the whole ship as they think it should be run.

The whole promotional issue is only partly bound up in increased wages and preparation for a shore job; the dominant factor is increased opportunity for the display of discretion, followed by increased status on board and within the company.

These, then, are the five main threads which will be traced out in the rest of this section i.e. The authority structure
The 24-hour community
The problem of role conflict
Task groups and sentient groups
The promotional system.

It will be shown that the ways in which individuals react to the influences of each thread can be explained and understood in terms of individual bargaining processes in which each individual makes his own 'payments' in return for his own desired 'rewards' and that, in most cases, each man has to make a series of compromises.
In an attempt to avoid any misunderstanding in the following sketches of individuals, ships and companies, three sets of definitions are given:

The Authoritarian Personality (after Adorno et al. 1950; Krech et al. 1962; Himmelweit & Swift 1970) may be found in some persons and is composed of a number of traits including:

1) A high degree of conformity leading to conventionalism.
2) Rigidity of thinking.
3) Over-concern with status and power relations.
4) Readiness to stereotype and generalise, especially about subordinates.
5) Dependence upon authority.
6) Projection of hostility.
7) Submission to organizational superiors accompanied by aggressive dominance over subordinates.
8) Response to events with distrust and cynicism which, in high authoritarians, leads to a jaundiced view of life and work.

Although various tests for measuring authoritarianism are available (e.g., the long- and short-F scales) no such tests were used in this programme. As Himmelweit & Swift report, authoritarianism is manifested in various ways but, among ships' officers and shore personnel, the most easily observable manifestations occurred in statements about, and attitudes and behaviour towards subordinates; submission to superiors and defence of superiors to outsiders; manoeuvrings to gain physical proximity with superiors during social gatherings. When, in the sketches which follow, the researcher describes an individual as a high authoritarian, no claim is being made that the individual is high on all eight characteristics described above; what is being claimed is that the individual is high on characteristics numbered 1), 3), 4), 7) and, in some cases, 8) above.

Bureaucracy is a form of organizational structure well reported in the literature. Weber (1921); Argyle (1967); Hennis (1966); Blau & Scott (1963); Hutton (1969); Merton (1957); Udy (1959); Stinchcombe (1959) and others have identified many of the characteristics of bureaucracies. Within the two companies involved in this programme, the level of each characteristic was obtained in three separate ways:-

(i) from interview statements and discussions;
(ii) from direct observations by the researcher; and
(iii) from specific questions in the long questionnaire (see statistical appendix).

In the early stages of the programme, great difficulty was found in getting people to discuss the bureaucratic nature of their companies for the word "bureaucracy" carries with it pejorative connotations of inefficiency, red-tape and impersonality. The determination of existing degrees of bureaucracy had to be obtained by structuring the interviews around the characteristics rather than around the wholeness of bureaucracy.

It was in this area that the researcher found the greatest difficulty in keeping his own views and attitudes separate from what was observed and said by others. Drawing on the definitions of 'features' and 'attributes' given at the beginning of this research report, the table of characteristics given on the following pages shows, against each characteristic, the objective reality of each under the heading 'feature' and the subjective awareness of the characteristic held by members of the company under the heading 'attribute'.

The bureaucratic features of Gem Tankers and Polychem Tankers.

Scaling symbols used:

- **H** = characteristic found absolutely or to high degree
- **M** = characteristic frequently seen or to medium degree.
- **L** = characteristic rarely or never seen or to low degree.

<table>
<thead>
<tr>
<th>Feature (by observation)</th>
<th>GEM</th>
<th>POLYCHEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) A formal, rationally organized social structure clearly defining patterns of activities all being related to the purposes of the company.</td>
<td>H H H</td>
<td>H L H</td>
</tr>
<tr>
<td>2) A comprehensive set of rules and regulations embracing job descriptions and what should be done under all known and expected occurrences.</td>
<td>H H H</td>
<td>M L M</td>
</tr>
<tr>
<td>3) The organization is composed of a set of &quot;offices&quot; each of which has its designated responsibilities and authority and all of which are arranged into a hierarchy.</td>
<td>H H H</td>
<td>L L H</td>
</tr>
<tr>
<td>4) Clearly defined lines of authority run downwards through the organization usually based on the principle of &quot;one man - one boss&quot;.</td>
<td>H H H</td>
<td>L L H</td>
</tr>
<tr>
<td>5) Status, obligations and privileges are clearly related to authority which, in turn, is clearly related to hierarchical standing.</td>
<td>H H H</td>
<td>M L H</td>
</tr>
<tr>
<td>6) Authority, i.e., the power to control, lies in the &quot;office&quot; and not in the particular person who happens to be filling that &quot;office&quot;.</td>
<td>H M H</td>
<td>H L H</td>
</tr>
<tr>
<td>7) The rights and privileges attach to the &quot;offices&quot; and not to the incumbents.</td>
<td>H H H</td>
<td>H H H</td>
</tr>
<tr>
<td>8) There is a division of labour according to specialisms and according to the rules.</td>
<td>H H H</td>
<td>L L M</td>
</tr>
<tr>
<td>9) All or most administrative acts, decisions and rules are recorded in writing.</td>
<td>H M H</td>
<td>L L M</td>
</tr>
<tr>
<td>10) Impersonality in the application of the rules to individual cases.</td>
<td>H L M</td>
<td>L L L</td>
</tr>
<tr>
<td>11) Promotion on merit</td>
<td>M M L</td>
<td>H H H</td>
</tr>
<tr>
<td>12) Expectation of life-long tenure or employment.</td>
<td>H H H</td>
<td>L L L</td>
</tr>
<tr>
<td>13) All physical and economic property belongs to the organization and not to individuals.</td>
<td>H H H</td>
<td>H H H</td>
</tr>
<tr>
<td>14) Subordinates depend upon superiors for rewards outside the formally regulated rewards.</td>
<td>H H L</td>
<td>L L M</td>
</tr>
</tbody>
</table>
The list of characteristics 1) to 14) is by no means exhaustive but, after completing the field work, I am by no means convinced that these characteristics are quite as stultifying to the individual as reported — or implied — in the literature.

In order to measure bureaucratic orientation, I applied Gordon's (1970) Work Environment Preference Schedule (WEPS) to each respondent. This test is designed to measure (i) Self-subordination; (ii) Impersonalization; (iii) Rule conformity; and (iv) Traditionalism. The results of this test are described in detail elsewhere in this report.
No matter how they may be defined, social systems are composed of individuals and, before proceeding any further with this report, it may be appropriate to draw thumbnail sketches of some of the people involved in this programme.

To protect individuals against identification and exposure, pseudonyms are used throughout and if, by any chance, there exists a seafarer with one of the chosen names, such is purely coincidental.

The data used in these sketches came from direct observations by the researcher; from formal and informal interviews; from responses to the long and short questionnaires (see statistical appendix); and from informal discussions during social gatherings.

To avoid breaking the flow with too many sub-headings, each sketch will take the form of a brief personal description followed by separate paragraphs in the order:

- the authority structure;
- the 24 hour community;
- role conflict;
- task and sentient groups; and
- the promotional system.

Greater weight is attached to the world as each man sees it rather than to the aspects observed by the researcher.

**Tom Hitchins, Master:** Aged 40+; married with children; 30 years at sea, all within Gem Oil; a very low WEPS score of 19; a warm, outgoing personality, frequently seeking the company of selected friends on board; strongly oriented towards the company's goals; somewhat intolerant of misbehaviour among ratings.

While believing that neither he nor his officers are over-controlled by shore staff and that he is able to exercise a great deal of discretion in the interpretation of the rules, Tom nevertheless sees that one of his first duties as Master is to ensure that any instructions from head-office are properly executed on board. If a particular instruction is repugnant, Tom believes in obeying it first and objecting to it later. While not enjoying the duty, he has no hesitation in "logging" a rating when occasion demands.

He sees the rules and regulations as guidelines and the shore superintendents as friends who will defend him should something go wrong on board. Tom, like the other senior officers on board, does not relish the thought of "Mica" being held up before the rest of the fleet as an example of a high performing ship; he sees the continuing high performance of this ship as a means whereby he (as an individual) and the senior officer group can build up a stock of goodwill in head-office which goodwill may be used (i) to single him out as an identified individual from the very large number of Masters in Gem Oil; and (ii) as a form of defence should he become involved in an accident in the future. That is, Tom sees high performance of the ship as a means of self-identification and self-defence and, because of believed success in these areas, he feels very secure.

Tom Hitchins's inner security plus his high affiliative needs (he is an only child) may account for the fact that he does not remain distant and god-like (as the Captain Blights of fiction) but joins in social activities on board on a Christian name basis.

Tom's backlog of experience as a Master enables him to experience the Master-Pilot role conflict without signs of stress; he avoids the Master-Management Committee conflict by simply not holding Management Committee meetings; and he copes with the Master-Agent role conflict by simply accepting, without question, whomever the company has appointed as Agent.
Tom's task group - as he sees it - is a triad of himself, the chief mate and the chief engineer although, while the ship is moving through congested waters, his task group is extended to include the navigating officers. He chooses his sentient group not on the basis of professional discipline but on equal commitment to Gem Oil - thus his sentient group is composed of himself, the chief mate and the chief engineer. The totally overlapping task and sentient groups at the top of the hierarchy is a marked feature of this ship.

Tom Hitchins sees Gem Oil as a good company to work for. Quote "You realise you're not a name and number when something goes wrong at home or when you fall ill". He has seen many changes wrought during his 30 years with the company and expresses no fear of future changes. Quote "Gem changes slowly; we don't go off rushing into new things without a lot of planning and thought. The company has got a good training scheme so if they decide to run new types of ships they'll make sure that people are properly trained. A lot of nonsense is talked about the speed of change. Take the VLCC's - a few years back, anyone would have said you were crazy if you mentioned at 200,000 tonner - but we've got them now and the people running them are no different to you and me. No, the biggest change is in the people and the way we have to get the best out of the men we're given".

Tom's compromise patterns are clearly visible. At one level, he feels that his years of loyal service will correctly be rewarded by a good pension. At another level, he feels that high performance on his part will be rewarded by stronger self-identification and self-defence. And at still another level, he has struck a bargain with the chief mate and chief engineer under which he will back them up, and bend the rules if necessary, in return for their continuing high performance in their specialisms.

Arthur Lewis, Chief Mate; Aged 30+; married with children; 18 years at sea, all within Gem Oil; a higher than average WEPS score at 36; a warm personality frequently seeking the company of others on board; high job satisfaction experienced in efficient cargo-handling and, to secure this satisfaction, he maintains good relations with terminal personnel in order to avoid delays and to bend rules when safe to do so; somewhat intolerant of misbehaviour among ratings.

Arthur believes that Gem Oil has more rules and regulations than do other companies and that control from the shore staff, in Gem, is excessive. He acknowledges the existence of friendship patterns between ships' officers and their immediate superintendents ashore but finds that he is forever coming up against brick walls created by rules. He feels that long service in his present ship, plus his clearly demonstrated competence, makes him far more knowledgeable about the ship than some shore manager sent to check up on him during a fleeting visit. He enjoys the freedom he has to plan and direct cargo-handling in a day-to-day sense but the company's rules and organization which prevent him from exercising longer-term control over the ship e.g. in Manning, stores, expenditures and repairs, he experiences as highly repugnant.

As with Tom Hitchins, Arthur Lewis has also succeeded in splitting the work and life areas on board. He seeks the company of others and relationships with others in the bar are on a friendly and first name basis. In particular, Arthur shows friendliness towards the young cadets to which these young men respond warmly. (In many ships it is traditional for some chief mates to abuse deck cadets)
All the incidents of role conflict, ambiguity and stress observed in Arthur Lewis involved shore people. In one case, instructions were received from head office that the old, experienced pumpman should be relieved by a young boy (much against Arthur's will and judgement) and in another case, the agent (appointed by head office) refused to order a tug and pilot at the time Arthur wanted. Arthur felt powerless.

Arthur's primary task and sentient groups were the triad of the Master, chief engineer and himself although, whenever the ship is in port, his task group is extended to include the remaining deck officers and the pumpman. He also has friendly relationships with the second engineer.

Arthur is still affected by the company's promotional system. Promotion to Master is one of Arthur's goals and he knows it is within his reach because of the self-relieving system aboard this ship i.e. when the present Master (Tom Hitchins) goes on leave, Arthur takes command. Although this self-relieving system gives the chief mate earlier command than under conventional systems, it places an exceedingly heavy burden of role conflict and proof of competence upon him. As chief mate, he has to show his competence as a cargo-handler and, as Master, his competence in handling the ship and co-ordinating officers and crew. Fortunately, in this ship, there is a degree of similarity of personalities between Tom and Arthur - there is, also, this successful splitting of work and life areas - so that Arthur should not find it too difficult to make the switch from chief mate to Master and back again while still retaining his friendships with the remaining officers. At the time of the research, Arthur is in the situation of having to make pretty heavy "payments" to the remaining officers in return for certain ease in his first command and to secure his place within the group when he rejoins them as chief mate.

Arthur Lewis sees Gem Oil as a fairly good company to work for; he feels that it offers slow but sure promotion and very much more security than other shipping companies. He experiences the leave system, food and accommodation as better than available elsewhere in British ships but he experiences, in the most negative way, the lack of precise commercial information given to the ship and the manner in which shipboard control/planning (which he feels should rightly be placed in the hands of the senior officers) is totally executed within head-office.

Mark Gray Second Mate. Aged 27+; married with children; 11 years at sea, all within Gem Oil; an average WEPS score of 31; a remote personality not frequently seeking the company of others on board.

Mark displays many symptoms of the authoritarian personality and, while believing that Gem Oil has more rules and regulations than other companies and that a stricter obedience to the rules is required in Gem than elsewhere, he sees such rules as necessary quote "especially today with lowered standards among the officers and ratings". As can be seen in the analyses of the long questionnaire, Mark seeks the security of firm and unalterable rules. A few months before this programme, Mark had suffered an unpleasant experience when, after having been temporarily promoted to chief mate, a subsequent increase in fleet personnel resulted in his being re-appointed to this present ship as 2nd mate. Quote "Ratings need to have a system of instant punishment so that they are clear about the position. Too much is left to the Master's discretion with the result that officers - especially second and third mates - feel lost in controlling and disciplining ratings. I believe in making the position clear with ratings; I could do this as Mate but as second mate I have to rely on the top. We need disciplinary backing from the top and that's what is not
happening in this ship. Arthur is alright, and so is the Old Man in some respects, but they're too soft with the ratings. Also, the backing we need must come from head-office - we say a man is no bloody good and the next thing we here is that he's been offered a company contract. Gem is getting wiser now and improving but they did go through a silly stage".

Mark wants organizational clarity both above and below his present position. Quote "On my last ship, the Old Man was firm with the crew. No-one called him by his Christian name, he was always addressed as 'Sir'. He called me Second and, later, Mate or Mister Gray. I've seen him throw a third engineer out of the saloon for not wearing the correct uniform. . . . But here things are different; you must have seen that. Look how everyone calls the Old Man 'Tom' - I don't because I don't think it's right, so I don't know what to call him because no-one else calls him 'Sir' I don't want to be the odd man out. And look at the way he and Arthur dress - you must have seen the Old Man in that woolen cardigan thing in the bar".

