

MEDICAL PRACTICE

ABOARD

MERCHANT SHIPS

Its Present Limitations and their Correction.

Thesis for the Degree of M.D.

University of Glasgow

1947

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CHAPTER I - INTRODUCTION.

This work is based on experience gained during nineteen months' continuous medical practice aboard five of the larger British merchant ships and short periods at sea since then. During this time the writer was impressed by the opportunity which the ship's surgeon's post afforded for the careful and conscientious practice of medicine, but found much to criticise in the present state of medical practice at sea. This thesis is to point out the various faults and deficiencies which were encountered and to suggest remedies for them. Generalisations have been avoided as far as possible and the opinions of others introduced only to supplement deficiencies in personal experience or to emphasise personal findings. The work was done mainly among white ships' crews, since my service was almost all under wartime conditions when British passenger ships were turned over to troop carrying. The number of civilian passengers treated was thus comparatively small, but the strength of the crews averaged about 300 men, of all ages, a sufficiently large number for it to be assumed that their health picture reflected, for the most part, that of all souls aboard. Only in the case of passengers from tropical ports who have resided for some time in the tropics is there likely to be a different range of diseases. This must/

must also be so in ships manned by Lascar or other native crews, of which I have little first-hand experience. The health of the crews of ships not carrying a doctor is not directly considered, but certain deductions about this are made.

References to doctors aboard ships occur in some of the writings which have survived from ancient times. These show that the larger ships of the Roman fleet carried medical men, and an attempt has been made to prove that the disciple, Luke, may have at one time in his life been a ship's surgeon on a passenger vessel plying in the Mediterranean (1). More recent writings in English refer in the main to medical practice aboard ships of the Royal Navy, and from them can be traced the progress of the Royal Naval Medical Service from modest beginnings, and through apparently insurmountable difficulties, to the efficient organization which it is today.

The Merchant Navy differs from the Royal Navy in not having an organised medical service, a principal reason for the extreme slowness with which its medical reforms proceed. Carr (1945) complains that the ship's surgeon seldom makes recommendations on matters of hygiene and health and suggests that he is rarely qualified to do so (2). With this I disagree entirely. My feeling is that/

that the ship's surgeon is capable of making recommendations and very often does, but becomes discouraged by the lack of interest in ships' medical matters shown by his employers and by official shipping bodies in general. MacGregor (1943) points out that several administrations, national and local, are concerned with aspects of merchant seamen's health and these have little relation to one another and, taken together, do not provide an adequate service (3). He makes a plea for statutory sanction for a special service for the health of merchant seamen. Various correspondents to medical periodicals within recent years have also emphasised the need for a comprehensive health service for the Merchant Navy (4,5,6,7).

Medical services for seamen receive scant notice in the Statutes. As Nixon (1944) has pointed out, Arctic whalers and slave ships were the first merchant vessels required by law to carry surgeons (8). About fifteen years later, in the opening years of the nineteenth century, an Act to regulate passenger vessels appeared (9) laying down that every such vessel carrying fifty persons or upward (including the crew) should be provided with a surgeon. The Merchant Shipping Act of 1894 (10) is the first of these Acts to state that certain ships (viz. foreign-going ships with 100 souls on board and certain emigrant ships) shall carry a qualified medical practitioner. The 1906 Act (11) makes/



makes the shipowner responsible for the expense of treating illness or injury incurred aboard ships except if due to misbehaviour, while the 1923 Act (12) amends the former to include venereal disease as an illness to be treated at the shipowner's expense. These, a few references to matters of hygiene, and the list of drugs and equipment to be carried, comprise the total of statutory references to the practice of medicine aboard merchant vessels.

Clearly this lack of legislation and organisation puts the ship's surgeon at a grave disadvantage as compared with his colleagues in the medical branches of the Armed Forces. Whether the Merchant Navy is regarded as a Service like these, or merely as an industry, its importance to the country is such that it demands the best health service obtainable. It is hoped that the present writer's work, by pointing out the various faults obtaining from the viewpoint of the ship's surgeon as he encounters them in his everyday practice, may help to correct the rather fanciful views about the Merchant Navy expressed from time to time by medical observers ashore.

CHAPTER II - THE GENERAL DUTIES OF THE SHIP'S SURGEON.

The ship's surgeon, a qualified and registered medical practitioner, is responsible for the health of all on board. Except in the rare case of a very large vessel carrying more than one surgeon, he bears this responsibility alone. Thus, at sea, he must carry out whatever treatment, medical or surgical, his patient is deemed to require. He has no consultant from whom he can obtain advice and when he feels himself incapable of competently treating a difficult case, the only course for him to follow is that of landing his patient at the first port at which this is practicable.

The assistance provided for the surgeon varies according to his employing company. Some companies, indeed, provide no medical auxiliary. My assistant aboard ship has been one "hospital attendant" - his designation on the Articles of Agreement. The respective qualifications of the six men with whom I have been associated have been:-

- i) service as an R.A.M.C. orderly in France during the 1914-18 war, followed by a correspondence course in massage;
- ii) service as an R.A.M.C. orderly in West Africa during the 1914-18 war;
- iii) service as an orderly in the R.A.M.C. (Regular Army), followed by male nursing duties in London County Council hospitals;
- iv) service as a Royal Naval sick berth attendant during the recent war;
- v) preliminary study as a medical student cut short by inability to pass the First Professional Examination;
- vi) a/

vi) a course in First Aid.

It will be seen from these details that some familiarity with medicine was common to the men taking up this appointment, but that no recognised standard of proficiency was demanded of them.

The duties of my hospital attendant were to assist me in the ship's surgery, to care for the sick in the ship's hospitals, and to act as my personal attendant and steward, the last-named duty consisting of the tasks of keeping my quarters and attending to my personal needs, i.e. the ordinary duties of a ship's steward. He was forbidden by the company's regulations to dispense any drug or to perform any operation or injection, however small.

Some shipping companies carry in addition a trained nurse and/or a dispenser (with pharmaceutical experience), and, in most, the hospital attendant is not required to carry out ordinary stewards' duties, these being attended to by a steward or "doctor's boy".

The surgeon's medical duties are carried out in the surgery or dispensary and the ship's hospitals, the former a room of variable size which can be utilised as an operating theatre by the erection of an operating-table of the collapsible portable type. These premises will be referred to in more detail in a later section.

Drugs and equipment fall into two classes:-

- i) those statutorily carried in accordance with the Board of Trade Medical Scales (under the Merchant Shipping Act, 1894, Sections 200 and 300);
- ii) extra drugs and equipment carried according to the surgeon's personal requirements, subject to the approval of his shipping company, and those which are his personal property. It is a sad reflection that the last-named are most often used for private fee-paying passengers, and in my opinion this practice should be cut out by the Company's supplying all necessaries for treatment aboard ship.

In addition to strictly medical practice, the surgeon is concerned with the general hygiene of the ship and the welfare of those on board. This may, in fact, occupy a large part of his time.

Further references to existing organisation will be made in succeeding sections.

CHAPTER III - HEALTH AT SEA.

It has been stated, as the result of statistical survey (13), that service in the Mercantile Marine is no more inimical to life and health than are many of the occupations ashore frequently regarded as healthful; in many instances it has been shown that the advantage distinctly lies with the seaman. Health at sea is, however, governed by many factors which are non-operative ashore, and the consideration of these resolves itself into a discussion of preventive medicine at sea. Attention to general hygiene is, as previously stated, one of the surgeon's main duties; this involves supervision of food and water supplies, ventilation, and working and living conditions. The influence of climate on health at sea is marked. In this section, these aspects of hygiene will be discussed in some detail, under their appropriate headings.

FOOD SUPPLY.

Of necessity the food for a ship is loaded in great bulk, commonly sufficient for the duration of the voyage, and often many days before the ship sails, and is, therefore, largely refrigerated cargo. With modern methods of refrigeration the food keeps excellently and, in my experience, no article of food has been in a questionable state of preservation at the time of removal from the freezing chambers. It is after removal/

removal from cold storage that any contamination takes place. Quantitatively, the diet of the modern seafarer appears adequate as regards the major classes of food-stuffs, but there is still a tendency towards deficiency of the accessory food substances:-

- 1) Vitamin A deficiency seldom manifests itself though it may be present. Perusal of the Vitamin A and carotene contents of various foods would suggest that the mean daily requirement of 5000 International Units may not be met in the seaman's diet (14). Common sources, e.g. cheese, tomatoes, spinach, carrots, and liver, are such as may, voluntarily or otherwise, be omitted from the diet, but the very liberal butter ration enjoyed by seamen probably goes far to supply needs.
- 2) I have seen no cases of beri-beri or pellagra at sea. The only conditions which might be related to a possible deficiency of the Vitamin B complex are the outbreaks of furunculosis which occur from time to time in minor epidemic prevalence, but these, if due to hypovitaminosis at all, are without doubt a reflection of a generalised vitamin deficiency, and it is impossible to determine with accuracy which particular vitamins may be in short supply.
- 3) Hypovitaminosis C does occur on long voyages and I have seen several cases in which it was manifested by tender gums, bleeding with minor traumata, and purpuric patches in the skin, which signs cleared up on administering ascorbic acid in large doses. Every patient suffering from these symptoms was carefully questioned as to his dietary habits and, in each case, confessed to taking only cooked vegetables which, aboard ship, amount to a slushy mass, invariably overcooked. Similar findings have been recorded by Buchanan (1943) (15), but a number of other naval writers including MacDonald (16) and Ungley and Horton (1943) (17) deny a connection between tender bleeding gums and Vitamin C deficiency. In view of the good response to synthetic Vitamin C in my own cases, however, I feel that a vitamin deficiency cannot be ruled out.
- 4) Vitamin D intake is adequate because of the plentiful butter rations and regular consumption of fish tinned in oil. Moreover, the seaman is in a fortunate position/

position as regards exposure to sunlight or "sky-shine".

- 5) Iron deficiency manifested by hypochromic anaemia is not uncommon but in my experience seldom follows a primarily deficient intake. The anaemia is secondary in type and usually associated with concurrent or antecedent illness.

In view of the above, it is interesting to note that no less an authority than the Medical Director-General of the Navy states that, during all his Service career, there has been no clinically recognisable deficiency disease (18). It may be that the Royal Navy eats a better balanced diet than the Merchant Navy, but that is doubtful, and it is more likely that the qualification "clinically recognisable" is meant to exclude the borderline cases mentioned.

The ship's surgeon should pay particular attention to the hygienic conditions in the galleys. In older vessels these may be far from satisfactory, but it is quite within his authority and power to have this corrected, and friendly co-operation with the catering department will achieve much. It may even lead to his advice being taken in the building up of menus, in which case there is little reason for any dietary deficiencies.

#### WATER SUPPLY.

Numerous faults may be found with the water supply aboard ships as regards its purity. Contamination of fresh water can occur at three points :-

- 1) ashore/

- i) ashore, by water from an impure source;
- ii) during transit to the ship in water-barges in which the tanks, piping, or water hoses have not been adequately supervised, or when the delivery pipe has been trailed along a quayside through stagnant pools or has fallen over the ship's side. Hydrants are frequently sunk into the stone setts of the quayside and depressed below the surface of the surrounding stonework, thus being liable to have their covering metal grille in a pool of stagnant rainwater. It is the duty of the officiating officer of a ship flatly to refuse to accept water which he notices or suspects to have been fouled in any of these ways;
- iii) contamination aboard the ship through dirty tanks or filters, accidental leakage of seawater, or vermin. I have had occasion to find fault with drinking-water on each of these counts. It is a curse of merchant ships that hygiene is often secondary to economy, and many a skipper or chief officer will keep water stored in a tank for many months by stringent rationing of its use. The saving of a few pounds looks well on his official voyage returns to his company and may even accelerate his promotion, but the inevitable discontent among a ship's company which has to drink brackish water stored in a tank that requires cement-washing more than outweighs his intended economy. I have known fresh-water tanks not to be cement-washed for a year and contend that every storage tank for fresh water should be emptied, scrubbed out, and cement-washed at the end of every voyage exceeding three months in duration, and, in any case, not less frequently than twice a year. A legal obligation to do this would be a worth-while legislation. It deserves mention that, during the scaling and scrubbing of tanks in British ports, workmen (especially youths) have been seen by at least two of my engineer colleagues urinating into the tanks and once actually defaecating. This is a dreadful reflection on British hygiene and on the system of supervision of work.

Filters on older ships, consisting merely of layers of gravel, are frequently exposed to dust and dirt through inadequate shielding, and are seldom inspected. The ship's surgeon should make himself acquainted with the location of all filters aboard, and personally inspect filters every few months. On one particular ship I found it difficult to locate the various filters through an unwillingness on the part of the carpenters, etc., to have these closely examined. On being relieved by a colleague at the end of a voyage, this question was discussed and enquiries made by him about a certain top-deck filter which/



which I was unaware existed. During my absence he had this cleaned and his journal entry opposite the date on which this was done reads: "Filter above officers' flat dismantled and cleaned; copious slimy deposit present; appears not to have been cleaned since I was last here". That was two years previously.

Accidental leakage of seawater into fresh-water tanks happened twice on the same ship within six months and under circumstances which graphically illustrate the danger of this occurrence: the instances occurred while the vessel was in port and at anchor respectively, and the seawater leaked from a brine tank to a fresh-water tank to such an extent that the contents of the latter became strongly salt in flavour. Seawater tanks naturally draw their contents from the water immediately surrounding the ship and in these two instances it was extremely foul water, Bombay harbour water in the first case, and the water of the Don Nai River estuary (French Indo-China) in the second. The latter case deserves closer attention. The river mentioned drains the sewage from Saigon, some 35 miles upstream, and from numerous settlements on its banks, i.e. from an area where water-borne diseases are rife. Moreover, at anchor, the ship was surrounded by Annamite barges whose working parties of natives passed their excreta and dipped their limbs (frequently covered with gruesome-looking exuding sores) into the water near the intake pipes. A simple chemical test revealed the extent of the contamination, viz. the addition of 10% silver nitrate solution and a few drops of concentrated nitric acid to the salty-tasting water in a test tube; a control was provided by water from the same tank drawn that morning into the carafe in my cabin, the contamination being first detectable by taste in the evening. In the test sample a thick curd of silver chloride settling after 12 hours to a  $\frac{1}{2}$ -inch deep precipitate developed, compared with a slight haze settling to a precipitate less than  $\frac{1}{10}$ -inch in depth in the control. The haziness in the control may have been due to the customary chlorination of the water supply, but, if any doubt existed about the other sample, its high chloride content as shown by the test ruled it out. I ordered the offending tank to be shut off at once and not to be used during the remainder of the voyage. Fortunately no ill effects accrued from either of these incidents, although my peace of mind was not helped by learning the fact that the Purser of another of our vessels had contracted typhoid fever at Saigon a month before our/

our visit, without having eaten or drunk ashore.

The seaman's tale of a dead rat in the water tank is no myth. This too occurred during my stay on the same vessel, but how it got there remains a mystery. Again prohibition of the use of the offending tank until it is properly treated is the only course to follow.

It is only fair to state that I had no case of illness definitely attributable to polluted water. Water which has lain for a long time in tanks, especially in warm weather, develops a musty taste and is often suspected to be the cause of minor epidemics of diarrhoea associated with nausea, but there is no proof of this and the ailment invariably clears up in a very few days.

To summarise, the safeguarding of a ship's water supply entails:-

- 1) loading only water certified to be pure by a competent authority, and observing careful precautions during loading;
- 2) adequate chlorination of the water before or after loading; stabilised chloride of lime (e.g. Stabochlor, I.C.I.) should be used for this purpose, and, if doubt exists, chlorination should be repeated;
- 3) frequent cement-washing of tanks and inspection of filters;
- 4) immediate notification of a peculiar taste in the water;
- 5) immediate shutting off of a suspected tank till it is properly treated;
- 6) construction of water tanks so that contamination by seawater or vermin is impossible, i.e. by having no seawater pipes in its close proximity and providing a coarse-mesh filter at the inlet.

The last provision is somewhat out of the surgeon's province, but he must ensure that the others are observed.

Since/

Since the loading of water comes under the supervision of a deck officer, deck officers should be well instructed in the principles pertaining to purity of water supplies. MacGregor of Glasgow, who has shown considerable interest in the welfare of merchant seamen, has more than once advocated for officers a course in hygiene (3,19). Instruction in this might well be included in the requirements for a navigating officer's certificate.

#### VENTILATION.

1) In cold-weather ships, i.e. in ships making voyages without exception in northern waters, e.g. the North Atlantic. In these ships, ventilation is mainly concerned with the removal of vitiated air, especially from the dining-saloons, galleys, and engine-rooms. If suction ducts remove air from the accommodation, fresh air (in this case cool) will take its place. Only in the case of stuffy inboard cabins are supplementary measures necessary, either electric fans or forced draught.

2) In hot-weather ships, i.e. vessels plying in tropical and sub-tropical waters. In these, adequate ventilation is vital for the preservation of health and morale. Nothing undermines a man's general condition and mental outlook more than to feel uncomfortably hot and be perpetually covered with sweat. In the past, electric fans were the principal means of creating air movement which is recognised to/

to be the main factor in the toleration of hot atmospheres, but even the best fans require constant attention. If kept continuously in action, the electrical components burn out rapidly and, moreover, variations in the main electric supply of the ship (an almost unavoidable occurrence) causes fans to alter speed and vary in efficiency. For all parts of the ship, the forced draught system of ventilation is essential, the ultimate supply being through directional blowers ("punkah-louvres") consisting of a ball and socket joint in the air trunking through which air is impelled at high speeds, the ball having an air outlet spout which can be turned in any direction and shut off by a metal slide if desired. Comparing accommodation so ventilated with the same accommodation ventilated by a fan and the blowers shut off, I have frequently shown the superiority of the blowers by simple temperature experiments. The results of one of the less conclusive of these are given in Figure 1.

The observations were made at anchor at Port Swettenham, Straits Settlements, under oppressive tropical conditions with no breeze. The cabin chosen for the experiment was equipped with a fan and two blowers which were directed away from the wet and dry bulb thermometer. The cabin was unoccupied throughout, the port-hole kept open, and the door closed for an hour before the readings commenced. On the first day, the temperature in an adjoining similar cabin remained within 1° of 86° F throughout; on the second day, this control temperature varied between 85° and 86°. In the first day's experiment, the pressure in the punkahs was very low due to faulty blades in the impeller fan. Having regard to the limitations of the experiments, it may be concluded:- 1) that, as might/

might be expected, neither fan nor blowers appreciably lower the dry bulb temperature; ii) that both have considerable effect on the relative humidity and so lower the effective temperature which is a more reliable standard for measuring comfort than ordinary dry bulb readings; iii) that the greater effectiveness of the blowers is

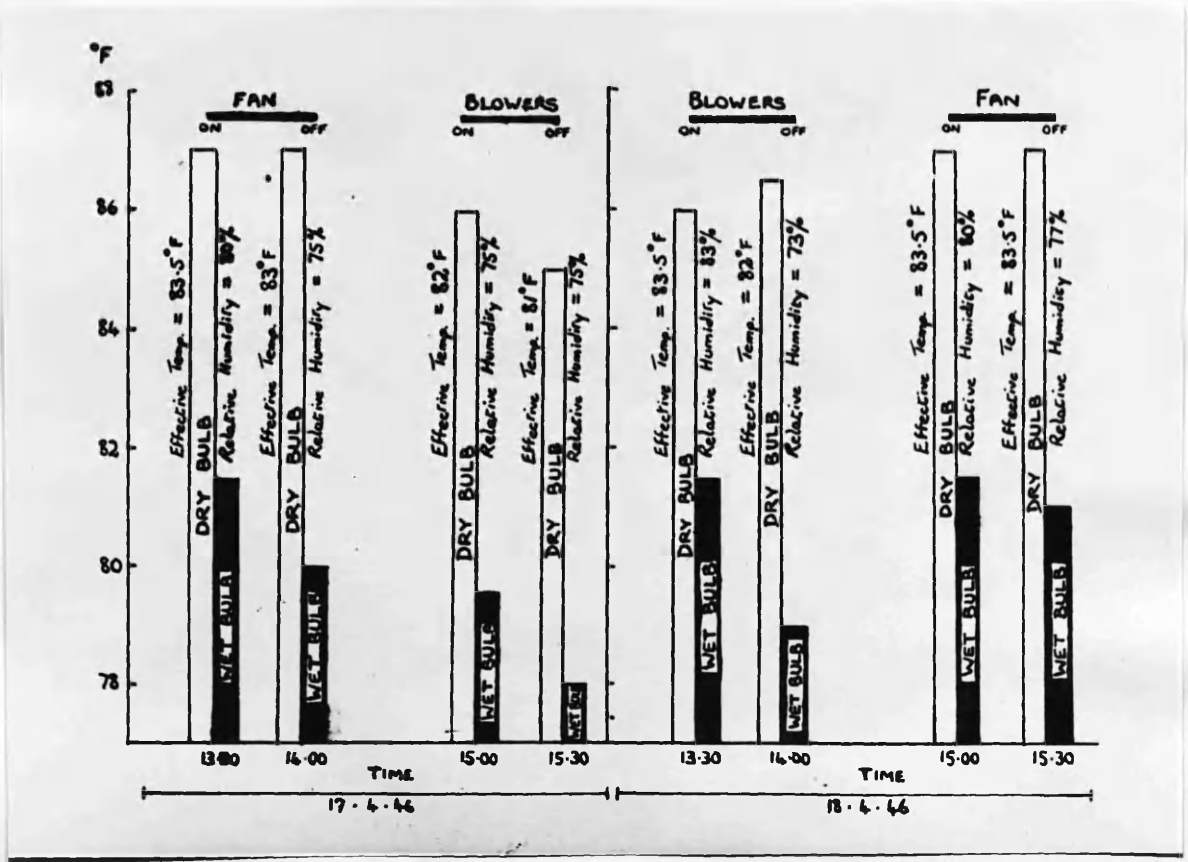


Figure 1.

(The relative humidity and effective temperature readings are read from the psychrometric chart in A.J.Mellish's "Simplified Lessons in Cooling" (New York, 1937). The effective temperatures can only be regarded as approximate values for tropical conditions).

apparent in the considerable lowering of the effective temperature (by 1.5°) in the second day's experiment, and by further lowering (by 1°) below the level achieved by the fan in an equal time of operation in the first day's experiment.

McDonald (1944), writing of ship ventilation, makes no mention of cabin fans (20). A crowded troop-deck, holding about 150 men, equipped with air blowers, called forth no complaints from those sleeping in it, even in the Singapore area during March when the seawater temperature was 90°F, whereas a troop-deck about half its size but holding only 40 men and having a vertical hatch and canvas windsail to the foredeck as the sole means of ventilation was voted intolerable at night. Air movement is essential and forced draught at high speeds ensures it. In inboard cabins, galleys, laundries, toilets, and engine-rooms, efficient suction exhausts are necessary in addition.

The most obvious means of ventilation, the port-hole, may appear to have been forgotten. It is, of course, one of the most important single factors. A cabin without a port-hole is depressing even when elaborate schemes of ventilation are devised. It requires artificial lighting all day long, with its unavoidable heating effects. It is a powerful argument against very large vessels that so much of their accommodation has to be completely inboard.

Air-conditioning, the supplying of filtered air at any desired temperature, thermostatically controlled, has been adopted on a limited scale in some of the larger and more modern passenger liners. The s.s. "Orcades" (Orient/

(Orient Line), lost during the recent war, had air-conditioning in one of her public rooms, a few cabins, and the First Class dining-saloon, and her sister ship, the s.s. "Orion", has air-conditioning in the First Class dining-saloon. Several objections have been brought against the system, however, and it is no exaggeration to say that it has met with only moderate support. Apart from considerations of cost and difficulty of installation - the necessary plant is bulky, weighty, and extremely expensive - it is not pleasant to pass from a warm deck where one has been perspiring freely to an artificially cool saloon with a minimal air current. There is a definite feeling of chill and clamminess and I have no doubt that this is a predisposing factor in susceptibility to head colds which occur in seamen almost as frequently in tropical climates as in temperate zones. During a heat-wave in Bombay in March, 1946, when the temperature rose to within one Fahrenheit degree of the highest temperature ever recorded in the Colaba Observatory there, I had a minor epidemic of head colds among men who had attended cinemas in the city where air-conditioning at a low temperature was in use. By drying the nasopharynx and suddenly chilling the body, a predisposition to nasal infection from hot dusty streets and decks is no doubt set up.

For good ventilation, therefore, directional blowers are/

are advised, together with forced exhaust from the hotter and more odorous quarters of the ship, and accommodation built to the exterior as far as possible to allow of port-holes. If air-conditioning is adopted, an excessively cool atmosphere should be avoided in the tropics. Heat exhaustion, which will be considered presently, can be cut down to a minimum by attention to ventilation. The ship's surgeon can play a part in these recommendations by seeing that, on his vessel, the ventilating system is maintained in efficient working order by insisting on the repair of any faults which may be brought to his notice.

WORKING AND LIVING CONDITIONS OF CREWS.

The crew is broadly divisible into three departments, deck, engine, and catering. Except for variations in exposure to the elements, the working conditions of deck hands vary little from one ship to another, and it is hardly possible to make health recommendations except that, as required, protective clothing (e.g. heavy gloves) should be worn. I attended two cases of septic infection of the hands following cuts by razor blades lodged in choked scuppers which were being manually cleared of debris, and one case of dermatitis of the palms of the hands which proved resistant to treatment, and was finally diagnosed by a dermatologist as of occupational origin, due to the handling of dirty lead piping.



In the modern engine-room, ventilation is exemplary and there is little tendency for fumes to gather. However, in motor vessels using heavy Diesel fuel oil, there is a considerable production of vaporised oil fumes. Much more of this fume is inhaled than from vaporisation of the lubricating oil. Diesel fuel oil contains about 0.4% of sulphur which contributes an appreciable volume of sulphur dioxide to the atmosphere. These fumes cause no major disability, but, after long exposure, lead to anorexia and dyspepsia with their accompanying depression of vitality for which marine engineers have coined the expression "Dieselitis". Headache tends to follow the throbbing necessarily associated with the motor vessel's engines whose principle is, of course, that of the internal combustion engine, the pistons being operated by explosive combustion of ignitable fuel. After questioning about a hundred engineers, greasers, and firemen, I was convinced that an overwhelming majority preferred to work in the engine-room of a steam-driven vessel, despite the somewhat higher temperature there than in a motor vessel.

