The Health of British Trawlermen on the Arctic Fishing Grounds

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Summary
A history is presented of medical facilities available at sea for British trawlermen from 1881 until the last trawler support ship was withdrawn in 1980. Nine hundred and sixty-six consultations by sick or injured trawlermen at sea, of whom 170 were repatriated, are reviewed. Fishermen were hospitalized on 237 occasions and six died. Two-thirds of consultations were for sickness with dental, gastrointestinal and respiratory conditions predominating but with cardiac and psychiatric complaints causing most problems. Among the 340 accidents the commonest site of injury was to the hand but the sites causing most problems were to the chest and lower limbs. Trawlermen should be carefully screened to keep unfit men, especially those with asthma, previous myocardial infarcts and psychiatric disease off the fishing grounds. A dental service for trawlermen and emergency dental training for support ship medical officers is suggested and antibiotics for all open hand injuries is recommended.

Introduction
Trawling in Arctic waters is a rigorous and dangerous occupation. Dyson (1977) in his history of British fishermen and Tunstall (1962) in his sociological study of Hull trawlermen describe the lives and habits of these intrepid men. Popham (1957) and Villiers (1970) have described the dangers encountered. None of these authors mentions the medical problems.

Schilling (1966, 1971), was the first to attempt to analyse mortality and morbidity among British trawlermen and pointed out that fatal accident rates in deep sea fishermen were at least twice those of coal miners. The majority of accidental deaths was due to drowning. Moore (1969a, b) investigated the mortality and morbidity of deep sea fishermen sailing from Grimsby in 1963. He highlights the hazards of illness at sea and the advisability of assuring that trawlermen are fit. Statistics of trawlermen hospitalized from the fishing grounds around the Shetland Islands and Faroes were presented by Cadenhead (1976).

The following account analyses the medical problems of trawlermen on the Arctic fishing grounds, as seen from a trawler support ship.

History
Medical aid to British trawler fleets at sea started in 1881 when Mather (1887), appalled with the conditions in the trawler fleets on the Dogger Bank, founded the Mission to Deep Sea Fishermen which soon provided smacks with personnel on board to see not only to the spiritual needs of the trawlermen but also to render first aid (Villiers, 1970). In 1888 Grenfell, of Labrador fame, was appointed the first doctor and sailed for the Dogger Bank in the sloop Cluow. By 1910 there were 4 such hospital ships with doctors on the Dogger Bank and over 15 000 trawlermen were given medical attention (Wood, 1911).

Between the two World Wars trawlers increasingly made voyages to the Arctic fishing grounds and only short trips to the Dogger Bank and this resulted in these medical ships being withdrawn from the North Sea in 1937 (Dinsdale and Scott, 1971). After the Second World War fishing in these waters resumed with increased activity and in these early post war years the only medical help available was from the Royal Navy (Bowdler, 1954).

In 1955 the Hull trawlers Lorrela and Roderico were lost with all hands north-east of Iceland. The subsequent court of inquiry was unable to make any useful suggestions to reduce such dangers (Dinsdale and Scott, 1971) but from 1959 a small number of Royal Navy ships providing medical expertise were seconded to fishery duties off Iceland (Miller, 1959).

The disasters in 1968 in which the 3 Hull trawlers Kingston Peridos, St Romanus and Ross Cleveland capsized off northern Iceland within a period of 3 weeks with a loss of 59 lives led to a public outcry. A subsequent committee of inquiry into trawler safety recommended that the Government should supply a trawler support ship on a permanent basis for the Arctic fishing grounds (Trawler Safety, 1969). As a result the Board of Trade converted the Swedish four-masted schooner Albatross into the trawler support ship Miranda which sailed for the Icelandic fishing grounds in late 1970. The vessel patrolled in these waters until 1976 when the British trawler fleet finally left after the ‘Cod Wars’ to fish off northern Norway. Miranda followed and remained with the fleet until sold in 1980, having completed 76 months at sea as a trawler support ship.

The Ships and Men
Trawler support ship MIRANDA (Fig. 1)
TSS Miranda was a vessel 1500 tons gross with a speed of 12 knots. She carried a complement of 36, including a medical officer, a sickbay attendant, and a meteorological officer.