As already mentioned, this ship has adopted a self-relieving system under which the chief mate takes command during the permanent Master's vacation periods. Mark does not like this Quote "Self-relieving is no good. We all use his first name now, but what are we going to call Arthur next trip when he's the Master? We'll have to switch to calling him 'Sir' and then back to calling him Arthur when the Old Man returns".

Mark Gray sees the work and life areas aboard ship as being inseparable. So long as ranks penetrate both the work and off-duty areas, he feels that everyone knows where they stand. Quote "Fraternizing with the crew (i.e. ratings) is no good - the job suffers".

Mark suffers excessive role conflict from his personality and previous chief mate experiences mismatching the general style and his rank in this ship. He wants to behave as a firm officer, directing the ratings in their work but finds that his seniors do not want him to behave in that way. He wants to take charge of the navigation of this ship but finds that Tom Hitchins takes control of all navigation. Drawing on the satisfaction he derived from participating in planning and decision-making in his last ship (when he was chief mate), he wants to participate in similar planning activities aboard this ship yet finds that he is excluded from the triad of Master, chief mate and chief engineer.

While the ship is at sea, Mark belongs to the deck officer task group increased to include the watchkeeping ableseamen. In port his task group includes the deck officers, pumpmen and deck cadets. His sentient group is composed of the junior chief mate, himself and the third mate.

The company's promotional system is very important to Mark and he has an exceedingly strong desire to regain the position of chief mate. He perceives the chief mate's job as the most attractive at sea for he believes it to be filled with challenge and to carry attributes of power and status. Mark wants faster promotion and is willing to pay any price for it except a reduction in the frequency of leaves.

He sees Gem Oil as being fairly good to work for but containing a wide variety of people, some of whom are good and firm while others are bad and soft. He sees little wrong in the traditional manning systems but fears that there are too many people trying to predict the future and making manning changes before the ships and people are ready for such changes.
Eric Palmer, Chief Engineer. Aged 40+; married with children; 24 years at sea, all within Gem Oil; an above average WEPS score of 39; highly committed to his job and deriving satisfaction out of high technical performance of the ship; a man who firmly believes that machines are there to do what he tells them to do and not what they want to do; some of his subordinates feel that he transfers this attitude to the engineer officers on board.

Eric sees the company's rules and regulations as being eminently sensible; he calls on past experiences to illustrate that the rules are born out of actual shipboard experiences and he sees them as essentially practical provided everyone sticks to them. He is intolerant of engineering incompetence in others but he is even more intolerant of people who disrupt mechanical maintenance systems through notions of economy. Quote "Planned maintenance is good; the job cards we're given are drawn up from experience on running various bits of machinery. So, if the card says that certain spare parts must be fitted after so many running hours, I must fit them. It doesn't matter whether I think the existing parts are alright - if the job card says replace them, I replace them. The trouble comes when an engineer thinks he knows better than the cards. He thinks he is saving the company money by replacing the old parts and keeping the spares on the shelf. So he boxes up the job with the old parts inside and marks the card that the bits were renewed. The next chief comes along and gets into trouble when that machine fails soon after it was supposed to have been overhauled."

In common with Tom Hitchins, Eric believes that instructions from head office should be obeyed before any objections are lodged. Signs of an authoritarian personality creep through in the way he defends all shore staff against criticisms coming from outsiders and subordinates.

Eric approves of the separation of life and work areas to a limited degree and participates in the social activities on board but the high pressure and direction which he imposes on the engineers at their work place makes it difficult for them to completely switch off and accept him as just another individual in the bar.

Eric showed no signs of role conflict and stress by simply accepting that his primary duty is "to keep the job running at maximum efficiency".

Eric is a member of two task groups: (i) formed of the Master, chief mate, pumpman and himself for all cargo purposes; and (ii) formed of all the engineer officers for energy, propulsion and maintenance purposes. His sentient group, however, is clearly the Master, the chief mate and himself; he tends to remain somewhat distant from the rest of the engineers and this is clearly resented by his subordinates. For example: All diesel ships have what are known as 'critical revolutions of the engine'. When the engine turns at this speed, the natural frequency of the hull coincides with the frequency of the engine and excessive vibration results. It is impossible to avoid passing through these critical revolutions when the ship slows down while entering port and the common practice is to bring the engine down through these 'critical revs' as quickly as possible. Also, at most oil terminals, it is forbidden to carry out welding tasks while the ship is berthed alongside. While the researcher was aboard, the ship entered Rotterdam and to avert subsequent delay, Eric went to the engineroom to complete a welding job before the ship berthed. Vibration was excessive while the ship entered port and later, during a social gathering, the statement was made quote: "Hey, did you see how I held her on the critical revs? I knew Eric was trying to get that job finished, but b----r him. He's always rushing to get things done and that job could have easily waited until later".
Eric sees Gem Oil as a large, financially strong company which, above all else, requires reliability and certainty of service from its ships. He sees his duty as having to provide mechanical reliability at the highest possible level (within the resources at his disposal) and at almost any personal cost in resentment or rejection by subordinates. In return, he sees Gem Oil granting him very high job security.

Bill Steadman, 3rd Engineer, Aged 27; 10 years at sea all within Gem Oil; unmarried; an above average WEPs score of 37; an only child with apparently high affiliative needs; oriented more towards operational than maintenance duties.

Bill sees the company's rules and regulations as reasonable and as essential for the efficient running of the ship but, drawing on past experiences, he feels that control from the shore is excessive. In his inter-personal relationships with fellow engineers, he rates technical competence above personality strengths and deficiencies; he admires Eric Palmer and Arthur Lewis for their very high technical skills. Unlike some of the other engineers who perceive instructions from Eric as somewhat over-demanding, Bill reacts positively to Eric's instructions.

The separation of work and life areas established by the senior triad is well accepted by Bill and he joins in all social activities on a first name basis.

Bill is an interesting contrast with Mark Gray. It will be remembered that Mark had served in his previous ship as chief mate but was now serving as second mate. Bill, too, had enjoyed higher rank for, in his last ship, he had served as second engineer. Yet, on this ship, Bill shows no signs of role conflict in his subordinate position - he feels that he is here to learn about diesel engines and that he is fortunate to be able to learn from so high a performing chief engineer as Eric.

Bill's task group is clearly formed of all the engineer officers. His sentient group, too, is composed of all the engineer officers. At the time of the research Bill was hoping to be accepted by the triad in order to gain permanent appointment to this ship.

The promotional system is important to Bill Steadman in order to escape from the engineer officer group before automation demotes, in his view, engineers from operational officers to maintenance fitters. He knows that, once he reaches the position of Chief Engineer, he will be an operational officer within Gem Oil and will not be required to carry out 'fitter' tasks. In this, he may reflect commonly held views of engineer officers who embarked on their careers as engineer cadets instead of through the traditional channel of first having to complete an apprenticeship ashore as a fitter or mechanic.

Bill sees Gem Oil as owners of a large fleet of diverse ship types, offering rapid promotion for engineer officers willing to learn all they can about different types of machinery and willing to study for and obtain their certificates of competency. He sees his fellow officers as more friendly than those in other fleets and Gem ships as running more efficiently than other British ships.
Frank Oliver, Catering Officer. Aged 45; married with children; 27 years at sea in five different companies; an average MIEPS score of 31; in common with the majority of catering officers encountered during this programme, more concerned about individuals and the 'atmosphere' on board than about the technicalities of his job.

Frank experiences some problems in getting adequate performance out of what he perceives as below average ratings. Frank is willing to make very high points for better behaved ratings. He sees his problems with ratings as being the result of inadequate personnel management by Masters and senior officers rather than as a result of personality deficiencies in the ratings themselves. In fact, he feels that many ratings have more genuine and complete personalities than do many of the officers.

In common with the majority of the catering officers in this programme, he believes that catering officers have an important role to play in achieving harmony aboard ship and that a great deal more thought needs to be given to the total 'life' area in ships. Through his unique position at the interface of officers and ratings he is able to hear both sides of many stories and feels that some junior officers present a false front in social gatherings.

Frank experiences extreme role conflict and stress. As Catering Officer he is, formally, the head of a shipboard department and yet he recognises that neither he nor any other catering officer has a Department of Trade and Industry certificate similar to those held by the heads of the deck and engineering departments. In this particular ship, Frank experiences great stress because, even though he is the head of a department, he is firmly excluded from the senior triad. The cause of this exclusion is partly a personality conflict between Frank and Tom Hitchins and partly resentment by Tom, against certain shore managers for not appointing to the ship the catering officer requested by the triad. Frank experiences further conflict (in common with other catering officers) from not knowing quite where he stands vis-a-vis the other officers. Deck and some engineer officers pass through a cadet scheme and, no matter what their origin, all deck and engineer officers pass through a long period as junior officers before being promoted to head of their respective departments. Catering Officers, on the other hand, are promoted directly from rating status to officer status as head of department - there being only one officer in the seven man catering department in cargo ships.

Frank's task group, for catering purposes, consists of the whole group of catering petty officers and ratings but, in all his clerical and medical duties, he is an isolate. His sentient group does not exist aboard the ship - as a catering man, his group would be the rest of the catering people on board but, as an officer within a system which forbids social mixing of officers and ratings, he is expected to join the officer group; yet no other officers have catering backgrounds or interests and so, again, he finds himself isolated.

Having reached the top of his seagoing career, Frank is not directly concerned with the promotional system within catering but what does bother him is the very rapid promotion open to engineer officers and, more recently, to deck officers; the young engineer or deck officer can advance more rapidly - and to higher levels - than can the best of catering officers.

Frank sees Gem Oil as a very friendly company but so strongly oriented to the mechanics of transporting oil by sea that catering and human needs take second place. He draws on past experiences to illustrate his contention that repairs and improvements within the shipboard catering area are executed after engineering and navigational work has been done, and then only if time and funds permit.
"Mica" If the sketches have been accurately drawn, the reader should, by now, have a relatively clear picture of this ship. On many dimensions - keeping to schedule, minimization of time in port, avoidance of breakdowns, etc - she is one of the most efficient ships in the Gem fleet. On board we see a tightly-knit triad of the Master, chief mate and chief engineer demonstrating very high levels of individual and group performance in the operation of the ship. These three enjoy a high level of job satisfaction; as a group and as individuals they are well known among the shore managers; they have built up a back-log of goodwill which will stand them in good stead should something go wrong in the future. So far as the Gem operational managers are concerned, these three form an ideal team and there is mutual trust and friendship between these three and their immediate superintendents at head-office. But it is their success and proved competence which highlight the organizational weaknesses in Gem Tankers - these three want more information on the commercial success of their ship than Gem is prepared to - or can - give; they want more direct participation in the long-term planning and control of their ship than Gem practices can allow e.g. on who is and who is not appointed to the ship.

The ratings refer to "Mica" as an "officers' ship" by which they mean that the needs and statements of officers are accepted before those of the ratings in any dispute; but, while not using the exact phrase, the junior officers see "Mica" as a "Senior Officers' ship". Those junior officers who feel they have much to learn from observing extremely high technical competence welcome service aboard "Mica" but those who wish to participate in planning and decision-making find the tightness of the triad highly repugnant.

Much is to be learned from a study of "Mica" for, if some of the Norwegian researchers are correct we may find, during the next decade, that most ships will be manned with a small elite group of professional officers supported by about twenty people who spend no more than 18 to 24 months at sea in their whole lifetimes.

The study of "Mica" shows that a strong, self-confident team of non-authoritarian seniors can split the work and life areas on board but they may take so large a slice of the 'job satisfaction cake' that little satisfaction is left for the remaining people on board. An authoritarian personality - particularly in a man who has been demoted - may find service on such a ship highly unattractive.

It was noticed, on "Mica", that the seniors were too busy operating the ship efficiently to bother much about status and uniforms. The almost complete absence of uniforms and military-style titles is in harmony with social trends ashore but may be resented by authoritarian officers and by shore personnel managers who place personal smartness above operational efficiency.
Peter Knight, Master: Aged 50+; married with children; 43 years at sea, 21 of which within Gem Oil; an average WEPs score of 33; a warm, friendly personality who, above all else, respects the dignity of man; highly tolerant of weaknesses in others except cheating.

Peter sees that the cornerstone of authority is justice and that all disciplinary actions must take into account the dignity of the offender. Quote "I don't believe in fining a man a day's pay; think of the effect on his dignity. You wouldn't get away with it ashore so why do it at sea. What I do is allow a man to slip up once but if he does it again, I ask for his cards (i.e. ask him to resign). But we don't have much trouble; we get a good crowd in these ships - they know they can get off whenever they like so we get the steady ones who make up their minds to stay until Whit or until the summer so that they can be home with their kids".

While acknowledging the friendly relationships which exist between sea and shore staff within Gem Oil, it is the very high value Peter places on fairness that causes him to be angered by certain ship-shore control activities e.g. before the researcher joined, the ship had visited a certain port at which a shore terminal operator had omitted to shut a particular valve with the result that the ship had been sprayed with thick, black oil some of which had spread onto the water - this, in turn, resulted in Gem Oil being fined for polluting the harbour. Peter knew that this was not the ship's fault but declared to the researcher "I bet the ship will be blamed". On returning to this port while the researcher was on board, Peter's fears were confirmed when he received notice, from a Gem Oil official, that the ship's officers and not the terminal operators were held to blame for the pollution and subsequent delay to the ship. Peter wondered just whom he could trust when there was so patent a miscarriage of justice.

Peter clearly sees the company's rules and regulations as good, sound guidelines which, if followed, form a sound means of defence should an accident occur. He does not see the rules as limiting his discretion for he sees them as technical in nature while he perceives his real job as getting the best out of people; he does experience technical control from the shore as being excessive for he is bothered by the explosive increase in paper-work within Gem Oil. The notion that paper-work within Gem has "gone mad" in recent years penetrates right through this ship yet no mention was made of paper work within "Mica".

Peter rarely uses the bar and rarely joins in social activities but approves of others using the bar as and when they like. At the same time, he does not remain remote and god-like - he is seen by all on board as easily approachable. Quote "I don't take to this Christian name business; maybe I'm too old fashioned - but I've adapted to change in other ways".

Peter's years of experience as Master enable him to cope with Master-Agent and Master-Pilot role conflicts with no signs of stress. He recognises the potential role conflict in the Master-Management Committee situation but copes with it by taking final decisions after listening to all everyone has to say.

So far as his task group is concerned, Peter is an isolate and moves from one task group to another. In difficult or congested waters, he works closely with, and monitors, the navigating officers; in port he works with the chief mate in planning various supply activities; and when occasion arises, he works closely with the catering officer. His sentient group is a dyad of himself and the chief mate but Peter ensures that he does not get tightly locked into any particular group. Peter encourages all members of the crew to participate in the total work of the ship - junior officers attend the management committee meetings with some being given special responsibilities for the
forthcoming dry-dock period; able-seamen assist with the loading and discharge of cargo; the engineer's assistant stands watch and watch with the pumpman.

Peter sees Gem Oil as offering good working and leave conditions in return for loyal service and for accepting the loss of shore friends during a lifetime at sea. He feels that, during his 45 years at sea, he has seen and has adapted to many changes and now, nearing the end of his career, he looks forward to a good pension.