Heat exhaustion and hyperpyrexia seldom occur in the engine-room today, even with temperatures in the region of 150° F. Of 16 cases of heat exhaustion treated by me in the year 1945-46, only 3 (=19%) originated from the engine-room. Mild and localised heat cramps occur without concomitant/

concomitant exhaustion or pyrexia; I have seen about a dozen cases. They respond well to the extra intake of salt (in lgm. compressed tablets, up to 8 of these being given 2-3 times daily if the man dislikes salted foods) and strikingly well if, in addition, medicinal glucose is given in teaspoonful doses 4-5 times per day.

Swelling of the feet and ankles is common after working on hot metal platforms. It is hard to avoid but can be minimised by wearing stout leather-soled shoes in preference to rubber-soled sandshoes.

On the whole, working conditions are much worse in galleys. The temperature, during working hours, may not only be higher than that of the engine-room, but there is the added discomfort of humidity and food odours.

The four-hourly temperature record made recently by me and shown in Figure 2 is of interest on account of the high galley temperatures reached in a short coastal trip aboard an up-to-date passenger liner when the galley staff was catering for a mere fraction of the customary number of passengers. The engine-room temperatures were recorded on the starting platform where the watchkeepers normally stand, and the galley temperatures at a cook's bench, away from the direct heat from cooking-stoves.

Clouds of steam and wet decks make galley work in the tropics a severe strain. On one ship I have seen the deck in the large galley so wet and slippery that to negotiate it without sliding and falling was quite an achievement even in calm weather. These unfavourable conditions pertain more, as in this particular case, to older/

older vessels where cooking is done by coal-ranges and pressure-steam boilers. In the future, every ship should be equipped with all-electric galleys. In ships of this

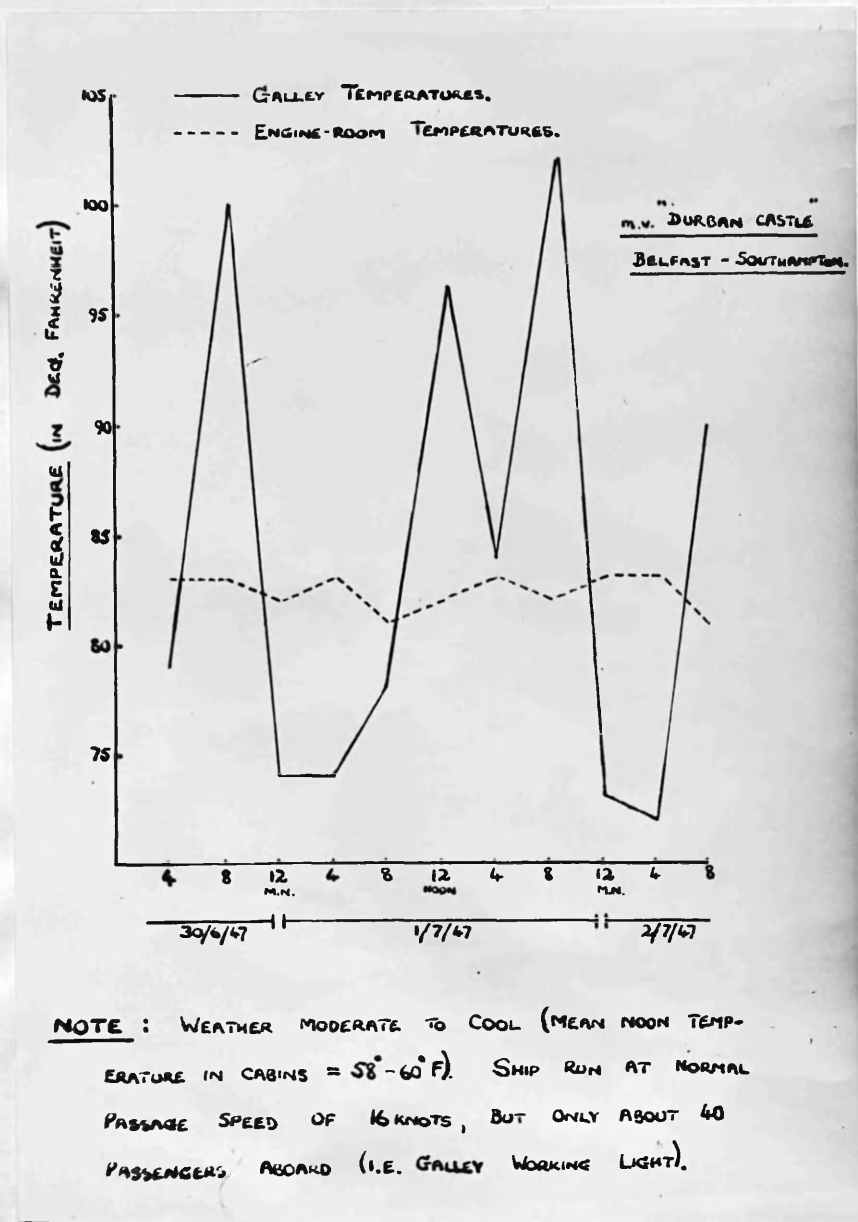


Figure 2.

type, e.g. the m.v. "Capetown Castle", the galley working conditions/

conditions are improved immeasurably. Galley ventilation is most important: every device to ensure cooling and air movement should be incorporated. Strong suction ducts with inlet grilles over each cooking appliance to remove food odours are a most important factor.

It is interesting that heat exhaustion occurs with much greater frequency in cooks and other galley workers than in other members of a ship's company. Of the 16 cases mentioned above, 12 were galley workers. I quote three typical cases:-

- 1) K.F., aet. ca. 30 yrs. Normally in excellent health. Reported to me at 23.00 hrs., while on night-cook's duty, complaining that he had almost fainted over the stove where he was frying fish for the early morning breakfast; he had succeeded in frying 150 pieces. The ship was then in the Red Sea during August. On examination his temperature was 100°F; his pulse was hardly perceptible and the rate could not be counted. His heart sounds were very faint and poorly differentiated. His body was covered with profuse sweat.\* He was sent to bed immediately, after being given two large teaspoonfuls of glucose in one pint of water. Seen the following morning, his condition was more or less normal; temp. = 98.3°; pulse of average force and volume, rate = 84/min. He had no complaint beyond feeling weak. He was advised to increase his salt intake and was given 4 teaspoonful doses of glucose during the day during which he rested on a shady part of the open deck. He was quite fit to return to duty on the evening of the day following.
- 2) R.P., aet. 22 yrs., cook. Normally in good health, but

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\* This excess outpouring of sweat is typical of the majority of ships' heat-exhaustion cases. When the humidity is high, as in galleys, sweat evaporation is reduced, and sweat which is not evaporated is without effect as a cooling agent.

of the "vagotonic" class - very slow pulse rate in region of 55/min., given to sweating easily, and of tall slender build. This man reported to me on two occasions with the same complaint, viz. being unable to carry on in the galley during hot weather (on both occasions in the Red Sea, in August and October respectively; in the latter month there was a following wind of the same velocity as the ship, which rendered it practically airless). On both occasions he had a pallid complexion, drenching sweats, and vertigo. His pulse rate was about 80/min. and the pulse was shallow. The heart sounds were barely audible. The temperature on both instances was over 102°, and the outstanding feature was utter exhaustion. In neither case was he able to return to duty for four days, the feeling of weariness persisting after his general condition had approached normality. The treatment was as for the first patient described and he had been quite well for six months, even in hot humid climates, when I last saw him. It is understandable that this type of individual should be prone to heat collapse. Vasodilatation having depleted the circulating plasma by raising the capillary pressure and forcing fluid into the tissues, filling of the circulatory system becomes markedly inadequate when muscular exertion is carried out, and the diastolic blood pressure falls (21). Normally a person with this constitution has a low blood pressure, and in his case the diastolic blood pressure becomes reduced to a dangerously low level. Ladell and his co-workers (1944), in their authoritative report on heat exhaustion (22), emphasise that the most consistent feature of their so-designated Type I heat-exhaustion was a reduction in pulse-pressure; on standing, the blood pressure fell and syncope occurred. Chemically this type of heat exhaustion was a salt-deficiency dehydration, and appeared due to excess sweating with great loss of chloride in sweat. As pointed out above, this is the type to which, in my experience, most ships' cases conform.

- 3) A.F.T., aet. 33 yrs., Pantryman. A small, spare man of limited intelligence and enormous capacity for work. He reported at 20.00 hrs., on coming off duty, complaining of cramps in his limbs, tightness in his chest and trunk muscles, and overpowering fatigue. The temperature was normal, the pulse rate 88/min., and the pulse regular but of rather low volume. He was pale and sweating profusely. Deep pressure over the calves, thighs, and upper arms caused him to wince, but there was no appreciable spasticity in the muscles. This case is not really typical, generalised heat cramps being now a rarity, aboard ship at least, through oft-repeated/

repeated warnings about salt and copious fluid intake. Interrogation of this patient revealed that he never added salt to food, his own rather naive excuse being that "there's so little time"\*. He was given 1gm. tablets of sodium chloride and instructed to take 3, 3 times a day, in addition to adding salt to his food. Phenobarbital, gr.  $\frac{1}{2}$ , was administered that night to allay his extreme apprehension, and on the next day he was quite fit to resume work.

It should be noted that heat exhaustion of moderate severity occurs often without the sufferer's temperature rising above 99°F. Heat exhaustion need no longer be confused with heat retention (classical "heat-stroke" or "sun-stroke") where the temperature reaches hyperpyrexial levels and sweating ceases. After heat exhaustion, the appetite tends to be poor and the bowels irregular, constipation, diarrhoea, or those conditions alternating, being common. Mild laxatives as required and a bitter tonic mixture to stimulate appetite are essentials of after-treatment.

#### DRESS.

The question of suitable dress at sea has received considerable prominence of late, especially during the war,

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\* The cramps of salt-depletion heat-exhaustion tend, as Marriott (1947) stresses (23), to be precipitated by the ingestion of large amounts of water, and this patient, in his pantryman's duties, had always ready access to drinking-water which he took freely. His deficiency was, like the others, primarily one of salt, and I regret that it was not then possible to carry out quantitative urinary salt determinations, as subsequent study of the problem has indicated that this is of the first importance in assessing progress (23).

and Critchley (1945) has discussed the subject ably (24). My experience in hot-weather ships makes me endorse his views with enthusiasm. It is essential to health and comfort in the tropics to be properly clad and the general wartime adoption of shorts by all ranks was a commendable advance. Naval ratings afloat in the tropics wear shorts and sandals and usually nothing else, even on their heads. Contrary to all prognostications, states Critchley, the health of the Navy has improved since this scanty rig became the custom. The officer of a merchant ship in wartime who wore, perhaps for the first time in his sea career, shorts and an open-necked shirt with short sleeves, found that, at last, it was possible to be comfortable in the tropics. This garb has undoubted advantages over the formal rig of pre-war days, long drill trousers and, for officers, the patrol-jacket of heavy white drill, buttoning right up to the neck. The incidence of prickly heat has been cut enormously since its adoption. It is, of course, frowned on by the older school of seamen, quite unjustifiably in my opinion, for the newer rig is quite as neat and tidy as the old (often more so, since it is more easily kept clean and uncreased). Its undoubted popularity with all ranks should point to its continuation and I deprecate any wholesale return to the formal wear of pre-war days in which one sweated profusely in uncomfortable garments for the "sake of appearance". The diehards might remember that cocked-hats, buckled/

buckled shoes, and pigtails were once considered essentials of seafaring rig.

### LIVING CONDITIONS.

These leave much room for improvement, but so much depends on the men's co-operation in keeping their quarters clean and bright that one cannot be too dogmatic. Slovenly crews ruin good quarters, and good crews can make poor quarters reasonably attractive. It is noteworthy that stewards' quarters are always the worst kept on the ship. I can only suggest a system of fines for failing to keep quarters clean; one cannot punish for lack of tidiness. There is a tendency now towards individual cabins or two-berth cabins as opposed to dormitories sleeping 6-10 men. The advantage of privacy thus obtained is not sufficient proof of the desirability of this scheme. To my mind, a large light dormitory with several port-holes and a fair amount of clear deck space is healthier and preferable to a small cabin which is dark and confined, with little room left after the space of the bunk is deducted. The solution probably lies in the provision of, say, 6-berth dormitories with small "study" cabins (one or two in number) for those who prefer quiet reading or letter-writing to the communal activities of the messroom.

From the medical viewpoint, a principal feature of crew quarters is their liability to verminous infestation. The/



The offenders in my experience are bed-bugs, lice, the acarus of scabies, cockroaches, ants, and the rodents. Deratisation every six months is compulsory, but thorough fumigation of living accommodation is not performed with anything like this regularity. I feel that fumigation from stem to stern, and from holds to top deck, should be done at least once yearly, not one cubic foot of enclosed space being omitted. One might then be rid of the swarming hordes of ants and cockroaches which are typical of many ships. These are merely a nuisance, but the others mentioned are a danger and demand extermination. As regards scabies, it is the surgeon's duty to impress upon his crew that every rash should be reported though, by so doing, he brings on himself a deluge of harmless heat rashes which constitute 90% of the skin affections met with in ships. Head lice are very rare: I have not seen a single case at sea. Body lice are also infrequent but pubic lice are very common, and often spread to the hair of the chest and axillae, the peri-anal region and thighs (see also Page 86).

The eradication of vermin from quarters is not easy while a large ship is at sea, since it involves taking all the cabin furnishings into the open air in most cases. Exposure to wind and bright sunlight are most valuable, and, as a temporary measure, I have found the Westinghouse Electric/

Electric and Manufacturing Co.'s "Freon-Aerosol" insecticide "bomb" very efficient\*. Its ease of operation commends it; on unscrewing the cap of the nozzle, a cloud of very fine spray is released under high pressure, and remains suspended in the atmosphere. My experience with D.D.T. in kerosene sprays did not convince me that it was the perfect insecticide, but the absence of strictly standardised preparations at that time may be somewhat to blame. Such fumigations should be under the supervision of the surgeon who should encourage crews to report the presence of vermin of any kind in their quarters.

The solution to the recent increase in ships' rat populations is efficient deratisation. In that remark I sum up the opinions of most ship's surgeons I have met. They are, however, not free from guilt, for they should see to it that the recommendations regarding floodlit gangways and rat-shields on hawsers are carried out, recommendations which, so far as I have seen, are quite disregarded except in Australia, whose port sanitary arrangements are admirable (see also p. 36). When rats do get a hold on a ship, they must be discouraged from trespassing to the cabins by leaving no edible articles within their reach. I have not encountered any specific

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\* It contains pyrethrum extract and sesame oil and is, incidentally, very toxic to mosquitoes.

rat-borne disease, but food contamination by rats may well account for cases of diarrhoea and vomiting of doubtful origin.

MEDICAL EXAMINATION OF SHIPS' CREWS AND MEDICAL RECORDS OF SEAMEN.

The above somewhat protracted list of factors influencing health, though under the direct or indirect supervision of the ship's medical officer, are not strictly medical problems. It is important for him to realise from the outset that a healthy crew is likely to be a more efficient crew than men originally in an indifferent state of health, and, with this in mind, he should examine carefully all men submitted for engagement before his vessel leaves its home port. During my wartime sea service, seamen belonged to the Merchant Navy Reserve Pool, by whose medical officer they were examined before being sent to whichever ship required them. It might seem superfluous for the ship's surgeon to insist on another medical examination, but experience proved this not to be so. The official examination must then have been most cursory, otherwise how could: (1) a man with a large fungating ulcer of the penis, with enlarged, tender inguinal glands, (2) a young man with a recent history of rheumatic fever, pronounced enlargement of the area of cardiac dullness, and constant apical cardiac murmur, be passed/

passed as fit for sea service and sent to a ship for provisional engagement? \* These instances occurred one in my own experience and one in that of a close colleague. Such gross cases, however, are seldom met with, but numerous complaints, apparently trivial at first sight, can prove to be of considerable magnitude at sea, either by their long-continued nature, spontaneous exacerbation, or by being unfavourably influenced by climate and environment. The following list is illustrative of such complaints:-

- i) Recurrent dermatoses, especially of the hands; hot weather almost always aggravates skin conditions, which can cause extreme discomfort and depression if not actual loss of working time;
- ii) Chronically enlarged tonsils. The possessors of these are prone to repeated attacks of tonsillitis, which render them unsuitable for dealing with food-stuffs or saloon utensils, and unsuitable for deck work with its exposure to dampness and cold, alternating with the germ-laden atmosphere of the stuffy quarters which many seamen have to tolerate or, indeed, prefer;
- iii) Eyestrain associated with headache. This cannot be treated at sea, and there is no point in signing on a man with this complaint;
- iv) Chronic inflammatory conditions of the middle or outer ear. Every case of discharging ear should be subjected to thorough scrutiny. If evidence of otitis media or externa exists and there is a history of previous attacks, the man should not be accepted. These conditions are notoriously difficult to treat to a successful conclusion, and few things are more disheartening than to see the condition go on for weeks or months with alternate improvement and recrudescence. The patient is usually a regular surgery visitor throughout the

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\* The medical examination under the new Merchant Navy Establishment is much more thorough (see Appendix).

voyage.

- v) Bad condition of the teeth. I refused to sign on a man whose dental condition was unsatisfactory unless its treatment was within my capabilities, viz. the easier extractions and temporary fillings. Carious teeth almost inevitably give rise to pain after a time, and in many foreign ports the cost of dental treatment is excessive - one might almost say prohibitive were such an expression ethically acceptable.
  
- vi) A history of dyspepsia or peptic ulceration, unless there has been an interval of at least a year since the last symptoms. Apart from the difficulty of supervising a diet on shipboard, it must be remembered that the average merchant seaman is a grumbler at heart. If he is a chronic dyspeptic, he will soon discover, and make widely known among his shipmates, that never before has he been on such a poorly-fed ship. Thus he is more than a purely medical problem.

One cannot demand the standard of health required for entrance to the Armed Forces, otherwise some of the finest seamen would lose their livelihood, but, in signing on a crew, I have found the best general rule in borderline health cases to be a rapid general assessment of the man's condition and mental outlook, having in mind the question: "Will this man become a chronic attender of the dispensary?" If I felt the answer likely to be in the affirmative, I wrote him off as unfit for engagement.

The absence of medical records of seamen has long been a disappointing feature of Merchant Navy practice. During the past few years this has been remedied to a certain extent by the compilation of records of seamen who/

who have been released from ships on medical grounds. These records were compiled by the medical officers of the Merchant Navy Reserve Pool, and did not leave the offices of this organisation\*. Thus the ship's surgeon has no information regarding the men's medical history further than what he gains by interrogation, which may be misleading. The difficulty could be overcome by the issue to each man of a medical history card at the same time as his seaman's identity card; this card would record all vaccinations, inoculations, and medical attention, being filled in aboard ship by the surgeon of each vessel on which the man was engaged and, ashore, by medical officers of the Shipping Federation Ltd. Such a card is issued to each seaman employed by Cunard White Star Ltd., and forms a useful permanent health record. Unfortunately, on leaving the employ of that particular Company, the seaman frequently destroys the card. Compulsory carrying of an officially issued medical history card would be a useful practical measure involving little extra effort on the part of the Mercantile Marine organisation. As an alternative, pages for medical history might be added to the seaman's Discharge Book, his official permanent record of seafaring service.

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\* They have presumably been handed on to the medical officers of the Shipping Federation Ltd., which body is responsible for the administration of the new Merchant Navy Establishment (see Appendix).

I am informed by the Medical Superintendent of Cunard White Star that such an addition to the Discharge Book is likely to be made shortly. This will fill a long-felt want, and the information gained may form the basis for a statistical survey of the health of the Mercantile Marine at sea and ashore. Such a survey was (in 1926) declared to be an impracticable proposal, "having regard to the inevitable limitations of the data" (25).

CHAPTER IV - PORT HEALTH PRECAUTIONS.

No attempt will be made to discuss these in detail; the subject of International Sanitary Conventions is too vast to be summarised and is again largely outwith the ship's surgeon's province. Personal observations are:-

- 1) that port health authorities tend to be interested only in the "Convention" diseases, viz. plague, cholera, yellow fever, typhus, and smallpox, and other communicable diseases occurring on board ship receive scant attention. Ships' declarations of health should include details of tuberculosis, venereal disease, and any other communicable disease aboard, and the forms supplied by port health authorities should have specific questions directed to these diseases. The Declarations of health demanded of ships by the Union of South Africa and the Australian Commonwealth are far more comprehensive than those in use in the United Kingdom, and although the declaration form issued in the U.K. under the 1945 Port Health Regulations does make it clear that any acute infectious disease should be declared, it still places undue emphasis on the Convention diseases;
- 2) that port health authorities abroad, especially east of Suez, pass people as medically fit to travel who are, in fact, dangerous to their fellow-passengers\*. While admitting that, on occasions, a change of climate may be necessary for a person's health, a sick person (especially one who may prove dangerous to others aboard) should never be embarked by a port health official without his first having

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\* At the time of writing the above notes (20/4/46), I was confronting this difficulty; among the 2,000 Cingalese passengers then being carried to Colombo from Port Swettenham (Straits Settlements) were two cases of active open tuberculosis and one case of mania with violent tendencies. There were further cases which, though not dangerous, were offensive to the other passengers. All of these people were examined by a representative of the Malayan branch of the Colonial Medical Service and passed fit to travel. Within one hour of their embarkation, I was called to see the tuberculous patients, who were lying in a crowded troop-deck.



communicated the particulars of the case to the ship's medical officer and received the latter's sanction to the patient's being carried; this also allows the ship's medical officer to make prior arrangements for the invalid's passage;

- 3) that anti-rat precautions in many ports, at home and abroad, are deplorable. Rat shields on hawsers seem to be an afterthought\*. Painting gangways white and having them brightly lit at night is done by less than one ship in ten. The most timorous rat would have little hesitation in ascending the dark gangways of most vessels;
- 4) that deratisation and fumigation of ships in British ports leaves much to be desired. That there was a considerable rat population left alive after a cyanide fumigation of the s.s. "Arundel Castle" (to which I was attached) in Liverpool in August, 1945, seemed to prove that the process had not been properly carried out. Again, fumigation of quarters for the destruction of vermin like bugs requires closer supervision.

During the wartime rush on shipping, many port health restrictions lapsed, a reason for, among other things, increase of rat infestation on vessels as reported by Olesen (1945) in the case of vessels arriving at New York (26). It is the duty of the Ministry of Health to see that port health authorities leave no measure undone to prevent the importation of disease, a real danger in view of the thousands of persons now returning to this country from places where communicable disease is rife.

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\* On a tour of the dock area in Southampton on 10/7/47, I examined the hawsers of 21 foreign-trading vessels then at the quayside. Of these, only 6 vessels had anti-rat guards (metal shields or tarred canvas collars) on all hawsers; 7 were partially protected (i.e. rat guards on some of the ropes only); and 8 vessels were completely unprotected in this respect.

In particular, the state of protective vaccination against smallpox should be investigated before embarkation at Eastern ports is permitted, and this information should be obtained by the ship's surgeon, either directly or through the port health officials.

CHAPTER V - SICKNESS RATES AMONG CREWS.

From my journals I have compiled the following figures relating to sickness among ships' crews and, in a later chapter, a classification of the major ailments met with. The ship's surgeon must be prepared to deal with a vast number of trivialities, uninspiring work giving little satisfaction, in a greater proportion than in general practice ashore, where the medical man is not so readily at his patients' beck and call. Like the medical officer in the Armed Services, the ship's surgeon is very accessible, and a visit to his surgery may constitute a not unpleasant half-hour's break from work.

The total rate of sickness naturally varies considerably; over the period of a year, I have found those under treatment at any time averaged from 4.8% to 7.2% of the total ship's company. My lowest sickness rate was 1% and my highest 14%.

In Table I, I have divided my cases into four groups, according to their severity. Trivial complaints, e.g. minor cuts, bruises, uncomplicated head colds, form the first group. Minor complaints are those which, though not necessitating time off duty, caused a varying amount of general malaise, e.g. simple sore throats and localised skin diseases. Major complaints are those which/

which caused considerable incapacity, where the man had to go off duty or could only carry on with difficulty. Serious illness implies a danger to life, or of permanent damage to health, or causing prolonged debility.

TABLE I - Cases graded according to severity (over period of one year - 16/5/45 to 15/5/46)

	<u>NUMBER</u>	<u>% OF ALL CASES</u>
Trivial complaints	1206	64
Minor complaints	598	31.7
Major complaints	67	3.6
Serious illness	13	0.7

In Table II, I have assessed the number of days under treatment for each of these graded classes of sickness. The figures actually refer to the number of daily consultations though, in many cases, medicinal treatment might be going on for a much longer period. The conclusions to be drawn from these figures is that over 60% of the cases seen by the ship's surgeon attend

TABLE II - Duration of treatment for cases graded in severity (over 6-month period, 16/11/45 to 15/5/46)

	<u>NUMBER OF CASES</u>	<u>AVERAGE NUMBER OF DAYS UNDER TREATMENT</u>
Trivial complaints	521	1.54
Minor complaints	349	3.30
Major complaints	44	8.00
Serious illness	11	25.55

on only one or two occasions. The number of serious illnesses seen by him is small and constitutes a negligible proportion of his cases. On the other hand, their/

their average time under treatment is close upon a month, so that the time the surgeon spends on them is not inconsiderable. It is interesting to compare these figures with those published in the annual reports of general hospitals. Thus one finds that an average stay in hospital of a medical case is between 20 and 25 days, and, of a surgical case, between 15 and 20 days. The total duration of treatment in these cases is, therefore, likely to be longer than in ships' cases since a large proportion of treatment will be out-patient treatment. There are two reasons for this:-

- i) the necessity for getting a seaman back to duty as soon as possible, since his absence involves additional duties for his fellows;
- ii) the greater incidence of chronic sickness among the inmates of shore hospitals.

The death rate, apart from war casualties, is low. I was fortunate in having only one death to record, from acute leukaemia, to which further reference will be made. From a hospital attendant who had been 20 years at sea in that capacity, I learned the various causes of death to include malignant malaria, septicaemia, haematemesis, and, the principal cause, trauma. The other main causes of death at sea or abroad, among merchant seamen as a whole (13), are enteric fever, pulmonary tuberculosis, cerebral vascular catastrophes, cardiac diseases, and pneumonia. It must be remembered that many cases of serious illness are landed to hospitals ashore, where a number/

number prove fatal. Technically speaking, they are not deaths at sea, but it would be fair to include them as such in many cases. I have no personal experience of avoidable deaths, but, from the causes of death listed by my hospital attendant and his recollections of these cases, it would appear that the fault lay, as is usual, in erroneous or over-delayed diagnosis, probably the latter, when even efficient treatment could not curb the course of the disease.

CHAPTER VI - THE INVESTIGATION OF CASES.