The medical accommodation included a 6-bedded ward and a large and well equipped surgery for consultations complete with dental chair convertible to an operating table and a portable X-ray machine.

The Trawlers
There were two types of distant water trawler in the British fleet.
Fig. 1. The trawler support ship TSS Miranda. The medical accommodation is the forward superstructure.

(a) Side-winder steam or motor trawler (Fig. 2): On these trawlers where the freeboard (the distance between the deck and sea in calm weather) may be less than 1 metre, the nets are shot and hauled over the side and the fish gutted on deck. Prior to storage the fish is packed on ice in the hold. Voyages were approximately 3 weeks duration allowing the 20-man crew 2-3 days ashore between trips.

(b) Modern stern freeze factory trawler (Fig. 3): These vessels were pioneered in Britain after the Second World War in the interests of more efficient fishing and crew safety (Hjul, 1972). The nets are shot and hauled through a stern ramp and there is a high freeboard offering more protection. Gutting is carried out below deck and their larger crews remain at sea for many months and have a turn round time in port of over a week.

Source of Information
The origins of the data for this survey were the excellent Miranda hospital records and her medical logs. In the 10 years of this support ship's service a total of 58 medical logs should have been kept by medical officers who signed on for 6 week voyages, and after all possible sources had been investigated details from 55 were available, the majority being well kept. Only trawlermen examined by the doctor were documented. Patients were divided into those whose conditions were the result of trauma and the remainder who were classified under the heading of illnesses.

Results
Nine hundred and sixty-six patients were reviewed. Clinical details were unavailable in two.

Of the 527 trawlermen whose occupations were known, 608 worked primarily on deck. The engine-room staff accounted for 109 cases and the galley personnel for 68. Skippers numbered 22 and radio operators 20. Documentation of the fishermen's ages appears to have been neglected. Nearly two-thirds (624) were for illnesses, many of a minor nature, while 340 men were treated for trauma.

Illness (Tables I and III)
The diseases were divided into twelve groups. Where there was multiple pathology the patient was classified under the condition for which he first sought consultation. The commonest illnesses were dental conditions, gastrointestinal complaint and respiratory disease.

Added to the 112 dental cases are 10 patients with traumatic dental conditions including 2 mandibular fractures. In 87 cases the presenting symptom was toothache and generally dental hygiene was poor. There were 13 dental abscesses, 2 of which required drainage. One hundred and one teeth were extracted and there were a further three failures. Two fishermen had extractions ashore. Management was conservative in 24 cases with 10 temporary fillings.

In the gastrointestinal category 42 men were diagnosed as having peptic lesions, the most serious presenting as haematemesis and/or melena. There were 12 definite peptic ulcers, one thought to be neoplastic and 17 cases with a diagnosis of gastritis. Five patients with peptic symptoms were noted to have marked psychoses. There were 22 instances of gastroenteritis, 8 of which occurred simultaneously on a trawler leading to a temporary cessation of trawling. Five of the 7 cases of severe seasickness required hospitalization on Miranda. Five cases of appendicitis occurred, including a perforation. Of the 7 trawlermen...
cases presented with tinea infections and a similar contact dermatitis, half among the galley staff. Eight number with scabies. Inflammatory lesions included 13 presented no serious problems. There were 16 cases of status asthmaticus.

There were 13 anal lesions including 6 cases of tuberculosis with 2 prior myocardial infarcts. One patient had recently had a thoracotomy for a bronchial neoplasm and another to thought to be due to a neoplasm and another to tuberculosis. One patient recently had a throracotomy for a bronchial neoplasm and a second had a history of tuberculosis with 2 prior myocardial infarcts. There were 11 men with acute asthma, including 2 with status asthmaticus.

Dermatological consultations were common but presented no serious problems. There were 16 cases of contact dermatitis, half among the galley staff. Eight cases presented with tinea infections and a similar number with scabies. Inflammatory lesions included 13 boils or carbuncles and a single case of erysipelas. No case of erysipeloid was recorded. The so-called haddock rash, a condition in which abrasions on the hands sustained during the gutting of this fish become infected, accounted for three cases.