Brian Downing, Chief Mate; Aged 50+; married with children; 16 years at sea, 10 of which in Gem Oil; an average WEPs score of 51; a friendly personality but not searching for especially strong friendships with any particular individuals.

Brian feels that Gem has more rules than other companies but that control from the shore staff is neither more nor less than in other companies. However, in common with the other officers in this ship, Brian resents the underlying control built into the Gem system of records, documents and paper-work. He experiences friendly relationships with his immediate superintendents in head office but perceives terminal operators overdemanding and as potential dangers to his security. In fact, Brian seeks security above all else and this search leads to a degree of anxiety which manifests itself in his almost continual personal supervision of all cargo activities.

Brian does not separate the shipboard work and life areas; he addresses - and refers to - junior officers by their rank titles and not by their Christian or surnames; he rarely enters the bar and prefers to have two beers in the privacy of his cabin before turning in.

Brian shows signs of stress arising from role conflict - he wants to give subordinate officers more freedom of discretion during their cargo duties yet his anxious search for job security within Gem Oil forces him to stay awake, or out on deck, whenever cargo is being worked. He also suffers stress in the triangular relationship between himself, the head-office staff, and terminal operators - on the one hand he needs to show head office that he is efficient at his job but on the other hand he dislikes coming under the direct pressure of a terminal operator wanting to collect the cargo documents which, when transmitted to head-office, will help to confirm his job security.

Brian's task group is composed of the deck officers, the pumpman and whichever cadets or ratings are assisting with cargo work. His sentient group is the dyad of himself and Peter Knight, the Master.

He sees the size and financial strength of Gem as offering him a very high degree of job security in return for a satisfactory level of service. He experiences his long absences from wife and children as a large payment on his part but, due to the lack of suitable openings ashore, he is prepared to go on making this payment in return for a good standard of living for his family. He has no very strong desire for promotion to command and enjoys the variety of Gem ships which offer hard work (in the product carriers) and time for relaxation in the very large crude carriers. (The VLCC's, it should be noted, work cargo only once in 50 days and it is during cargo handling that Brian experiences the greatest stress).
John Osborne, 2nd Mate. Aged 24; married; 5 years at sea all within Gem Oil; an average WEPs score at 50.

Above all else, John is searching for a challenging job. It is this strong desire for challenge and the exercise of discretionary judgement which makes John experience the chief mate's constant supervision of cargo work as particularly negative; and it is this same desire for challenge which makes the V.L.C.C's particularly repugnant to John. Quote "What frightens me about the VLCC's is having to rely on the social side for giving any meaning to life. There's nothing to do on the job. If it wasn't for the bar, people would go mad on those ships. Sure, the office make a big play about the importance of those ships - but they are only building up a false status about them just to get people to join. Take me - the office phoned up while I was on leave and said that I had been selected for the "--" (one of Gem's VLCC's) but when I got there I found out that five other second mates had refused to join her. Once clear of Ushant, the job's so empty it's not true!"

John has no particularly strong desire to establish special friendships on board and, thus, sees no need to try to separate the work from the life areas. Although all the officers in the bar at any one time converse freely and without rancour, there is a visible division between the engineer and junior deck officers (the senior deck officers do not use the bar) and John only enters the bar when the third mate is able to join him there.

John shows signs of role conflict in his relationship with ratings and signs of an authoritarian personality emerge when it comes to ratings behaving as John thinks ratings ought to behave. In this ship practices had grown whereby ratings were allowed to smoke on the bridge and mates called their own reliefs (i.e. the mate on watch had to wake the next officer to take the watch - provided, of course, it was safe for the watchkeeper to leave the bridge for a few moments). John felt that both of these practices were wrong and asked the Master to order they be stopped. Peter could see nothing wrong in these practices and refused to alter them with the result that John has very negative feelings each time he has to call his relief and each time the ratings smoke on the bridge.

On the other hand, John believes that the desire for a challenging job must be just as strong in a rating as it is in an officer and he strongly approves of the ratings assisting with cargo-work; he wishes there were further interesting jobs which could be given to ratings.

At sea, John's task group is composed of the ratings on watch and himself, extended to include the Master in dangerous waters; in port he joins the task group of all deck officers, the pumpman and the ratings and cadets assisting with the cargo work. His sentient group is composed of the Master and deck officers.

He desires faster promotion only so far as it leads to a more challenging job where he can more fully exercise his discretion and judgement.

John sees Gem as a fairly good company to work for; he enjoys all jobs which offer some challenge. The most repugnant aspect of Gem is that the fleet contains some VLCC's to which he may be appointed at any time - he finds these large ships so highly unattractive that successive appointments to such ships would certainly persuade him to leave Gem Tankers for a company without VLCC's.
Stanley Ford, 2nd Engineer; Aged 30+; married with children; 14 years at sea all within Gem Oil; an average WEPS score of 31; shows some signs of an authoritarian personality.

Stan feels that Gem has more rules than other companies and expects much stricter obedience to them. In common with other officers on this ship, he feels that Gem paperwork is excessive and that there is a bit too much control from shore staff. At the same time, he sees his immediate superintendents as friends.

It is in his views on ratings that Stan is quite unlike the rest of the officers on this ship; in general, he finds the ratings well below average and would like to have some of them dismissed from the ship. He has logged ratings in the past and will not hesitate to do so again in the future although he would prefer simply to sack a (quote) "troublemaker". Whenever he has a disciplinary problem he expects the full backing of his superiors i.e. the chief engineer and Master.

Stan does not separate the work and life areas. Should Stan feel that a watchkeeping engineer is staying up too late, he does not hesitate to order him to leave the bar and go to bed.

He sees his present ship as technically fragile, in which planned maintenance is impossible (owing to the trade) and in which repairs crop up as a series of major and minor crises. In fact, the maintenance system in this ship could be described as 'repair by crisis'. This does not bother Stan for, in his experience, the hardest working ships are the happiest - and his implied definition of hard work is 'repair by crisis' and not equally hard work on a planned and regular basis.

Stan's authoritarian personality allows him to avoid all role conflict. He clearly sees his role as having to carry out the instructions coming from head office or from the chief engineer; and to so carry out these instructions he sees that he has the authority (and backing of superiors) to persuade or force his subordinates to carry out his orders.

Stan's task and sentient groups overlap completely; both consist of the whole engineer officer group.

Stan is quite satisfied with his rate of advancement in Gem Oil and has no pressing urge to reach the chief engineer's position except so far as it will offer him a slightly quieter life. If anything, he finds a bit too much challenge in his present job.

Stan sees Gem Tankers as financially very strong and as offering him the high degree of security he needs, seeing that he is married with children.

James Merrill, 4th Engineer; Aged 25+; unmarried; at sea for 3 years all within Gem Oil; a very high WEPS score at 43; very high affiliative needs constantly seeking the company of others; a high degree of pride in his skill as an engineer with a constant desire to do jobs properly.

While James believes that Gem has neither more nor less rules than other shipping companies, he is completely confused about the meaning of the rules - his confusion being the consequence of his seniors placing different interpretations on the rules. Quote" 1 get confused about the company's rules when 1 change from ship to ship. In one ship the Second (Engineer) says that the company wants something done in a certain way but in the next ship the Second says the company wants that same thing done a different way. So when I join a ship, I find out what the Seniors want - what way they want things done - and this is what the company's rules and regulations are to me.
For example, on one ship I was on, the Second neglected the watertight doors; a new Second joined and he went mad and made us stop what we were doing while we greased the watertight doors and made them work.

James clearly separates the work and life areas; he sees his own cabin as nothing more than a place for sleep and writing letters; nearly every minute of his awake off-duty time is spent in the bar with others and, even though a strict teetotaler, he readily offers drinks to others.

Job satisfaction is very important to James and his conversation confirms the 'repair by crisis' methods in this ship. Quote "The spares system is very much related to job satisfaction. Things aren't as they should be here. I start so many jobs wanting to do them properly and then find that they haven't got a spare and I've got to put the old parts back - it's either that or there's no time to do the job properly. Take the other night - the bilge pump was playing up so I opened it up; the Second told me to. But before I could do it (repair it?) properly he said 'just box it up, we haven't the time to wait'. But you just wait, it's going to break down again and I'll have to go and open it up all over again and do the job I should have done last night".

James shows very clear signs of role conflict and stress. Whenever a new Senior engineer officer joins his present ship, or when he is transferred to another ship, he passes through a period of trying to determine just what that senior requires. Even when he has established what is wanted he still experiences conflict between doing a job as instructed and doing it in the way he thinks it should be done.

James' task group consists of all the engineer officers except the chief engineer but he tries to expand his sentient group to include all the Gem officers on the ship.

James seeks promotion for one reason only and that is to have more personal control over his work pace and level; he wants to be in a position in which he can do jobs as he thinks they should be done.

James sees Gem as a very friendly company full of good people ready to offer him the friendship he needs. The only thing that bothers him about Gem is that, in his perception, the company wastes money. Quote "If this is the way all oil companies run their ships, I don't see how any tanker can pay".

Don Guthrie, Catering Officer. Aged 28; married; at sea for 12 years, 10 of which in Gem Oil; an average WEPs score of 26; very conscious of the contribution good catering can make to the efficiency and happiness of a ship.

Don sees Gem as a company with many more rules than other companies have but with no great insistence on strict obedience to them. He sees the authority structure and company organization as perfectly reasonable. Like Peter Knight, the Master, he sees the ratings as a good group of men and he admires the manner in which Peter deals with crew matters.

Don does separate the work and life areas as much as he can but he would like to see even greater separation. Shipboard routine which forces everyone to have their last meal of the day as early as 5.30 p.m. bothers Don. Quote "We should do away with the traditional evening meal and rather run along the lines of a hotel restaurant where one can go for a meal when one is hungry and not when the bell rings and everyone troops down to the saloon like sheep".

Don's satisfaction comes from doing his job well, knowing that Peter
Knight looks upon the chief mate and catering officer as his two key subordinates. It is because of this that Don experiences role conflict between what he would like to do to improve shipboard catering and what he thinks tradition and the company allow him to do. But he experiences greater stress from the conflict he perceives between his prime task - good catering - and current changes being made in Gem under which more of the general clerical and ship's stores work is being transferred from the chief mate and chief engineer to the catering officer.

Although on certain tasks he worked closely with the Master, Don's task group is the whole catering staff. In common with catering officers in all cargo (as opposed to passenger) ships, his professional sentient group lies outside the ship but, in Don's case, his age and personality enable him to be an accepted member of the young officers' social group (engineer and radio officers).

Don sees Gem as a reasonably good employer; his wife sails with him; he welcomes recent improvements made by Gem in the training of catering ratings. He does not like the traditional constraints placed on the way he executes the catering function and would move to another company - or to shore employment - if it offered him greater discretionary freedom in his job.

"Quartz" by now the reader should have a relatively clear picture of this ship's group of officers. Defects in a number of items of equipment permit her to be described as 'technically fragile' with the engineer officers working from one crisis to the next. Allowing for this technical fragility, the people aboard believe they are maintaining a satisfactory level of performance.

Peter Knight's personality pervades right through the ship. In particular, the ratings respond very warmly to his recognition of human dignity in his fellow man. Many members would describe Quartz as a happy ship. The Master, chief mate and catering officer all approve of the ratings and have no wish to punish or fine them. But the warm relationship between the top officers and ratings results in the junior officers feeling somewhat squeezed out of things.

Peter tries to involve as many officers as possible in the running of the ship and holds frequent management committee meetings the aims of which are to plan operational and maintenance work. However, in Quartz the most specific of planning techniques - planned maintenance - is not used at all. However much Peter tries to give satisfying jobs to all members, the anxiety of the chief mate (resulting in his constant supervision of cargo-work) reduces markedly the exercise of discretion by the junior mates; and 'repair by crisis' reduces job satisfaction in the junior engineers.

In Quartz the senior officers do not keep separate the shipboard work and life areas with the result that rank and departmental divisions penetrate into social activities.

There is much to learn in a study of Quartz. Junior officers feeling that they are 'being left out of things' has been noticed in other ships in which the Master and ratings enjoy a warm relationship - this is a relationship which authoritarian junior deck officers find difficult to accept. Lack of planning in the engineroom can result in decreased job satisfaction among those engineers who want to do each job properly; and friction between terminal operators and ships' officers can result in unnecessary delays. Even though technical fragility may be one of the root causes of sub-optimal performance of the ship, the exceedingly high dislike of paperwork found among all the officers in Quartz may be a manifestation of their unspoken acknowledgement that personal performance levels are below optimum.
One clear set of differences between "Mica" and "Quartz" was in the attitudes which individuals appeared to hold towards other individuals and towards other groups; these are summarised in the table below.

In order to simplify the table, certain people have been compounded into groups e.g. terminal operators, superintendents, service managers, junior officers, and ratings. Service Managers are taken as the staff of servicing (as opposed to operating) departments in head office i.e. technical, accounts, personnel, etc. Operating managers are those directly or indirectly concerned with the day-to-day operations of the ships.

So that easy comparison may be made, the attitudes of the Mica and Quartz people are given one above the other - Mica being above and unbracketed; Quartz being below and contained within brackets. Obviously, the attitude to, say, a chief mate held by a chief engineer must refer to two people in the same ship.

The symbols used are: Positive = +
Negative = -
Neutral = 0

<table>
<thead>
<tr>
<th>ASHORE</th>
<th>HEAD OFFICE STAFF</th>
<th>ABOARD OWN SHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Operators</td>
<td>Master Mica (Quartz)</td>
<td>+  (+)</td>
</tr>
<tr>
<td></td>
<td>Chief Mate</td>
<td>+  (-)</td>
</tr>
<tr>
<td></td>
<td>Chief Engineer</td>
<td>+  (0)</td>
</tr>
<tr>
<td></td>
<td>Second Engineer</td>
<td>0  (0)</td>
</tr>
<tr>
<td></td>
<td>Catering Officer</td>
<td>0  (0)</td>
</tr>
<tr>
<td></td>
<td>Deck Officers</td>
<td>+  (-)</td>
</tr>
<tr>
<td></td>
<td>Engineer Officers</td>
<td>0  (0)</td>
</tr>
<tr>
<td></td>
<td>Pumpman</td>
<td>+  (-)</td>
</tr>
<tr>
<td></td>
<td>Ratings</td>
<td>0  (0)</td>
</tr>
</tbody>
</table>

The table above shows the attitudes of the Mica and Quartz people towards various groups and individuals. The symbols used are: Positive = +, Negative = -, Neutral = 0.
While the individual sketches and the last table point towards different friendship and trust patterns in "Mica" and "Quartz", attention should be drawn to other important differences between the two ships and between different groups of officers.

Friendship patterns: In "Mica" we saw the close friendships existing between the Master, Chief Mate and Chief Engineer; the junior deck officers tended to be isolates; the junior engineer officers were friendly with one another; the catering officer had not established strong friendships with any specific individuals on board. The attitudes held by the senior officers to the ratings were generally negative.