In some respects the ship's surgeon is in a more fortunate position than his counterpart ashore. His patients are at his very door, and he need waste no time travelling from district to district in his practice. Moreover, he is usually less harassed by night calls, and is seldom overworked. For these reasons, he can devote much more time to his individual patients, can undertake a more leisurely and thorough clinical examination, and follow the progress of cases continuously. He is like the hospital resident in having his clinical material right at hand, but, unlike the former, he has abundant time to make use of it, and he knows that his patients are his own personal responsibility all the way through. He is a general practitioner who must rely on fundamental principles of investigation, but he has every opportunity to use these to their limits.

The types of illness found aboard ship tend to fall into definite classes, of which some of the principal are: enteritis manifested by diarrhoea, sore throats, and ill-defined minor febrile illnesses. The incidence of these varies throughout the voyage, largely due to the influence of climate, but it is noticeable that, on some days, diarrhoea, say, is the complaint most frequently encountered, and, on others, there may appear to be a preponderance/

derance of head colds. The importance of this is that, after seeing a few of these cases, one tends to be rather careless in the investigation of subsequent ones presenting similar symptoms. Thus, after seeing two cases of simple diarrhoea, without abdominal pain, nausea, or vomiting, one may place a third patient complaining of diarrhoea in the same category without making proper enquiry into all of his symptoms of which diarrhoea may seem, to him, the most important. Such a fault, viz. a habit of symptomatic treatment, can, of course, occur in medical practice anywhere, but I incline to the belief that it is one of the most prevalent faults of medical practice on ships because of their rather stereotyped cases which, ashore, would in many cases fail to reach the medical man. As an instance, most people ashore with an attack of diarrhoea do not trouble to consult their doctor, and, when he is consulted by someone suffering from this symptom, he gives it full attention, with his mind directed towards its possible graver causes. On a ship, on the other hand, it is so easy for a man to visit the dispensary that the ship's doctor sees almost everyone whom diarrhoea afflicts, even in mild degree. Thus to him diarrhoea is an everyday complaint, and familiarity may breed contempt. In this frame of mind, the ship's medical officer may easily forget that diarrhoea is but  
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a symptom and that the underlying pathology can be one of many conditions.

I may have laboured the above example, but I found myself falling into the very trap described. For that reason, I schooled myself into taking a full history in all but the most trivial cases and making written notes. A good history is probably more difficult to elicit in the case of a seaman than any other class of patient. He often prescribes for himself within the first few words he addresses to the doctor. By being firm this tendency can soon be discouraged, and it is noticeable that others soon learn to avoid it. A ship is a confined community, and if the medical officer makes it known from the start that he is a doctor and not merely a dispenser of palliative drugs, he is well on the way to organising his department of the ship in the best possible way. The popular conception of the ship's doctor as a man getting on in years, out of touch with his work and using antiquated methods of treatment, lazy, and the slave of the gin-bottle, is certainly not without foundation. At the present time, however, this undesirable relic from the past is in a small minority and there is every reason to hope that he may before long disappear from the sea. The main mischief he causes is to undermine the seaman's confidence in ships' medical men in general, so that even the most conscientious are aware/

aware of some distrust and veiled or open antagonism. Having overcome this by firmness tempered <sup>with</sup> ~~by~~ a sympathetic determination to investigate each case fully, the medical officer should find, as I did with all but the most antagonistic (who would in fact be problem patients anywhere), that he can obtain a satisfactory response to systematic interrogation. More than in any other branch of practice, it is necessary here to inspire confidence in ones abilities and this can best be done by giving each man a thorough investigation.

My experience teaches me that the seaman is, until after long acquaintance, an unknown quantity, whose psychological make-up is not easily assessed. In other words, he can seldom be taken at his face value, and this necessitates a more impersonal attitude than one would employ in family practice. Again this leads back to what must now be becoming a tedious repetition, namely that thoroughness is essential. I discussed this with several medical colleagues at sea and we agreed that, on a ship, there is fruitful work to be done if one cares to do it. Caring to do it is the epitome of the above argument.

It would be superfluous and unreasonable to make any description of clinical examination. Such is the mainstay of the practice of medicine. There are, how-

ever, certain methods of examination which, for lack of time or foresight, tend to be omitted, and which can be of the utmost diagnostic value, especially aboard ship.

These are:-

- i) Examination of the urine, by which I have diagnosed two mild cases of diabetes, one with thirst as his only complaint (and physically almost perfect), and one a youth who had a chronic acneiform condition of the back of the neck for several months.
- ii) Inspection of the faeces, by getting the patient to use a bed-pan. I found this mainly of negative value in refuting the graphic and quite false descriptions by some patients of their excreta.
- iii) The use of the microscope. It is regrettable that many ships do not carry a microscope; it is quite essential. I compliment my former employers on providing a good model for each of their ships; its value was proved time and again. How else can one conclusively diagnose malaria, specific urethritis, syphilis, and anaemic, leukaemic, and other abnormal states of the blood?
- iv) Estimation of the blood by the haemoglobinometer and haemocytometer. One of my clinical teachers, the late Professor Noah Morris, was wont to stress his opinion that the former was the most useful instrument in clinical medicine. His trust in it may have been exaggerated, but it remains of extreme value. I found it essential in following the progress of hypochromic anaemias, primary or secondary to haemorrhage or debilitating disease. The haemocytometer proved its value mainly in white blood cell estimations in the progress of acute infections, maximum sulphonamide dosage, and a case of acute leukaemia to which previous reference has been made. The description of this case which follows is decisive in its proof of the necessity of the microscope and its cell-counting accessories, and illustrates how no avenue of approach should be neglected in a mystifying case.

CASE NOTES.

The patient, a Malayan merchant seaman, aged 48, was embarked at Bombay in health on 4/8/45. He had come from hospital in Calcutta where he had been under treatment for what was described in his/

his papers as an eczematous dermatitis, this now being healed.

He first came to me four days later, complaining of pain in the left subcostal region. Temp. =  $100.2^{\circ}$ ; pulse rate = 120/min. Examination revealed definite localised tenderness in the left hypochondrium, thought due to stomach. There was no abdominal rigidity and no bowel irregularity. He was given an alkaline powder to take after food.

The following day, while waiting at the surgery, he almost collapsed. Temp. =  $101^{\circ}$ ; pulse rate = 126/min.; respiratory rate = 32/min. He complained of pain across the chest and examination revealed the presence of râles throughout the lung fields and a patch of bronchial breathing at the left base posteriorly. A diagnosis of bronchopneumonia was made, and the patient admitted to the ship's hospital for sulphathiazole therapy. The white blood cell count was 14,000/cu.mm. On the next day, crepitations were audible at several points over both lungs and, two days later, signs of scattered patchy consolidation. The temperature gradually fell to normal over a period of four days, the physical signs in the chest cleared up, the patient's appetite returned and he seemed to make a good recovery. The sulphonanamide was discontinued after 31gms. had been administered in all.

Throughout his illness, the patient complained of vague abdominal pain, but repeated examination failed to reveal any definite findings apart from a tendency to tenderness over the gall-bladder region and in the left hypochondrium. A small ulcer appeared in the buccal mucosa on 17/8/45 (the third day of the apyrexial period). During all this time the tongue was heavily coated and the breath extremely offensive. On 18/8/45, he complained of severe abdominal pain, but examination again was negative. The temperature started to rise again on this date and reached  $101.5^{\circ}$ . The bowels had been constipated since just after his admission to hospital, and an aperient was given without result. A blood film was made with the possibility of malaria in mind; no malarial parasites were found, nor did there appear to be an unduly large number of leucocytes. It is unfortunate that this film was immediately discarded in view of subsequent findings. On the next day, there was very definite tenderness over the gall-bladder and the liver was palpable; the tongue was now black and dry and the general condition had deteriorated considerably. The/

The urine was repeatedly tested but revealed no abnormal constituents.

By 20/8/45, the temperature had risen to 103°, and the general condition was poor; he complained of constant abdominal pain and severe headache. An enema had been given on the day previously and had as result large shreds of blood-stained mucus. It was decided to repeat the blood films, when it was readily apparent that there was a great excess over normal of white cells, which appeared to be mainly lymphocytes. The white blood cell count was done again and found to be 147,600/cu.mm. There was an enlarged and tender liver, but no splenic enlargement and the spleen was not palpable. A few small glands were palpable in the axillae.

On 21/8/45, the general condition had worsened further. Another blood film was made, showing little change from the previous one. Red blood cell count = 1,370,000/cu.mm. White blood cell count = 188,000/cu.mm. Haemoglobin = 38% (Sahli).

On 22/8/45, the general condition was very poor. There was marked dyspnoea and the patient was confused and unable to answer questions. He died at 14.40 hrs.

The blood films were later examined ashore under higher magnification, when the true nature of the leukaemia was determined; the presence of immature cells of the lymphoid series enabled a decision of acute lymphatic leukaemia to be made. I express my thanks to my friend, Dr. J. A. Milne, attached to the Pathology Department of Glasgow Western Infirmary, for examining these films for me, and for showing them to Prof. D. F. Cappell, who confirmed his diagnosis of acute leukaemia of the lymphatic type. It was hoped to have been able to include photomicrographs of the films which I have in my possession, but they were not suitable for the photographic process.

- v) Blood pressure estimations. Most medical men possess a sphygmomanometer, but travelling does not permit the carrying of ones armamentarium, and this too should be provided by the ship. The condition in which it proved most helpful to me was assessment of degrees of shock. Incidentally, the sphygmomanometer cuff makes an excellent and easily released tourniquet for venipuncture, and may be operated by the patient himself.
- vi) Observation of response to therapeutic measures. This is only recommended in puzzling cases, has limited/

limited application, and is undesirable inasmuch as it often only narrows down the differential diagnosis and may mask essential pathology. For all that, it may be life-saving in pyrexial cases, e.g. exhibiting quinine or sulphonamides.

To conclude this discussion of investigation of cases, I would repeat that the fact that ones patient is so readily accessible for repeated examination is a great diagnostic aid. By visiting my patients, or having them visit me, frequently (several times a day, if necessary), I seldom had to confess myself at a complete loss for a diagnosis.

CHAPTER VII - THE SHIP'S HOSPITAL.

The number of hospital cases occurring aboard ship is relatively few - a fortunate thing, since proper hospital facilities are not always to be had. The main fault to be found is in the nursing of cases, a skilled undertaking which cannot be efficiently carried out by anyone not having a good training. I will revert to this, so far as it has concerned me personally, in a subsequent paragraph.

During the twelve months from May, 1945, to April, 1946, during which I was on the s.s."Arundel Castle", I treated 53 cases in the ship's hospital. This comprises but 8% of the total cases seen (disregarding the trivial cases). On considering major cases, however, it will be seen that two-thirds of these were hospital admissions. The other major cases were treated in their own quarters where this was feasible. The average stay in hospital of each patient in this series was nine days.

For the proper organisation of a ship's hospital the following requirements must be met:-

- i) Suitable premises;
- ii) Good water supply, ventilation, and other facilities;
- iii) Efficient nursing.

It would be difficult to suggest a better lay-out for a ship's hospital than that on the s.s."Arundel Castle"  
and/

and certain other Union-Castle Line vessels. Without being elaborate, it embodies the features necessary for the patient's well-being and the ease of working of the attendant. The hospital referred to was the passenger hospital in pre-war days, and used as crew hospital during "trooping" days, when a separate and much larger troop hospital was set up. In a passenger ship, two hospitals must be provided - one for passengers and one for crew - and I suggest they be in close proximity and similar in design. In the "Arundel Castle's" hospital, a small entrance hall leads to two small wards, each with three beds. Each ward has a wash-basin, and a bath and W.C. in adjacent separate compartments, and is ventilated by a fan, air-blower, and two port-holes. At the far end of the wards is a sluice-room with the customary water-flush type of sluice for the disposal of excreta, and to which each ward has access. Above each bed is a small locker and a bed-light, suitable for reading. The beds lie fore and aft and are of the swing-cot variety, an unnecessary fitting devised by designers ashore who have little idea of conditions at sea. During a visit to his vessel, the medical officer in charge of H.M.H.S. "Gerusalemme" (an ex-Italian ship used by the Royal Navy as hospital ship during the recent war) informed me that never in his long sea experience had he made any use of swing-cots, on which he always kept the locking device.

If/



If a bed-patient were disturbed by the ship's movement, it was a clear indication for his being landed without delay. Normally a bed-patient is more or less oblivious to the motion of the ship, even in moderately heavy seas. A plan of the hospital just described is shown in Figure 3, drawn approximately to scale. Each ward actually measured 17 ft. by 12 ft., with an 8 ft. ceiling.

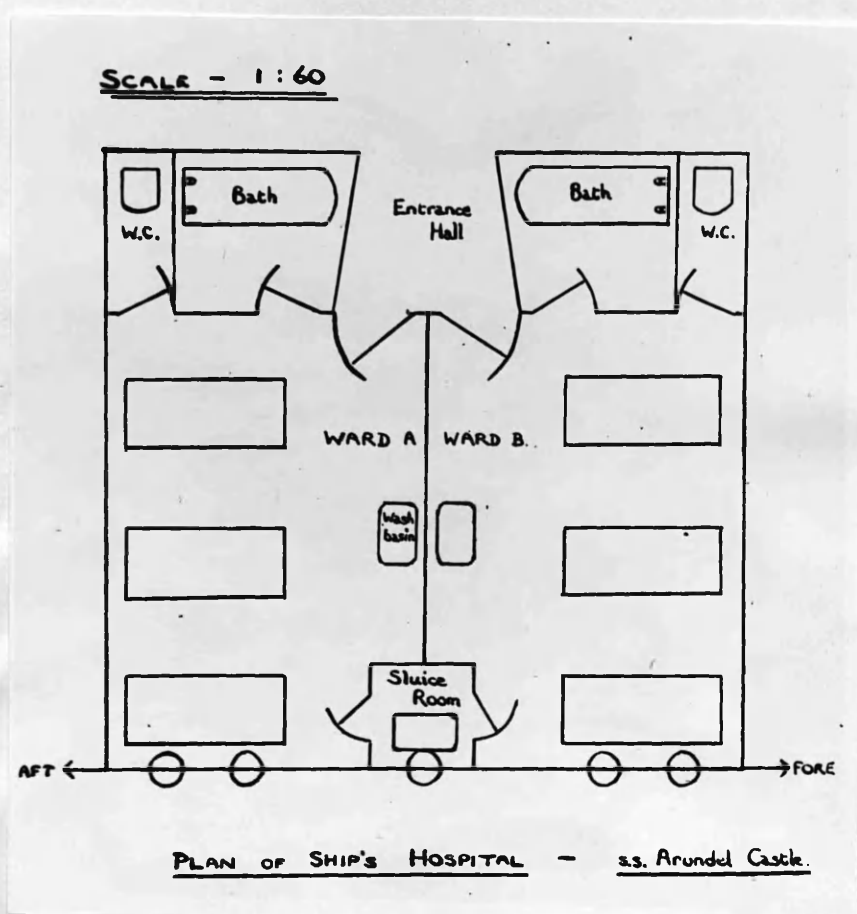


Figure 3.

Taking the above as an example of a well-planned hospital, there remain the details of fitting and decoration/

ation. The bed accommodation can be decided upon at will either by adjusting the length of the wards or providing additional similar pairs of wards; I would suggest allowing one bed for each 50 members of the crew, and one bed, in the passenger hospital, for each 80 passengers, since the latter can more often be confined to bed in their own quarters. The fittings of the above hospital are adequate for most cases. One improvement of value may be suggested (which is actually in use in the newer Union-Castle ships), viz. the provision of beds of the Lawson Tait type, which makes it possible to maintain Fowler's position and to raise the foot of the bed without any danger of instability when the ship is rolling or pitching. Tiered bunks must be avoided at all costs; they are unpleasant for the patients and unsuitable for the attendant who cannot conveniently reach the occupant of the upper, and is hampered in his attentions to the occupant of the lower through lack of space. Tiered bunks have been the rule in crew hospitals; they should be abolished permanently.

The provision of good ventilation in the hospital is of the utmost importance, and every effort should be made to provide for free intake of fresh air and dispersal of vitiated air and odours. The patient confined to bed in the tropics is acutely conscious of heat and dampness, and constant discomfort is a great bar to progress. The hospital should be provided with as many port-holes as possible/

possible, fans, directional air-blowers, and exhaust ducts. During really hot weather I found the hospital to be one of the coolest parts of the "Arundel Castle", despite its proximity to the engine-room. Fresh water, hot and cold, should be available at all times.

The decoration of the hospital can be dismissed briefly as it is mainly a matter of interior colouring. It is essential to choose a light colour so that, so far as possible, the patients can be examined by natural daylight. The Service hospitals of troopships during the war were painted a dark shade of green which was unsuitable, as the wards were dark and gloomy and required artificial lighting throughout the day. On the other hand, the glare from bulkheads painted pure white is distressing to sick patients. My personal preference in colouring is white for the bathrooms and toilets and, for the wards, white tinted very palely with green. The latter colour is cool and restful to the eyes in hot weather and has not the chill appearance of pure white in cold weather. Moreover, it does not darken appreciably with age. The angles of the room and the junctions between bulkheads and deck or deckhead should be rounded as in most hospitals ashore, leaving no corners for dust to gather. This same plan could indeed be adopted with advantage throughout the accommodation of ships.

The hospital should be situated in a part of the ship away from noise, and where the movements of the ship are least pronounced. I have mentioned above that the "Arundel Castle's" hospital is near the engine-room. This might appear to be the least suitable place, but one must add that, on this ship, engine noise hardly exists, nor is there any vibration. This hospital lies amidships on "B" Deck (the decks are named "A" - "F" from below up) and even in rough weather the movement is minimal. The latter factor, however, concerns the attendant's comfort more than the patient's. There should not be an open deck above the hospital, for nothing is more distressing to a sick person than the sound of footsteps overhead, and, on a crowded ship, passengers are apt to stand around in groups, tapping their feet, the noise of this being particularly disagreeable to the frayed nerves of a sensitive patient.

The main problem that arises in connection with the ship's hospitals is that of nursing. As I have previously pointed out, the only assistance I had aboard ship (except on my last ocean voyage) was that of a male hospital attendant untrained in nursing, and whose knowledge of it had been acquired by reading or after years of experience under various medical men. In all fairness to my hospital attendants, I must state that they gave me invaluable assistance, often helpful advice by their/

their longer acquaintance with conditions at sea, and always showed themselves willing to carry out my instructions. At the same time, their basic training repeatedly revealed its deficiencies, particularly with regard to nursing. I would state categorically that no one who has not received a full course of training as a nurse (i.e. up to the requirements for State registration) is really capable of looking after bed patients. The amateur nurse, however conscientious, fails in not having a proper grasp of fundamentals. The professional nurse, by virtue of her intensive study and training, has such an intimate knowledge of nursing that its essential details become second nature. It is when this takes place that the medical man can place full confidence in the nurse, knowing that he or she can be trusted to attend to details without reminder. This statement brings to mind the sad fact that so many qualified medical practitioners take nursing for granted, and are themselves unfamiliar with its important details. Indeed, on the whole, they are often as careless as the hospital attendants whom I have criticised, and for the same reason, namely that they have not been grounded in the fundamentals of nursing and have not had sufficient acquaintance with nursing to assimilate them. How then can a doctor and inadequately trained auxiliary be expected to provide ideal nursing?

Since/

Since my objections to the assistant untrained in nursing are the result of my own experience, it is worth describing some of the shortcomings I have encountered:-

- 1) A lack of a rigid time-table such as obtains in a well-run hospital. The untrained nurse allows things to proceed at a leisurely pace, the only fixed times being meal-times. Bed-pans are not administered at set hours, but as the patient asks for them. Thus, charting of bowel movements and the passage of urine tends to be imperfect. When the hospital attendant is not in the hospital and the patient requires a bed-pan (a not infrequent occurrence if strict hours for the purpose are not adhered to), the latter either endures discomfort (thereby upsetting the natural bowel rhythm) or gets out of bed to visit the toilet, very often against the surgeon's express instructions. The same fault holds as regards washing the patient. In addition to its being difficult for an untrained person to bathe a bed-patient well, he is apt to forget to do it at all on many occasions, and the duty is left to the patient himself, who may not be strong enough or too disinterested to do the bathing properly.
- 2) A lack of discipline, shown by the patients smoking, failing to remain in the proper posture where this has been recommended, jumping up in bed or getting out of bed as they wish, having visits from their shipmates at all hours of the day, and not observing the proper time for "lights out". These take place because, to the lay mind (in this case I refer to the untrained attendant), they seem negligible offences. If the patient seems able to read late at night, if he feels he would enjoy a cigarette, or if his friends want to chat to him, the layman cannot understand why these privileges should be denied. To the medical man and qualified nurse it is only too obvious. I may have given the impression that, in a ship's hospital, the patients act as they please. This is not so, but, over and over again, the lack of real hospital discipline manifests itself in one or other of the ways enumerated.
- 3) A failure to perform the routine tasks of a ward. The most glaring examples are:-
  - a) failure to attend to the pressure points of the skin by treating them with spirit and dusting/

dusting powder and by altering the patients' positions regularly. I was ashamed of the number of minor bed-sores I saw in my hospital patients through the failure to carry out these tasks. On first coming to one ship, it did not occur to me that the hospital attendant would have to be reminded of this duty. When by chance, after ten days on his back, a patient complained of agonising discomfort which proved to be due to bed-sores, the fact emerged that his pressure points had never been treated or even inspected by the hospital attendant. This particular attendant had been at sea in that capacity for almost 20 years. The inference is obvious.

b) Carelessness in recording temperatures, pulse rates, and the other customary hospital chart observations. I insisted on a chart for all hospital patients irrespective of their complaint; to the trained nurse this would seem a commonplace but it appeared to surprise my attendant. Apparently he thought a chart necessary only in cases pyrexial from the outset.

4) Ignorance of aseptic principles. This I found to be common to all my hospital attendants and to those associated with my medical colleagues at sea.

Some of the ways in which this was revealed were:-

- i) doing surgical dressings without washing the hands;
- ii) touching sterile gauze and lint with the fingers and cutting sterile dressings with unsterilised scissors;
- iii) laying sterilised instruments on an unsterilised surface;
- iv) picking instruments out of the steriliser with dirty forceps and, I shudder to admit, drying instruments intended to be sterile on an ordinary, unsterilised, clean towel;
- v) believing instruments to be sterile if they had been in contact with an antiseptic, and storing instruments in a weak antiseptic solution in a container, often exposed to the atmosphere, whose contents were not changed for weeks or even months.

These examples could be multiplied ad infinitum, and I have seen each one perpetrated many times, but from them one conclusion emerges, that the amateur or semi-professional nurse positively cannot differentiate between cleanliness and sterility, between antisepsis and asepsis. In this factor, more/

more, perhaps, than any other, lies the fear which so many ship's surgeons have of performing a major operation. It is my belief that only two classes of people consistently apply asepsis to medical work, surgeons and competent State-registered nurses. The semi-trained nurse and the ordinary medical practitioner have many lapses from grace.

- 5) Failure to observe salient features in a case, and attention to irrelevant details. A good example of this is the case of smallpox reported on pp. 69-73. On the seventh day of the illness, and even after the correct diagnosis had been considered and vaccination performed, my hospital attendant was quite excited to report that the man's temperature was down to the normal level and that his bowels had moved. He had completely failed to observe that the maculo-papules which had been present on various parts of the body had now become definite vesicles. The same failure of observation makes the attendant's assessment of a patient's condition unreliable. The trained nurse can tell from experience, very often better than the doctor, when a patient is showing improvement, or when his condition is deteriorating or becoming dangerous. Attention to irrelevant details is shown mainly as a pre-occupation about the patient's bowels. This probably results from the attendant's association with elderly practitioners whose concern in moving the bowels often over-rode their discretion. I had to restrain my attendants' enthusiasm for "Black Draught" and other purgatives on many occasions, notably in the case of haematemesis reported on pp. 131-132 (two days after the actual vomiting), when I eventually persuaded the attendant on that case that an irritant purgative was not likely to improve our patient's condition.
- 6) A loss of perspective in assessing the day's work. This statement requires some clarification. By it I mean that the man who has been at sea for years loses his sense of proportion with regard to work. For quite a few of the crew of a modern ship, a hard day's work is an exception, and ship's life tends to make everyone - including the doctor - lazy. For this reason, in the case of the hospital attendant, what would be a normal or light day's work to the nurse ashore seems to him a harassing day. Thus, when one does become busy on the ship, the hospital attendant is unable to cope with his task, and the standard of work and nursing tends to fall very low.

To summarise the contents of the preceding paragraphs,



it is essential if the standard of medicine at sea is to reach a high level that a fully trained nurse should be carried on every large ship. I would go further and state that it should be statutory for ships compelled by law to carry a surgeon to carry also a State-registered nurse of experience. If this point alone of this thesis were accepted and acted upon I would feel that much had been achieved. Those shipping companies which already carry nurses on their vessels are to be commended on their foresight.

Bearing in mind that the number of hospital cases on a ship is relatively small, the nurse's duties would also include attendance in the surgery to do dressings and assist in surgical procedures. For the same reason, viz. that her duties aboard ship would be much lighter than the work she had been doing ashore, the appointment of a nurse to a ship for a limited period would provide her with an agreeable change from the harassing life to which she had been used, and an opportunity to see something of the world, an opportunity which is unfortunately denied most young women in peacetime. The following are my suggestions for the appointment of nurses to merchant ships, based on the grounds of suitability for the job, and the undesirability of remaining in it (a relatively static occupation) for a long period:-

a) A panel of nurses wishing to have appointments on

ships to be set up by a central authority, e.g. the General Nursing Council, to which alone shipping companies might make application for nurses for their ships

ADDENDUM - page 61, to follow line 4.

In the interests of accuracy, it might be advisable to correct the references to the General Nursing Council which appear here and in Chapter X. The General Nursing Council exists primarily to supervise nursing education and as a Board of Registration and, as such, could hardly be expected to undertake the duties herein suggested. The non-specific term, "Central Nursing Body", which is understood to mean an official body representative of the nursing profession (e.g. the Royal College of Nursing) should be substituted for General Nursing Council where the latter designation appears.

- 
- f) The nurse to render a report on her duties at the end of each voyage, with whatever suggestions for improvement she finds relevant.

While insisting that a fully-trained nurse be carried, I think it essential for there also to be a male attendant, who again should be free from ordinary steward's duties except for the cleaning of the hospitals and surgery. So many cases occur which require firm treatment, e.g. acute alcoholics, or involve actual physical effort, e.g. trauma in inaccessible parts of the ship requiring first-aid and careful transport to the hospital, that a man's help is necessary, especially the help of a man with some knowledge of first-aid and the handling of injured and collapsed cases.

