PORT OF LIVERPOOL

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

TO THE

PORT SANITARY AUTHORITY

FOR THE YEAR

1935

BY

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Port Medical Officer of Health.

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1936.

PRINCIPAL CONTENTS.

SECTIONS :—

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Staff of the Liverpool Port Sanitary Authority, 1935.

Medical Officer of Health:
W. M. FRAZER, M.D., M.Sc., D.P.H., Barrister-at-Law.

Deputy Medical Officer of Health:
C. O. STALLYBRASS, M.D., B.S., M.R.C.S., L.R.C.P., D.P.H.

Senior Assistant Port Medical Officer:
E. R. PEIRCE, M.R.C.S., L.R.C.P., D.P.H., D.T.M.

Assistant Port Medical Officers:
P. P. FOX, M.B., Ch.B., M.R.C.S., D.P.H.
W. L. WEBB, M.B., Ch.B. (Part-Time).

Sanitary Staff.

Chief Inspector: E. CLARKE.
Assistant Chief Inspector: J. GRIFFITHS.
Four Sanitary Inspectors.
Eleven Rat Officers.

Food Inspection Staff.

Chief Food Inspector: J. H. SAVAGE.
Seven Food Inspectors.

Crew of Motor Launch "Moyles."

Captain: T. PENWILL.
Seven members of crew.

Port Sanitary Hospital, New Ferry.

Caretaker: W. H. DODWELL.

Clerical Staff.

Senior Clerk: W. G. DUNNING, M.B.E. (to April 30th).
J. F. WARD (from May 1st).
Three Clerks.
Clerk at Municipal Annexe: L. MANDIN.

PORT SANITARY AUTHORITY

OF

LIVERPOOL.

REPORT FOR THE YEAR 1935,

BY THE

MEDICAL OFFICER OF HEALTH.

This is the 63rd Annual Report on the work of the Liverpool Port Sanitary Authority.

The report covers the work of the Authority during the year and includes an account of :—

(*a*) the measures adopted under the Port Sanitary Regulations, 1933;

(*b*) the measures taken to reduce the number of rats on dock quays and in ships, and to ascertain the existence of plague among any such rats;

(*c*) the measures taken in regard to the sanitation of vessels;

(*d*) the inspection of imported foodstuffs under the Public Health (Imported Food) Regulations, 1925, and the Public Health (Imported Food) Amendment Regulations, 1933;

(*e*) the medical inspection of aliens under the Aliens Order, 1920;

together with observations on various aspects of Port Sanitary Administration.

Jurisdiction of the Port.

The limits of jurisdiction of the Port Sanitary Authority are those of the Customs Port of Liverpool as defined in the Treasury Warrant of November 3rd, 1896, which are as follows:—

"From the Red Stones in Hoylake on the Point of Wirral and "continued up the river Mersey on the Cheshire shore thereof to "the Western side of the entrance to the Manchester Ship Canal "at Eastham, thence in an easterly direction across the said "entrance and along the Cheshire shore of the river to Ince "Ferry, the western termination on the Cheshire shore of the "Port of Manchester, thence crossing the said river Mersey in a "supposed straight line to Dungeon Point, being the western "termination on the Lancashire shore of the said Port of "Manchester, and continued along the coast of the County of "Lancashire to the southern boundary of the Port of Preston, "viz., an imaginary line drawn in a true north-north-west direc- "tion from the inner north-west sea-mark on the beach at Formby "Point, shown on the Admiralty chart of the survey of the West "Coast of England from Formby Point to Kirkcudbright, published "on the 23rd day of October, 1893. And the said Port shall include "all islands, rivers, bays, channels, roads, bars, strands, harbours, "havens, streams, and creeks (except the said Manchester Ship "Canal) within the said limits contained, and shall extend sea- "ward to a distance of three miles from low water-mark along "the coast within the aforesaid limits."

The contributing Riparian Authorities are the County Boroughs of Birkenhead, Bootle and Wallasey, and the Urban District Council of Bebington.

Amount of Shipping Entering the Port during the Year 1935.

Class of Vessels.	Number.	Tonnage.	Number Inspected.		Number reported to be defective.	Number of vessels on which defects were remedied.	Number of vessels reported as having, or having had, during the voyage, infectious disease on board.
			By the Medical Officer.	By the Sanitary Inspector.			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SAILING FOREIGN—							
Steamers	7,024	13,929,341	851	3,845	460	402	235
Motor				439	38	38	
Sailing				3	—	—	
Fishing	—	—	—	—	—	—	—
TOTAL FOREIGN...	7,024	13,929,341	851	4,287	498	440	235
SAILING COASTWISE—							
Steamers	7,554	2,723,038	—	384	44	32	1
Motor				23	—	—	
Sailing				2	—	—	
Fishing	—	—	—	—	—	—	—
TOTAL COASTWISE...	7,554	2,723,038	—	409	44	32	1
TOTAL FOREIGN AND COASTWISE ...	14,578	16,652,379	851	4,696	542	472	236

Figures in columns 1 and 2 supplied by H.M. Collector of Customs for this Port.