In "Quartz", the only discernable friendship pattern among the seniors existed between the Master and Chief Mate; the junior deck officers were friendly with each other but not with other groups on board; some isolates existed among the junior engineer officers; the catering officer had established friendly relationships with the younger officers on board and, to a degree, with the Master. With the exception of the second engineer, the attitudes held by the senior officers to the ratings were generally positive.

Professional respect: Although some of the juniors felt they were excluded from planning activities, there was mutual respect for professional competence between seniors and juniors in "Mica" i.e. the seniors respected those among the juniors whom they rated as competent and all the juniors respected the triad of seniors for achieving such high levels of performance.

In "Quartz", almost everyone on board respected the Master for his professional competence and for the way he organised the ship but the high level of anxiety in the chief mate and the 'repair by crisis' style of the second engineer resulted in a complete absence of mutual - or even one-way - respect between the senior and junior officers (excluding the Master).

The 24-hour community: In "Mica" there was complete separation between the work and life areas. All officers - senior and junior - met together in the bar when off-duty. In the bar, all (including the Master) were on a first-name basis and this, together with the mutual professional respect mentioned above, allowed individuals to participate in social activities and discussions free of rank and departmental constraints - they acted and behaved in precisely the same manner as do shore workers while in their local pubs or clubs. In turn, this freedom to switch from being a rank on duty to being a whole, complete individual off duty meant that the shipboard atmosphere was free of the tensions normally encountered in ships.

In "Quartz", there was no separation between the work and life areas. The seniors rarely used the bar; neither, for that matter, did the junior deck officers. The bar was the public room in which the catering, radio and engineer officers met. When seniors did enter the bar, the forms of address were first names downwards and ranks or 'Sir' upwards. In this ship, tensions which arose at the work place were carried through into the bar and vice-versa. As has already been mentioned, even when off-duty the seniors felt it was still their duty to guide the drinking and sleeping activities of their subordinates.

Commitment and satisfaction: In "Mica", the seniors were far more committed to the ship than to the company - to them, "Mica" was the best and most efficient ship in the fleet; maintaining "Mica's" very high level of performance was a real goal for the senior triad as a group and as individuals. This pride in "Mica's" performance had been absorbed by the juniors and was manifested in a complete absence of reference to other or previous ships. (The significance of this last statement may be lost on the lay reader: To most seamen, their "last ships" are the paragons of all virtues and conversations between
Seamen are littered with statements commencing "On my last ship..." or "On (name of last ship) we did this or that...". During his stay on "Mica", the researcher never once heard mention of the names of previous ships—had he been unaware of the structure of Gem, he could have easily believed that Gem Tankers possessed only one ship—the "Mica". The only exception to this was Mark Gray, the second mate, who frequently referred back to his last ship when discussing levels of job satisfaction or how shipmasters ought to behave.

It was also observed, among the officers in "Mica", that delays caused by terminal problems were experienced in a most negative manner i.e. they expressed no satisfaction whatsoever at being delayed in port.

In "Quartz", both seniors and juniors were far more committed to Gem Tankers as a whole than to this particular ship; they liked the trade but would have preferred to have been on a better ship. Within 20 minutes of joining the ship, the researcher was referred back to the speaker's last ship and frequent references to previous or other ships was a common pattern of conversation aboard "Quartz".

Whenever, through technical problems ashore or through terminal inefficiencies, "Quartz" was delayed in port, such delays were experienced by most officers in a positive manner i.e. they expressed pleasure at being given an unexpected break in port.

Relationships with head-office personnel: In this respect, similarities rather than differences were found between the two ships.

Within the head-office of Gem Tankers, the formal organization consists of four groups of operational managers and superintendents and a number of general or service departments. The tanker fleet has been divided into four sub-fleets with each of the sub-fleets being operated in a day-to-day, technical sense by one of the teams of managers and superintendents. The service departments include personnel, technical, stores, marine, accounts etc with the most important department—so far as this study is concerned—being the personnel department. Within the personnel department are people whose duty it is to appoint officers and ratings to ships.

The most common pattern of appointments within shipping companies—and within Gem—is to rotate sea staff between ships i.e. a man serves aboard one ship for 5 months, goes on home leave, and is then appointed to another ship. Within Gem, an attempt had been made to stabilise senior officers by appointing a permanent team of four to one ship on a self-relieving basis. The junior officers are rotated between ships on the grounds that they need various experiences for training purposes. In "Mica", the senior officers were on a self-relieving basis while in "Quartz" the senior officers knew they would be appointed to another ship after their home leaves. In both ships, the junior officers were appointed on the conventional, moving basis.

Owing to the nature of shipping operations, the senior officers (Master, chief mate, chief engineer and catering officer) are frequently in touch with their immediate operational managers and superintendents—by letter, telephone or by personal visits. The junior officers have few if any contacts with these operational managers.

It should also be mentioned that, within Gem Tankers, all the operational managers and superintendents had served at sea within the Gem fleet; ex-sea staff were also to be found within some of the service departments. But, within these service departments at all levels, are many people who have never been to sea and who are perceived, by seafarers, as "not being able to understand seagoing problems".

Thus the pattern of interactions and methods of appointments explain the attitudes held by the various groups of officers towards the staff in head-office.
In both ships, the senior officers identified themselves closely with their immediate operational managers and superintendents—in a number of instances, members of the two groups had sailed together in previous ships. The relationships between these groups were positive and friendly; individuals felt they knew each other and, during the research interviews ashore and aboard ship, frequent reference was made to individuals in the other group on a first name basis i.e. the superintendents mentioned Tom (Hitchins), Arthur (Lewis), Brian (Downing), Eric (Palmer) and Peter (Knight).

In the case of "Mica" the identification was even stronger than in "Quartz" for the "Mica" seniors knew that they would be with their particular operational managers for many years to come and vice-versa—the operational managers knew they would be dealing with Tom, Arthur and Eric over the next few years.

But the position of the junior officers was quite different; they had no direct dealings with these operational managers and, in addition, they knew that within a few months they would probably be serving in a different sub-fleet under a different set of operational managers. The only permanent relationships these juniors have are with people in the personnel (service) department.

Still another factor which needs to be taken into account was found in "Mica". Their permanent appointment to the ship plus their proved competence has created within the "Mica" seniors a strong desire to have greater personal control over "their" ship i.e. so far as stores, personnel, repairs and certain parts of expenditure are concerned. They also have a strong desire for more information on the commercial success of "Mica". They perceive the withholding of commercial information and their inability to have greater control over their ship as being the results of inappropriate organizational design and "empire-building" within the service departments in head-office. The negative attitudes they hold towards these departments are the result of their own desire for greater participation and contribution rather than from any fear of job insecurity.

In "Quartz", the negative attitudes held by the seniors towards the service departments had a different cause. Owing to the transient nature of their appointments to "Quartz" they knew they could not develop permanent relationships with their sub-fleet managers—the only permanent relationships they could have were with people in the personnel department (who appointed them to ships) and in the technical department responsible for overseeing technical standards in all ships of the Gem fleet. As already mentioned, these seniors were searching for job security with a good pension at the end of their seagoing careers. Their attitudes towards the service departments were negative for two reasons (i) they had already invested many years' service in the company; and (ii) they felt that their security and pensions could be endangered by failing to please the heads of these service departments.

It is well known that the organization as seen by its members often differs from that shown on the formal organizational chart. As both "Mica" and "Quartz" were in the same sub-fleet, the formal Gem organization was precisely the same for each. Yet the senior officers of those ships saw it differently. The MICA seniors did not differentiate between one service department and another—the staff of all service departments were seen as a group responsible for withholding direct onboard control from the ships' officers. MICA seniors also saw themselves as members of Sub-fleet IV's team of managers.

QUARTZ seniors did differentiate between one service department and another and paid great attention to those departments who, in their view, could most affect their job security. QUARTZ seniors did not see themselves as permanent members of the team of Sub-fleet IV managers.

In both ships, the junior officers saw themselves as permanent members of the personnel department.
The formal structures of Gem Oil and Gem Tankers are as follows:

**GEM OIL**
(Board of Directors)

- Exploration
- Production
- Transport
- Refining
- Marketing
- Finance

(crude oil)

Sea

Land

**GEM TANKERS**
(Board of Directors)

General Manager

**OPERATIONAL DEPARTMENTS**
Assistant General Manager

Sub-fleets I, II, III, IV

Within the head-office
Each sub-fleet contains:

- The sub-fleet manager
- A chartering manager
- Deck, engine and catering superintendents.
- Junior personnel manager.

At sea:

- Up to 50 ships following the same trading patterns.
- Up to 500 Gem officers and Gem contract ratings who man the Gem owned ships.
- All, except some senior officers, are moved from ship to ship across the sub-fleet boundaries.

**GENERAL SERVICE DEPARTMENTS**
Assistant General Managers

Personnel
Technical
Chartering
Finance

The identifiable managerial levels within Gem Tankers are:-

- General Manager of Gem Tankers
- Assistant General Managers
- Sub-fleet Operational Managers
- Sub-fleet Superintendents
- Ships' Officers
- Service departmental managers
- Supporting staff within the operational and service departments.
It may be appropriate to draw very brief sketches of some of the people within the head-office staff. Again, pseudonyms will be used.

Charles Barnett: a senior operations manager. Aged about 50; 30 years in shipping of which 26 years within Gem; command experience at sea in Gem ships.

Having himself experienced promotion to a very high level as a reward for loyal service and high performance, Charles prefers the "carrot" to the "stick" methods of getting the best out of people. Charles sees a complete inter-relationship between the authority and promotional systems.

Charles holds current officers in very high professional esteem; he respects the way in which they have adapted to large technical changes at sea caused by the introduction of V.L.C.C.'s and sophisticated products carriers. Such ships had not been developed during his time at sea and he respects the men who man them.

As a member of the Gem Tankers' Board of Directors, Charles is very aware of the changed position of oil majors within the global oil industry; he experiences this as a 'wind of economic change' and sees great need to move the staff of Gem Tankers away from any notions of being in a "comfy club" and towards running their ships at maximum efficiency.

He sees, too, a change within the social system ashore and at sea and, while acknowledging the need among all levels of sea staff for greater participation and responsibility, he does not see that total care of sea staff by the company leads to these seafarers becoming irresponsible. He acknowledges that current sea staff are under great pressure to achieve efficient performance while aboard ship but feels that adequate compensation is made in the longer and more frequent leaves.

One of Charles' dominant traits is his awareness of the extent to which sea staff rely upon and trust senior shore staff which leads him to never making any changes unless he is sure that he can keep any promises made to sea staff.

John Linton: an operations manager. Aged 50+; 36 years in shipping all of which within Gem; command experience at sea in Gem ships.

Having first gone to sea during a time of high unemployment ashore and having experienced a high level of autocracy and authoritarian control over many years at sea, John understands but cannot fully accept the present relaxation of control within society at large and within Gem Tankers. He strongly believes that traditional methods aboard ship and ashore had - and still have - many advantages.

Like Charles Barnett, John, too, has experienced the promotional rewards which Gem is able to offer to loyal and high performing staff. As a consequence, he believes that greater loyalty and improved performance can be obtained from current sea staff by using a mixture of 'carrot and stick' methods.

But John experiences some conflict between what he sees as the payments he had to make to Gem in return for limited rewards and the less payments he perceives current seafarers are making for greatly increased rewards. Promotion is an important issue to most officers and John is no exception. When he was at sea promotion was very slow and officers spent many years in one rank before being promoted up to the next rank. John believes that, in those days, officers had the time - and professional pride - to prepare themselves for the job of the next rank up. But today, through shortages of personnel and high labour turnover, John sees the young being promoted very much faster than in his days at sea and he believes that current
officers have insufficient time - and, in some cases, insufficient interest - to prepare themselves for the job of the next rank up. Quote "There's a lack of threat today; life is too easy; but people don't work any harder now". It is against this background that John experiences conflict with some of the trends emerging in Gem's new personnel policies.

Unlike Charles, John does not hold the VLCC's in any awe; he sees the greatest challenge and satisfaction imbedded within the smaller products tankers.

Kenneth Wharton, a superintendent: Aged about 40; 24 years in shipping all within Gem; command experience at sea.

Ken strongly believes that greater efficiency can come only from inter-disciplinary team work both ashore and aboard ship; he shows signs of fairly high affiliation needs in wanting to be with others and to be friendly with others. He much prefers to feel that sea staff look upon him as a supportive colleague than as a 'policeman'.

Ken attaches great importance to people being satisfied with their jobs while doing those jobs rather than looking forward to some future rewards in return for tolerating a currently unpleasant job. As he is currently experiencing high satisfaction out of membership of a multi-disciplinary team, he would like to bring about far more team involvement aboard ship - both horizontally across departments and vertically across ranks. To him, strict departmental divisions are wholly repugnant.

Like Charles, Ken holds the VLCC's in some awe and would reward high performing senior officers by appointing them to such ships.

Andrew Mitchell, a superintendent: Aged about 40; 22 years in shipping all within Gem; sea experience as chief engineer.

In common with other engineers encountered during this programme, Andrew attaches little or no importance to status and to potential status conflicts between Masters and Chief Engineers. Andrew sees the actual engineering job as all important and satisfying and, like Ken, attaches great weight to inter-disciplinary work.

And, like Charles Barnett, Andrew is very aware of the extent to which sea staff rely upon and trust senior shore staff. Both his attitudes and observed behaviour indicate that he sees himself - and wants to be seen - as a supportive colleague of sea staff and not as a 'policeman'.

Andrew has experienced reward for loyal service and high performance and feels that these traits should be encouraged among all staff by (1) greater job challenge; and (ii) monetary or promotional rewards.

Andrew clearly recognises the interdependence of deck and engineer officers aboard tankers and sees that mechanical soundness in the engineroom lies at the root of shipboard efficiency and harmony. To some extent he sees a need to separate the work and life areas aboard ship so long as discipline can be maintained. He does not want to be seen as a policeman, he sees some need to separate the work and life areas, yet, quote "If I went aboard a ship for technical reasons and noticed, say, a junior mate who appeared to be drunk, even though he is off-duty, I would not hesitate to report this to the deck or personnel superintendents so that the matter could be investigated and action taken, if necessary". Andrew sees such action as his duty and as supporting the Master - yet the Masters interviewed would see such action as gross interference in the way they are running their ships.
Michael Nicholson, a senior personnel manager. Aged about 40; 15+ years within Gem Oil, none of which at sea.

Although he would like to introduce aspects of personnel policies which have been soundly developed and proved in land-based industries, Michael is well aware of the strength of tradition at sea and has learned, from experience, the value of making small changes in an incremental manner instead of upsetting the whole social system by making major changes. In this, he harmonises with all the other Gem staff interviewed – changes should be made slowly and surely.

Michael finds himself in a position of some conflict. He sees his primary responsibility as recruiting and retaining sufficient people to man all the Gem ships. Recruitment is wholly within his direct control but retention is not. He has the authority to make improvements to shipboard facilities (in a physical sense) provided these do not interfere with the operational efficiency of the ship; he has no authority to alter, unilaterally, shipboard working practices even if he believes these to be accelerating wastage. Thus Michael's activities (aimed at improving retention) are seen within greater provision of leisure facilities e.g. video tape-recorders; an increased total welfare service; an improved company's newsletter; and increased pre- and in-service training.