Some ships carry a pharmacist in addition to the other medical auxiliaries. In a busy passenger liner he may prove a useful member of the medical team, but I am inclined to think this post is superfluous unless, of course, the retail sale of drugs in the ship's shop is an approved feature of the shipping company's financial policy. I dispensed nearly all my own prescriptions, leaving only the innocuous mixtures (e.g. calamine lotion) to be made up by my attendant, and I did not find that this involved too much of my time, even on my busier days. Indeed, I found it to be time well spent, since the close acquaintance with drugs and their dosage gained from it was of immeasurable value. A few hours spent thus in practical pharmacy teach more about compounding and combining drugs than several days' reading about prescription-writing.

I would point out that the dispensing of drugs should not be delegated to a nurse where one is carried. Although materia medica forms part of a nurse's training, few nurses have a sufficiently familiar knowledge of the subject to make it safe for them to compound prescriptions. I say this advisedly, in view of my experience with trained nurses during my last ocean voyage; their unfamiliarity with dosage and administration of drugs commonly used in general practice was noticeable. The nurse's duties in the surgery should be mainly confined to dressings, and here too it must be pointed out that she must learn to exercise/

exercise a much greater economy in the use of dressing materials than she did in hospital ashore. Were I asked whether the trained nurse is inferior to the sick berth attendant in any respects, I should have to admit that:- i) she keeps a less tidy dispensary, and appears to be less at home with drugs in bulk, and ii) she is unnecessarily wasteful of surgical dressing materials and certain other items of equipment.

An important practical point with regard to medical auxiliaries is their relative status. Without this being adjusted, unpleasant friction is bound to occur. It is natural for a trained nurse to wish to take precedence over a partially trained hospital attendant, and it is equally natural for the latter (a man with several years of sea experience) to resent what seems to him a superior attitude. This very state of affairs led to one of my attendants leaving a company whose ships carried nurses. My experience suggests that the remedy lies in having the nurse and attendant separately responsible to the surgeon who will apportion their various duties, unless the hospital attendant has no medical training, in which case it is admissible for him to work under the nurse's direction. This is, however, a matter for the individual surgeon to decide and is really irrelevant to our present consideration.

The nurse and hospital attendant should occupy cabins near/

near the hospital, in telephonic communication with the surgeon's cabin, and connected to the hospital by electric bell, so that the patient can summon his nurse when he wishes. A good plan would be for the bell circuit to be so arranged that, for example, the bell would ring in the nurse's cabin by day, while at night it could be switched over to ring in the hospital attendant's cabin.

CHAPTER VIII - INFECTIOUS DISEASE ABOARD SHIP.

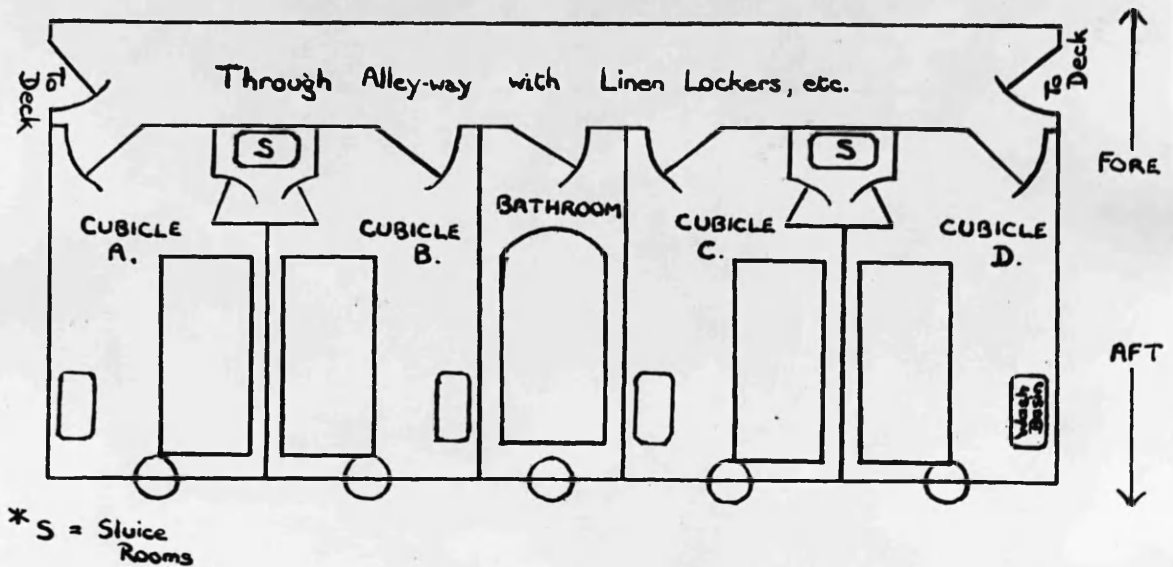
Most ships have a small isolation hospital, but, in some, the one hospital has to serve for all cases. This is, for obvious reasons, undesirable, and no effort should be spared to provide a small hospital for isolation. It should be situated in a part of the ship well away from other living accommodation and on a part of the deck not ordinarily frequented by passengers or crew. The poop-deck meets these requirements fairly well and is commonly chosen as the site of the isolation hospital. The somewhat greater vibration felt at the stern of the ship is no contra-indication to this location for, as has been previously stressed, bed-patients are seldom sensitive to the ship's movements. I have not yet seen a well-planned isolation hospital, and, in Figure 4, illustrate what appears to me to be a suitable lay-out, with four individual cubicles, which should be sufficient for most ships. This isolation hospital may be used for passengers or crew, but, in certain cases, passengers can be isolated, though less efficiently, in their own cabins. Each cubicle should measure about 10 ft. by 6 ft. and contain a metal-framed bed - not a bunk - and a wash-basin, with hot and cold water always available. A bathroom and sluice rooms should be adjacent. The need for four individual cubicles instead of the customary two double-berth rooms becomes obvious when one considers that:-

- 1) two/

- i) two different infectious diseases must not be nursed together;
- ii) a male and female patient cannot occupy the same room.

The remarks regarding ventilation and decoration of the ordinary hospital are applicable here also. An important point in the case of the isolation hospital is that the bulkheads of the cubicle should be smooth and painted with

SCALE - 1:60.



SUGGESTED PLAN OF SHIP'S ISOLATION HOSPITAL.

Figure 4.

a glossy, washable paint. Panelled walls or bulkheads lined with wood-planking are quite unsuitable. The same type of bulkhead is desirable, but less necessary, in the ordinary/

ordinary hospital.

The nursing of cases of infectious disease does not create any special problems except that, in my own cases, it proved difficult to impress upon my hospital attendant the need for the strictest precautions. However, by laying down the injunction that every pathway of infection had to be circumvented, I brought about measures which were easily remembered, reasonably effective, and not unduly troublesome, viz. that before ever entering the isolation ward the attendant should (1) don a long gown with sleeves, (2) don a gauze face mask, and, before leaving the ward, (3) rinse his hands and forearms in a dilute antiseptic solution, e.g. Dettol. The face masks should be left on a small rack outside the isolation ward or cubicle, and be wrung out of weak Dettol after use and hung on the rack to dry.

The communal life of ships' crews favours the spread of infectious disease, and it is important that isolation of cases should be prompt, even to the extent of its preceding a definite diagnosis. It is manifestly impossible for all contacts to be determined since everyone aboard is, in theory, a contact, but it is possible to determine the immediate contacts, i.e. the man's room-mates, those who work beside him, and his personal friends. By keeping all these under daily surveillance, it is unlikely that any/



any suspicious symptoms will be missed.

My experience of infectious disease aboard ship has been confined to diphtheria (one case), mumps (four cases), whooping-cough (two cases), and smallpox (one case). The diphtheria and one case of mumps occurred in members of the French Army, one other case of mumps in a woman member of the Croix Rouge Française, the other cases of mumps and whooping-cough in civilian passengers, and the smallpox in one of my own crew. They were dealt with as follows:-

- 1) The case of diphtheria was isolated on suspicion, as soon as he reported complaining of sore throat and extreme general malaise and was seen to have a small whitish patch on one tonsil. He was landed at Port Said after two days in isolation. All men who shared the same troop-deck were examined that day and, again, three days and a week later, special attention being given to the state of the fauces. No other case developed. One case of sore throat detected during the first inspection was isolated, but turned out to be a non-specific angina.

It is interesting to note that all French troops are compulsorily actively immunised against diphtheria. In spite of this, I learned from my French colleagues that diphtheria is not uncommon in the French Army. I have not seen a case of diphtheria among British troops aboard ship, although the number of these carried during one year on my ship amounted to over 24,000, and of whom a negligible proportion had ever received anti-diphtheritic immunisation.

- ii) The two cases of mumps in Service personnel occurred within two days of one another, when the troops had been only a week aboard. In view of the long incubation period of this disease and the fact that the troops and Red Cross detachment had come from different parts of France, each having spent only a few days in Marseilles before embarkation, it was clear that the infections were from quite different sources. The cases were isolated immediately on being diagnosed. No other precautions were taken and again the outbreak was limited to these cases.

The other two cases of mumps occurred in a mother and/

and one of her children (a boy aged 4), the swelling of the mother's parotid being unilateral, and taking place two days earlier than the onset of the boy's illness. On the mother's reporting sick, she was suspected to be a case of mumps, and put into a small ward with her two children (the other being an infant of  $1\frac{1}{2}$  yrs.). The family was kept in isolation for the remaining ten days of the voyage, then transferred to isolation hospital in Southampton, from which they were released one week later. The infant did not develop the disease, nor did other cases appear aboard ship, as might be expected with the long incubation period of mumps.

iii) The cases of whooping-cough were actually at the stage of the "whoop" and occurred in a brother and sister aged 4 and 3 years respectively. The mother heard the little girl whoop on the day of sailing and became alarmed since the boy had had whooping-cough one month previously, but had been pronounced fit to travel. The whole family were put into isolation for the duration of the voyage (two weeks). Apart from the characteristic whoops, no other symptoms were present, and it is likely that both children had been infected about the same time, the earlier stages of the girl's illness being so slight as to be unrecognised. No other cases occurred aboard ship and it is fortunate that these were notified to me so early in the voyage, as, although they were probably past the stage of infectivity, there was a large number of young children aboard whom it was important to protect against the slightest possibility of infection.

iv) The case of smallpox I report in more detail. Its interesting features are the mildness of the attack, the very high percentage of positive results obtained in the mass vaccination, and the atypical distribution of the skin lesions. It is a good illustration of smallpox modified by previous successful vaccination.

CASE NOTES (Temperature chart illustrated in Figure 5).

The patient became ill on 21/3/46, five days after leaving Bombay where the ship had been in dock for a week, during which the crew had been ashore and had frequented the native markets and restaurants. During the week ending 9/3/46 there were, in the port and city of Bombay, 174 cases of smallpox and 49 deaths from the disease.

The patient, an engineers' steward, aged 20, first reported to me on 23/3/46, when he complained of general weakness, pains in his shoulders, and headache/

headache, present for two days. His temperature was 98.8°, and his pulse rate 82/min. Examination failed to reveal any signs suggesting a specific febrile illness, and he was given a sedative mixture containing ammonium bromide, aspirin, phenacetin, and caffeine to take three times a day. When seen the following morning, his temperature had risen to 101°, and his pulse rate to 100/min. He was sweating profusely, had a pallid complexion, and complained that his right leg had been aching badly all night. His headache was frontal and had become agonising. There were still no signs to suggest a specific fever but in view of his severe symptoms he was admitted to hospital (where there was one other patient; the latter was landed to the care of the Royal Naval medical authorities in Singapore the next day and when the true nature of the fever was determined they were promptly notified by radiotelegram of his having been a contact). No visitors were allowed into the hospital from then on because of the patient's very ill condition. At this stage the possibilities suggesting themselves were cerebrospinal fever, early acute poliomyelitis, and influenza. There was, however, no nuchal rigidity to support a diagnosis of the first of these, nor was there any muscle tenderness or weakness in any of the limb muscles to favour the second. No nasopharyngeal symptoms or tracheitis were present to support the possibility of influenza.

On 25/3/46, he had a rigor and his general condition was worse, with definite drowsiness and constant severe headache. On 26/3/46, he complained of aching in the abdomen, which seemed distended, with troublesome passage of flatus. His bowels were constipated and his tongue thickly furred. White blood cell count = 4000/cu.mm. This leucopenia together with his abdominal symptoms made typhoid fever a possibility. The same day a blotchy maculo-papular rash appeared, mainly about the forearms and flexures of the elbows, definitely unlike the "rose spots" of typhoid, but not unlike the rash of dengue fever which was then, incidentally, affecting a tremendous proportion of the British Forces in India. The patient was vaccinated on this date, the remote possibility of smallpox having been considered; although, if the case were smallpox, vaccination at this late stage of the prodromal illness would probably be futile, it was considered worth while taking the precaution. His last vaccination, 1½ yrs. previously, had not taken, but he had four large/



the thighs (one on each side), and feet (3 in all). There were 3 vesicles on the face, and none on the scalp. The patient felt well and was free from all symptoms. The possible diagnoses could now only be chickenpox and smallpox; the lad had not had the former. After discussing the case with two R.A.F. medical colleagues aboard, one of whom had taken an interest in the case for several days previously, a diagnosis of variola minor was made. The reasons for this were:- i) the severity and long duration of the prodromal illness, ii) the distribution of the vesicles mainly on the distal parts of the limbs, iii) the regular shape of the vesicles and their tendency to be umbilicated, iv) all the skin lesions being at the same stage. There were, however, several points in favour of chickenpox:- 1) the scantiness of the rash on the face, and a tendency to invade the axilla, 2) the vesicles were unilocular. The diagnosis of smallpox was borne out by the subsequent course of the illness; the lesions became pustular after 2-3 days and after a further 2-3 days commenced to dry up leaving little scabs, some of which were very deep-seated and almost buried in the skin (those on the hands and feet). The customary treatment by permanganate baths and soaking of the "seed-like" lesions was carried out in the last stage, and the patient was discharged from hospital on 10/4/46, all the skin lesions having healed. At no time was there any "cropping" of the skin lesions, and no secondary fever occurred. Thus, although we had penicillin and sulphonamides ready in anticipation of secondary infection, the mildness of the attack did not warrant their use. The patient's vaccination did not take.

The precautions taken to prevent spread of the disease were:- a) isolation of the patient from the fourth day of his illness; b) vaccination, on 28/3/46, when the diagnosis was established, of everyone aboard without exception and regardless of the date of previous vaccination. Mass vaccination allowing no exemptions is the only course to follow aboard ship to make sure that everyone is protected. It is noteworthy that over 90% of the vaccinations resulted in positive reactions, even in men who had been vaccinated only a month or two previously. This is rather a tribute to the quality of the lymph, which is prepared for ships' use by the Jenner Institute for Calf Lymph, Ltd., London, S.W.11. The lymph used had been manufactured on 15/5/45, and had been stored/

stored at 0°C since its delivery to the ship a few days after manufacture; c) supervision of close contacts (7 room-mates and one soldier friend) every second day for a fortnight, after which they were instructed to report at once if they felt at all unwell; d) immediate removal of the patient's bedding and personal effects from his quarters; e) thorough terminal disinfection of all bedding and clothing used by the patient, and the provision of clean clothes just before leaving hospital and after a good bath.

I must express my indebtedness to Squadron-Leader J. R. Tasker, of the R.A.F. Medical Service, for his help and advice in this case. We had several interesting discussions on its various aspects, and his organisation of the vaccination of some 2,700 troops within 6 hours reflected great credit on himself and his colleagues.

A practical point emerging from the case is the inadequate amount of calf lymph carried by merchant ships. The Board of Trade Medical Scales provide only for "an amount equivalent to one dose for every other person on board", while the Army supply is sufficient for only a fraction of the troops carried by large troopships. Fortunately my stock greatly exceeded the statutory amount and was sufficient to vaccinate 2,600 persons. Enough lymph should be carried to vaccinate everyone aboard, should the occasion arise.

#### THE DISINFECTION OF CABINS AND HOSPITALS.

Eventually I came to use only liquor formaldehydi (formalin) for this purpose. About 18 fl.oz. in a sprayer delivering a very fine spray were used for 1000 cu.ft. of enclosed space, the operator wearing a respirator during the process, preferably of the Service pattern. This is much in excess of the quantity usually stated to be necessary, but I ceased troubling to seal the room entirely before filling it with vapour, only the port-holes, door, and any ventilating shafts being closed. The escape via the cracks of/  
of/

of the door, etc., necessitates using a greater quantity than that recommended for a sealed room. The escaping vapour causes a pungency in the atmosphere around the disinfected room, but it does not last for long and is by no means unbearable even in an adjacent cabin except, perhaps, for the first two hours after the disinfection. The treated room is kept closed for 24 hours. By then the pungency of the atmosphere in it will hardly affect the most sensitive nose or throat. Formerly for disinfection we used sulphur candles burning the recommended 2-4 lbs. of sulphur per 1000 cu.ft. of enclosed space. This necessitated sealing the room completely for fully a day. At the end of that time the room was still filled with acrid fumes of sulphur dioxide, and these were appreciable for several days. Moreover, the sulphurous fumes are apt to discolour paintwork. The advantages of undiluted formalin over burning sulphur are, therefore, that it:- (1) does not necessitate complete sealing of the room provided an excess is used; (2) clears more quickly from the atmosphere; (3) does not stain the room interior; (4) is a more efficient germicide.

THE DISINFECTION OF CLOTHING, BEDDING, AND LINEN.

This can be done chemically or by means of heat, the latter method being probably the more simple and less likely to damage fabrics. Newer ships have proper steam disinfectors/

disinfectors where high-pressure steam fills the chamber containing the articles being treated, i.e. the same apparatus that is used in disinfecting stations run by public health authorities. In the ships in which I served, I had to make do with a steam-bag for the purpose.

This consists of a large canvas sack for holding the infectious articles, with a metal fitting at one end to attach to a steam-cock (usually on the open deck). The steam thus fills the bag, permeates its contents, and escapes through the canvas. The main drawback to this method is its tendency to spoil dyed fabrics, the moisture from condensed steam causing many dyes to run or fade, their colours being taken up by the inside of the sack itself. Thus, although they should be treated separately, both white and coloured articles are liable to suffer in the process. Apart from this disadvantage, the method is satisfactory for the common infections, and, if the steam is allowed to permeate the contents of the bag for at least half-an-hour, adequate disinfection may be assumed. The ship's surgeon should himself supervise the procedure, making sure that the steam current is adequate and the time of disinfection sufficiently long.



CHAPTER IX - THE PRINCIPAL CAUSES OF SICKNESS ON SHIPS TRADING IN TROPICAL AND SUB-TROPICAL WATERS AND THE ESSENTIALS OF TREATMENT.

In Table III are classified 300 consecutive cases of sickness occurring aboard ship from late November, 1945, to mid-April, 1946, in order of decreasing frequency. From this series, all the cases classed as trivial on pp. 38-39 have been excluded. During the period under consideration, 3 weeks were spent in cold wintry weather (Mediterranean winter), 3 weeks in a temperate climate (U.K. before departure, and Japan in spring), and the remaining 15 weeks (approximately) in extremely hot, tropical atmospheres (West Africa, Indian Ocean, Far Eastern waters).

TABLE III - Classification of 300 Cases of Illness during a mainly tropical voyage.

<u>NATURE OF ILLNESS</u>	<u>NUMBER OF CASES</u>
Ringworm affections of the skin	25
Dental extractions	24
Enteritis with diarrhoea	17
Conjunctivitis and corneal ulceration	16
Severe febrile colds and chills	13
Acute gastro-enteritis	12
Minor septic lesions	12
Affections of the middle ear	11
Dermatoses	11
Painful affections of muscles, tendons, joints, and fascia	11
Ligamentous strains	10
Acute bronchitis	10
Acute tonsillitis	9
Burns	9
Septic lesions of the fingers	8
Wounds requiring suture	8
Otitis externa and furunculosis of the meatus	8
Pediculosis/	



The reason for the considerable number of dental extractions (the figures refer to patients, some of whom had multiple extractions) is that several of the crew were signed on at the last moment and I had to waive my objection to bad teeth on this occasion, with the result that several of the late-comers came to me as dental patients. When I achieved a fair measure of success with my earlier cases, others, who found it more convenient to have teeth out during the voyage than during their leave, did not hesitate to have this operation performed.

The table faithfully reflects the incidence of enteritis, gastro-enteritis, eye and ear complaints, bronchitis, tonsillitis, and parasitic infestations.

Complaints which figure too low on the list include skin diseases other than tinea, and septic lesions of the fingers. Minor operations are also more frequently performed than the table would suggest.

The figures for venereal disease are interesting in that less than 2% of cases (i.e. even excepting a large number of trivial ones) are cases of venereal infection. This is at variance with the popular belief in the extreme prevalence of venereal disease among seamen\*. I have no

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\* It also disagrees with Hutchison's wartime figure of 10.1%, although the circumstances differ in his cases (27).

reason to suppose that the figures I have quoted are misleading, for concealment of venereal disease is no longer common on ships. Indeed, many men report on suspicion of venereal disease, or even as a routine after intercourse in foreign ports, and their fears are unfounded. The supply of condoms and calomel cream prophylactics is gradually gaining acceptance in shipping circles as an effective means of cutting down venereal infection.

The complete absence of malaria from the table, during a voyage when several highly malarious districts were visited, deserves comment. In some of these ports, mosquitoes in considerable numbers invaded the ship, and many men were bitten. It is difficult to assess to what extent the absence of malaria is due to suppressive mepacrine, but that the latter has been a major factor is almost certain. From the time of my first visit to tropical ports, I made a mepacrine issue to the crew on each occasion we approached a malarious district. These included Bombay (variable), Colombo (variable), Singapore, Saigon, and ports in Gold Coast and Sierra Leone. Issues were not made routinely for Mediterranean or Indian ports but only when it was learned that malaria was prevalent at the time of our visit. At the same time, any man wishing to have the protection of mepacrine in a doubtfully malarious port, was not dissuaded from taking it. The taking/

taking of mepacrine soon becomes a habit; several seamen who had never previously considered protection against malaria now take the tablets throughout their stay in the tropics. The instructions are extremely simple:-

"Take one tablet every day for ten days before you reach the malarious port, all the time you are in the port, and for thirty days after leaving it; swallow the tablet whole during a meal, and take a good drink of water afterwards".

Strangely enough, the objection to the yellow mepacrine complexion weighs heavily with a number of men. When the newer synthetic antimalarial drug, Paludrine, supplants mepacrine, as is anticipated, the absence of colour in it will remove this objection, but, since prophylactic Paludrine necessitates only one tablet per week, I doubt whether a Paludrine habit will be so easily acquired as the daily mepacrine habit; one tablet a week may be more apt to lead to forgetfulness. I encountered only one toxic reaction to mepacrine, viz. persistent nausea, and in these cases advised discontinuing the drug. Substitution of quinine in these cases usually causes the same nausea, so that it is as well to avoid antimalarial specifics, and attempt to escape infection by measures to avoid mosquito bites. Undoubtedly the use of an effective insect repellent has been another important factor in cutting down the incidence of the disease. Dimethyl phthalate for this purpose was added to the Board of Trade Medical Scales in February, 1945, and has proved of sterling/

sterling worth, being acclaimed with enthusiasm even by hardened seafaring adherents to oil of citronella. Its ease of application, economy, freedom from smell, and undoubted efficiency have caused it to supplant the traditional insect repellents.

In the following pages, the commoner ailments are discussed in greater detail, emphasis being laid mainly on their treatment. The greater leisure enjoyed by the ship's surgeon enables him to carry out some experimentation in the treatment of common conditions, and this has to be done of necessity in certain cases which fail to respond to the accepted drugs or applications, for the unwell afloat soon become impatient and spend more time thinking of their ailments than they would ashore. No originality is claimed; one can hardly be original with the means at ones disposal. The main purpose of the descriptions is to show: (1) how much can be done under what may often be difficult circumstances; (2) what improvements and additions to standard equipment are necessary or desirable; (3) how improvisation must play a large part in the ship's surgeon's work. With regard to the second of these points, it is necessary at this stage to mention again the Board of Trade Medical Scales for merchant shipping. These are lists of drugs and equipment which merchant vessels are compelled to carry under Sections 200 and 300 of the Merchant Shipping Act, 1894. There are different/

different scales for different classes of vessel; Scale I lays down the drugs and equipment and their exact quantities (varying according to the estimated duration of the voyage and the number of persons aboard) to be carried by all ships required by law to carry surgeons. The Scales are revised from time to time and amendments and additions made in special notices to shipowners issued by the Ministry of Transport, which is at present the Government department in control of shipping and has replaced the Board of Trade in official pronouncements on shipping subjects. Recent additions to the Scales include benzyl benzoate emulsion, mepacrine hydrochloride and methane-sulphonate, and dimethyl phthalate. In the discussions on treatment which follow, drugs and equipment which do not appear in the Scales, and drugs which cannot be compounded from items appearing therein, will, throughout this chapter, be underlined in red. Most shipping companies allow their surgeons to carry drugs and equipment in addition to those of the official scales, according to their special needs and preferences, but it is worth noting that most companies deprecate the purchase of drugs other than those appearing in the scales.

#### Diseases of the Skin.

a) Tinea. This, the commonest skin condition met with, occurs in three forms, tinea of the body mainly the trunk (the typical ovoid patches of tinea circinata, with/

with their irregularly raised margin), epidermophytosis of the feet affecting mainly the skin at the webs of the toes, and epidermophytosis of the groin folds and the lower aspect of the scrotum (tinea cruris or dhobi itch). The latter occurs with distressing frequency in the tropics, its incidence being roughly three times that of either of the others, the numbers of which are more or less equal. Tinea of the body presents no great difficulty in treatment; in my cases, the daily application of ordinary B.P. tincture of iodine cleared up even widespread cases within a fortnight. In no case was irritation or itching severe and, in a number, the patch of tinea was discovered fortuitously during examination of the patient for another reason. Epidermophytosis of the interdigital spaces of the foot responds less readily to treatment. After repeated trial, I restricted the daily applications to two in number:- i) for cases in which the skin was reddened, moist, or tender, 1% alcoholic solution of gentian violet; ii) for cases where the skin was dry and scaly or of a sodden greyish appearance, some form of Whitfield's Ointment. Salicylic acid, 3%, with benzoic acid, 5%, in simple ointment, is an efficient form of Whitfield's Ointment for this use. The duration of treatment in these cases may be prolonged up/



up to a period of months, and the tendency to recurrence is great, especially among engine-room ratings standing on hot platforms. Epidermophytosis of the groin folds is met with in every degree of acuteness, and some cases are very resistant to treatment. Discomfort may be slight or intense, and where there is constant intense itching in the scrotal region the patient soon becomes depressed and irritable. The milder cases show a faint dull red area on one or other thigh, close to the groin, usually but by no means invariably symmetrical, and extending back, as a rule, almost to the anus. Irritation is slight and the lesions are dry and not raised above the surrounding skin surface. Daily painting with tinct. iodi mitis or daily application of Whitfield's Ointment is quite adequate. In the more pronounced stage, the edge of the patch is somewhat raised and there is a variable degree of scaling over the area. Again iodine painting or Whitfield's Ointment is sufficient. In the very acute cases, which are met with in really hot and damp climates, the patches are large, uniformly raised above the surrounding skin, of a bright red colour and very moist. At this stage, irritation is considerable and no strong application can be tolerated. If persisted with, the skin may be damaged to an extent which delays ultimate recovery up to a year or more.