Low back pain with 38 cases was the major presenting symptom in the musculoskeletal group in which 18 were diagnosed as lumbar sacral strain and 20 prolapsed intervertebral discs including 2 with foot drop. The latter 2 cases were both factory managers manhandling heavy blocks of frozen fish. Of the 5 men with cervical spondylosis, one had a cervical graft. An alarming case was the flare-up of a chronic osteomyelitic humerus. Three cases of 'jumbo' wrist, a tenosynovitis around the forearm and wrist associated with the prolonged gutting of fish, were seen.

All otolaryngeal conditions were of a comparatively minor nature with pharyngitis or tonsillitis accounting for 23 cases. There were 11 ear infections which rapidly resolved on antibiotics. Ten patients with deafness due to wax were treated. One of the more exotic cases was a previously diagnosed chondroma of the nasal bone and in another case a piece of duff (a type of sea urchin) in the external auditory meatus required removal.

Ophthalmic disease was uncommon. Most cases were a mild conjunctivitis and only one gave cause for

<table>
<thead>
<tr>
<th>System</th>
<th>Dental</th>
<th>Gastrointestinal</th>
<th>Respiratory</th>
<th>Dermatology</th>
<th>Musculoskeletal</th>
<th>Otolaryngology</th>
<th>Neurological</th>
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<th>Genitourinary</th>
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Table III. The dispersal of trawermen with 'illnesses'

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<th>Illness</th>
<th>Dental</th>
<th>Gastrointestinal</th>
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<th>Musculoskeletal</th>
<th>Otolaryngology</th>
<th>Neurological</th>
<th>Psychiatric</th>
<th>Cardiovascular</th>
<th>Genitourinary</th>
<th>Venerology</th>
<th>Ophthalmology</th>
<th>Infectious</th>
<th>Miscellaneous</th>
<th>Totals</th>
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<td>Totals</td>
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<td>111</td>
<td>108</td>
<td>73</td>
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<tr>
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<td>5</td>
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</table>

with inguinal hernias, one became critically ill following strangulation with peritonitis and pneumonia. There were 5 cases of biliary disease and 5 of constipation. One jaundiced patient diagnosed as having cirrhosis also had severe bronchitis and auricular fibrillation. There were 13 anal lesions including 6 cases of haemorrhoids, and 3 perianal abscesses requiring drainage.

The respiratory diseases included influenza. A diagnosis of acute or chronic bronchitis was made in 42 instances. There were 9 cases of pneumonia or pleurisy and a further 2 were the complications of measles and a strangulated hernia. Five men had haemoptysis, one thought to be due to a neoplasm and another to tuberculosis. One patient recently had a throracotomy for a bronchial neoplasm and a second had a history of tuberculosis with 2 prior myocardial infarcts. There were 11 men with acute asthma, including 2 with status asthmaticus.

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concern. He was a cook, blind in one eye, who developed signs of acute inflammation in the other which fortunately settled with antibiotics.

Thirty-one patients presented with psychiatric or neurological conditions and a further 6 diagnosed when seen with other conditions. Acute depression was the commonest psychosis (15 cases). There were 8 cases of psychiatric illness related to alcohol, usually withdrawal symptoms. Five trawlermen presented with schizophrenia, 1 with previous in-patient treatment. One known epileptic required treatment and in another case a neurological condition was noted. There were 3 cases of post-traumatic stress disorder.

The majority of cardiovascular cases were over 40 years old. Ten fishermen were hypertensive, 1 a known diabetic. There were 5 myocardial infarcts. One fisherman known to have mitral stenosis was seen in congestive cardiac failure.

Patients with urological complaints were seen on 18 occasions, 4 presenting with renal colics. Infections, (epididymitis, cystitis and balanitis) accounted for 10 cases. Two elderly fishermen presented with prostatic disease. The 11 cases of sexually transmitted disease were divided into anatomical groups. The commonest injuries were to the hand, the most serious being 2 traumatic amputations of the thumb, 2 amputations of little fingers and a degloving of the index finger, all resulting from trapping the digit in machinery or between warps. Infection, with 39 cases, was the commonest presenting pathology. The most serious were 2 cases of supplicative tonsillitis of a finger and an osteomyelitic thumb. Whitlows and felonias were common. Cellulitis was present in 7 patients and 9 had marked axillary lymphadenitis.