Michael shows signs of an authoritarian personality in the way he supports and defends the traditional shipboard hierarchy; in the weight he attaches to his present managerial position; and in his readiness to generalise about subordinates. Quote, "We cannot allow a system aboard ship whereby the people had complete freedom to choose the food they eat – they'd all eat fish and chips the whole time. The only way we can ensure nutrition is by the company issuing food".

Harry Gunton, a junior superintendent. Aged about 30; 13+ years in shipping all within Gem; experience at sea as a catering officer.

Harry is similar to the catering officers observed aboard ship in that he recognises the importance of good catering but feels that traditional habits and organizational rigidity prevent the catering people from meeting the needs of crews by introducing an element of variety in the timing and setting of meals. He feels that people aboard ship are not utilised to their full capacity and that full utilisation can be achieved only through reorganizing shipboard tasks.

If anything, Harry feels drawn more closely to the deck than to the engineer officers; he sympathises with the relative slowness of promotion among senior deck officers and holds somewhat negative attitudes to the speed at which engineer officers pass through the system – from cadet through junior ranks to chief engineer and then out of the company into some shore job.

James Davidson, a commercial manager. Aged 40+; some experience at sea but most experience within chartering and shipbroking.

James sees his primary task as having to satisfy specified transport needs of the parent Gem Oil; his resources are the owned and chartered ships within his sub-fleet; his authority and responsibility are clearly related to the correct scheduling of his ships.

In common with the other Gem managers interviewed, James sees the senior ships' officers as professionals who have the ability – and are paid – to get on with the job; he deprecates over-much (quote) "screaming for help" from the ships. His job is highly dependent upon having in the ships seniors who are prepared to use their own judgement to maintain a high level of performance; his job depends
somewhat on his ability to judge what actions will be taken on board when an accident or crisis occurs. Thus, he needs to know the seniors aboard each of the ships under his commercial control—\textit{a need that is now being satisfied by the permanent appointment of seniors to certain ships within the sub-fleets.}

James sees that the most complete information about the technical state of ships is lodged within the records at head-office; on occasions he needs this information and thus he requires, in ships' officers, an ability and willingness to complete paperwork correctly. Like Ken Wharton, James enjoys working within a multi-disciplinary team and sees no distinction between the shore managers and senior officers connected with the operation of a ship. He would like to see such teamwork strengthened provided that all members understand the totality of the ship scheduling problem \textit{i.e.} that a certain action in one ship may be wholly beneficial for that ship but it can throw into disarray the whole of a fleet scheduling programme. Thus James experiences a continual need to have about him (both ashore and aboard ship) people who will follow the rules while things are going right and who will exercise their own discretion when things go wrong—\textit{with such discretionary judgements always taking into account the effects on other ships of a certain action in one ship.}

\textbf{Gem Tankers' Shore Staff.}

\textit{If the sketches have been accurately drawn, the reader should have some idea of the complexity of the realities of the Gem organization and of the inherent organizational conflict between the operational and personnel departments.}

We see a group of people who, in the main, have high regard for the professional competence of the seniors in the ships. We see individuals who, having been themselves rewarded for loyalty and high performance by promotion to relatively high managerial positions ashore, feel that promotional opportunity is the most effective 'carrot' to hold out in order to improve performance levels aboard ship. Some shore managers would reward high performing seniors by appointing them to the Very Large Crude Carriers yet the seniors interviewed would experience such an appointment as a punishment.

For personal and task reasons we see most of the shore managers wanting—\textit{and needing}—to be close to senior ships' officers. The performance levels of superintendents and shore managers are highly dependent upon the performance levels of individuals and groups at sea and these shore people respond by accepting the high degree of reliance and trust placed upon them by the sea staff.

We see certain shore managers who feel the need for change aboard ship within task reallocation but the preponderance of shore people see no need for rapid and drastic changes to be made within shipboard working practices.

We see actual and potential conflict built into the organizational design of Gem Tankers in the way that the personnel manager is barred from interfering with operational practices (and so over-concentrates on improving physical facilities) while the operational managers are wholly dependent upon the personnel man recruiting and retaining sufficient sea staff.

We see potential conflicts arising from mismatches between the personalities of key managers within Gem Tankers. But such personality conflicts are submerged beneath the larger and more visible problems emanating from the nature of the tasks performed by the operational and service departments—\textit{the operational tasks being, essentially, short-term while those of the service departments are long-term.}
Organizational bonds and interdependencies as seen by ships' officers

In the diagrams below, groups enclosed by solid lines indicate perceived positive bonds and interdependencies. Broken line arrows indicate negative attitudes.

**OPERATIONAL DEPT.**

- Managers
- Superintendents

**SERVICE DEPARTMENTS**

- Personnel
- Technical Accounts

**OPERATIONAL DEPT.**

- Master
- Chief Mate
- Chief Engineer

**SERVICE DEPARTMENTS**

- Junior Mates
- Junior Engineers

**OPERATIONAL DEPT.**

- 2nd Engineer

**SERVICE DEPARTMENTS**

- Catering Office
- Ratings

Gem Tankers as seen by the senior officers in "MICA"

Gem Tankers as seen by the junior officers in "MICA"

Gem Tankers as seen by the senior officers in "QUARTZ"
OPERATIONAL DEPT. | SERVICE DEPARTMENTS

Managers | Supervidents | Technical | Accounts
---|---|---|---
[Master] | [Personnel] | [Junior Mates] | [Junior Engineers]
[Chief Mate] | [Catering Officer] | [2nd Engineer] | [Ratings]

Gem Tankers as seen by the junior officers in "QUARTZ"

It is hoped that the above four diagrams illustrate the following points:

1) The MICA seniors see all the service departments as an undifferentiated group clearly separated from the operational departments while the QUARTZ seniors differentiate between the separate service and operational departments.

2) In both ships, the junior officers do not differentiate between service and operational departments nor, with the exception of the personnel department, do they separate one department from another.

3) So far as the seniors in MICA are concerned, "we" are the team of senior officers plus the operational managers while "they" are all the service departments. But among the seniors in QUARTZ, "we" are the total sea staff while "they" are all the head-office staff.

4) In both ships, the junior officers see themselves permanently and positively attached to the personnel department. The TOPAZ seniors see themselves as permanently attached to the personnel department but, owing to perceived threat to their security, they view this attachment negatively.

5) In MICA, the catering officer and ratings are isolated while in QUARTZ they are seen as members of various groups.

6) In MICA, the seniors see some of the junior mates and junior engineers as members of their team but the reverse does not hold - the juniors do not perceive themselves as members of the MICA team.

7) In both ships, the junior mates and junior engineers see their senior officers as members of the head-office operational and service departments.

The remoteness or closeness of groups has important implications for (i) the dissatisfaction/satisfaction of individual desires to participate in planning and decision-making; (ii) the shipboard disciplinary style i.e. a remote superior uses rules and formal punishment procedures while a close superior uses persuasion and notions of loyalty.

The perceived organizational differences among the Topaz and Mica people are probably the consequence of the permanent appointment of the seniors in MICA and the 'floating' appointment of all officers in QUARTZ. This has important implications for change programmes: If teams of seniors were permanently appointed to ships the result would probably be greater technical efficiency but, equally probably, a split could occur between the operational and service departments.
ashore and between the seniors and juniors aboard ship. There could, in fact, be two sets of sea staff — seniors identified with and controlled by the operational managers and juniors identified with and controlled by the personnel managers.

However, the observations made in MICA and QUARTZ indicate that the senior/junior gap can readily be closed by the separation of work and life activities aboard ship. In MICA the seniors formed a tight triad for all technical planning and decision-making but the almost complete absence of uniforms while off-duty, the full participation by seniors in the bar and social activities, the use of Christian names throughout (both upwards and downwards) all helped the juniors to feel that they were recognised as whole, complete individuals while off duty. Had the work and life areas in MICA not been separated (i.e. had the QUARTZ characteristics existed in MICA), it is highly probable that junior officers would have found service in MICA intolerable.

Organizational bonds and interdependencies as seen by shore staff.

Shore staff are located at head office; they have frequent dealings with members of their own and other departments. It is likely, therefore, that the perceptions they hold of Gem Tankers differ from those held by sea staff.

In common with most other organizations, there is, within the Gem Company, a degree of organizational politicking and perceived 'empire building' but, excluding these negative elements, there appears among the head-office staff a greater awareness of the interdependence of the operational and service departments — such awareness increasing with managerial level.

Of all the organizational views held by the MICA and QUARTZ officers (illustrated on previous pages), the view of the MICA seniors most closely matches the view held by the operational managers and superintendents — without the negative attitudes contained in that diagram. The Operational managers and superintendents see themselves closely bound to their permanent seniors; and they see the remaining officers and ratings as 'belonging' to the personnel department.

The view held by personnel managers differs from that of their operational colleagues and is more closely aligned with the view held by the QUARTZ seniors i.e. the personnel managers see themselves bound to and responsible for the total sea staff.

Organizational 'reality' and authority.

What is the organizational reality of Gem Tankers? Is it the formal organization and sets of responsibilities shown on their organization chart? Is it the ideal organization which would make the jobs of senior managers somewhat easier and more predictable? Is it the organization as seen by the members — and what then of the different departmental views? Or is it some sort of compromise between all three? Observation shows that it is a compromise organization with the ideal elements being used and strengthened wherever possible; the formal organization being used to strengthen the positions of individuals and whenever interdepartmental conflict arises; and the perceived organization being used by the lower members when considering their own positions and commitment to the company. But, as will be discussed later, it is the perceived organization which has to be used to bring about any desirable changes and which, without deliberate design, may force undesirable changes upon the company or departments.

The objective reality of the Gem organization is that some 3,000
people have come together and have been arranged within defined patterns of activities all of which are related to the purposes of Gem Tankers. But what keeps them together and, when members leave and are replaced, what drives the newcomers to carry out the duties allocated to them? What enables Gem Tankers to retain its essential character year after year with completely different groups of members?

There are many different — and sometimes opposing — views on organizational survival and individual commitment. Some writers argue that continued commitment by an individual depends upon his being able to satisfy his basic needs; some say that it depends upon members feeling that they are getting equitable rewards for their efforts; while still others say that it depends upon the individual believing that he is getting more out than he is putting in. However, among all the Gem personnel observed, the common thread running through organizational commitment was security.

As can be seen in the statistics, 94% of the Gem people interviewed are committed to the company because of the security they believe it offers. Gem Oil is seen by all members as very large and by most members as financially very strong. All members see that a high degree of job security is available within Gem but individuals adopt different strategies to strengthen their perceived positions regarding job security.

The observed behavioural patterns of members clearly indicate a universally held belief that performance of allocated duties and compliance with instructions will strengthen the job security of the individual. In addition, the junior officers of both ships and the senior officers of QUARTZ believed that job security is partly dependent upon their not displeasing members of the personnel department. The MICA seniors held neither positive nor negative attitudes towards the personnel department as such — their behaviour indicated a belief that job security was best obtained by very high levels of technical performance out of which they could enlist the strong support of their sub-fleet managers in any threatening conflict with the personnel department. As has already been mentioned, the MICA seniors saw the personnel department as just one of the many service departments barring their greater direct control of their ship.

As can be seen, not all officers place job security as their prime motivator — some seek greater challenge in their work and some seek better ratings. But all of the people interviewed had served for many years in Gem Tankers and none (but one) expressed any plans to leave the company so that greater challenge and better ratings can only be wanted within the same level of job security, especially in the cases of the older members. Where, as in the case of John Osborne 2nd Mate of QUARTZ, a man is willing to trade off some job security in return for a more challenging job, this indicates a very high demand for a more satisfying job.

The high degree of job security being sought after by Gem officers has important implications for communication and change programmes; it also points towards potential role conflict among senior managers. Even though very few officers have ever been sacked from Gem Tankers, the weight that individuals attach to job security is the means whereby seniors are able to get juniors to carry out orders and instructions. This also implies that almost any change programme could be introduced effectively if — and only if — members perceive the change as strengthening their job security.

But while managers can use the valued job security to achieve Gem's
corporate objectives, this same valued security acts as a blockage
to certain communications and may result in managers experiencing
a degree of conflict. The top managers are well aware that the oil
industry is changing; that through various nationalization
programmes, crude oil is becoming more expensive; and that, as a
result of inflation in wages and repairs, shipping costs are rapidly
increasing. The parent company - Gem Oil - is in a position of
having to economize at all levels with part of the economization
programme being the consideration of alternative sea transport
methods i.e. chartering completely instead of owning most of their
ships. But directives and communications from shore managers to
sea staff on the need to economize wherever possible imply that
the financial strength of Gem is being threatened - and this the
sea staff simply cannot accept. That is, their commitment to Gem
has for so long been based upon job security that any threat to
their job security is - and must be - disbelieved; they simply
cannot believe that Gem is financially fragile for such belief
would be experienced as an attack upon their self-identities and
very existence.

In summary, then, this is what Gem Tankers is all about: -
1) It is a very large and, financially, relatively strong oil
company which operates its own and chartered ships.
2) In many respects it has the characteristics of a classical
bureaucracy.
3) Within the sub-fleet operational departments in which there is
a high degree of task interdependence between shore and sea staff,
close, friendly and organismic relationships exist between
superintendents and senior officers.
4) Within the service departments - and especially personnel and
technical - there is no task interdependence between sea and
shore staffs; relationships are somewhat remote, neutral
attitudes prevail and, owing to the very large number of officers
administered by this department (over 2,500), a degree of
bureaucracy creeps in.
5) Individuals and groups have different perceptions of the Gem
organization.
6) Most members are retained in Gem by notions of high job security
but individuals adopt different strategies to achieve this security.
7) Shipmasters have a dominant influence over the social climate
aboard ship and over the working styles of their officers.
8) A tightly knit triad of high performing senior officers can
operate a ship at maximum efficiency; members of the triad can
enjoy a high degree of job satisfaction but the very tightness
of the triad can cause dissatisfaction among juniors who wish
to play an active part in planning and decision-making. To make
the shipboard situation more tolerable to juniors when a tight,
senior triad exists, the work and life areas need to be separated
for total social interaction between all officers.
9) A high performing, permanently appointed group of senior officers
identify themselves closely with their immediate operational
managers ashore. The shore managers come under pressure from the
seniors to persuade the service departments to release more
direct control of certain functions to the shipboard team.
9) Any change programme within this company will need to be based
on (i) relating high performance to job security; and (ii)
increasing the job satisfaction of seniors by releasing more
direct control to permanently appointed teams of seniors.
10) While any change programmes for the senior officers will need to come through their operational managers, changes for juniors will have to come through the personnel department.

11) Potential organizational conflict between the operational and service departments is built into the structure of Gem Tankers, the position being worsened by the emergence of two separate sea staffs - seniors permanently appointed to and identified with the operational managers of a subfleet, and juniors moving from ship to ship across subfleet boundaries.

12) Organizational and role conflict - and perceptions, by some officers of money being wasted on the wrong things - is the result of the personnel department having complete control over recruitment and training yet little control over shipboard working practices.
Organizational characteristics and managerial styles in Polychem are somewhat different from those found in Gem. The differences are shown in the table of bureaucratic characteristics earlier; in responses by shore staff to the long questionnaire; and in responses by sea staff to the short questionnaire. However, the description of Polychem may be more meaningful if short sketches were given of some of the people in that company. Again, pseudonyms have been used.