In/

In the acute inflamed weeping stage, I confined treatment to frequent applications of calamine lotion to which a few grains of menthol (up to 1%) might be added to allay discomfort. When the intense inflammation had subsided and the patches were almost dry, I changed over to Whitfield's Ointment once daily for about a week. Thereafter treatment was brought to a conclusion with daily painting with gentian violet (1% alcoholic solution). No hard and fast time-table can be laid down for treatment along those lines. The calamine lotion should be persisted with till the lesions are almost dry, and the gentian violet should not be started until the lesions are quite dry and dull in colour or showing some scaling. The condition has a discouraging tendency to relapse and recur and one must often retrace ones therapeutic steps, but, with patience and the return to a more favourable climate, eventual cure can be guaranteed. In all cases of tinea cruris, I advised the patients to boil their underwear after each wearing and instructed them to use the one toilet until the condition was healed. The peak steward was detailed to scrub this toilet daily with disinfectant, and others were forbidden to use it.

- b) Prickly heat (miliaria rubra). This minor dermatosis affects about 50% of travellers in ships in the tropics. It/

It has been mentioned previously under the heading of dress (p.26), and I would summarise my advice to patients thus:-

- i) Wear as few clothes as possible and let them be loose and soft.
  - ii) Wash away sweat with fresh water as frequently as possible.
  - iii) Achieve a good "sun-tan" by gradually increased but cautious exposure to the sun. (The sun-bronzed deck-hand does not suffer from prickly heat).
  - iv) Use only the mildest applications, e.g. lotio phenolis, B.P.C., or mentholated calamine lotion.
- c) Parasitic affections of the skin. The only parasites commonly found on ships are pediculi, bugs, and the acarus of scabies. Bugs are eradicated by the use of insecticidal sprays, and measures of general cleanliness, and their bites present no medical problem. Pediculosis affects the pubic region most commonly (in over 80% of my cases this region alone was involved) and in about 90% of my cases the parasite was the pubic louse (phthirus pubis). In the remainder, pediculus vestimentorum was the offender. I have not encountered a single case of head lice aboard ship, even among a number of U.N.R.R.A. refugees whose hair was otherwise in a dirty condition. I believe that infestation with phthirus pubis originates from sexual intercourse with an affected partner, and innocently acquired cases on the ship from contact with lavatory seats or bedding used by other sufferers. Many cases are pronounced before they reach the medical officer, and/

and the lice and nits are found also on the hair of the buttocks and thighs, sometimes right down to the knees. In severe cases the pubic louse extends its migrations up the abdomen to the hair of the chest, axillae, and eyebrows. One lad, normally fastidious about personal cleanliness, had all of these areas infested before consulting me. Clothing and toilet seats were treated in the customary manner. I used two forms of local treatment:- (1) in mild cases, blowing A.L.63. powder (now supplanted by D.D.T.-containing parasitocides) over the affected region; this was repeated daily till no signs of lice or nits were present; (2) the conventional treatment of shaving all the affected areas followed by daily inunction with mercury ointment for 4-5 days, if the skin tolerated the applications for that time. The latter treatment I found definitely more certain than the more easily performed alternative procedure, and, despite reported success with D.D.T. preparations, I feel that shaving is the sine qua non of treatment.

The diagnosis of scabies was frequently extremely puzzling. I did not find the microscope very helpful; it usually confirmed cases which were clinically obvious. Atypical distributions were common and minute vesicles quite as frequent as burrows in my experience. Treatment I confined to one routine - a daily hot bath, with/

with vigorous scrubbing with soap by an attendant, followed by painting of the whole body with the B.P.C. emulsion of benzyl benzoate, a large soft brush being used. This was done on a minimum of two occasions and a maximum of four. I had no case in which the acarus survived this routine.

d) Other dermatoses.

i) Impetigo. This was not frequent and when seen was usually accompanied by streptococcal fissuring of the ears. The almost invariable presence of the latter lesion in addition to the impetiginous lesions on the face might suggest that drying of the skin by the salt air and a consequent tendency to crack favoured the entrance of streptococci. In that case, the application of ointments to soften the skin should be rational and effective treatment. This, however, did not work out in practice. The customary applications of ointment of ammoniated mercury or nitrate of mercury were disappointing in the extreme, and, in the end, I seldom used them. I insisted on the patient's shaving before he came to me each day, when I painted the raw areas with a 1% solution of gentian violet in methylated spirit. The procedure - both the shaving and the painting - were painful to the patient, but the results were gratifying.

ii) Acne/

ii) Acne. This is one of the commoner skin affections in seamen. It affects the back more often than the face and is quite as common among adult members of the crew as among deck-boys, etc., in the years of adolescence. Engineers are commonly affected, no doubt due to prolonged wearing of oily clothing. I advised sunbathing in most cases, and one form of treatment which was described to me by a hospital attendant as having been used by my predecessor on the ship, worked amazingly well. in about 50% of cases where the back was mainly affected. It consisted of rubbing the back liberally with methylated liniment of soap, after which the patient lay in the sun for an hour or less, according to the sensitivity of his skin to the sun's rays. The action of the liniment is presumably that it clears away much of the excess sebaceous secretion from the skin, allowing the skin to dry and intensifying the action of the rays. Crew and Whittle (1938) have indeed pointed out that ultra-violet rays are absorbed by sweat and sebaceous material (28). This might suggest that sunbathing in the tropics is likely to have little or no value. When sunbathing at sea, the presence of breeze favours the rapid evaporation of sweat, so that the ultra-violet light/

light is allowed to reach the skin.

iii) Pityriasis rosea. I mention this, not because it is common - I encountered only 4 cases in all - but because of its extreme severity in two of these. It is usually described in text-books as a "mild inflammatory affection", but these cases were positively fulminating, requiring confinement to bed, and causing the sufferers extreme discomfort and a great lowering of their general health. One was a man of 50, the other a man of 20. In both cases, the lesions were on the trunk and thighs, and the patches very close together, hardly any clear skin being left. Starting as dull red maculo-papules, they progressed within the space of a week to large flaking sores with raw underlying areas which became secondarily infected. Itching was intense, and when the lesions became moist and crusted, pain was caused by their adherence to the bed-clothes, etc. After a variable period for the individual lesions, crusting and drying took place. The total duration of the illness was about five weeks. It is interesting that both of these patients were of a worrying, introspective nature, and brooded over their complaint. Soothing applications of calamine lotion were all that could be tolerated, with potassium permanganate/

permanganate baths in the crusting phase. For the larger, more septic lesions, loose applications, twice daily, of gauze soaked in saturated sodium sulphate solution removed most exudation in 2-3 days, after which recourse to calamine lotion could be had.

#### The Treatment of Dental Emergencies.

The ship's surgeon must of necessity learn the elements of dentistry with respect to the extraction of teeth, and I would suggest that no surgeon goes to sea without having some instruction in this from a competent dentist. Unless the surgeon has experience in the use of elevators, he is well advised not to attempt the extraction of badly decayed teeth which are liable to crumble and break. Toothache due to such teeth can almost always be relieved by the daily insertion of cotton-wool plugs soaked in oil of cloves. All ships carry a set of dental forceps, by means of which any tooth can be extracted. Local anaesthesia is generally the most suitable, but a special syringe is essential. I prefer the cartridge type of syringe with cartridges of local anaesthetic in a strength of 2% novocain or its equivalent. The surgeon should learn the commoner nerve blocks; their technique is not difficult to acquire, and, when accomplished in them, and having a proper dental syringe to carry them out, he should be able to deal with almost all **dental extractions** which he/



he may be called upon to perform.

Affections of the Gastro-intestinal Tract.

Those commonly met with are of a mild inflammatory nature, having diarrhoea and/or vomiting as the presenting symptom(s), and which may conveniently be grouped together under the heading of enteritis. They constitute fully 75% of the gastro-intestinal ailments aboard ship.

Acute gastro-enteritis presents a typical picture as a rule. After a dietary indiscretion or an excessive consumption of alcohol, the man is attacked the following day by repeated vomiting which starts on waking. Soon after, he begins to pass watery motions, and suffers the discomfort of an acute diarrhoea. The main features of the illness are :- (i) early morning onset of vomiting, which is repeated until the vomitus consists of watery fluid with a bilious tinge; (ii) diarrhoea, the motions being watery, without blood or mucus and not really painful; (iii) absence of, or only a slight degree of, abdominal pain; (iv) considerable weakness and general malaise with headache; (v) tendency to rapid spontaneous cure with rest in bed, warmth, and minimal diet.

An illness of the type just described is more than likely to be a simple irritation of the stomach and intestines, but, when the patient has eaten ashore in tropical and sub-tropical ports, the possibility of bacillary

dysentery cannot be ignored. I find it of interest that, in  $1\frac{1}{2}$  years of practice aboard ships making tropical voyages, I did not encounter a true case of acute bacillary dysentery. One case of diarrhoea with traces of blood and mucus in the stools and with slight pyrexia, which responded rapidly to large doses of sulphaguanidine was, no doubt, a dysenteric infection, but the illness was of no great severity. Differentiation of the two conditions is not difficult. In the non-dysenteric enteritis, pyrexia is rarely present, and, if present, seldom above  $99.4^{\circ}\text{F}$ , the general condition is fair apart from the patient's own feeling of weakness, and the motions are free from blood and mucus and their passage does not cause great pain.

Diarrhoea unaccompanied by vomiting is even more common and frequently assumes epidemic proportions. This is one of the major problems in ship's medicine. Every surgeon meets it early in his sea career, and its origin remains obscure. During the war, the same problem arose in practice ashore, and much literature has accumulated on the subject without, in many cases, a definite cause having been established. At sea, it is more than likely that several factors are operative together, and the problem then becomes increasingly difficult.

The usual state of affairs is as follows. From time to time, and more particularly in tropical and sub-tropical climates and in certain waters, a percentage of the crew (and passengers) is simultaneously affected with diarrhoea. The percentage naturally varies, but, in the frequent minor outbreaks is about 8% (20-25 cases at one time in the crew of a large passenger ship). Only about one-fifth of the cases are sufficiently ill to be unable for duty, and confinement to hospital is rarely necessary. The usual course of the illness is diarrhoea, mild at the onset, but becoming increasingly more severe, and lasting for a variable number of days. The motions are loose to begin with and soon become quite watery; they may eventually contain some shreds of mucus, but never in any quantity. Blood is not present in the motions. In many cases, diarrhoea is the only symptom, the number of motions daily varying from 4-6 in the mild cases to 10-12 in the more severe. There is seldom more than 15 motions in the day, even in the worst cases. Rosenthal (1940) gives a good description of the condition under the name of acute enterocolitis (29). Other symptoms are:- (i) headache; (ii) loss of appetite; (iii) abdominal pain or discomfort; (iv) general weakness. Any, all, or none of these may be present. There is no pyrexia. Abdominal colic is common just before going to stool, and is often accompanied by loud rumbling/

rumbling. Severe abdominal pain is infrequent, but aching in the muscles of the anterior abdominal wall usually comes on when the condition lasts for more than one day. This aching is constant, often severe, and is intensified after going to stool. Loss of appetite is common. General weakness succeeds on the second or third day of the illness and may be pronounced. In a small minority of cases, the diarrhoea continues for a considerable time. In one case, an electrician, it lasted for as long as six weeks. This man had suffered from a Vincent's gingivitis about  $2\frac{1}{2}$  months previously and it could be postulated that organisms from the mouth might have prolonged the condition, i.e. the condition might have been an intestinal fusospirochaetosis. In spite of passing about 8 loose motions daily for this period, this man's general health remained quite good. Objective findings are few; apart from a dry mouth, furred tongue, and paler complexion than normal, there is little to be found.

Before discussing the treatment of the condition, its possible causes must be considered. It is, as stated above, one of the major problems of nautical medicine.

The possibilities are:-

- a) bacterial infection of the intestinal tract;
- b) virus infection of the intestinal tract;
- c) intestinal protozoal invasion;
- d) chemical irritation of the intestinal tract;
- e) sudden external temperature change, producing undue/

undue chilling of the abdomen, or upset in water balance of the body.

The possible sources of bacterial infection of the intestinal tract are, of course, food and water. The latter can reasonably be ruled out as a source of bacteria since, during recent years, ships' drinking water has been so adequately chlorinated as to preclude bacterial life. This has not apparently reduced the incidence of the complaint. Bacteria from food might explain the diarrhoea, possible responsible organisms including *B. dysenteriae* Sonne, the *Salmonella* group (*S. aertrycke*, *S. enteritidis*, *S. suispestifer*, *S. paratyphi*), enterotoxic *Staphylococci*, and the coliform group. It has been suggested (30) that the last-named normal inhabitants of the lower intestinal tract may, at certain temperatures and conditions of humidity, become pathogenic, just as it has been shown (31) that, with high environmental temperatures and high relative humidities, *S. enteritidis* infections have much more serious effects. It is unfortunate that, aboard ship, the facilities for bacteriological investigation are very limited. This makes it, in practice, almost impossible to develop stool cultures, etc., and determine whether an organism, or which particular organism, may be causing the symptoms (see footnote\*, following page). This being so, one has to rely on the investigations of others into the causes of similar epidemics ashore, which have been fully investigated/

tigated from the bacteriological aspect, and assume that their findings are also relevant in the case of shipboard outbreaks. This is admittedly a rather daring assumption in view of the number of variables involved, but sufficient evidence has now accumulated to suggest that, in many outbreaks of epidemic diarrhoea, no causal bacteria can be isolated. Indeed, the mass of recent evidence goes to show that minor epidemic outbreaks of diarrhoea are unlikely to be of bacterial origin. Otherwise, why cannot the responsible organism be more easily isolated? In a recently described outbreak of epidemic diarrhoea and vomiting of considerable proportions in a general hospital and surrounding district, the writers found that the stools were invariably negative bacteriologically (34). Many writers, however, maintain that bacterial contamination of food is the principal determining factor (35). While maintaining an open mind on the question, and in the absence of bacteriological evidence to support my belief, I incline to the view that, in many cases, the complaint is not bacterial in origin. It occurs even when the most stringent precautions are taken to prevent contamination of food, when any suspect foods (e.g. shell-

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\* One must, however, acknowledge the work, in this connection, of Royds Jones of the Orient Line (32,33) who has succeeded in making a number of helpful bacteriological investigations aboard ship, which have exonerated drinking water and incriminated, in his experience, certain foodstuffs, although no pathogens were isolated.

fish) are excluded from the menu, when all cases are promptly stopped from participating in the preparation and handling of food and kitchen and table utensils, and even under ideal conditions, e.g. complete absence of flies and other insects, good ventilation, and dust-free atmosphere.

Recent work on the etiology of epidemic diarrhoea, in particular epidemic diarrhoea of infants, has created strong grounds for believing a virus to be responsible for the condition in most cases. In the previously mentioned hospital outbreak (34), the authors found that the epidemiological data conformed in type more to a virus infection than a bacterial one. Reimann and others (1945) (37) give strong support to the theory that an air-borne virus is responsible for many epidemics of this type. There is as yet no means of proving to what extent this might account for shipboard outbreaks. Referring to the virus theory, MacGregor (1946) (38) cites a considerable series of cases investigated by himself in the Middle East, and shows a significant parallel between the incidence of acute enteritis and that of upper respiratory infections over a period of 80 weeks. He too suggests a virus origin, and that chill may play a part in lowering the general resistance of the gut to such a virus carried from the nasopharynx in the bloodstream.

One might mention here that a small proportion of diarrhoeal cases, especially in the tropics, may be due to the *Giardia lamblia*, in which cases stool examinations would be of positive diagnostic value. The proportion would, however, be very small. Fraser and Taylor (1945) found only 3% of their diarrhoeal cases to be due to this flagellate (36).

Chemical irritation of the intestinal tract may be due to the toxins produced by food-contaminating organisms, or to other ingested irritant substances. It is unlikely that the former will produce diarrhoea without vomiting. It was formerly suggested that refrigerated food was likely to be the cause of gastro-intestinal upsets because of chemical changes in its protein element due to the activity of non-pathogenic bacteria associated with putrefaction during the thawing process. In the particular case of ships, this could be of the utmost importance, since almost all ships' food is refrigerated and, in the case of hot-weather ships, the thawing of food may be excessively fast, favouring the protein breakdown suggested to be responsible for intestinal symptoms. An investigation carried out a number of years ago with kittens\* fed with foods in an extreme state of decomposition singularly failed to bring forward any evidence associating the consumption of food in a state of incipient putrefaction with illness in those who consumed it (39). Food in the latter state

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\* Animals akin to man in the physiology of their digestive system.



must contain the breakdown products of protein referred to above, and, in that case, the attractive protein-breakdown theory of causation can hardly be regarded as tenable.

Chemical irritation of the gastro-intestinal tract from the contents of drinking-water is possible, but unlikely to be the cause of epidemic outbreaks. Drinking-water taken aboard at foreign ports varies considerably from place to place, and an individual sensitivity to certain of its contained inorganic constituents may well be responsible for a few diarrhoea cases. Bacterial contamination of water has previously been ruled out on account of adequate chlorination. It is worthy of note that highly (recently) chlorinated water causes diarrhoea in some persons, though I can find no reference to this in recent literature. If the chlorine content of any of our tanks was unduly high, one particular deck-boy at once suffered in this way; he had also had a severe attack of diarrhoea at home in 1939 when, soon after the outbreak of war, chlorination of civil water supplies was instituted.

"Chill" is an oft-quoted cause of diarrhoea on ships, usually, it should be added, by Chief Stewards and the heads of catering departments who wish to exonerate food from all blame. There is no doubt that chilling of the body/

body, particularly the abdomen, does have physical re-percussions and chilling may certainly be a factor in reducing resistance to infection, but to explain an epidemic of diarrhoea, this argument alone appears unsatisfactory. No doubt individual sensitivity again plays a part; some men cannot sleep under a fan uncovered without, the next day, suffering from abdominal colic and diarrhoea. On the other hand, in epidemic outbreaks, questioning of the patients commonly reveals that they have previously been unaffected by a fan, blower, etc., playing on them while in bed, and, even in their present attack, no history of exposure to cold draughts can be obtained. The case in favour of chilling of the abdomen as the cause of the condition is stated with some emphasis by Kershaw (1947) (40). It can be argued that diarrhoea following a change to a colder climate is a compensatory reaction designed to eliminate excess of water from the body following a drastic reduction in sweating, and simultaneous with the greatly increased output of urine which undoubtedly takes place. The condition known to seamen as "Gypsy tummy" commonly occurs in the Mediterranean 2-3 days after leaving Egyptian ports. Hurst defines it as a very common disorder characterised by short attacks of colicky abdominal pain accompanied by explosive diarrhoea, and states that it is frequently brought on by nocturnal abdominal/

abdominal chill, the patient having worn too little covering for the abdomen during the cool nights which frequently follow hot days (41). He adds, however, that attacks "probably never occur in the absence of latent infection with either *B. dysenteriae* or *E. amoebæ*". To what extent chilling alone is the cause is again difficult to assess, but the clinical entity which has earned itself this name is sufficiently well-known to make a correlation with climatic changes hard to exclude. Dunham, however, states that the prevalence of common diarrhoeas is determined almost entirely by environmental conditions and that seasonal influences apparently have no effect on their occurrence except in so far as climate and weather modify the men's environmental conditions and activity (35). In our consideration, the latter proviso would not appear to be relevant. Before leaving the question, it might be noted that, quite as often, diarrhoea occurs in minor epidemic proportions when a ship suddenly runs into a hot zone; it is not unreasonable to suppose that this is during the phase when the body's fluid balance is unstable, and the adjustment between greatly increased water intake (copious drinking, the natural response to the sudden temperature change) and sweating has not reached stability.

To summarise, what has been said in the preceding paragraphs/

paragraphs shows that the precise cause of these diarrhoea outbreaks is uncertain. The complexity of the problem is such that, in ships' outbreaks, one cannot definitely say which factor is predominant. The virus theory is the most promising, with chill and individual sensitivity as possible predisposing factors. Very often, in practice, there is no apparent cause. That is no reason for not making a determined effort to discover one, otherwise what at first appears a simple, comparatively trivial, malady may be the forerunner of a true epidemic of dysentery or specific enteritis. It is unnecessary to detail preventive measures; they are those demanded by general hygiene, e.g. inspection and interrogation of food-handlers, exclusion of cases or suspects from food-handling or care of utensils\*, food and water investigation, and so on.

The treatment is, in the main, symptomatic. With respect to treatment, I divided my cases into 3 classes:-

- I. Diarrhoea (with or without vomiting) with temperature elevation.
- II. Diarrhoea and vomiting of acute onset, without temperature elevation.
- III. Diarrhoea alone, without temperature elevation.

Class I was treated with sulphaguanidine in large doses, e.g. 3gms. four times a day for 3 days, followed by 2 gms.

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\* In particular, attention should be paid to kitchen and table utensils. On some ships, dishwashing facilities are primitive.

three times a day for 4 days. It did not cause increase in gastric upset if the tablets were powdered before taking, and the response was excellent in most cases. This, contrary to what previous arguments may suggest, points to a bacterial origin for the complaint. The diet was minimal, but fluids were not withheld. Class II got a preliminary purge, the traditional  $\frac{1}{2}$ -1 oz. of oleum ricini, and a first day's starvation, fluids only being permitted. Very often, no further treatment was necessary, and the patient needed only to take dietary precautions, keeping his food intake low for several days. If the diarrhoea persisted, it was controlled by pulv. kaolin, as in Class III, to be described. If the vomiting lasted longer than 24 hours, the case would have to be reviewed, and a more serious diagnosis than acute gastro-enteritis considered.

Class III received kaolin powder alone from the start, was semi-starved for 2-3 days, then advised about eating only a light diet for 2-3 days more. The kaolin is best mixed into a semi-thick paste with warm water; this makes it less lumpy and more palatable than cold. It is administered 2-4 times daily to keep the number of motions not more than four per day. The dose was varied according to the response to treatment, an average dose being  $\frac{5}{4}$  oz. (about 3 heaped teaspoonfuls). I ceased to use tinct. opii with kaolin except in some very severe and/

and resistant cases; its taste often adds vomiting or, at least, pronounced nausea, to the patient's discomforts. Further, an authority on tropical diarrhoeas finds that the worst possible treatment is ordinary sedation by an opium derivative, and confirms that finely divided kaolin forms one of our best remedies ("and is generally included in the essential baggage of experienced touring officers") (42). Nor did I give a preliminary purge; like many others, I found it useless (43), despite Rosenthal's definite statement (29) that it forms the most important part of treatment.

Aboard ship, outbreaks of enteritis of the types described become of considerable practical importance when they lead to a number of men being rendered unfit for duty. This is unusual, but the possibility must be anticipated and no measure for limiting spread of the complaint must be left undone. A ship does not carry a reserve of labour and even a few men off duty imposes a strain on the others who are left to carry on. This was well illustrated by my troopship experience when, on the average, the galleys were providing 9000 full meals per day. As can be imagined, the absence from duty of only two or three cooks put a great burden on their already overworked colleagues, generally amid unfavourable climatic and environmental conditions.

The/

The strain is no less marked under ordinary passenger-carrying conditions, for any reduction in the numbers carried is offset by the greater attention naturally demanded by non-military passengers.

Dyspepsia. Hall (1946), in an article on his experiences as an emergency surgeon in wartime to ships in the Downs anchorage (44), stated that the incidence of dyspeptic complaints among seamen was very low, being only some 4% of his cases. This statement was questioned by the Senior Medical Officer of the Merchant Navy Reserve Pool in the same journal a few weeks later; in his experience, the merchant seaman was considerably more dyspeptic (45). With the latter statement I am in complete agreement, for it is probable that Mr. Hall, as a surgical specialist, would see only a fraction of the gastro-intestinal cases, probably those requiring surgical treatment. Moreover, Hutchison, who acted as Port Boarding Medical Officer to ships in the Clyde anchorage emergency port, and saw a vast number of merchant seamen in this wartime capacity, found that gastro-intestinal complaints figured high in the list of incapacitating ailments (27). "Indigestion" is a very common complaint on ships, and requires close investigation. It is, incidentally, one of the commonest complaints made by malingerers, and it is worth while making good mental notes of the case history (to be transferred to paper/

paper later) at the first interview, to be compared with the patient's story at a subsequent examination. The usual history is one of a flatulent dyspepsia - discomfort and great fullness in the epigastrium after meals, eructations of gas and often sour mouthfuls. Anorexia is common. Epigastric pain is seldom complained of. The patient is commonly of a nervous, worrying nature - the "peptic ulcer type", and not the stout "gall-bladder type". His anxious nature is the most constant finding. In some cases, gastric or duodenal ulcer is suggested by the history and examination. In the great majority, the symptoms appear due to anxiety and have no organic basis. In a negligible number of cases is there evidence of cholecystitis. Reassurance of the patient is helpful in some cases, of little avail in others. A thorough examination preceding any statement on the surgeon's part is, of course, essential in such cases. Otherwise, and rightly so, his reassurance is likely to be futile. In cases where there is regurgitation of acid-tasting food from the stomach, alkalis are of definite value. The compound mixture of magnesium trisilicate of the B.P.C. is useful, and, being prescribed in liquid form, does not suggest to the patient that this is just another MacLean's powder. In very apprehensive patients, mild sedation by a small dose of a barbiturate nightly for 2-3 weeks often brings about some improvement. In cases/



cases which fail to respond to treatment, it is wise to have fuller investigation at the first port where this is possible, and, on return to a home port, discharge the man until he has had a radiosopic and radiographic examination. I would place the incidence of dyspepsia just as high, if not higher, among seamen as among the shore population, and a seaman who is an habitual sufferer is well advised to give up seafaring because of the difficulty of keeping to a diet on a ship, the inevitable absence of fresh foods, and the greater tendency to worry over his complaint in a confined existence. He invariably does better ashore.