There were 36 lacerations, the majority caused during gutting, but no cut tendons or nerves were documented. Twenty-two patients reported with contusions and 1 foreign body was removed. Thirteen hands sustained injuries and 2 cases of frostbite among deckhands and 4 of the galley staff sustained minor burns.

Most head and neck injuries were of a minor nature. In only 11 cases was intracranial injury suspected. Two patients were thought to have fractured skulls and the accidents were divided into anatomical groups.

The majority of injuries consisted of facial bruises and lacerations, but included 2 fractured mandibles, 2 badly displaced nasal septa and 6 broken teeth. Four of the galley staff sustained face scalds. Eye injuries accounted for 17 cases and the only serious lesion was a dislocated lens. Two engineers sustained flash burns and foreign bodies were removed from 7 corneas. Two radio operators were injured, one with a scalp wound from an airgun pellet. The severity of the trauma varied considerably but 102 trawlermen were hospitalized, 98 on the support ship. There was a single fatality. A total of 81 fractures, 5 amputations, 3 dislocations and 3 palsies were noted among 71 patients. The accidents were divided into anatomical groups.

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cases of inflammation were probably fisherman's conjunctivitis, an inflammatory condition caused by contact with the juices of a marine growth.

In the lower limb the most serious injuries were to the thigh; there were 2 fractured shafts of the femur and probably a third in a man with gross bruising and a sciatic palsy. Injuries around the knee included a 'bumper' fracture with a foot drop, a dislocated patella and 5 lesions described as torn cartilages, including a locked knee. The remaining fractures were 3 of the tibia and fibula and 5 involving the ankle joint. The commonest injuries (11 cases) were inversion strains of the ankle. One case which caused concern was an infected haematoma over a previously plated tibia. Contusions, lacerations and several traumatic knee effusions were recorded.

Chest injuries hospitalized on Miranda were often worrying. Two with fractured ribs required chest drainage; one a haemothorax, the other a pneumothorax with a grossly collapsed lung. In 19 cases, including a bronchitic with a history of tuberculosis, a diagnosis of fractured ribs was made although in only 9 was the chest X-rayed. Two patients developed pneumonia. A common diagnosis (15 cases) was bruising of the chest wall.

The most dramatic injury was to the upper limb. A deckhand sustained a traumatic amputation through the upper arm when the limb became trapped in a warp. Although critically ill he was resuscitated on the support ship and survived after surgery ashore. Eight fractures were seen; 5 of the radius and ulna, the remainder being a shaft of humerus, a clavicle and a Colles' fracture. The two dislocated shoulders were both reduced on Miranda. The remaining injuries were trivial except for a radial palsy following a blow to the arm.

Injuries to the foot were generally of a minor nature, the only cases of note being a compound fracture of the first metatarsal and a deckhand with multiple phalangeal fractures.

All spinal injuries were in deckhands who sustained their injuries by falls or being buffeted by the elements whilst on deck. None was serious, except for 1 traumatic prolapsed intervertebral disc.

The only serious abdominal injury was a ruptured kidney presenting with haematuria in a deckhand thrown against machinery. Two patients sustained minor pelvic fractures and another claimed his inguinal hernia followed a fall.

Three injured trawlermen could not be classified anatomically. Two deckhands suffered from salt water immersion and hypothermia while the third reported with an infected bee sting!