George Westerly, a senior manager. Aged about 45; 21 years experience at sea plus a further 8 years ashore of which the last three have been in Polychem.

George welcomed the opportunity to help start Polychem and to be in a position of being able to introduce organizational aspects which he sees as improvements over the traditional ways of running ships and shipping companies. In particular he wants to implement a fully consultative process throughout the company both horizontally and vertically; he actively pursues this goal by freely passing on commercial information to colleagues ashore and aboard ship, by involving colleagues in planning and decision-making activities, and by encouraging the use of Christian names throughout the head-office and aboard ship. He tries to create a corporate image of Polychem as a company which is 'different' and, in being different is 'better'.

But George suffers a high degree of role conflict and stress from two sources, both of which involve other people. (i) being highly flexible in his approach to operational problems he needs to have about him people who are equally flexible; in fact, as Polychem is still passing through its pioneering phase, the whole enterprise needs flexibility in all its members; and (ii) having moulded the organization on 'organismic and non-authoritarian lines, he does not know how to deal with a high authoritarian who slips through his selection process and later causes disruption by trying to impose autocratic control over his particular subordinates - George feels that the sacking of such a man is not the solution; he prefers to handle and develop people.

George is sensitive to 'atmosphere' and social climate and brought with him, into Polychem, a set of values and attitudes fairly closely matched to those held by modern shore society at large. However, he had to recruit officers from other companies some of whom brought with them traditional seafaring attitudes from conventionally manned ships and he is sufficiently sensitive to feel the mismatch between these traditional attitudes and those he hoped to instil throughout the company. In Beckhard's terms, George is "hurting".

Edward Fowler, an operations manager. Aged about 45; 30 years in shipping with command experience at sea; 2 years within Polychem.

Ed's personality fairly closely matches that of George. In common with George - and, in fact, in common with all the other Polychem managers - Ed wants to make Polychem 'different and better'; he enjoys the pioneering phase of the company, he approves of the attempts to introduce a greater consultative process throughout the company but, unlike George, Ed is not "hurting" for he carries a strong awareness that individuals are all different, one from the other. Ed sees that some of the Polychem people are responding positively to the new organizational style but that others are simply not matched to the new Polychem ideals. Ed feels that time will be needed to establish a Polychem culture throughout the sea and shore staff and that during these early days problems are bound to arise.
Roger Kelland, a technical manager. Aged about 45; 24 years in shipping of which 14 years at sea and 2 years within Polychem.

In common with all the other managers, Roger brought with him into Polychem, ideas on desirable improvements for ship operations. Having experienced fairly strict departmental divisions in his previous company, he welcomes the experience of working within a multidisciplinary team in Polychem. He approves of the attempts to make Polychem "different and better" and sees the present fluid state of the company's manning systems as a good opportunity to bring deck and engineer officers closer together on certain tasks e.g. to involve engineer officers in cargo-handling. Having a technical background himself, and needing technically competent men aboard the ships, Roger wants to involve deck officers in mechanical jobs e.g. cargo-pump overhauls.

Roger is highly aware of the costs of repairs and, more importantly, of the total costs involved when a ship is delayed through mechanical failure. While George and Edward attach most weight to achieving ship efficiency through good human relations, Roger attaches most weight to achieving the same ship efficiency through high technical competence in individuals. Quote "It would make my job much easier if everyone on board were more technically oriented".

Steven Gill, a personnel manager. Aged about 35+; 15+ years in shipping, some of which at sea and 2 years within Polychem.

Steve was attracted to Polychem by the idea of being in a position to be able to help make the company "different and better" for, in common with the other managers, Steve had experienced rigidity and constraints within his previous company. Unlike Michael Nicholson (a senior personnel manager in Gem), Steve is a full member of the operational team and participates directly in introducing new working practices aboard ship. Steve brought with him, into Polychem, fairly strong ideas on what are the most desirable improvements to make within the total social system and, while there is a high degree of alignment between his and George's views, there are also some mismatches. While George simply "feels" that certain activities are right or wrong, Steve prefers to apply well developed personnel management techniques to measure what is right or wrong.

Steve may be experiencing actual or potential role conflict caused by the personalities imbedded within the present organizational structure. George, the senior manager, is convinced that the biggest threat to the continued survival of Polychem may come from its inability to recruit and retain sufficient people of the right calibre to man its ships while Steve, a personnel manager, believes that the survival of Polychem is more threatened by fluctuations in the world's chemical trade and by managerial inability to control costs. George pays great attention to variations in the social system which Steve may experience as almost constant supervision of his personnel duties; Steve also feels that Ed Fowler is highly interested in personnel matters so far as they affect the operational efficiency of the ships.

Jim Lee, a cargo manager. Aged about 30; 7 years at sea; 4 years in shore industries before joining Polychem 2 years ago.

Jim seeks security; his earlier employment was within large, secure enterprises and he likes the knowledge that Polychem is financed by two large, and apparently secure, companies. He joined Polychem "in order to get in on the ground floor and to contribute to the company's success. The more it succeeds and grows, the more secure my job - and that's what I want". Like Roger, Jim is very conscious of the need to control costs and make a profit - he believes people join Polychem for
economic reasons and to avoid redundancy and, because of this, the company will always be able to get sufficient people. Quote "I wish the threat (to the survival of Polychem) lay in the technology for we could cope with that - but the real threat will come if we are unable to make sufficient profit. We won't ever be threatened by inability to get and keep sufficient people".

Jim shows many signs of an authoritarian personality and, as a result, experiences some conflict within this highly organismic company. Quote "Superintendents are both colleagues and policemen; we in the office try to collaborate with the men in the ships but we have to issue certain instructions and check up on them. ... I don't know why all the fuss about giving the Master information on costs. In the past the Master hasn't known about costs and budgets but has managed to sail the ship - so why does he need to know costs now? Is the Master big enough in stature to understand costs and management methods? But I'm not suggesting there is any evidence to suggest they are inadequate - they're just about right for the job".

David Miles, an assistant manager. Aged about 35; 17 years in shipping all ashore; 2+ years in Polychem.

Having experienced great rigidity and many constraints over many years within a large, old shipping company, David welcomes the greater flexibility and challenge within Polychem; he is very enthusiastic about working within a multidisciplinary team. Quote "I was down a pumproom with Roger helping him and some of the engineers to fit a pump, and then we all went ashore together later. You'll even find George joining the sea staff ashore for a meal in port. ... This is what Polychem is all about, we're building one organization with the sea and shore staff".

David sees the lack of profits as the only thing which could threaten the survival of Polychem and he attaches great weight to making everyone cost conscious - but in the long term. He is bothered when, in his view, money is spent on some short-term solution to a problem i.e. on buying the cheapest item at the time instead of paying a higher price for something that will last longer.

Polychem shore staff.

If the sketches have been drawn correctly, the reader should be able to see a group of pioneers among the majority of whom is a common idea of wanting to make Polychem "different and better". Each member, however, has diverging views on what is meant by "different and better" and on how best (and at what speed) to achieve this desirable state of affairs.

We see some members placing good human relations and participative relationships above all else; others placing reallocation of shipboard tasks in first priority; and others feeling that all members must become more cost conscious if Polychem is to survive.

Whatever their particular plans for improvements, we see a degree of urgency to make the changes quickly and these different notions on the speed of change, plus some personality mismatches, cause some people to experience "hurt" or conflict.

Not mentioned in the sketches (because it applies to all) is the awareness in each manager of a high level of interdependence between the shore and sea staffs. All are in a very new, pioneering company and all recognise that "we all sink or swim together".

Most important of all - for this has a bearing on what is to follow - is that the key managers in Polychem believe that they can and do attract recruits on the grounds that jobs within Polychem are more challenging, more participative and different; and, as is well known, the means of recruiting people must be matched to the means of controlling people once they have joined.
Paul Johnson, Master, Aged about 35+; 20 years at sea all within an oil company but for the last 2 years within Polychem; a very high WEPS score of 41.

Paul shows all the signs of a very high authoritarian personality (in fact he was the highest authoritarian encountered during this programme). Quote "I tied to break rigid saloon seating and use Christian names but they (the officers) don't like it - they prefer to know their place" . . . "The young want to know where they stand; they need to know that I'm up here and they're down there" . . . "Some of these people think that the Polychem democratic approach is a carte-blanche to do what they like yet the greatest need on these ships is self-discipline. If an officer does something wrong or misbehaves, especially in the bar, it's no good if I deal with it because the bar is supposed to be an off-duty area run by a committee. It's best if Company discipline is used throughout, then they (the officers) will remember what the company wants both on and off duty".

Paul had joined Polychem to gain rapid promotion to command. Promotion to Master is a major step for any officer, even within a company and with people with whom he has served for years. Promotion to first command within a brand new company with a group of people not yet absorbed into a common culture - and especially within a company which is urgently trying to be "different and better" - may be too big a step for any man.

Paul is experiencing greater role stress and conflict than any other man encountered in the programme. Because of his authoritarian personality he is desperately trying to conform to all the wishes of his superiors ashore (i.e. to develop participative involvement by all and to do all he can to develop good human relations) yet this same authoritarianism casts him into a self-perceived role as policeman having to enforce obedience among his subordinates. The only type of authority he can exercise is the disciplinary system brought from his previous company i.e. he relies heavily on traditional methods of imposing authority and discipline and yet this conflicts, totally, with the attractive image of Polychem that it is "different and better".

Paul suffers stress in the Master/Management Committee role conflict. He knows that his superiors want him to involve as many officers as possible in planning and decision-making yet this conflicts with his notions of the traditional role and authority of the Master. He copes with this particular conflict by having private, pre-meeting discussions with the senior officers in order to sound out opinion and to ensure that the Committee minutes (which he knows are examined by his superiors ashore) reflect his sound planning and judgements.

Paul does not separate the work from the life areas aboard this ship. He insists on uniforms being worn in the dining saloon and lounge with the result that symbols of rank are clearly visible within the off-duty area. Neither he nor the chief engineer use the bar very often.

Paul's task group is composed of the deck officers as navigators but he has no sentient group; Paul is extremely isolated on board and is perceived as very distant from the rest of the officer group. Another factor causing separation from the remainder is that Paul is the only ex-tanker man on board; the remainder are ex-liner men. As mentioned in the section of this report dealing with the technical system, these Polychem ships bear many of the operational characteristics of liners and Paul's views on how the ship should be run and managed conflict with the views of his officers and with the demands of the technology. Quote "Polychem should have twice as many superintendents as they do have and every one should have at least 15 years' tanker experience in order to weed out the misfits and troublemakers. We should have kept going along traditional lines for two or three years and then have changed".
Sam Carter, Chief Engineer. Aged about 50; 27 years at sea of which 2 years within Polychem; a very high WEPS score of 44.

Sam seeks security and yet, as a result of takeovers and mergers, he feels that he has been pushed around a lot during his career at sea; in fact, Sam joined Polychem because his last company had made him redundant. Quote "Pension and leave are the most important things to me but the only thing that really counts is that the individual ship must make money. You see, I've had four shocks in my life by being taken over by other companies and each time I've lost. You can see, now, why I'm so concerned about Polychem and this ship making money - I don't want to find myself out again, especially at my age. That's all I worry about - that this company makes a success of it in the commercial sense. . . . Polychem has lots of good ideas but there's only one right idea - to make money".

Prior to joining Polychem, all of Sam's experience has been within traditional, bureaucratic liner companies and he sees rule obedience as a necessary part of commercial success in shipping. Quote "My first loyalty must be to myself and then to my senior. You'd know what I mean if you'd been taken over as much as I've been. But as seniors we must guide the loyalty of the juniors in the right way, that is to Polychem - and it doesn't matter if the juniors don't know all the costs of running the ship".

So far as Sam concerned, authority is legitimate if he feels that it contributes to the commercial success of the company; that is, he obeys - and he sees it is his duty to make subordinates obey - all rules, orders and instructions which, in his perception, are related to commercial success.

Sam does not separate the work and life areas; he does not use the bar very often but when he does he chats about the ship and machinery with the engineer officers. He feels that this is his best opportunity for finding out more about the engineers and what is bothering them.

Sam experiences some conflict in his dealing with others and, in particular, in his dealings with Paul Johnson, the Master. Sam wants to import into Polychem all that he believes to have been good and effective in his previous companies. But he finds that he cannot introduce all the practices he would like for Paul - an ex-tanker man - does not understand him and, in any case, Polychem wants certain things done in a new way.

Sam sees his task group as being composed of himself and the two most senior engineers. Whenever the ship is in a U.K. port, he sees that his task group expands to include the company's technical superintendent. Sam's sentient group is composed of the same senior engineering people.

Colin Pascoe, a Junior Engineer Officer. Aged 25+; 3 years at sea, 1½ years of which in Polychem; a WEPS score slightly below average at 25.

Beyond all else, Colin wants a challenging job which demands the exercise of his skills and discretionary judgement; he feels that he is over-controlled and supervised. Quote "The Chief is always checking up on me; so is the Second - maybe they don't like my qualifications (Colin is, in fact, more highly qualified than anyone else on board); they certainly don't use what I can do and know about. There is very little encouragement from the top".

Colin is more bothered by the people above him than about anything else. Quote "The top four in this ship don't get on together. I'd make sure that the top men were psychoanalysed and were allowed to select each other for we must have compatible
personalities among the seniors if we’re going to get anywhere. One of the troubles, of course, is that the Old Man tries to bring into Polychem all his old ideas from his last company”.

Colin wants to separate the life and work areas but feels that he is prevented from doing so by the Master. Quote “The Old Man wants uniform the whole time and he has laid down the law that we have to wear uniform in the bar. We agree with uniform in the saloon (dining room) but we are all up in arms about uniforms in the bar. But there’s no shifting him - it has to be uniform in the bar, including epaulettes”.

Colin experiences a great deal of conflict in two areas: (i) between what he knows he can do on the job and what he is permitted to do; and (ii) between what he expected to find in Polychem and the reality of Polychem. Quote “I was attracted by the pioneering spirit of Polychem but it’s completely lacking; it is to do with the wrong personalities in the company.

Colin is bothered by the reality of Polychem not meeting his expectations. Quote “Something happened which was very private and, instead of writing a personal letter directly to me they (head office) sent it to the Old Man. You would have thought that in a company that preaches good human relations, they would have got over the old-fashioned nonsense of sending all letters via the Master”.

Colin’s task group consists of all the engineer officers. He gets on well with the junior officers on a social plane; but his sentient group is not in the ship. His past training and high qualifications make him feel that he belongs to the large body of chartered engineers.

Colin is frustrated at not being able to contribute all he thinks he can. Quote “The trouble with Polychem is that it attaches most importance to trying to make the company different from any other company. They seem to forget that there are some good ideas in other companies - Polychem doesn’t know everything. When we go on the induction course we are told to forget our last companies and never to mention them. Okay, I can see what they’re trying to do - but they forget that some of us might have quite liked our last companies and that we might have learned things that could be useful to Polychem”.

Gordon Kennedy, a junior deck officer. Aged 27; married; 10 years at sea of which 1½ years in Polychem. A very low WEPs score of 19.