#### Minor Eye Affections.

Foreign bodies in the eye are very common, the usual offenders being particles of funnel soot. In the sensitive person they can cause distressing discomfort. They are usually easily removed without the need of a local analgesic. When one is required, I prefer one of the cocaine-free substitutes, e.g. amethocaine, whose analgesic action is, in my experience, far superior to that of the statutorily carried cocaine eye drops ( $\frac{1}{2}\%$  in castor oil). For soot specks, a twist of cotton wool round a swab-stick is preferable to a metal spud.

Conjunctivitis is a common complaint, resulting from:-

- i) exposure to cold winds;
- ii) splashing of irritant substances into the eyes,  
commonly disinfectants;
- iii) rubbing dirt into the eye because of some irritation.

More/

More than half the cases which reach the surgeon's notice are purulent. Except in very mild cases, I liked to douche the eye 2-3 times daily with warm normal saline solution, using an undine. The undine is one of the most useful little sundries in the ship's surgeon's equipment, the ordinary eye-bath being a poor inefficient substitute. Very mild cases had drops of 5% silver proteinate solution 2-3 times per day and all other cases "Albucid" (10%) drops 3 times per day (i.e. solution of sodium sulphacetamide). Contrary to modern teaching, e.g. Summers (1947) (46), I covered the eye with a gauze pad and shade in all but the mildest cases because of the likelihood of exposure to cold draughts.  $\frac{1}{2}$ -1% zinc sulphate drops 3 times per day are still the mainstay in treating more chronic and resistant cases.

#### Affections of the Ear.

These form another of the major problems of ship's medical practice. The incidence is high, the response to treatment disappointing, and the recurrences numerous. Such cases are so disheartening to treat that, as previously stated, I directed particular attention to the ears when examining new crew members submitted for engagement, and refused those who gave a history, or showed evidence, of chronic discharge from the ears.

The conditions which mainly demand attention are otitis externa and otitis media, which occur with about equal/

equal frequency. Acute middle ear catarrh causing a dull sensation bordering on pain is usually an unpleasant complication of a head cold and requires nothing more than twice daily instillation of 5% glycerin of phenol drops.

Otitis externa I found as:- (1) a primary acute condition; (2) a latent condition, activated by recent irritation; (3) a chronic eczematous condition. The cause of the former is most often a small abrasion caused by the patient inserting some pointed object into the auditory meatus to clear away a real or imagined obstruction. When there is a tendency to repeated attacks of the condition (what I have referred to above as a latent condition) it is most frequently activated by bathing in tropical waters. Seamen are notoriously careless about the waters they swim in, and it is an everyday sight in tropical ports and anchorages to see them swimming from the ship amid refuse and filth of every description. Following stays in ports where such swimming is permitted, there is usually an outbreak of ear troubles; in most cases it is a moist eczematous condition of the external auditory meatus, but several cases of chronic latent middle-ear disease are lit up and proceed to suppuration with external discharge. I found Port Said and Singapore to be danger spots in this respect and, at these ports and others/

others, made broadcasts to the crew advising against swimming from the ship. The habitual offenders were, however, not deterred and suffered accordingly. Among Royal Naval drafts on tropical shore stations and other Service personnel similarly stationed, the incidence of inflammatory ear complaints is also high. This is, without doubt, due to bathing in dirty tropical waters. Chronic otitis externa usually presents the picture of a reddened, roughened, and scaly auditory canal with some dull-red, moist, tender patches; exudation is seldom copious.

Furunculosis of the external auditory meatus presents no particular problem. On no occasion did I find surgical intervention necessary, and conventional conservative treatment was quite satisfactory. Unfortunately ichthyol, one of the most useful applications in its conservative treatment, does not appear in the B.O.T. Scales.

Otitis media is usually of a chronic type, there being a history of repeated attacks. Experience taught me how difficult these cases are to deal with, and eventually I saw less by refusing them from the outset. They are usually associated with an unhealed perforation of the drum, and give rise to periodic attacks of aching pain followed or accompanied by copious discharge from the ear, serous in some cases, but more often purulent.

I have yet to find a satisfactory treatment for the condition. The old method of instilling hydrogen peroxide, followed by 90% spirit and gentle thorough mopping, several times per day, is by no means perfect, but so far I have been unable to improve on it. I have used the dry method, viz. mopping out the ear with cotton-wool and inserting a dry wick drain, but have found it to have little, if any, curative value. For a time I insufflated sulphaniilamide powder lightly in addition, but found this made the condition considerably worse, impeding drainage and increasing pus formation. 3-hourly instillations of 10% sodium sulphacetamide solution were successful in a very small percentage of cases. More recently I used 1:1000 acriflavine drops, but they too were disappointing. Whatever treatment is chosen, one must have patience, and some supervision over the patient is essential; the hospital attendant must ensure that, when the patient is given ear drops, he uses them without fail as instructed. Where there is any doubt, he should instil the drops himself. Even with close supervision and conscientious carrying out of the chosen treatment, the cures are disappointingly few. These cases being afebrile, I see no indication for the use of sulphonamides by mouth. Their value is in the treatment of acute otitis media with pyrexia and pus in the middle ear, for some reason a rare condition aboard ship.

Otitis/

Otitis externa presents somewhat less difficulty in treatment. Where there was discharge, I employed hydrogen peroxide and 90% spirit in the usual way, 2-3 times per day; it is one of the oldest of methods, but worked satisfactorily in this type of case. In very mild cases, where there was only a red, slightly moist, tender spot, 90% spirit drops alone, 3 times daily, usually checked the progress of the condition and caused it to dry up and heal. In almost all other cases, 1:1000 acriflavine drops, 3 times daily, were of value although they sometimes had to be used for as long as 2-3 months. A spontaneous improvement was noticeable in most cases with a return to a temperate climate; the tropics are most unfavourable to the treatment of inflammatory ear conditions. The most important general measure is to impress on the patient how unwise it is to poke things into the ear and keep rubbing it with the little finger.

#### Acute Tonsillitis.

In the treatment of this disease, when is it justifiable to prescribe sulphonamides? I believe that sulphonamides are unnecessarily prescribed in many cases, and that, being given them, the patient is upset more than before, and has to take to bed where, in the first place, this was not necessary. On a ship, one cannot put men off duty with the slightest malady, and acute tonsillitis is, in some cases, not a very incapacitating complaint. More-over/

over, the response to pre-sulphonamide treatment is, in the milder cases, satisfactory. For these reasons, I restricted the use of sulphonamides in tonsillitis to the following groups of cases:-

- I. Where there was exudate in the follicles and the temperature raised to  $99.6^{\circ}$  or over.
- II. Where the temperature was  $100.5^{\circ}$  or over, in the absence of exudate.
- III. Where comparatively slight local signs and a slight temperature elevation were associated with severe general malaise.

Sulphonamides, as always, I prescribed in full dosage. They necessitate the man's being off duty, and I generally kept him in hospital. In cases with red, enlarged tonsils and a slight rise in temperature, without severe constitutional illness, liquor ferri perchloridi was employed as a gargle, to be used every hour without fail (approximately 30 minims in a half-glass of warm water). This in spite of popular teaching that gargles are useless. The unpleasant taste of the gargle is more than compensated for by the relief from pain afforded by it. At night, simple diaphoretic mixtures were given, e.g. Dover's powder, gr. 10, with aspirin, gr. 5. There was usually definite improvement by the next day, but if the response was not satisfactory and the patient then fell into one of the other categories, sulphonamides were started.

Whenever a diagnosis of tonsillitis is made in anyone connected with the handling of food on a ship, he must be put/

put off duty.

The Malingerer and the Neurotic Patient.

I class these together because, in both, the illness is mental. This does not apply to the minor type of malingering, e.g. the case of the man who exaggerates a trivial complaint in order to obtain a day off duty, but to the major types, where an elaborate medical history is woven, in an attempt to establish an erroneous diagnosis of sufficient severity to warrant the man's permanently leaving the ship. This is the ultimate aim of almost all major malingering. It is by no means easy to detect every malingerer, for some have studied their feigned complaint thoroughly, and have practised their deception several times previously. There is, however, usually some fact which arouses suspicion and, while the patient must always have the benefit of the doubt, careful observation and examination lead to further incriminating facts. The confined life of a ship gives the doctor more scope for seeing his patient at all times and hearing reports of his conduct; the malingerer is seldom popular with his shipmates, who often pass on reports about his actions to the hospital attendant or doctor's steward - an unethical means of obtaining information, but one which will not readily be eradicated, and which is frequently of great assistance to the doctor. By feigning illness for a considerable period, a belief in its actual presence/



presence is often set up, and attempts to deny or minimise its severity are resented by the malingerer and even met with hostility. There are two methods of treating the case:- (1) by giving way to the patient's desires; (2) by a frank discussion of his state of mind with him. The former statement must be qualified to correct a possible misapprehension; the patient's wish being to get off the ship, this can be arranged by mutual consent with the Master, the position having been explained to the Master; no question of false certification of an illness then arises. By adopting this course, the ship's surgeon clears himself of the worry of dealing with the man, but I do not think it a satisfactory course to adopt. When the malingerer leaves a ship in this way, his immediate end has been gained, but it is likely that, when he confronts another difficulty in the near future, he will adopt the same deception which, each time it is employed, becomes more of a self-deception. Eventually he either comes to believe implicitly in his feigned complaint, and may then suffer from actual physical symptoms, or he meets a rebuff on an occasion when his story is frankly disbelieved. At this juncture he may well develop paranoid beliefs and open the path to a confirmed mental illness. These are, it must be added, amateur psychological theorisings, but I do not think their basis is faulty. Much can be achieved by frankly/

frankly discussing the case with the patient, when he may unburden personal reasons for his condition.

By treating him firmly, but with sympathy for his individual difficulties, a good understanding is promoted. If the man is then allowed to leave the ship soon after, the incident is more likely to be permanently over (47).

The neurotic patient is no rarity aboard ship. The newly appointed ship's surgeon soon comes to realise that he is meeting many "queer types" in his practice. At first, the surgeon naturally takes their descriptions of their complaints as being accurate, but as the stories become more bizarre and are not substantiated by physical findings, he begins to question the patients' mental outlook. It is not long before this reveals itself, for such patients are never far from the surgery during consulting hours. They are often highly intelligent, and capable workers, and their attitude to disease is, in my experience, often based on fear or guilt. Treatment is difficult. Discussion of the patient's imagined or exaggerated physical ailment helps in only a few cases. The exhibition of drugs has seldom more than a transient value, and sedation is not much more successful. I believe that a spell ashore is the best measure; the atmosphere of his home, meeting friends, and the greater variety of interests, turn the patient's thoughts away from himself. It should be emphasised that, in/

in such patients, there is usually a genuine physical complaint. The patient can, moreover, usually attribute it to some definite happening, and it is magnified because of the patient's feelings with regard to that happening. Unlike the malingerer, this type of man has no aim in the magnification of his symptoms; it is not a wilful exaggeration. What he describes is real to him, and arises out of his psychological state at the time.

Among the many instances of this personally encountered in seamen, two stand out. One man was a bosun's mate aged about 40 years, an excellent physical specimen. During wartime troop-ferrying in the Mediterranean, he had led rather a hectic life in Algiers, and had, under the influence of drink, consorted with women. He had not long been married at the time, and when the ship left this area, he seemed to be suddenly filled with remorse for his conduct. From then on he visited my predecessor and, during the next voyage, myself, almost every day. His first complaint was about his gums; pyorrhoea was undoubtedly present and was treated satisfactorily by my predecessor. When he first consulted me, his complaint was pain in the testicles. Examination was entirely negative. Later symptoms included headache, burning sensations behind the eyes, and numerous vague aches and pains. In none of these cases was there any evidence of organic upset. He became very depressed and/

and short-tempered and, on several occasions, while sitting on deck, burst into tears. I recommended him for shore duties for a time, and met him at the end of my following voyage. He had then been three months ashore and confessed to feeling quite different. All his depression had gone and, with it, every symptom which had troubled him. He returned to sea a month later, and though I subsequently made a voyage on the ship to which he was promoted bosun, he did not visit me during the whole voyage. His photograph, taken on deck during this last voyage referred to, appears in my personal album of photographic seafaring recollections, and shows one of the happiest and least neurotic of persons imaginable.

The second man was a middle-aged officer, who had previously been a very infrequent visitor to the surgery. He visited me with a small skin rash on the wrists, which was of short duration and seemed trivial. I prescribed a soothing lotion and expected to hear no more of it. His visits became, however, more frequent, until he was coming to me daily or even twice a day. The true nature of the rash became apparent about two weeks later - it was scabies, confirmed by the microscope. The usual treatment was carried out, but he did not seem satisfied. He continued attending me, worried about the most insignificant skin blemish. He shaved his arms, pulled/

pulled out hairs by the root, picked out pigmented spots with a razor-blade, and applied almost every external application sold by chemists, in spite of my advice to leave well alone. It was about this time that I learned that he had accompanied a friend on an escapade in Marseilles about two months before, when his friend had contracted syphilis. There could be little doubt that fear of venereal disease was behind his present condition. In several talks with him, I explained why his skin condition could not be attributed to venereal disease. Apparently unconvinced, however, he kept on prescribing for himself, doing everything to produce a pronounced dermatitis. He tried all the remedies for skin diseases advertised in the Bombay press. Daily he brought me particles carefully wrapped in paper, which particles, he stated, had been ejected by his skin. They included tobacco shreds, particles from blankets and sheets, minute wood splinters, etc., and, once or twice, an ant. When I pointed out to him that, if all were as he stated, his condition was one unknown to medical science, he replied, in all seriousness, that no doubt there were still many diseases to be discovered. By this time, I regret to say, he had lost all faith in me. In the end, he was referred by me to the dermatologist of a well-known hospital whose advice I thought he might find more convincing. I was transferred about this time to/

to another ship and, some time later, heard through an acquaintance that my patient had attended the hospital and had been told that his complaint was certainly scabies but that the treatment he had received aboard ship was quite wrong. This interesting information led me to call at the skin department on my next visit to the hospital. There was no record of my patient ever having visited there!

Such cases require to be handled tactfully and with patience, however irritating they may become. A respite from seafaring is definitely indicated; the tedium of ship's life is prejudicial to recovery from all types of mental illness.

#### The Treatment of Surgical Cases Aboard Ship.

These fall into the categories of trauma, minor surgical procedures, and major non-traumatic surgical emergencies. At sea there is little place for surgical work apart from emergencies. Unless he has had extensive training in the practice of surgery, and is on a ship exceptionally well equipped for the purpose, the ship's surgeon should confine his surgical activities to the minimum. Except for minor surgical procedures and emergencies where surgery is definitely indicated, conservative treatment should always be preferred to operative. It is worth noting that the late James Sherren, the eminent surgeon whose name is associated with the conservative delayed/

delayed treatment of acute appendicitis (the Ochsner-Sherren method), was a master mariner before he studied medicine. No doubt his work in this connection was based on his intimate experience of sea life, where he had found that conservative measures were often safer in the "surgical" case. The main objections to major surgical operations at sea are:-

- i) cramped premises;
- ii) poor lighting;
- iii) adverse environment, when the motion of the ship is pronounced;
- iv) shortage of dressings and linen;
- v) difficulty in achieving sterility and observing strictly aseptic principles - the most important single factor;
- vi) lack of sufficient trays, receptacles, etc.;
- vii) absence of skilled assistance when a trained nurse is not carried;
- viii) the problem of satisfactory anaesthesia;
- ix) the difficulty of post-operative care.

In certain ships, several of the above objections are not relevant, viz. in those ships which have a recognised operating theatre. Some quite small American-built vessels of the recent war were so equipped. The Anchor Line's m.v. "Cilicia" had, during her troopship days, a well-equipped theatre with good lighting, a permanently installed operating table and dental chair, and every facility for the sterilisation of instruments and dressings. The m.v. "Carnarvon Castle", on which I did one voyage, has also an operating theatre conveniently situated between hospital wards. This theatre measures approximately 20 ft. by 12 ft. and has a well-constructed operating table/

table (a semi-permanent installation), three powerful overhead lamps which can be directed in all directions, white-enamelled instrument cabinets, an electric steriliser for instruments (measuring 20 x 10 x 6 inches), and a steam autoclave which can accommodate drums of 15 ins. diameter. The wash-basin has elbow-control taps and there are movable stands for hand basins. Exhaust grilles carry away vitiated air and there is no forced draught to introduce dust into the room. It should be pointed out that the "Carnarvon Castle" is still sailing as a civilian transport under Ministry of Transport charter, and these facilities are not permanent provisions. Likewise, the facilities referred to aboard the "Cilicia" were more extensive than when the vessel was in commercial service, carrying a considerably smaller number of passengers.

In vessels so equipped, performance of operations is greatly facilitated, but I believe that the expense of providing rooms for this use alone is unjustified. The very infrequent use of these theatres tends to bear this out. If the ship's surgery is sufficiently large to accommodate a portable operating table, is fitted with a powerful overhead lamp, an instrument steriliser, and sufficient utensils (hand bowls on stands, dressing receptacles, etc.), it should suffice for the performance of any surgical emergency aboard ship. Sets of all the dressings necessary for a major operation, ready sterilised and/



and packed in sealed boxes, are provided for all ships carrying a doctor. If such a set is used in an emergency, it can usually be replaced at a not distant port of call.

My experience of surgical cases at sea is slight. I did not have to perform any major operation, nor had I serious trauma to deal with: considering fractures alone, only three simple fractures in a year can under no circumstances be called a high figure. Minor surgical procedures included circumcisions, incision and drainage of abscesses, excision of cysts and lipomata, excision of finger and toe nails, and suture of wounds; none of which required elaborate apparatus, expert assistance, or highly developed surgical technique. I cannot, therefore, speak with authority on surgical practice at sea beyond making a plea for conservatism, and suggesting certain additions to equipment (see pp. 150, 151, 153).

#### Traumatic Cases.

These may be broadly divided into three groups:- (1) soft-tissue injuries, (2) skeletal injuries, (3) burns.

Various subdivisions and combinations of these can be readily visualised. As pointed out above, fractures are not common, nor are dislocations, but ligamentous strains occur with comparative frequency, the ankle being the joint most often involved. As is well known, inversion and eversion strains of the foot are a common cause of fractures/

fractures of the ankle, particularly in the region of the external malleolus, and it is often most difficult to exclude a fracture with certainty. Strong presumptive evidence against bony injury is the ability to bear weight on the ankle without undue pain. Fractures elsewhere are more readily diagnosed. Where doubt exists, I believe that the injury should be regarded as a fracture and treated accordingly until radiographic confirmation is possible. A knowledge of traumatic surgery is most essential to the ship's surgeon and should, I feel, be a pre-requisite to engagement. In the case of soft-tissue injuries, the first consideration in local treatment is cleaning the wound and, in most cases, this simply means the careful and systematic use of soap and water which, thoroughly used, are far more efficacious and less destructive to the tissues than most antiseptics. Suture of wounds has often to be performed, and a few words on suture materials may not be out of place. Many of the needles provided would be more suited to the sailmaker's art than the surgeon's; it is obviously wrong to use large cutting needles for wounds of the face and lips (a common site), and the surgeon should check over his stock of suture needles carefully before each voyage. Again, the sutures provided are, on the whole, of too thick catgut. Suture of the skin is the operation most often performed, and for this a liberal supply of fine but/

but strong suture material is required. Nylon sutures are admirable for this purpose and much superior to catgut, silkworm gut, or silk. The thinnest nylon sutures have considerable tensile strength and are ideal for facial wounds. The number of wound dressings is legion, but one of the most useful of all, as proved by war experience, is not yet\* provided for by the B.O.T. Scales. That is sulphanilamide powder and vaselin gauze. I confined my wound dressings to this, dry gauze, and gauze soaked in 1:1000 acriflavine. Clean, dry, surgical incisions require only dry gauze. Where there was a raw surface I used sulphanilamide-vaselin gauze, and, for a sutured wound with a possibility of contamination, the flavine dressing.

The treatment of burns still remains something of a problem, and while the treatment by cetyl-trimethyl-ammonium-bromide and sulphonamide-containing creams evolved by the Medical Research Council's unit in Glasgow Royal Infirmary gives the best results with the least trouble, I was unable to use it at sea because of non-availability of the former preparation at that time. The burn dressing incorporating it now added to the

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\* I add "yet" advisedly, as a sulphonamide-paste-impregnated tulle dressing for burns is an addition to the Scales operative from 1/1/47. It is hoped that vaselin gauze (or tulle gras) may soon follow.

Scales may well introduce a new era in the treatment of burns aboard ship. As a preliminary dressing, a tannic acid jelly is soothing and effective, and subsequent use of a gentian violet or triple dye jelly will suffice in many cases. It need hardly be stressed that the patient must be treated before the burn, and it is essential that, in severe burns with resultant shock, intravenous transfusion of plasma should be instituted immediately. The supply of dried plasma, sterile water for its reconstitution, and delivery sets has been one of the greatest advances made in nautical medicine in recent years. Two cases occurred recently in Union-Castle ships where severely burned men owed their lives to this measure.

The mention of plasma transfusion brings to mind blood transfusion and the difficulties which this procedure entails aboard ship. With the apparatus ordinarily at ones disposal, collection of blood under aseptic conditions is well-nigh impossible. Sera for typing blood should be carried, and, for the purpose of giving transfusions by intravenous drip, the method of choice, the patent "Sterivac" flask is recommended. This well-known device consists of a sterile flask, in which a vacuum has been created, connected by sterile tubing to a needle in the donor's vein, from which blood is collected into the flask/

flask by suction when the vacuum is released by the control tap provided on the apparatus. The flask contains an anticoagulant, and when the requisite volume of blood has been collected, it is used as the reservoir for delivery of blood to the recipient by simply inverting it and plugging in the customary delivery outfit. By the use of this apparatus there is little danger of contamination of the blood, and the procedure is much simplified. Where transfusion of whole blood is indicated at sea, this method is to be preferred to all others, and I consider this type of blood-collecting flask with its accessories an integral part of ones armamentarium. When time permits, and it really need not take long, a direct test of compatibility should precede transfusion. The indications for transfusion are too well-known to need listing, but I am convinced that it should be performed much more often than it is on ships, and I personally was dissuaded from carrying it out only because of technical difficulties which the above apparatus would overcome. A transfusion badly carried out, with apparatus of doubtful sterility, has always seemed to be an unjustifiable risk, and more dangerous than no transfusion at all. It is worth mentioning that haematemesis is a not uncommon complaint among merchant seamen - a fair percentage of the cases of haematemesis admitted to general hospitals ashore are/

are merchant seamen - and serious cases frequently provide a definite indication for blood transfusion.

### Anaesthesia at Sea.

This subject has been ably discussed by Woolmer (48). So far as was possible, I used local anaesthesia; it is admirable for most operations on the hands and feet, which formed a large part of my surgical work. 2% procaine is provided, and is effective for most minor procedures. General anaesthesia of short duration is most conveniently, and probably most safely, achieved by the use of an intravenous anaesthetic, and I used Evipan and Pentothal on numerous occasions without any untoward effect. Provided the stated precautions are observed, I do not think these drugs are of great danger and the fact that the anaesthetic is administered by the operator himself and not by a lay assistant under the operator's supervision eliminates one grave source of misgivings. Recently, considerable attention has been drawn to the dangers of spinal anaesthesia, e.g. by Kremer (1945) who describes seven cases of meningitis following the procedure (49) and by Fairclough (1945) who describes ten cases of sixth cranial nerve paralysis (50). The former's cases all occurred in the Middle East where it was difficult to maintain rigid asepsis (cf. ships) and the latter's ten cases were from a total of 2021 cases receiving spinal analgesia. These facts must be taken into/

into consideration in assessing the true extent of the dangers. The general conclusion arrived at is that this form of anaesthesia should not be practised by the "amateur". Hill (1945) states that no one should give a spinal anaesthetic until thoroughly trained not only in methods, but in the possible sequences and how to deal with them. At the same time, he points out its advantages, and urges a spread of the knowledge and practice of spinal anaesthesia (51). The undoubted advantages of spinal anaesthetics at sea are obvious. Woolmer states definitely that it is the method of choice for acute abdominal conditions, has little fear of complications or mishaps, and feels that inexperience of the method is not a contraindication, and that the medical officer who is unwilling to use it is creating needless difficulties for himself. Under a properly organised system, the prospective ship's surgeon would receive instruction in this technique before proceeding to sea. Inhalation anaesthesia still remains the mainstay in practice, and if, as often happens, one has a medical colleague aboard as a passenger, his aid may be enlisted for its administration. Otherwise I feel it to be a procedure fraught with danger and to be avoided at all costs.

This chapter is concluded with summaries of the case notes of five of my patients. The purpose of these descriptions/

descriptions is outlined in the commentary following each case.

CASE I - F.M'T. aet. 50 yrs. Ship's hairdresser.

On the evening of 27/1/46, the patient had a copious haematemesis, much clotted blood being vomited up. For about 3 years previously, he had been troubled with intermittent epigastric discomfort, sometimes amounting to pain, and with occasional vomiting. The discomfort was unrelated to meals, and worse in the morning. A year previously he had haematemesis while serving on another ship. For several days before the present attack, the epigastric discomfort had been intensified and constant, and he had eaten hardly anything. He had vomited in the morning for 3 days and, on 26/1/46, the vomite contained black material. On 27/1/46, he passed a black tarry motion. At 19.30 hrs. on 27/1/46, copious dark-red blood and large clots were vomited. The patient was a heavy smoker and drinker and had, in Bombay, the week previously, been consuming considerable quantities of spirits.

Examination revealed a pale apprehensive patient, moderately shocked. The pulse was very rapid and feeble, the heart sounds quiet but distinct. Blood pressure = 118/88 mm. mercury.

The patient was put to bed with a low pillow, given gr.  $\frac{1}{2}$  morphine by injection, and allowed only sips of water by mouth. The blood pressure and pulse rate were recorded  $\frac{1}{2}$ -hourly till midnight, the former not falling below a systolic pressure of 100 mm. mercury and the latter gradually settling to a rate of about 100/min. without any tendency to rise.

Subsequent treatment consisted of rest in bed, gradually increased diet, and full doses of ferri et ammon. cit., from 1/2/46.