### Table V. Ten most common conditions leading to consultations, hospitalization, and repatriation or death, in order of diminishing frequency

<table>
<thead>
<tr>
<th>Order</th>
<th>Consultations</th>
<th>Hospitalization</th>
<th>Repatriation/death</th>
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<tr>
<td>1</td>
<td>Hand trauma</td>
<td>Gastrointestinal illness</td>
<td>*Gastrointestinal illness</td>
</tr>
<tr>
<td>2</td>
<td>Dental conditions</td>
<td>Hand trauma</td>
<td>Musculoskeletal conditions</td>
</tr>
<tr>
<td>3</td>
<td>Gastrointestinal illness</td>
<td>Musculoskeletal conditions</td>
<td>Lower limb trauma</td>
</tr>
<tr>
<td>4</td>
<td>Respiratory conditions</td>
<td>Lower limb trauma</td>
<td>**Cardiac conditions</td>
</tr>
<tr>
<td>5</td>
<td>*Dermatology</td>
<td>Head/neck trauma</td>
<td>*Psychiatric/neurology conditions</td>
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<td>Musculoskeletal conditions</td>
<td>Psychiatric/neurology conditions</td>
<td>Hand trauma</td>
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<td>7</td>
<td>Head/neck trauma</td>
<td>Respiratory conditions</td>
<td>Chest trauma</td>
</tr>
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<td>Otolaryngology</td>
<td>Chest trauma</td>
<td>*Respiratory conditions</td>
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<td>9</td>
<td>Lower limb trauma</td>
<td>Upper limb trauma</td>
<td>*Head/neck trauma</td>
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<tr>
<td>10</td>
<td>Chest trauma</td>
<td>Cardiac conditions</td>
<td>Upper limb trauma</td>
</tr>
</tbody>
</table>

Number of patients in each group in parenthesis.

*Denotes a death.

Dispersal of Patients (Tables II, IV and V)

Patients can be divided into those managed on their trawlers, those hospitalized and those who died. Patients were also repatriated.

Three-quarters of the patients (721) were managed on their trawlers. However, the majority of dental cases and hand injuries, the two largest groups were initially treated on Miranda, all but 32 returning to their vessels immediately.

Two hundred and thirty-seven patients were hospitalized, 17 of whom were admitted to hospital ashore from their trawlers. The conditions most often requiring hospital care were gastrointestinal, and of these 42 fishermen only 10 were hospitalized ashore, 4 after initial resuscitation on the support ship. While musculoskeletal conditions were the second most common cause of non-traumatic hospital admissions, it was among psychiatric/neurological and cardiac patients that most problems arose both at sea and ashore. Most trauma admissions were hand injuries, often to ensure rest and effective antibiotic treatment. Hospitalization with lower-limb injuries, mostly fractures, was common as were head and neck lesions. Although the latter were seldom life threatening, by contrast over half the chest injuries required urgent evacuation to hospital ashore.

There were 6 deaths, the only trauma fatality following a severe head injury caused by an engine room explosion. An unfortunate trawler death followed a massive haematoma, the crew not realizing the urgency of the situation. The third death was an asthmatic who, after initially being stabilized on the support ship, relapsed into status asthmaticus. Myocardial infarcts accounted for 2 deaths, 1 of which was confirmed by post-mortem examination. The remaining fatality was a skipper on treatment for depression who was lost overboard.

A total of 170 patients was repatriated, 138 directly from the trawler support ship. Illnesses accounted for
101 repatriations, the largest number being gastrointestinal followed by musculoskeletal disorders, all but one presenting with severe backache. The illnesses most likely to necessitate repatriation were cardiological and psychiatric conditions.

Sixty-nine trawlermen were repatriated after accidents. Lower limb trauma, mostly fractures, was the commonest cause followed by hand injuries. Over a third of chest trauma patients were sent home but only one-sixth of the head and neck injuries.

**Discussion**

Little appears in the literature on the health of British trawlermen at sea. Miller (1959) of the Royal Navy’s Fishery Protection Service states that the majority of patients suffered from the effects of trauma. Moore (1969b) reports on the medical aid given by this same service but states that just as many trawlermen suffered from illnesses.

In this survey, 35 per cent of consultations were for trauma. The West Germans, who run a comprehensive trawler support ship service, state that between 1950 and 1955, 31 per cent of consultations were the result of trauma (Goethe et al., 1959), while between 1976 and 1980 the figure fell to 20 per cent (Kaerger, 1982). In 1955 22 per cent of consultations by Polish trawlermen at sea resulted from injury (Ejsmont, 1959), while during a 6-month voyage in 1974 by a Polish fishing fleet only 11 per cent of consultations involved trauma (Kozielec, 1976). The lower West German and Polish figures may result from their more comprehensive medical service at sea, while the British figures reflect a primarily emergency service.