Above all else, Gordon is extremely unhappy in Polychem. Quote “I am really very unhappy here; Polychem is no different from any other company. I was attracted to Polychem by all their new ideas and I thought they would put all these things into action - but my biggest disappointment is in the standard of people they’ve got in the ships”.

Quote “I just feel dispirited - there’s no sparkle in the ship or job. I came here expecting things to be different and they weren’t. I thought they’d put into practice the ideas they talk about - the sort of things we all think about in other companies - and now I find there’s no difference”.

From all this, it can be seen that Gordon suffers extreme stress arising from his expectations not meeting reality. In common with the others on board, he does not separate the work and life areas.

Gordon’s task group is composed of the Master and other deck officers and this matches his sentient group. However, he experiences further
mismatch between reality and his expectations of being able to participate in the planning and decision-making processes.

Quote "The management meetings here are a farce. The Old Man goes around with a notebook beforehand and sees the Mate, the Chief and the Second - so by the time the meeting comes up, everything is fixed. There's no discussion at the meetings - just bits and pieces tacked together to form minutes to satisfy the company (i.e. head-office staff)".

(Note: Within a few weeks of these observations and interviews, Gordon resigned from Polychem).

"JOAN"

The sketches show an extremely unhappy group of people with high levels of personal and inter-personal conflict and tension. In fact, at the end of this voyage, out of eleven officers (excluding the Master), three resigned from Polychem.

At the top we see a Master who is very unsure of himself and who has fallen back on traditional methods of control. We see a Chief Engineer in search of job security and who puts the commercial success of Polychem above all else. We see conflict between the tanker ideas of the Master and the liner ideas of the Chief Engineer. We see both imposing (upon their subordinates) forms of control and supervision quite contrary to the advertised ideals of Polychem.

Owing to the Master's insistence on officers wearing full uniform in public rooms, there is total penetration of ranks into the off-duty area and no separation of the work and life areas.

We see juniors feeling that their talents are not fully utilised and that their desires for participation are being frustrated by the Master's habit of having private, pre-meeting chats with the senior officers. In particular, we note that the Master and Seniors perceive the management committee meetings and minutes as a mechanism whereby head-office staff check up on sea staff.

We see that almost the whole set of behavioural patterns in this ship are in sharp conflict with the plans and ideals held by George Westerly and Ed Fowler.
Leslie Griffin, Master. Aged about 45; nearly 30 years at sea of which 15 years in Polychem.

It may be important to note Leslie's background. All his seagoing experience had been within a large passenger and cargo-liner group; he had had many years' experience in handling large numbers of officers and ratings in passenger ships; and before joining Polychem he had had nearly ten years' experience as Master.

Although he, himself, had not been declared redundant, Leslie felt that the scrapping of the passenger ships and the replacement of cargo-liners by container ships were bound to lead to large scale redundancies within his last company. He saw Polychem as a new company in an expanding chemical trade and which, provided it was successful, was bound to offer good prospects. It is interesting to note that the chief mate in this ship left his last liner company and joined Polychem for precisely the same reasons.

Leslie wants Polychem to succeed for many reasons, one of which being that he wants the company to obtain better ships than the old, second-hand ships it operates at present. But Leslie believes that the success of Polychem is mainly dependent upon people. Quote "All that really matters are people. Get them right and most of your troubles are over".

Leslie likes the ideals of Polychem and wants to make the new schemes work. His past experience as Master plus his experience in handling very large crews have given him an inner security and he suffers no role conflict and stress. Quote "I quite like Polychem's way of doing things and I want to make their scheme work. They want us to use new titles and run management meetings; that's Okay by me. Heavens! I've had years of dealing with many more people than in this ship so I'm not worried. I've seen enough new things in my life to cope with the new methods here. In fact, I learned a lot in the passenger ships which I can put into practice here. But the main point to watch is this - they're (the rest of the officers) all from different companies and they need a lot of pulling (drawing) together".

Although there is a high degree of separation of the work and life areas and although Christian names are used throughout both upwards and downwards, uniforms are still worn during all off-duty activities. The seniors do not seem bothered by uniforms but the juniors feel that uniforms should not be required in the bar.

Leslie sees that he belongs to two task groups - one consisting of the senior officers in all three departments; the other consisting of all the navigating officers. His sentient group lies partly in and partly outside this ship - he sees himself as belonging to the large body of professional ships' officers.

It is significant to note that Leslie views on management committee meetings differ markedly from those of Paul Johnson, Master of "JGAN". Leslie sees these meetings as a real way of encouraging participation. Quote "I never fix the meetings beforehand; that's defeating their whole purpose and I'd jump on anyone who had pre-meeting meetings to arrange things. Quite often the first I hear of something is when it is brought up at one of these meetings... These meetings and the minutes we send to head-office have nothing to do with them (the shore stuff) checking up on us".
John Page, Chief Mate. Aged 30+; married; 15+ years at sea within three different companies before joining Polychem 2 years ago.

John joined Polychem for a variety of reasons; he did not find it easy to leave his last company, in fact it took him six months to decide to leave the XYZ Line and join Polychem. The XYZ Line operated cargo-liners to a particular part of Africa and what tipped the balance, so far as John was concerned, were the increasing political problems in that trade. So John joined Polychem to escape the negative aspects of his former company; to escape from the potential redundancies arising out of container ships replacing conventional liners; and to seek challenging employment within a new and expanding trade. John had to drop down to 2nd Mate on first joining Polychem but he is now back to sailing as chief mate in which job he enjoys high satisfaction. He looks forward to early promotion to command.

John needs Polychem to succeed in order to prove to himself and to his wife that he made the correct decision in leaving the XYZ Line and joining Polychem. He likes many of the Polychem methods but finds some highly repugnant. In particular he feels that the manning system adopted in these ships was, in fact, designed for the new Polychem ships and that the structure, work load and equipment on these old, second-hand ships make the general purpose manning scheme singularly inappropriate. John has had many years' experience in maintaining complicated cargo equipment in liners and is proud of his skills in this area. Under the Polychem scheme, John is subordinate to the chief engineer so far as cargo equipment maintenance is concerned and, under the Polychem personal appraisal system, the Chief Engineer has to report upon John's performance as a maintainer of cargo gear yet, in John's perception, this same Chief Engineer has had no previous experience in the maintenance of cargo equipment.

John is bothered by the Polychem Rule Book. He feels that these rules were written by someone who had no experience of the trade; that the rules were written before the first ship came into service; that the chemical trade is changing so rapidly that the rules need constant updating. In particular, John does not know how his performance can be equitably rated against a background of inappropriate rules. Quote "Whenever I'm not sure of something or when I'm not sure on what way Polychem wants it done, then of course I fall back on the ZYX way of doing things. I can't help it. The real trouble is being a new company, we don't know how Polychem (i.e. the managers) will react to errors and calamities".

In common with the other officers in this ship, John does separate the work and life areas and addresses people by their Christian names. However he attaches great importance to uniform but in an unusual way. Quote "Polychem's image to officers is 'life in a boiler suit'; it is considered the done thing to be in a boiler suit. But the (chief) mate's job has been so much downgraded - not only in this ship or in this company but everywhere - that I stay in uniform all the time, or as long as I can, just to upgrade the (chief) mate's job. Then the junior officers have something to look forward to. I even go and inspect tanks in my uniform when the inspector comes on board. I do that to impress him for he'll think the tanks must be clean if I'm prepared to go down in uniform!"

John experiences role conflict and stress arising from two sources: (i) mismatch between his own expectations and the realities of Polychem; and (ii) perceived mismatch between the way in which attempts are made to operate these ships as tankers while, in his opinion, they are essentially cargo-liners.
A specific source of conflict for John is that he considers himself as a professional seafarer with certain, useful skills and with a variety of experiences behind him. He wants to import some of these skills and experiences into Polychem yet feels that he will be criticised for doing so. Quote "Polychem is hoping to attract people with experience of different trades - then they must also be prepared to use their experience and way of doing things" and "They (the shore managers) tell us all sorts of things on the induction courses but then we find on the first ship that things are different. The company is not keeping its promises on certain conditions. The real trouble is that they said too much at the start (i.e. the managers claimed too much for Polychem)."

John is an ex-liner man and he thinks in liner ways Quote: "Instead of thinking about parcels of oil I have to think in terms of blocks of cargo". The ships are, in fact, traded like cargo-liners with fairly long periods in port close to towns and customers' terminals and with frequent face-to-face contacts between ships' officers and shippers (i.e. customers). John has negative feelings about the Polychem ships not being maintained as cargo liners. Quote "Polychem sold itself (to shippers) as a new, bright star and yet we aren't allowed to use paint for cosmetic purposes. They (the managers) aren't selling the ships as bright, clean objects and they're going to lose customer goodwill. Also, recruitment is going to suffer if people see these rust tubs floating around".

John's task and sentient groups completely overlap - he sees his groups as being composed of the Master and deck officers.

Like Leslie, John does not see the management meetings as a mechanism adopted by shore staff for checking up on sea staff. Quote "I certainly don't look on the management meetings as the company checking on us - in fact, quite the reverse, it's a way of letting them know what a work load we have. There's certainly no fixing of the meetings beforehand, we discuss whatever we like!"

Victor Hewett, a senior engineer. Aged about 30; married; alternated between sea and shore employment over 8 years within 4 shipping companies; in Polychem for just over a year.

On attempting to return to his previous shipping company after a period of shore employment, Vic found that he would be temporarily demoted and so applied for a position in Polychem. Quote "Although this is a diesel ship and I have had only steam experience at sea (although I have worked on diesels ashore) I was inspired by Polychem trusting me when they immediately appointed me to my former rank" and "The appeal of this company is that I can contribute and, when it comes to it, I can get a genuine grievance settled".

In common with many marine engineers, the central core of Vic's satisfaction lies in the job itself and he is exceedingly dissatisfied with his job aboard this ship. Quote #I don't get much job satisfaction in this ship; I don't get any, I used to have personal pride in all I did, but not here - the job's going downhill. It's just one patch-up job after another. There's a pipe in the engine-room which is just a series of bandages and thistlebond (a fibre-glass repair material) and as fast as you repair one section another leak starts. They should renew the whole pipe but they won't because the ship is old and they'll get rid of her as soon as they can. So why put any effort into doing a good job? All we've got to do is keep the job running from one emergency to the next".

Having experienced working ashore where work and life areas are very clearly separated, Vic attaches great importance to separating
these two areas aboard ship. Quote "The people aboard are important. What I'm really against is abuse of authority in the M.N. (Merchant Navy). On the job the seniors (his superiors) can have as much authority as they like, but not off the job in the bar. It gets me when we have to dress up in uniform to go into the bar; that's why I have a few beers in here (his cabin). . . . On the induction course it was great. We got to know each other by our first names; there was no rank and we didn't even know who was the Master, Second or Sparks. So when we joined on Voyage No. 3 we all knew each other and it was a really happy trip but Voyage No. 5 - after my leave - wasn't so good - we were all strangers".

Vic experiences some conflict and stress between what he expects of Polychem and what happens in practice. Part of this conflict is rooted in what Vic believes Polychem to claim and part in the working practices he has absorbed ashore. Quote "In this outfit we are encouraged to speak out. This is good and I quite agree that things should be brought out into the open - that's what they (the managers) say but they don't live up to it. Let me give you an example: After the last drydocking, all the engineers were on field days (i.e. working all day in addition to keeping watches). We had a meeting with the Old Man and the Chief and said we would continue to work field days until arrival at the next port but not thereafter. We sent a radio message to head office telling them what we felt and all we got back was a message from (Roger) Kelland saying that it is common practice in tanker companies for engineers to work two field days a week. But what's that got to do with it? In factories ashore management wouldn't ask men to work overtime to maintain their factories without paying them. That's the trouble; people at sea don't know what they're here for and they get abused by the company taking advantage of this 'leave instead of overtime' rubbish. They (the company) are living on our faith in them. They promised to be good but they're the same as all other companies.

Vic's task group are the engineer officers and petty officers in this ship but his sentient group is greatly expanded to embrace all engineers with practical skills whether they work at sea or in industries ashore.

(*In fact, subsequent checking revealed that Kelland did not say this)

"NADIA"

The sketches show a group of people who have been attracted to Polychem by what it offers in its consultative procedures, its foothold in a new and expanding trade, and by an expected degree of challenge in the jobs.

At the top we see a Master who is very sure of himself; who is concerned about the human relations within Polychem; and who is trying to get things right. We see some match between the liner habits of the Master and the liner habits of the chief mate. In fact, all the men - and particularly the ones in key positions - in this ship are ex-liner men with a high degree of commonality in their values and perceptions. We see a high degree of match between the attitudes of the Master and those of George Westerly and Ed Fowler.

We also see that the causes of disharmony and dissatisfaction are rooted in the technical system and, in particular, the perceived mismatch between Polychem operating this ship as a tanker when, in most respects, she is a cargo-liner. It should be mentioned that while JOAN is only two years old, this ship - NADIA - is over eleven years old.

We see that while the work and life areas are separated to a high degree, uniforms are worn off duty. The wearing of uniforms is seen as logical and necessary by ex-liner men who feel that they are serving in a liner ship - even though she may look like a tanker.
The company is, as yet, too young and too small for there to be any departments at head-office as in Gem Tankers. In Polychem, the total number of people at head-office is less than 20 with the operational team numbering less than 10. The head-office operational team has, imbedded within it, both operational and service functions. Sea staff see the shore staff as one cohesive team; sea staff do not differentiate between one shore manager and another. While there are some departmental divisions aboard ship, the officers see themselves as one group associated with and controlled by one group ashore – unlike Gem in which departmental identifications and loyalties were seen to exist. Polychem is still within the phase of developing individual loyalties to the company as a whole and cannot afford to develop especial loyalties to particular ships or departments. Self-relieving, such as was found in "MICA", does not exist in any Polychem ships.

In Polychem, the sea staff is composed of individuals who are comparative strangers to each other and to the company; each carries with him his own self-identity, skills, values, habits and perceptions of what should be done based upon their former experiences within their previous companies.

There is a high degree of confusion about the rules – not as they are written but as to how they are being, and will be interpreted, by individuals in authority when rating the performance of subordinates, especially when accidents occur.

Inter-dependencies

There is a high degree of awareness in all individuals that each man is highly dependent upon the performance of all others about him for the survival and success of Polychem. Such interdependencies are seen horizontally and vertically aboard ship and between shore staff and sea staff. Each man came to Polychem for different reasons and each has different reasons for wanting Polychem to succeed; but each also brought with him different notions of how people ought to be controlled. Those in senior positions inject their particular control methods which they have found to be effective in the past. When such past methods match Polychem ideals, a degree of harmony results but, when the past methods conflict with Polychem ideals, subordinates come under varying and conflicting methods of control which they experience as Polychem not keeping to its promises for greater participation and more challenging jobs.

Organizational 'reality'

What is the organizational reality of Polychem? In an objective sense the reality of Polychem is that it is small and very young. Its small size means that individuals cannot escape another person with whom they are in conflict and that management cannot transfer any disruptive individual to another part of the company where he would do less harm. Its young age means that there is, as yet, no Polychem culture; no history of incidents to give meaning to the rules. Both the small size and young age together mean that a single individual has much greater effect on the total enterprise than he would have in a larger organization such as Gem – and this is particularly significant in the cases of high-aspiring individuals wishing to impose their particular changes on the organization.