Progress was excellent, there being a steady return of strength and no recurrence of symptoms. A careful examination on 4/2/46 and on several subsequent dates revealed no abnormal findings in the abdomen. Presumably the haemorrhage resulted from a gastric erosion\*. Blood examinations were carried

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\* I had the good fortune to meet this man again in February, 1947, when he turned up at the Radiodiagnostic Department of the Western Infirmary, Glasgow, for a barium meal examination for continuing dyspeptic symptoms. No peptic ulceration was visible; he was still intemperate.



out every few days and the following examples show the progress made:-

28/1/46:	Haemoglobin = 76%;	R.B.C. = 3,430,000/cu.mm.
1/2/46:	" = 60%;	R.B.C. = 3,680,000
7/2/46:	" = 61%;	R.B.C. = 2,550,000
16/2/46:	" = 75%;	R.B.C. = 3,400,000
5/3/46:	" = 92%;	R.B.C. = 4,900,000

Comments. A characteristic case of haematemesis, which can occur frequently in ship's practice, and illustrates the following points:- (i) the need for frequent blood pressure estimations in shocked cases of this type; (ii) the possibility of blood transfusion being required in such a case, as and when indicated by a falling blood pressure and rising pulse rate; (iii) the value of blood estimations in assessing progress; (iv) the necessity of carrying sufficient quantities of useful drugs like ferri et ammonii citras which must be prescribed in full dosage to be of value; the B.O.T. Scales provide for only 4 oz. of this drug for ships having up to 1000 persons aboard for a one-month voyage, 6 oz. for a 2-months voyage, 7 oz. for a 3-months voyage; these quantities seem quite inadequate as this is probably the iron preparation of choice in such cases; (v) the need for skilled nursing and a careful and constant watch over the patient.

CASE II - R.M'L. aet. 25 yrs. Engineer officer.

Just at the termination of his forenoon watch in the engine-room on 6/2/46, this patient felt very sick, went to his cabin where he vomited several times, then/

then collapsed, with transient loss of consciousness. His room-mate laid him on the couch where I saw him about 5 mins. later. He was pallid (although normally of a pale complexion), covered with sweat, and rather drowsy. His only complaint was of severe headache, weakness, and aching in the limbs. His vomitus had consisted mainly of greenish fluid. For several days he had felt nauseated after meals with a feeling of fullness in the epigastrium; his appetite was very poor. He said he had been a sufferer from "indigestion" for years. This consisted mainly of distension after meals, but he had never had abdominal pain. He thought he had lost weight recently. That morning he had passed a black motion.

Examination revealed no abnormal findings in the abdomen. Likewise there was no abnormality detected in the cardiovascular or respiratory systems. The blood pressure was within normal limits. The temperature was raised to 99.4°. Pulse rate = 84/min. The pulse felt rather shallow. The blood pressure and pulse rate were noted hourly after his admission to hospital. The former remained within normal limits, while the pulse became of better quality and the rate became steady about 70/min. He was kept at rest and given light diet. He was constipated for 3 days, then passed a rather dark motion. Headache, his principal symptom, persisted for about 2 days, then wore off.

A blood estimation was done on 10/2/46: haemoglobin = 56%; R.B.C. = 2,760,000/cu.mm. He commenced taking ferrous sulphate tablets, gr. 3, t.i.d., from that date until 20/3/46. Subsequent blood estimations were as follows:-

17/2/46:	Haemoglobin = 66%;	R.B.C. = 3,120,000/cu.mm.
18/2/46:	" = 86%;	R.B.C. = 4,020,000
20/3/46:	" = 103%;	R.B.C. = 5,590,000

His general condition improved markedly, he recovered his appetite, and was quite free from all digestive upset from the time of his collapse. When discharged from hospital on 14/2/46, he felt better than he had done for months. He returned to duty on 18/2/46, and, 3 months later, was still in perfect health.

Comments. An interesting case, on which it was difficult to pronounce a precise diagnosis. An internal haemorrhage occurring 1-2 days before his collapse was suggested by his epigastric discomfort, headache, and weakness, black motions, and microcytic anaemia, but/

but the origin of the haemorrhage could not be defined. The absence of a history or physical findings to suggest peptic ulcer is interesting as is also the rapid, apparently complete, disappearance of his digestive symptoms. All the points stressed in the preceding case hold good in this instance, and, in particular, I would emphasise the need for good nursing. In an undiagnosed case, such as this was, constant observation might reveal changes in the patient's condition of the utmost moment, changes which only a trained and experienced nurse would recognise. Adequate supervision of diet for such a case is also important, and this too needs an attendant with a considerable degree of knowledge. The case also emphasises once more that all relevant investigations must be carried out; without the blood estimations, treatment by iron might never have been embarked upon, and a valuable index of progress would have been lost.\*

CASE III - G.H. aet. 24 yrs. Assistant steward.

On 4/11/45, this man reported with a purulent discharge around the prepuce, and a doubtful urethral discharge. He had been exposed to venereal infection almost three weeks previously. After cleaning away the discharge

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\* The following information about this man has just reached me: he was admitted to the Victoria Infirmary, Glasgow, on 2/5/47 as an acute abdominal emergency and, on operation, was found to be suffering from perforation of an anterior wall duodenal ulcer.

from the retracted foreskin, a urethral smear was made and stained by Gram's method, and gonococci were found to be present in small numbers. The patient was put off duty, instructed about hygiene, and put on 4-hourly sulphathiazole.

The following morning he reported as instructed; he felt sick and weak, was markedly cyanosed, and covered with a generalised papulo-erythematous rash; his face was very puffy, especially the eyelids which were almost closed; his temperature was 101.5°. This was a pronounced case of drug fever, although he had had only 6 gms. of sulphathiazole. No previous history of "having M & B" (or of any similar attack after drugs) could be elicited. He was admitted to hospital and the drug discontinued. His urethral discharge was minimal.

On the next day he was examined by an R.A.M.C. passenger, a specialist in venereal diseases, who diagnosed chancroid, three sores now being present in the coronal sulcus; local treatment for these was instituted and proved successful within a week. His general condition was much improved; he was afebrile and felt quite well, there was no cyanosis and his rash was now merely a fading erythema. There was no urethral discharge.

On 8/11/45, a copious purulent urethral discharge appeared and systemic penicillin treatment was instituted ( 5 intramuscular injections, each of 30,000 units, at 3-hourly intervals), this drug being supplied by the kindness of the R.A.M.C. staff then aboard. The following day there was no discharge, and he was quite free from symptoms of any kind.

He was kept under supervision until he left the ship two weeks later, at the end of the voyage, and had no recurrence of symptoms. It was impressed on him that, in any future illness, he must inform his doctor of the reaction he had had to a drug of the sulphonamide group. He was also instructed to attend a V.D. clinic regularly for investigation regarding cure of gonorrhoea and possible syphilitic infection, carrying a full report of his recent illness, which was given into his keeping.

Comments. The case illustrates several important practical points:- (1) It is wise to question a patient regarding previous "M & B" before administering it; (2) A patient who exhibits any undue sensitivity to a drug should be informed of the nature of the drug and/

and instructed to tell his doctor in the future of the occurrence before he has drugs prescribed for him; (3) It is essential to supervise patients having sulphonamides; (4) two or more venereal diseases are liable to be contracted at the one time, especially in a foreign port, and no diagnostic investigation dare be neglected; (5) In gonorrhoea, especially if complicated by chancroid, the incubation period can be much lengthened; (6) The penicillin treatment of gonorrhoea may delay the development of the serological reactions of a simultaneously contracted syphilitic infection; the patient must be instructed about having blood tests at 3-monthly intervals for at least a year in such a case.

CASE IV - D.E. aet. 46 yrs. Fireman.

From time to time, for many years, this man had suffered from sudden attacks of urticaria. These were of abrupt onset and accompanied by headache, sometimes feverishness and sweating, and a variable amount of general malaise. Sometimes the attacks were sufficiently severe to necessitate confinement to bed. Injections of adrenalin gave only very temporary relief from the intense itching caused by the rash.

He consulted me frequently during the last eight months of 1945 with this complaint in fairly mild forms. The rash appeared mainly on the arms and trunk and consisted of large itching papules with mild surrounding erythema. He felt mildly ill during these attacks, headache being his worst symptom. With a day off duty, hypodermic injection of 5 minims of adrenalin, and aspirin gr. 10 (benzedrine, mg. 5, was tried alone and in combination with aspirin with little result), he was more or less back to normal condition.

During/

During December, 1945, he had a very severe attack, and had to be admitted to hospital. His temperature reached over 100°, and he sweated profusely. The rash covered all of the trunk and upper arms and itched intolerably. The injection of adrenalin (up to 10 minims), several times repeated, was without effect, but the potency of the preparation was suspect. For the first time, there was complaint of tightness in the chest and some difficulty in breathing; chest examinations consistently failed to reveal any abnormal findings. Headache was very severe, and he had taken several aspirin tablets for this on the day before consulting me. Aspirin was prescribed as required for his headache while in hospital, mainly on the first day of his illness. After four days in the ship's hospital, he was quite recovered and resumed duty.

A few weeks later he came to ask me whether tea might have initiated his urticaria, as he imagined it came on after his drinking a lot of tea. This seemed unlikely, but I did a patch test on his arm with tea leaves; the negative result was of no assistance in assessing the value of his suspicions.

Very soon after, he consulted me one morning, complaining of violent headache. He was given aspirin, gr. 5, phenacetin, gr.4, and caffeine, gr. 1. In the late afternoon he developed a typical urticaria of the upper arms. On this occasion, for the first time, it occurred to me that there might be a connection between the aspirin and urticaria. Subsequent investigation proved this to be so. If he took aspirin he developed the rash. By avoiding the drug, he could be without urticaria for as long as 2½ months (the period for which I had him under observation following this discovery). He now prefers to suffer his headache for a day than risk the itch of an urticarial rash.

Comments. An idiosyncrasy to aspirin, producing an allergic urticarial condition. Rather an unusual case on a ship, but a timely reminder that skin rashes require more than local treatment, and that the apparently unimportant matter of a case history in such cases may give the clue to the condition. I have some personal misgivings over not having got to the crux/must of the matter sooner in this instance. A cause

must be sought for all illness.

CASE V - F.C. aet. 53 yrs. Ship's printer.

On 20/12/45, this man consulted me complaining of trouble with a hernia which had been present for many years. For several days he had been finding it difficult to pass water, and the slightest straining "blew out" the hernia, causing much discomfort. There was an enormous left inguinal hernia present, and on straining, the scrotum was ballooned out by its intestinal contents. Rectal examination revealed considerable enlargement of the prostate, which was firm and even in consistency - apparently the cause of his difficulty in micturition. He was advised to wear his truss which he was inclined to omit, and asked to report any development in the condition. Two days later, he reported that he was having to strain a great deal to pass any urine, and, the day after, could only pass a few drops with painful effort. He looked ill and was in great discomfort; his bladder extended to the umbilicus. He was admitted to hospital and catheterised without difficulty, a soft-rubber catheter being tied in. The catheter was left in for two days, then changed, and rechanged after two more days. In spite of all possible precautions to avoid infection, the urine was, by this time, cloudy and contained pus cells. On the evening of the day following the second change of catheter, his temperature rose to 100.1°, and there was a deterioration in his general condition. He was very restless that night and pulled out the catheter during the night. He was catheterised once the following day (29/12/45), and landed that evening to the Combined Services Hospital at Trincomali. His urine was now heavily loaded with pus and it was considered unsafe to carry him further.

Cablegrams were received from the hospital in February, 1946, when he was reported to be dangerously ill from bilateral pyonephrosis, and in March, when an improvement in his condition was reported.

He rejoined the vessel at Colombo on 25/4/46 where he had been taken by ambulance from Trincomali the day before. He had had suprapubic cystostomy performed on 30/12/45, and was wearing a de Pezzer catheter through which he had twice-daily irrigations with  $\frac{1}{2}\%$  acetic acid, this treatment being continued aboard the ship. He was in much better condition generally, had gained weight, and was quite cheerful. The urine, according to his discharge report from Trincomali, was only mildly infected. A degree of bilateral pyonephrosis was suggested. On arrival

at Southampton, he was transferred (on 16/5/46) to the Royal South Hants Hospital and operated on there four days later. At operation, a large vesical calculus was removed; the prostate was considered not to be unduly enlarged and left alone. I saw the patient again two months after this (when he was about to be discharged from hospital). He looked fit and had no urinary symptoms; his urine was quite clear. The hernia, untreated, was giving him no trouble.\*

Comments. The following items of equipment are suggested to be necessary in anticipation of such cases as the above:- (1) Indwelling catheters of the Foley bag or similar type; where an indwelling urethral catheter is required, these are preferable to the improvised means of holding in ordinary soft-rubber catheters; (2) de Pezzer catheters and an introducer, to facilitate the operation of suprapubic cystostomy in urgent cases aboard, and to allow of changing a de Pezzer catheter inserted elsewhere when the length of time since the original insertion indicates that it is advisable; (3) Sufficient rubber tubing, and straight and T-shaped glass connecting tubes to allow of an improvised St. Mark's bladder-irrigation apparatus being set up; (4) Ammonium or calcium mandelate, the most useful urinary

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\* I was interested to meet this man again when I examined the crew submitted for engagement on the m.v. "Durban Castle" in June, 1947. This was his first return to employment. He had had the hernia repaired in the Seamen's Hospital, Greenwich, in January, 1947, and was suffering from no physical disability which could be considered a contra-indication to further sea service.



antiseptics when an acid urine is desired, and preferable to hexamine, the drug statutorily carried at present.

From the remarks on treatment contained in this chapter, it will at once appear that the Medical Scales do not provide adequately for the modern treatment of prevalent diseases aboard ship. This is, I think, borne out by the frequency of the red underline in the text. To remedy this, I suggest:-

- (i) that the Scales be thoroughly revised by a Departmental Committee similarly constituted to those which have previously revised the Scales and including members of the medical profession who have had personal practical experience of medicine at sea;
- (ii) that the ship's surgeon should not be dissuaded by his employers from ordering additional drugs which he deems necessary. Where the cost of the requisition seems excessive to the Company, the requisition should be referred to their Medical Superintendent or shore medical representative for investigation, prior to refusal of the demands made.

These suggestions should be read in conjunction with the various recommendations to be made in the next chapter, in which further reference to the shortcomings of the official scales will be made. The remarks, it is again pointed out, are confined to Scale I, that applicable to ships which carry doctors.

CHAPTER X - THE PROVISION OF AN EFFICIENT MEDICAL SERVICE FOR MERCHANT SHIPS.

In this chapter I propose to outline and group my suggestions for improving the standard of medicine at sea. My sea experience taught me that the present scheme of things leaves much to be desired, the main fault being a lack of supervision of most aspects of the medical service of ships. In the present era of planning, nowhere is planning more necessary than in the medical service provided for merchant ships. No one with a knowledge of merchant shipping will deny that their medical care seems to be of little account in official eyes. So long as the letter of the law is complied with, viz. that a ship bound by law to carry a doctor has a doctor aboard and the medical stores laid down by statute are carried, official circles are satisfied. What happens on the ship is of interest only to those aboard, and, provided the doctor is not actually guilty of criminal negligence, his activities may go without question.

The vital importance of merchant shipping demands that the crews of merchant ships receive good medical attention at sea, and this depends ultimately on a capable and conscientious ship's surgeon working with suitable modern equipment under good conditions and having/

having proper assistance. Undoubtedly no scheme will work well unless the ship's surgeon carries out his duties efficiently. That he does so demands some form of official supervision by members of his own profession. That he is given the opportunity of doing so equally depends on such professional supervision. There should be set up a committee of medical men of high professional status, interested in, or with special experience or knowledge of, the practice of medicine at sea. Such a committee might work under the auspices of one of the recognised medical bodies in this country, e.g. as a Section of the Royal Society of Medicine, a Group of the British Medical Association, a committee analogous to the Central Medical War Committee, or a subsidiary to the Association of Sea and Air Port Health Authorities. In any case, it would work in close co-operation with the controlling authority for shipping (at present the Ministry of Transport) to which authority it would act in an advisory capacity. All prospective ship's surgeons would be interviewed by this committee which would decide their suitability for service at sea. No surgeon would then be registered as a seaman by the Ministry of Transport unless he had been approved by this Central Medical Body (by which term it shall hereafter be named). This body would also arrange for the prospective ship's surgeon to have some preliminary instruction in ship's medical/

medical matters before proceeding to sea, e.g. a short course including tropical diseases, emergency surgery, dental treatment, and general ships' procedure, in other words a post-graduate course of training with emphasis on the complaints most commonly met with at sea and how to deal with them. In view of the fact that a long time spent as a ship's surgeon may be detrimental to a medical man's knowledge and professional capabilities, the Central Medical Body would lay down that a ship's surgeon's registration as a seaman be automatically cancelled by the Ministry of Transport after an arbitrary period of service of, say, two years.\* A surgeon wishing to remain at sea could then only do so after he had been interviewed by the Central Medical Body and that body was satisfied that he was familiar with recent medical advances either through personal study or after attendance at an approved post-graduate course of study on recent advances. A liaison would exist between the Central Medical Body and the General Nursing Council (or other official body representing the nursing profession, e.g. the Royal College of Nursing), by which both bodies would satisfy themselves that the nursing aboard ships and the conditions under which nurses were employed

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\* Perusal of a brief American history of nautical medicine (52) suggests that this policy is followed, privately if not officially, by the medical directors of certain U.S. shipping concerns.

were satisfactory.

For the operation of such a scheme, it is essential that each shipping company employing ship's surgeons should appoint a medical superintendent of high professional status and with some experience of the peculiar aspects of ships' medical practice. At present, several companies employ a medical superintendent on a whole-time or part-time basis, but a great many do not. In the latter companies, medical affairs come under purely lay supervision, and the problems of the ship's surgeon are very often treated without much consideration because of failure to understand them. The duties of the medical superintendent might be summarised as follows:-

- i) To act as liaison between the shipping company and the Central Medical Body, between the ship's surgeon and the Central Medical Body, and between the ship's nurse(s) and the General Nursing Council;
- ii) To satisfy himself that the standard of practice in the ships of his company is being maintained, and to investigate any complaints about medical attention lodged by members of the crew or passengers;
- iii) To visit the various ships at the termination of each voyage and arrange for the transfer ashore of hospital cases; on these occasions to meet the surgeon and nurse(s) and discuss with them their duties during the voyage;
- iv) To discuss with the surgeon and nurse(s) any suggestions or complaints made by them, and refer them to the shipping company, Central Medical Body, or General Nursing Council, according to their bearing on the ships of that particular company, on medical practice at sea in general, or on nursing at sea;
- v) To advise the company regarding purchase of medical stores/

stores and equipment for their ships, and to examine and endorse the ship's surgeon's requisitions.

The Ship's Surgeon. Until the best type of surgeon is attracted to sea, no real improvement in ships' medical practice may be expected to result. During my time at sea, I did not personally encounter any surgeons whose work left much to be desired, but that such men do exist cannot, by all accounts, be doubted. The ship's doctor is popularly supposed to be incapable and intemperate, and, in the past, gave good grounds for this belief. Fortunately this is largely a myth in present times. That it might be decisively so could be ensured by the following measures:-

- i) The prospective ship's surgeon should have to pass a medical examination;
- ii) He should be interviewed by the Central Medical Body, without whose approval he might not enter the Merchant Navy;
- iii) He should have a course of instruction in ship's medical matters before proceeding to sea;
- iv) He should not be allowed to remain at sea longer than two years without the approval of the Central Medical Body, which must be satisfied that his knowledge of recent advances and methods of treatment is adequate before sanctioning an extension of his term of sea service;
- v) The surgeon should be required to keep adequate records of his professional work aboard ship, these to be presented to the medical superintendent at the end of each voyage for scrutiny;
- vi) In the event of the surgeon's work appearing unsatisfactory to the medical superintendent, this fact should be communicated to the company which would/

would then cease to employ him, and to the Central Medical Body, which would reconsider the question of his being allowed to remain in the Merchant Navy.

These measures would be directed towards the elimination of the undesirable types of surgeon from the Merchant Navy, and it will be noticed that they in no way interfere with the free choice of surgeons by shipping companies, provided these are men of good calibre, or restrict the surgeon in his choice of employment with a particular shipping concern or on a particular route. It need hardly be re-emphasised that the efficiency of the service depends primarily on the capability and enthusiasm of the surgeons for good work. If their aim is to do a useful task well, other improvements will inevitably follow. The system of selection outlined above bears this in mind. The ship's surgeon's official responsibilities under the scheme may be listed thus:- (1) to the medical superintendent of his company on all purely medical aspects of his work and, through him, to the Central Medical Body; (2) to his shipping company on questions not purely medical, e.g. stores, equipment; (3) to the Ministry of Transport, as a member of the Merchant Navy; from this Ministry he would receive all official pronouncements regarding his duties.

I have previously stated in some detail my case

for the surgeon's having proper assistance, and emphasised the need for a trained nurse or nurses aboard ship. Since writing that section, I have made a voyage with a complement of over 1,200 civilian passengers, 30% of whom were young children, and with the assistance of five State-registered nurses employed in that capacity. The invaluable help given by these nurses fully convinced me of the necessity of there being at least one nurse aboard ship during all ocean voyages. The nurse would carry out her duties under the direction of the surgeon only, and would be interviewed by the medical superintendent at the end of the voyage. She would remain under the direct control of the Central Nursing Body while holding her sea appointment and her position in relation to that body would be as outlined on pp. 60-61. Liaison would exist between the Central Medical and Nursing Bodies, as previously mentioned.

Finally, the position of the hospital attendant receives our attention. It has been pointed out that such a person is necessary to deal with certain difficult cases. In that section it was stated that a knowledge of first-aid was desirable. Subsequent experience has taught me that no more extensive knowledge of medical matters than that is desirable, since I now believe that the man chosen for this post should work under the direction/



direction of the nursing sister as well as under the surgeon's orders. A person with only the rudiments of a medical and nursing training will work better under such circumstances than a male attendant with a fairly extensive knowledge. Under this method, the male orderly - preferably the man should be rated as an untrained "orderly" and the post of "attendant" be abolished - would have to deal with patients only:

- i) when they were difficult and required restraint;
- ii) when they required first-aid treatment in, or transportation from, an inaccessible part of the ship, such treatment or carrying being under the surgeon's supervision;
- iii) when the nursing sister was off duty and not available.

Ordinarily his duties would be:-

- i) keeping clean the hospitals and surgery;
- ii) doing tasks in the wards, e.g. cleaning of utensils, under the nursing sister's direction;
- iii) bringing the patients' meals to the hospital from the galley;
- iv) ordinary fetching and carrying duties as required.

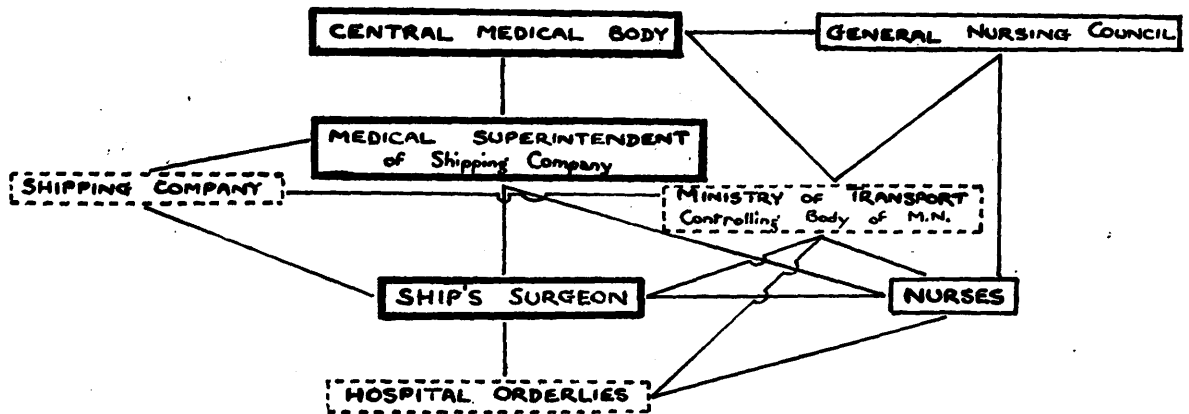
A young man is more likely to make a successful orderly than one who has been at sea for a long time, as he is less likely to resent working under female direction. The appointment of the orderly should rest with the ship's surgeon.

As a summary of the preceding paragraphs, I append a diagram (Figure 6) showing the inter-relationships of the/

the various parties concerned in the suggested scheme.

The aims of the suggested scheme are:-

- i) to ensure greater supervision of medical practice aboard merchant vessels;
- ii) to free the ship's surgeon from lay supervision or interference. At present, he has often to brook interference or, at least, obstructiveness on the part, mainly, of the Masters of vessels,



Coordination of Ships' Medical Personnel

Figure 6.

e.g. when desiring to land a sick member of the crew. With professional backing, such as he would have under the suggested scheme, his word on medical matters aboard ship would be the final one;

- iii) to set up the ideal organisation for efficient work at sea, and the co-ordination of medical services/

services ashore and afloat.

MEDICAL EQUIPMENT may be divided into (a) surgery fittings, (b) apparatus and instruments, and (c) drugs and dressings.

What is considered essential is detailed in the paragraphs which follow.

(a) Surgery fittings.

A good water supply is essential, and hot and cold fresh water should always be available. These should run into a sink of moderate size, with a flat bottom, this being more convenient than other patterns for the washing of glassware. The hot and cold taps should be of a type which can be operated by the elbows, to allow of ones scrubbing the hands and forearms thoroughly before any surgical procedure. The sink outlet plug should be controlled by a foot-pedal or knee-swivel for the same reason.

So that there may always be a supply of near-boiling water, a water-heater of some kind is advisable in addition. There is no doubt that an electric water-heater is in every way preferable to a steam-operated model, the principal disadvantages of the latter being the necessity of a constant steam supply (not always practicable in port) and the undue heating of the surgery by the steam pipes entering the heater. I was fortunate in having an electric water-heater with a thermostatic control in my various ships' surgeries; the control was set to heat the water to a temperature of 85°-90°C. It is the most convenient type, as it provides water sufficiently hot for most purposes, and can be left in operation all the time without fear of its boiling dry.

For obtaining boiling water quickly, an electric kettle is most convenient, and is a useful stand-by in the event of the main water-heater going out of action; it can also be used for rapid sterilisation of small instruments, e.g. hypodermic syringes.