Hand injuries were the commonest single cause of trauma. Burns (1955), prior to World War II recognized the seriousness of hand injuries among trawlermen, particularly those which became infected. Moore (1969b) showed that 38 per cent of trauma was to the hand. Goethe et al. (1959) reported that among West German trawlermen 13 per cent of all disabilities were septic conditions of the hand, and in this present survey septis was also the commonest presenting symptom in hand injuries. Lacerations and fractures rarely resulted in much time lost from work. With a combination of active use and antibiotics few cases required repatriation and rarely did the injury prejudice future employment on trawlers. As a sound principle all trawlermen with open hand injuries should be given a course of antibiotics.

As chest injuries caused so much concern and were potentially life-threatening, it is essential for any physician serving on a trawler support ship to be well versed in the diagnosis and management of these conditions.

It was injuries to the lower limbs, mostly fractures, which, though in the main not life-threatening, resulted in the greatest number of trauma repatriations. A lower-limb injury of any significance on a working trawler can be intolerable for the patient. The head and neck injuries, although including a fatality, were of less consequence than the statistics suggest.

When discussing accidents on the Arctic fishing grounds, mortality must be considered. Schilling et al. (1969) pointed out that the commonest single cause of death among British trawlermen at sea was drowning. The official figures covering the period of this survey are 89 deaths due to accidents at sea, of which 55 were drownings (Department of Trade, 1970/1980).

However, it was for illnesses rather than trauma that most consultations were sought. Gastrointestinal disease was common, accounting for the largest number of hospital admissions and repatriations. Similar findings are reported by Moore (1969). Richardson (1982) found one-third of all medical repatriations from Hull trawlers was for either gastrointestinal or psychiatric illness. While few in number, the psychiatric patients in this survey caused many problems confirming the view that they should be totally excluded from distant water trawlers. Although alcohol withdrawal symptoms were seen on occasions drunkenness was not a problem on the fishing grounds.

There were few cardiovascular complaints but three-quarters were either repatriated or died. Only health education and possibly more stringent routine medical examinations could reduce this morbidity. Respiratory conditions were numerous and most cases causing concern, including the fatality, were asthmatics. There must surely be a good case for barring known asthmatics from this employment.

The only other group which caused much incapacity was musculoskeletal conditions. Backache and sciatica were the commonest presenting symptoms often resulting in men off work for long spells. The West Germans found that musculoskeletal conditions accounted for 11 per cent of their consultations (Kaerger, 1982).

The West Germans have been aware of dental problems in fishermen for many years (Goethe et al., 1959), but in spite of strenuous efforts in both treatment and education (Galitzien, 1977) little improvement has resulted (Wianz, 1981). The Poles carry dentists on their mother ships (Ejsmont, 1958) and all doctors on West German trawler support ships undertake a 3-week dentistry course (Kaerger, 1982). Following a programme of treatment and education, few Grimsby fisherman over the past 3 years have been landed for dental treatment (Renfrew, 1982). It would be sensible to extend such a campaign and so provide a comprehensive dental service for all trawlermen. Any trawler support ship medical officer should have some dental training and be competent at extractions.

There have been good health services for trawlermen in both Grimsby and Hull since the 1930s, but men certified as medically unfit still manage to arrive on the Arctic fishing grounds. In the past this resulted from large numbers of side trawlers urgently requiring men to complete crews in order to achieve as little delay in port as possible. Careful selection of crew should now be possible with the larger stern trawlers having a longer time in port between voyages.

TSS Miranda's 10 years of service as a trawler support ship has highlighted the need for medical expertise on the distant fishing grounds. Trawlermen live hazardous and often extremely fatiguing lives. They contribute to the nation's economy and deserve good medical care while at work.

With the virtual closure to Britain of her traditional Arctic fishing grounds the future for our trawlermen may be long voyages to far-off waters. Such a policy
will require fit fishermen and adequate medical facilities at sea.

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REFERENCES

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