But, to individual members, organizational reality is partly objective and partly subjective. Individuals see Polychem in different ways. Right at the very top are a few individuals who want to make Polychem 'different and better' i.e. more participative, more challenging and more in line with emerging social trends ashore,
Top managers saw - and still see - the formation of Polychem in the late 1960's as a golden opportunity to introduce desirable changes into merchant shipping. They projected their own values on the desirability of good human relations onto all their recruits and believed that if the company's organization, rule book, control system and working methods were properly designed, everyone would respond positively and harmony would result.

However, now that the company has been in existence for two or three years, top managers are finding reality somewhat different from what they had hoped and planned for. In many respects, top management has succeeded in making Polychem 'different and better' but a number of forces have arisen which, in the perception of some members, are pushing Polychem back to 'the bad old ways':

1) The age and technical fragility of some of their ships plus the economic need to restrict repairs to operational and safety minima have resulted in reduced job satisfaction for some engineers with consequential perceptions among these people that jobs in Polychem are no more satisfying than in other companies.

2) For marine insurance and limitation of liability purposes, top managers have to be able to prove that they have done everything in their power to make their ships seaworthy. This results in the shore staff having to check up on sea staff in a variety of ways with consequential perceptions among some sea staff that they are not trusted by shore staff and that Polychem is not keeping to its advertised ideals of a more participative and consultative type of organization.

3) The rule book and manning system were, in fact, designed for the new ships which were expected to come into service when the company was born. In the event, Polychem directors decided to start off with some old, second-hand ships in which ships the designed rule book and manning system were inappropriate in many respects. This resulted in role conflict among shipboard departmental heads, and in reduced job satisfaction with consequential perceptions that Polychem is not offering its advertised challenging and rewarding jobs.

4) On all but two of the trading and operational parameters, these Polychem ships are cargo-liners and not tankers (the exceptions being that all the cargo is in liquid form and that the cargo equipment consists of pumps and not derricks and winches) yet a small number of key individuals ashore and afloat persist in looking upon these ships as tankers which need to adopt tanker values and habits. This is a particularly visible source of conflict seeing that most of the managers and officers are ex-liner men well matched to the operational demands of liner ships. It has resulted in a high degree of role conflict among senior deck officers with consequential perceptions of Polychem management 'doing crazy things'.

5) Although attempts were made to introduce new titles and working practices at all levels within the ships, Masters have still retained the title of 'Captain'. Polychem is quite unable to alter the Master's role and responsibilities as defined within the Merchant Shipping Acts (1894-1972) and so, in order to harmonise with the legal status of Masters, Polychem top management has allowed many strong elements of seafaring traditionalism to creep into its organizational structure. In particular, managers see it is their duty to 'back the Master' and to route all communications via him. This results in many subordinates holding very strong beliefs that, so far as the position of the Master is concerned, Polychem is no different from any other company.
6) But beyond all else, the subjective reality of Polychem as experienced by members - and particularly by subordinates - is almost wholly determined by the personalities of individuals in key positions.

The observations made within Polychem are clear proof of the fact that "a company", per se, cannot do things to people. People can only have things done to them by other people.

We see, in Polychem, a formal organizational design which (excluding the consequences of the legal status of the Master) is clearly aimed at achieving participation by all members and at improving job satisfaction through job enlargement and task re-allocation. We see the desires and values of top managers pervading this organizational design. And yet we see cases of members believing that Polychem is no different from any other shipping company and that Polychem has not stuck to its advertised claims.

But when we examine the roots of these beliefs (that Polychem is no better than other companies) we find that, consciously or subconsciously, an individual has intervened between the formal organizational plans and the manner of execution or that the mismatch between expectations and reality has arisen from economic considerations at Board level imposing the technical fragility of second-hand ships upon the company.

We see that George Westerley is powerless against both forms of intervention. As a salaried manager - and not a sole owner - of Polychem, he was unable to forestall the purchase of the second-hand ships. Whether he should have modified the rule book and manning system to match these older ships is a matter of conjecture and any opinion given would change this report from being descriptive to prescriptive.

Furthermore, the very limited size of the company prevents him from transferring disruptive individuals to less harmful positions. The only method open to him is to dismiss the disruptive individual from the company. Whether he should do so is not simply a matter for conjecture for, within the present climate of Industrial Relations in Britain, he may find himself in a position of conflict with the Trades Unions should he dismiss individuals on the grounds of temperamental unsuitability.

George, Ed, Roger and other top managers are now having to face up to the reality of individuals intervening in their organizational design. As has already been described, the small size of Polychem, its technical and economic fragility, and the high degree of inter-dependence between all members make it particularly vulnerable to the behavioural patterns and attitudes of individual members. Each member brought with him a whole set of different values, habits, skills and experiences and his own notions of what is and what is not desirable within shipping companies. So far as its cultural world is concerned - and particularly where the company's culture embraces the meaning given to rules - Polychem is highly fragmented and it would appear that one of Polychem's greatest needs is for sufficient time to 'settle down'. Whether Polychem should have tried to introduce so many new ideas and practices during its formative years is, again, a matter for conjecture but it will be explored in greater depth in that section of this report dealing with organizational change in merchant shipping.

As may be seen in the diagram on the following page, some of Polychem's problems lie in the mis-match between the planned technology of the expected new ships and the actual technology of the imposed second-hand ships. However, for organizational harmony, top managers had to risk being able to recruit sufficient seafarers - and especially senior officers - whose past experiences and values matched their own. Did they set themselves an impossible task?
The sources and direction of forces causing organizational conflict within Polychem Tankers.
Comparisons between Gem and Polychem.

Although there are huge differences in the size, organizational structure, financial strength, age and trading patterns of the two companies, a number of striking similarities can be found.

Aboard ship.

Similarities.

1) In all the ships visited, the Master of each exercised a decisive influence over:
   (i) The 'atmosphere' on board;
   (ii) The degree of separation between the work and life areas;
   (iii) The positive and negative attributes given to the company by subordinates. To these juniors, the Master is seen as the embodiment of the "company"; his actions are experienced as the company's actions.

2) In all the ships visited, the younger members seek - and respond positively towards - separation of the life and work areas.

3) The job satisfaction of engineer officers is determined partly by the technical age or fragility of the ship and partly by the maintenance methods adopted; engineer job satisfaction is positively related to planned maintenance and negatively related to 'repair by crisis'.

4) In all the ships visited, the junior deck officers feel 'squeezed out of the system' to greater or lesser degree.

Differences.

1) In the Gem ships, changes within the work and life areas had evolved naturally and slowly and, to great extent, were left to the wishes of the senior officers; in the Polychem ships, new working practices had been designed and implemented by shore managers.

2) In the Gem ships, uniforms were hardly ever worn off duty while in the Polychem ships uniforms were worn in all public spaces.

3) In the Gem ships, the company's rules and regulations were seen as meaningful, practical guidelines; in the Polychem ships the rules were a source of confusion to some people for many of the rules were inappropriate for the second-hand ships.

4) Gem officers, in general, are seeking job security while Polychem officers are seeking challenging jobs and something that is 'different and better'.

5) The Gem ships had European ratings within traditional divisions; the Polychem ships had Asian ratings within a new, general-purpose labour force.

6) Junior Gem officers realise that they may be transferred from ship to ship and that, should they clash with a senior on the present ship, they may probably never sail with him again. Polychem juniors realise that, owing to the limited size of the fleet, it is highly likely that they will sail again with all the people in the present ship.

7) Gem ships are traded as tankers between terminals owned by their parent Gem Oil company; contacts between ship and shore over cargo matters take place between chief mates and terminal operators, all of whom are employees of Gem Oil. Polychem ships are traded as cargo-liners between common-user docks; contacts between ship and shore over cargo matters take place between chief mates and the company's customers.

8) Gem officers have a common cultural background and Gem identities i.e. they can be identified by others in terms of their former
Gem experiences, Polychem officers have no common cultural background and carry separate identities based on their former individual experiences within a wide range of shipping companies.

**Ship-shore relationships.**

**Similarities.**

1) In both companies, the attitudes held by shore staff towards sea staff are far more positive than in the reverse direction; to some extent, negative attitudes are held by sea staff towards the shore staffs of shipping companies in general.

2) In both companies there is a high degree of interdependence between operational managers/superintendents and senior ships' officers.

3) In both companies, shore staff check up on sea staff in order to secure limitation of liability in the event of an accident.

**Differences.**

1) The Gem officers see the shore staff as being clearly divided into two functional areas - operations and service. Many of the shore managers in the service area are seen as remote from the ships, their precise functions are not clearly understood and they are universally attributed with not understanding, or with having forgotten, the realities of work and life aboard ship. On the other hand, managers and superintendents within the operational area are seen as close to the ships and as more aware (although not fully aware!) of the realities of life and work at sea.

   Polychem officers see their shore staff as one operational team in which the necessary service functions are imbedded. The whole shore team is seen as a group which is close to the ships and which, to some degree, understands the realities of life and work at sea.

2) In Gem, two separate groups of officers are emerging - seniors permanently attached to certain operational managers and juniors permanently attached to the personnel department. In Polychem both seniors and juniors are seen as being permanently attached to the whole operational team ashore.

3) In Gem, senior officers have known the operational superintendents as individuals over many years; some of the seniors have sailed with these superintendents in the past; and, in general, the superintendents are seen as their (the seniors') friends who will defend them against attack from service managers in the event of an accident. In Polychem, insufficient time has elapsed for the officers to get to know shore managers as individuals and, although close and friendly relations exist between sea and shore staffs, the officers are not yet too sure about who will attack and who will defend them in the event of an accident.

4) Gem officers see their company as financially strong and very secure. Polychem officers realise that their company is still passing through its pioneering phase. Gem officers do not believe communications from head office concerning the financial straits of the company and the need to economise; Polychem officers believe such communications.
In head-office.

Similarities.

1) In both companies, operational managers respect the professionalism and competence of their officers.

2) In both companies, all managers are concerned about cost control within the areas for which they are responsible.

3) In both companies, there exist managers who are concerned about the ability of their respective companies to recruit and retain sufficient people of the right calibre.

Differences.

1) The sheer size of Gem, forces upon that company an organizational structure of departmental divisions. Its size plus its age result in Gem manifesting many of the characteristics of the classical bureaucracy.

   The small size of Polychem, its short history, its pioneering nature and the fact that it was structured by men with high ideals on the need for participation at all levels result in Polychem manifesting many organismic - as opposed to mechanistic - characteristics.

2) The great majority of the shore managers in Gem have spent their whole working lives in that same company; in Polychem, no manager has been in the company for more than 3 years. Each Polychem manager has brought with him his own notions on the best way to run a shipping company while in Gem the shore managers conform to a common culture.

3) In Gem there are many more managerial levels than there are in Polychem.

4) In Gem, the personnel manager has little influence over shipboard working practices; in Polychem, the personnel manager plays an active role in the design and re-allocation of shipboard tasks.

5) Within the Gem head-office and staff lies a wealth of practical experience and knowledge of the operational and maintenance requirements of tankers; the Polychem shore staff are still learning about the carriage of chemicals and about the operation and maintenance of chemical ships. Gem shore staff designed practically all of the Gem ships; none of the present Polychem ships were designed by Polychem people.

6) Gem is large enough to be able to offer its shore managers both specialist and generalist career paths; Polychem can only offer generalist career paths.

7) Gem shore staff are coming under pressure from high performing senior officers to transfer direct control of certain supply services back to the ships; Polychem shore staff are under no such pressure - all in Polychem want to try and test out the present structure before demanding further change.
WORK ENVIRONMENT PREFERENCE SCHEDULE - WEPS

BY LEONARD V. GORDON

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In most organizations, there are differences of opinion as to how the organization should be run, or how people should conduct themselves. Following are a number of statements concerning these matters. You are asked to give your own personal opinion about each.

Specifically, this is what you are asked to do. Examine each statement and using the key provided below, decide on the extent to which you agree or disagree with the statement. Then blacken the space under the appropriate symbol, on the line next to that statement.

Please look at the example below. Suppose that you strongly disagree with the statement "Safety rules are made to be broken." First, you would notice that SD stands for Strongly Disagree on the key. Then, you would blacken the space under SD on the line next to the statement. Notice that this has been done for you.

Example:

Safety rules are made to be broken...

SA A U D SD

You may find yourself agreeing strongly with some of the statements and disagreeing just as strongly with others. In each instance, blacken the space under the symbol that comes closest to representing your own opinion. Whether you agree or disagree with a particular statement, you can be sure that many other people feel the same way you do. Be sure to make one choice for every statement. Do not skip any statements. Now, go ahead.

1. People at higher levels are in the best position to make important decisions for people below them. ........................................... SA A U D SD

2. Relationships within an organization should be based on position or level, not on personal considerations ........................................... SA A U D SD

3. In dealing with others, rules and regulations should be followed exactly ........................................... SA A U D SD

4. A person's expression of feeling about his organization should conform to those of his fellows ........................................... SA A U D SD

5. A person's first real loyalty within the organization is to his superior ........................................... SA A U D SD

6. Formality, based on rank or position, should be maintained by members of an organization ........................................... SA A U D SD

7. A person should avoid taking any action that might be subject to criticism ........................................... SA A U D SD

8. Outsiders who complain about an organization are usually either ignorant of the facts or misinformed ........................................... SA A U D SD

9. In a good organization, a person's future career will be pretty well planned out for him ........................................... SA A U D SD

Please turn the page and go on.
Key: SA — Strongly Agree
A — Agree
U — Undecided
D — Disagree
SD — Strongly Disagree

10. A person should think of himself as a member of
the organization first, and an individual second. .............................. SA A U D SD

11. People are better off when the organization provides
a complete set of rules to be followed. ................................................. SA A U D SD

12. Within an organization, it is unwise to question
well-established ways of doing things ................................................. SA A U D SD

13. A superior should expect subordinates to carry
out his orders without question or deviation ................................. SA A U D SD

14. Within the organization, it is better to maintain
formal relationships with other people ................................................. SA A U D SD

15. There is really no place in a small organizational
unit for the nonconformist ............................................................... SA A U D SD

16. Pins, written commendations, ceremonies, etc.
are all signs of a good organization ............................................... SA A U D SD

17. The most important part of a superior's job is
to see to it that regulations are followed ........................................ SA A U D SD

18. In general, a person's rank or level should
determine his relationships toward other people .............................. SA A U D SD

19. Job security is best obtained by learning and
following standard work procedures ............................................ SA A U D SD

20. A person should defend the actions of his organization
against any criticism by outsiders ....................................................... SA A U D SD

21. A person should do things in the exact manner
that he thinks his superior wishes them to be done ................................ SA A U D SD

22. Within an organization, a person should think of
himself as a part in a smooth running machine ................................ SA A U D SD

23. It is better to have a complete set of rules than
to have to decide things for oneself .................................................. SA A U D SD

24. Length of service in an organization should be given
almost as much recognition as level of performance ......................... SA A U D SD
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