A steriliser is one of the most essential surgery fittings and, in ships, seldom meets requirements. The Board of Trade insists that each ship with a doctor carries a steriliser "large enough to contain midwifery forceps". Only too often this condition is fulfilled by/

by the provision of what is little more than a metal dish with lid of the stipulated size, to be heated over a spirit or other lamp. Since sterilisation of instruments is an essential everyday task, something more should be insisted upon. I found the electric or steam steriliser (I have used both types in different ships) to be the most useful single fitting in the surgery, my only complaint being its excessively small dimensions in some cases and consequent tendency to boil dry - with disastrous consequences in the case of the electric instrument. I would demand the following specifications:-

- i) the steriliser should be operated by steam or electricity, preferably the latter, and should have a supply tap and outlet tap;
- ii) its dimensions should not be less than 20 x 10 inches, and 8 inches in depth ( a size which I used aboard one vessel and found convenient), to allow of the sterilisation of bottles, trays, and bowls of moderate size; too small a steriliser is futile for any surgical procedures bar the most trivial; for rapid heating of water, an electric kettle (previously mentioned) serves the purpose well;
- iii) raising the lid (which must be hinged) should raise the inner tray of the steriliser, thus minimising the danger of scalds while the operator is removing the contents; all of the better modern instruments embody this fitting;
- iv) if electrically operated, there should be a cut-out in the circuit which breaks it when the steriliser is about to boil dry; using a small electric steriliser without a cut-out, I had the misfortune to damage the instrument on at least three occasions within a year by leaving it switched on and unattended. Apart from the very real danger of fire, this minor electrical safeguard is called for by the expense of repeated repairs and the fact of the instrument's being temporarily put out of action. Even the most careful person is liable to leave an electric appliance switched on by mistake.

Before leaving the question of the steriliser, it is necessary to add that suitable forceps of various sizes (Cheate's pattern) be supplied for withdrawing instruments and utensils from it. Without them, the use of the steriliser is rendered unnecessarily difficult.

Recent developments in chemotherapy, notably the introduction of penicillin, have rendered a refrigerator a necessary part of surgery furnishing. Although drugs requiring cold storage have long been carried in hot-weather ships (e.g. calf-lymph for vaccination, easily melted suppositories, local anaesthetics in solution), few/

few ships have refrigerators in their dispensaries, the articles being stored in the ship's freezing chambers. The frequency and regularity with which penicillin must be injected throughout the 24 hours, demand that the drug must be readily accessible, and not stored somewhere in the bowels of the ship. Moreover, it is undesirable that the freezing chambers be opened more than 2-3 times per day, and, to gain access to them, some storekeeper or other person in charge must first be sought. All of this means inconvenience and delay, and the only solution is for the surgeon to have a refrigerator in his own premises (surgery or hospital). A large refrigerator is not necessary; the ordinary electric domestic refrigerator of medium size is quite adequate. A further point to commend this furnishing is that it ensures a supply of ice cubes from its contained ice trays. For the relief of severe pain, headache in particular, cold applications have definite value, especially during hot weather, and the small ice blocks from domestic refrigerator trays make an excellent filling for rubberised ice-bags. The undoubted practical value of this I proved on two occasions:-

- i) in the case of a young child suffering from mild concussion and severe headache after a fall on the head;
- ii) in the case of a very debilitated woman suffering violent headache due to continued seasickness.

While at sea, I had to discard considerable quantities of drugs which had deteriorated due to improper storage in tropical temperatures, and which it was impracticable to keep in the freezing chambers. They included neoarsphenamine and allied arsenicals, procaine and similar local anaesthetics in solution, sera and vaccines, and various ointments. For reasons of economy, the refrigerator is desirable; on consideration of the other factors, it becomes essential.

A good examination couch is an obvious essential which also frequently falls short of exacting standards. It should be sufficiently long for the tallest patient to lie full-length, sufficiently wide to allow of his turning from side to side without fear of rolling off, and should possess a head-piece capable of elevation. Preferably it should not be a permanent fixture against a bulkhead, but free in the middle of the deck (with sunk deck fittings to receive the legs where this is rendered necessary by a rolling or pitching ship). When considerations of economy of space forbid this, it should be fixed to the bulkhead so that the patient will be examined from his left side. This condition only applies, of course, when the couch has the recommended adjustable head-piece/

head-piece in operation. A padded surface covered with plain unstudded leather is the most suitable and durable upholstery.

The surgery lighting must be quite adequate. The apartment should be so situated in the first place as to have a good source of daylight in which to examine patients. For artificial lighting, which has nearly always to be relied on in practice, low-power bulbs are quite useless. I recommend, and always used, 100-watt lamps in the surgery, one of these being sufficient for approximately 50 sq. ft. of deck area. Thus four of these lamps would be needed in a moderate-sized surgery, which they would illuminate very satisfactorily. A carrying lamp with a long flex is a useful adjunct, and inspection of patients is facilitated by a powerful overhead lamp of the operating-theatre type which can be directed to any part of the deck. When the surgery is also used as an operating-theatre, this type of lamp cannot safely be dispensed with. It is to be noted that ships which were converted to troopships in the United States during the recent war, were supplied with much better lamps of this pattern than those normally present in British ships. In general, American merchant vessels are much in advance of British in their medical equipment.

(b) Apparatus and instruments.

Under this heading are mentioned only those items which I consider essential, and for which no provision is made in the Board of Trade Medical Scales.

Several of these have been referred to in some detail earlier. They are the microscope, sphygmomanometer, haemoglobinometer, haemocytometer, the cartridge type of syringe for dental work, and the "Sterivac" type of vacuum flask for withdrawing blood for transfusion. In connection with the first of these, one must add that it is of very limited value if certain accessories are not provided, namely the stains and reagents necessary for the preparation of microscope films which are very apt to be overlooked. In the choice of stains, etc., the surgeon should be unrestricted, as it is better for him to work with the materials with which he has achieved best results than to use stock stains with which he may not be familiar or proficient. One might suggest that future editions of the Medical Scales include under Scale I "suitable microscope stains and reagents for examining the cellular element of the blood and for demonstrating and identifying the organisms responsible for gonorrhoea, malaria, diphtheria, tuberculosis, and the commoner pyogenic infections".

During wartime, I endeavoured unsuccessfully to obtain a microscope condenser for the examination of material by the "dark-ground illumination" method. While not considering such a condenser an absolute essential, I believe it should be carried, as it provides the only practicable means of making a definite diagnosis of syphilis at the stage of the primary sore - the stage at which the ship's surgeon most frequently encounters syphilitic infection. I was able, on one occasion, to make a diagnosis of primary syphilis by finding a typical *Treponema pallidum* in material from a chancre overstained by Leishman's method, but am inclined to consider that was an unusual stroke of fortune. Prompt diagnosis of syphilis is of supreme importance as it enables prompt institution of the specific treatment. Reliance on the diagnostic facilities provided by centres ashore means considerable delay in instituting treatment in many instances. Moreover, the treatment of syphilis being necessarily a long-term one, it is in the seaman's interest to have it instituted as soon as possible and to have as many injections done at sea as the duration of the voyage permits. While on leave, there is a natural though regrettable tendency for the victim to neglect his clinic attendances, which does not obtain while he is on shipboard.

Aboard ship there is commonly a deficiency in utensils which becomes manifest when surgical procedures are contemplated. To remedy this, I suggest the carrying of at least six enamelled or stainless steel kidney-shaped dishes of various sizes, two sets of galley-pots, and a dozen larger enamelled basins suitable for washing the hands, etc. For use during surgical operations, there should be a stand holding two such basins put within the surgeon's easy reach.

An electric auriscope is preferable aboard ship to a headmirror, because of the difficulty of obtaining a conveniently-placed source of light for the latter. In many cases too an ophthalmoscope is found necessary, and one of the well-known diagnostic sets combining ophthalmoscope and auriscope by fitting the appropriate head to the one dry-battery container serves the dual purpose admirably. This I would class as an essential instrument.

The testing of urine forms a vital part of clinical investigation, and there should be pointed out three glaring omissions from the B.O.T. Scales. The first is Benedict's solution in the qualitative test for sugar. The Scales provide for the carrying of Fehling's solutions, but very few clinicians today countenance this test, whereas/

whereas Benedict's is almost universally used, its advantages being too well-known to need description. There is no reason whatever why Benedict's should not replace Fehling's solution in the Scales. Tincture of guaiacum and ozonic ether form the second grave omission which obviously requires amendment. The third is the omission of the necessary reagents for carrying out Rothera's test for the acetone bodies; this too is of too great importance to be neglected.

(c) Drugs and dressings.

Mention has been made of deficiencies in drug stores in the chapter on treatment of common complaints. We may now consider the B.O.T. Scales alone and suggest what seem necessary and reasonable amendments and adjustments. Although additions are made to the Scales from time to time in line with current advances in treatment, a scrutiny of the Scales reveals a mass of drugs which have very little place in modern therapeutics and whose value as ballast is negligible. Likewise, as has already been pointed out, many of the more useful drugs in modern practice do not appear in the Scales. The third great fault, which has also received mention, is the disproportion in the scheduled quantities of certain of the items. My presumption is that these quantities in many cases have been based on a dosage much less than the modern standard dose, and are, therefore, out of line with modern posology.

Since any description of useful drugs is coloured by personal bias, I will make no reference to many items which I never made use of myself, because I know others who do make use of them. The drugs whose inclusion in the Scales is recommended are chosen because the majority of practitioners today use them or would, at least, not find them redundant extras.

From the latest edition of the Scales (1945, Reprinted 1946), I recommend the deletion of the following items:-

- a) Acidum phosphoricum dilutum. This is seldom if ever used. If the occasion arose, dilute hydrochloric acid could be prescribed instead. This alternative is indeed included in the appendix of wartime alterations;
- b) Chlorbutol tablets, gr. 5. The principal indication for these was in the treatment of seasickness. In this malady, their usefulness is highly problematic. All recent work on seasickness goes to show that hyoscine is the most effective remedy (53,54,55), and I see no reason for chlorbutol now occupying/



- occupying space in snips' surgeries. Even as an ordinary sedative, it has been superseded;
- c) Hexamine. This was used solely as an urinary anti-septic. The introduction of mandelic acid and its salts, the sulphonamides, and penicillin, has provided us with far more efficient means of combating urinary infection. Moreover, hexamine necessitates prescribing separately a urinary acidifier and is itself prone to cause severe gastric upset. It has little place in modern prescriptions;
  - d) Infusion of buchu. The same may be said of this urinary antiseptic. Even as a vehicle for other drugs, its value is negligible;
  - e) Methylsulphonal (tablets, gr.5), a sedative now seldom prescribed. The appendix of wartime alterations wisely suggests sodium barbitone in 5 gr. tablets as an alternative;
  - f) Acid sodium phosphate. As a urinary acidifier this is much less effective than ammonium chloride by which it should be replaced;
  - g) Sulphapyridine. While not suggesting that this should be altogether omitted from the Scales, I think this drug has been so widely supplanted by the later sulphonamides that it need not be compulsorily carried. The same clause that appears beside the entry for sulphanilamide, viz. "or its equivalents", might well be added in the case of sulphapyridine;
  - h) Picric acid. It is difficult to conceive how the ship's surgeon would suffer any loss by having the customary 1 oz. of this commodity removed from his ship. It is not supplied in dry powder form, so that it cannot even be used for making up Esbach's reagent;
  - i) Vinum antimoniale. Other emetics are provided, notably apomorphine, and a stomach tube is included in the Scales. There appears, therefore, little justification for continuing to carry 2 oz. of this drug.

I strongly recommend the inclusion of the following items in the Scales, reference to a number of which was made in the preceding chapter:-

- a) For external application. (i) Acriflavine, solution tablets of which are readily available; (ii) Gentian violet, which is best supplied in powder form, from which aqueous and alcoholic solutions can be prepared as required; (iii) sodium sulphacetamide ("Albucid") in 10% solution for ophthalmic use; (iv) Whitfield's ointment, which is one of the most valuable remedies aboard ship; (v) Menthol crystals, for the preparation of mentholated/

- tholated calamine lotion; they can also be usefully employed in inhalations and nasal ointments or sprays;
- b) Oil of cloves, as a dressing for painful carious teeth;
  - c) Sedatives. Addition of two or more members of the barbiturate group is advised, one of rapid action, e.g. sodium barbitone or butobarbitone, and the other of slower, more prolonged action, e.g. phenobarbitone. The value of the latter drug, in particular, need hardly be stressed;
  - d) Ascorbic acid in tablet form;
  - e) Extractum glycyrrhizae liquidum, as a most useful flavouring agent in many prescriptions;
  - f) Hyoscine hydrobromide, in gr.1/100 tablets, as a remedy for seasickness;
  - g) Ammonium chloride as a urinary acidifier; and ammonium or calcium mandelate as a urinary antiseptic. These salts of mandelic acid do not necessitate giving a urinary acidifier concurrently and thus avoid the gastric upset so often associated with such acidifiers. They are also more effective than hexamine, which is carried at present;
  - h) Neocarphenamine, or alternative organic arsenical compounds, for the treatment of syphilis;
  - i) Pentothal, for intravenous anaesthesia;
  - j) Liquor formaldehydi (formalin), for the disinfection of accommodation;
  - k) As suggested alternatives to drugs already appearing in the Scales, the total Scales quantity being arrived at by a combination of the amounts of each alternative in cases where the surgeon elects to carry both:
    - (i) Sodium sulphate as an alternative to magnesium sulphate. A saturated solution of sodium sulphate has advantages over magnesium sulphate in the dressing of septic lesions\* and, alone, or in combination with acriflavine, is probably the simplest and most efficient wet dressing for infected wounds;
    - (ii) Powdered leaf of digitalis as alternative to the tincture. This preparation keeps better and is more accurately standardised;
    - (iii) Liquid extract of cascara sagrada as alternative to tablets of the dry extract. This allows of more accurate dosage of the drug, which can be included in fluid mixtures;
    - (iv) Pulv. kaolin. and magnesium trisilicate as alternatives to bismuth carbonate as in the present list of wartime alterations; this alteration should be a permanent one.

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\* Its superior osmotic properties have been stressed by Lyth (1940) (56,57), and Cellon-Jones (1940) (58).

The following drug items are quoted as examples of the specified quantity in the Scales being either excessive or, more often, quite inadequate:-

- a) Salicylic acid. Only  $\frac{1}{2}$  oz. of this is to be carried independent of the size of the ship or duration of the voyage. Allowing for dispensing losses, this quantity may prove insufficient in many cases. A double quantity is advisable;
- b) Ammonium carbonate. A 6oz. bottle of expectorant mixture commonly contains dr. 1 of this drug. Thus, at the most, 12 such bottles could be dispensed from  $1\frac{1}{2}$  oz., which is the quantity for a ship with up to 250 persons aboard. This number of bottles is quite inadequate for such a number of persons should an outbreak of bronchitic attacks occur;
- c) Stabilised chloride of lime for the sterilisation of drinking water. The Scales quantity is sufficient to treat only 55 tons of water, which is a small fraction of the freshwater carried by most ships. Sufficient should be carried to sterilise all the drinking-water likely to be taken aboard at ports where chlorination is not routinely carried out and to provide for any emergency;
- d) Linctus diamorph. et scillae. With up to 1000 persons aboard, only 4 oz. is allowed for one month. This allowance of 32 single doses for such a large number is ridiculously small in view of the useful nature of this drug as a sedative cough mixture;
- e) Liquor ferri perchloridi. Using this as a gargle, a patient goes through about  $\frac{1}{2}$  oz. per day. I usually supplied 1 oz. to a patient for gargling purposes. Thus the  $1\frac{1}{2}$  oz. for a ship with up to 250 persons is hopelessly small. At least a 300% increase is necessary;
- f) Methylated spirit. 4 pints are allowed with up to 1000 persons aboard, irrespective of the duration of the voyage. In spite of the strictest economy in its use, I found that I could not make this amount suffice. At least a 50% increase is desirable;
- g) Mepacrine tablets. The official allowance is 30 per member of the crew. Yet the official recommendation is that each member of the crew should take one tablet daily for 10 days before arrival at the malarious port, throughout the stay there, and for 30 days after leaving it. This recommendation cannot be followed with the present Scales allowance which I suggest might be increased to 45 tablets per man. This was the quantity on which I based my requisitions when ordering "extra" supplies of the drug;
- h) Mist./

- h) Mist. sennae co. This is an example of a drug which is supplied in excess. The quantities carried, when compared with my usual sickness rates, would have been sufficient for me to give a standard dose to every second surgery visitor throughout the voyage, a procedure which might in the past have found favour but has little to commend it today. A 25% reduction in quantity would appear reasonable.

As regards dressings, picric lint might well be omitted from the Scales. In burn treatment, it is now seldom, if ever, used. The quantities of dressings require considerable revision. Thus two 5 yd. reels of zinc oxide plaster in each of the widths  $\frac{1}{2}$  inch, 1 inch, and 3 inches, can hardly be considered sufficient with 1000 persons aboard. Nor are two rolls of 3 inch width elastic adhesive plaster likely to meet the surgeon's requirements. Likewise, the quantities of sterilised gauze in packets and cotton-wool in packets should be increased by about 100%. In particular, a large quantity of the "small" (36 ins. x 6 ins.) size packets of the former is desirable, for, once a packet is opened, the gauze may no longer be regarded as sterile, and the "small" packets tend to effect an economy in the use of gauze by leaving less discarded from each packet.

To bring the Scales more into line with modern usage, I would again suggest:-

- (1) the thorough revision of the Scales advocated previously, useless material being cut out, and new drugs introduced where where necessary;
- (2) the introduction into future editions of the Scales of a list of approved alternatives for certain drugs, suggested examples of which were given on p. 157. This measure had to be adopted from time to time during the recent war, when there was difficulty in obtaining certain drugs, and in some cases surgeons found the wartime substitutes more acceptable than the original drugs. In the new Scales, items for which approved alternatives could be substituted might be marked with some distinguishing sign, the list of alternatives being printed elsewhere in the Scales booklet, and including most of the drugs in common modern use. Thus, while all essential drugs were carried on the ship - the primary purpose of the Scales is, of course, to ensure this - the surgeon might exercise his own preferences more than is allowed under the present Scales. Moreover, it would cause some saving of space and expense. As the Scales stand now, the surgeon has to carry many items/

items which he personally finds useless, and has to order many drugs as "extras" (the term which usually signifies items outwith the Scales) which, if appearing as alternatives to others in the Scales, could alone be carried. Such an introduction of substitutes would specially benefit the surgeon whose employers wish to keep drug expenses to a minimum, but, in every case, it would be likely to result in a saving of expense as one item only would be purchased where at present two must be bought. To give one of the most obvious examples, this revision would provide most ships' surgeries with a bottle of Benedict's test solution (then appearing on the Scales as an approved alternative to Fehling's), which at present have to accommodate two bottles of Fehling's solution (A and B), seldom used, plus a bottle of Benedict's (ordered as an "extra"). It would be tedious to list other examples; the above and those given previously should make the point quite clear.

With a medical superintendent to inspect the requisition lists of surgeons, there should be little fear of needless expenditure, nor need the surgeon do without articles of recognised value because they may not appear in the Scales. When the surgeon's liaison with his employers is, as regards his professional duties, through a medical superintendent, the needs of his department of the ship will receive the consideration of one with full understanding of them. Thus his "extras" list will be considered with a view to providing items of real value, and not with an eye on the druggist's price list. In this connection, it might be pointed out that a considerable economy in the cost of drugs for ships could be effected if a medical man were allowed to purchase from whatever manufacturers he chose. This would/

would be the duty of the medical superintendent. The present practice is to obtain all the ship's medical supplies through one firm of shipping suppliers, which monopoly leads to definite overcharging on the part of the suppliers and to some restriction of choice. In my own experience, each ship on which I served was stocked as an individual unit before the commencement of a voyage by a firm of shipping chemists in the port visited. Had the Company employed a medical superintendent, he could have ordered supplies for the fleet as a whole, to be stored in the Company's stores and released to the ships as required. Thus, much greater quantities could have been purchased at the one time, resulting in a cheaper rate of cost price. There would also have been fewer items scored off the requisition lists as "unobtainable", as a medical superintendent would have been in touch with all the leading manufacturers' agents, free to purchase as he chose, and able to get orders attended to on short notice.

To conclude this chapter, I append a very brief summary of my suggestions for improving the standard of medical practice (and, as a consequence, that of health) on merchant ships, some of which suggestions appear in the pages immediately preceding, and others in earlier sections.

Summary/

Summary of Recommendations.

- 1) The establishment of an officially recognised organisation to co-ordinate, supervise, and control, medical practice aboard merchant vessels.
- 2) Closer supervision of the ship's surgeon's work by medical superintendents representing each shipping company and, at the same time, liberation of the surgeon from lay control.
- 3) Appointment of a trained nurse or nurses and of an orderly to assist the ship's surgeon.
- 4) Greater attention to be paid to the planning and furnishing of ships' surgeries and hospitals, and the provision of an isolation hospital with individual cubicles aboard each ship.
- 5) Provision of diagnostic equipment, instruments, utensils, drugs, and dressings, to conform with exacting modern standards.
- 6) Thorough revision of the Board of Trade Medical Scales.
- 7) Issue of an official medical record card to each merchant seaman, to be kept up to date by the ship's surgeon, company's medical superintendent, or medical officers of the Merchant Navy Establishment.
- 8) Careful medical examination of ships' crews prior to engagement, and rejection of all unfit men.
- 9) Careful case records of patients aboard ship, and unhurried systematic investigation.
- 10) Closer attention to preventive measures directed against ill-health - supervision of galleys, food-handlers, water supply, ventilation, and anti-vermin precautions.
- 11) Instruction of ships' officers in the principles of hygiene and welfare aboard ship.
- 12) Strict enforcement of Port Health Regulations.

CHAPTER XI - CONCLUSION.

When first I embarked upon the compilation of this work over a year ago, I did so with some hesitancy. In the first place, the subject concerned a very small section of the medical profession, for the majority of whom it would have but scant interest. Again, the subject was a vast one, and any discussion likely to be of a discursive and generalised nature, based more on personal and clinical impression than on statistical analysis. Thirdly, my experience was then that of little over a year at sea, during which time I could only have touched upon the fringe of the possible difficulties which may confront the ship's doctor.

On the other hand, the health of the merchant seaman affected to some degree each person in our islands, whose dependence on an efficient mercantile marine has been proved over and over again. The Merchant Navy was Britain's lifeline in war, and is no less so in the post-war era. During the war it lost 29,180 of its number, which was the highest percentage (ca. 11.6%) of casualties of any of Britain's Services. That a service with such a long history of faithful duty should, in many cases, be receiving inadequate medical care seemed wrong to me, and whatever improvements I might suggest seemed worth stating. A writer in an official publication (13), regretting the deplorable lack/



lack of statistics regarding the health of merchant seamen, states: "The Mercantile Marine represents our most important commercial undertaking, and, as the leading maritime nation of the world, we should lead the way in this field of work". This was written in 1932. Now, 15 years later, that statement has lost none of its truth, but the ship's surgeon of today, observing the superior medical facilities of American ships as compared with our own, cannot but wonder if we realise our responsibilities towards our seamen. Perhaps it is because the health problems of the Merchant Navy lack the genuine support of the medical profession that progress in this direction is slow, and faults take long to be eradicated.

To have based so much on a mere one and a half years of sea experience seems presumptuous. This duration of sea service is, however, sufficiently long to enable one to understand thoroughly the working of ships and to have learned how medicine in general can best be practised aboard ship, while, at the same time, one is not too far removed in time from ones experience of practice ashore to have lost perspective. Thus, while realising some inevitable limitations of practice afloat, I attempted to make it resemble as closely as possible current practice ashore. Improvisation is a necessary part of the ship's surgeon's art, but it can be carried to unnecessary lengths, and the surgeon who has long practised at sea may easily fall into slipshod/

slipshod ways by continually "making do" with a second-best method.

With the exception of the last two months of my service (when I was dealing mainly with passengers), my practice was almost exclusively among ships' crews. It was their health with which I was primarily concerned, but, while dealing with passengers during this latter period at sea, I found that they too would benefit from the various suggestions I have made. The provision of a good medical service for merchant seamen means also that passengers travelling by sea will receive better medical care. My suggestions are made from personal experience as a ship's medical officer and I have, therefore, considered

ADDENDUM - page 165, to follow line 21.

The above statement must be modified in view of particulars which have just been furnished to me by the Registrar General of Shipping and Seamen. These show that the number of men employed in ships which are not legally required to carry a qualified medical practitioner is approximately 88,500 while those employed on ships legally required to carry a medical practitioner number some 35,000. On making allowance for the fact that a number of the former ships do carry a doctor although not legally required to do so, the number of seamen on ships without doctors is still about twice that of seamen on ships with surgeons. I would take this opportunity of thanking the Registrar General of Shipping and Seamen for this information and for the further information that about 35,000 Asiatic seamen are employed on British ships..

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dents would be concerned with health conditions on the smaller ships of their company, and the experience of ships' surgeons/

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surgeons would be used in the formulation of any health scheme for the crews of those ships.

I must make apology for the undue prominence of the personal pronoun throughout my writing, but, without its use, it would have been difficult to emphasise that the facts quoted were those of my own experience. I would add, however, that I have had many discussions on a number of the subjects involved with other ships' surgeons, and feel that my opinions are not greatly at variance with theirs.

In conclusion, I wish to record my gratitude to the various medical officers of His Majesty's Forces who were associated with me aboard ship. Their help and advice were of the greatest value. I am indebted to the Managers of the Orient Steam Navigation Company Limited, 7 Bishopsgate, London E.C.2., and of the Anchor Line Limited, St.Vincent Place, Glasgow C.1., for permission to quote their vessels, to the Medical Superintendent of Cunard White Star Limited, Cunard Building, Liverpool 3, for allowing reference to be made to their medical record cards, and, in particular, to my recent employers, the Union-Castle Mail Steamship Company Limited, 3 Fenchurch Street, London E.C.3., for their continued co-operation.

APPENDIX

MERCHANT NAVY - ESTABLISHED SERVICE SCHEME.

Reference must be made to the above scheme, instituted on an experimental basis early in 1947, and replacing the wartime Reserve Pool. Operated principally by the Shipping Federation Ltd. (which consolidates shipping interests from both shipowners' and employees' points of view), it aims at a stable and attractive career for the prospective seafarer, by providing greater regularity of employment than has been the case in the past.

By means of contractual obligations between the seaman and the shipowner in one case, and the M.N. Establishment in the other, this ideal is hoped to be achieved. Such Company Service or General Service Contracts will be offered only to seamen having achieved a requisite standard of proficiency in their rating, thus ensuring that shipowners are given efficient and reliable personnel to man and maintain their vessels.

The Scheme is important from the medical aspect inasmuch as no seaman will be offered a contract without having undergone a comprehensive medical examination. Such an examination is now being carried out by the medical officers of the Shipping Federation. At the same time, I believe (and not without some grounds, see footnote\* overleaf) that the ship's surgeon should continue to

to examine prospective crews before engagement. Thus a double check on the seaman's health may be obtained, and an initially healthy crew become a greater certainty.

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\* This statement is made in view of my having had to reject (July, 1947) a steward because of severe haemorrhoids and anal prolapse, and an extremely cachectic appearance, who had been passed as fit by the Federation's medical officer.

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