Character of Trade of Port.

The Port of Liverpool trades with all parts of the world, and almost every conceivable kind of cargo is carried by ships arriving in the Mersey.

Passenger Traffic during 1935.

No. of Passengers ...	1st Class.	2nd Class.	3rd Class.	Tourist Class.	Pleasure Cruises.	Transmigrants
Inwards	5,337	8,267	11,515	9,312	11,937	1,175
Outwards	12,621	10,465	8,811	9,197	11,375	1,489

Source of Water Supply.

The water used in the docks on the Liverpool side of the River Mersey is supplied by the Liverpool Corporation. Vessels in dock are supplied from hydrants from the same source, and vessels in docks on the Birkenhead side of the River Mersey are supplied with water by the Birkenhead Corporation and the Wallasey Corporation.

There are no water boats in use in the Port of Liverpool, all water being drawn from hydrants on the quayside.

Latrines on the Dock Estate.

The latrines on the Dock Estate from time to time have been the subject of representations from the Port Sanitary Authority to the Mersey Docks and Harbour Board. The process of slum clearance in the City has almost eliminated the insanitary courts with their trough closets common to a number of houses, and *pari passu* with this process the Board have carried out a programme of modernisation of the latrines upon their estate, including a sum for this purpose in their annual estimates.

The latrines vary in depth some being four feet and some six feet deep, and in the older docks the brickwork and cement had not infre-

quently become dilapidated. In the more modern docks four-foot latrines are mainly provided, and these have been provided with automatic flushing tanks.

The reconstructed latrines have pipes at ground level and are provided with automatic flushing tanks. Up to July, 1935, the number of sets of latrines reconstructed was 52. For the year July, 1935, to June, 1936, provision has been made for the reconstruction of a further nine sets, and there remain a further 31 sets on the eastern side, of which 13 are four-foot latrines and the remainder are six-foot latrines.

PORT SANITARY REGULATIONS

1933.

Port Sanitary Regulations, 1933.

Arrangements for dealing with Declarations of Health.

(*a*) *Vessels from Infected Ports.* The Declarations of Health of vessels arriving from Infected Ports are obtained by the assistant port medical officers who board these vessels before docking.

(*b*) *Vessels from Non-Infected Ports.* The Declarations of Health from vessels arriving from non-infected ports are obtained by the customs officers who transmit them either by post or by hand to the Port Sanitary Office.

Infectious Disease.

The measures adopted in Liverpool to prevent the importation of infectious disease from abroad are as follows :—

(1) The boarding by the assistant port medical officers of certain vessels on arrival in the river and before docking, viz. :—

(*a*) Vessels from certain parts of the world where dangerous infectious disease is known to exist.

(*b*) Vessels in which infectious disease exists at the time of arrival, or has occurred during the voyage.

(2) The visiting of vessels in dock by sanitary inspectors as soon as possible after docking.

(3) The trapping of rats in ships and on quays and their examination for signs of plague infection.

(4) Co-operation with the officers of H.M. Customs, who report to the Port Sanitary Authority, if they obtain information of sickness on board vessels visited by them.

Information of the arrival of vessels which, under the regulations of the Port Sanitary Authority, must be boarded by the port medical officer before docking, is obtained by the co-operation of the pilotage service. All vessels, except very small craft, must be navigated into the port by either a licensed pilot or a master or mate holding a Liverpool pilot's certificate. Willing assistance has always been given by the pilots in carrying out the regulations.

All pilots are supplied by the Liverpool Port Sanitary Authority with a book containing questions to be put to the master immediately on boarding, and also a list of infected ports where dangerous infectious disease is known to exist. These instructions, together with the list of infected ports, are amended from time to time.

A medical officer is available both day and night for the purpose of boarding, by means of the boarding launch "Moyles," incoming vessels from infected ports, or vessels which have cases of infectious disease on board at the time of arrival. During the year 684 vessels from infected ports were boarded in the river by the assistant port medical officers, and in addition 167 vessels were visited for the purpose of alien and other inspection. Of the vessels boarded in the river 100 were bound for Manchester. Vessels, whether from infected ports or not, arriving in Liverpool are visited as soon as possible after docking by a sanitary inspector, who enquires into the occurrence of any sickness during the voyage, and if necessary communicates with the port medical officer.

The deratisation, or alternatively the deratisation exemption certificate, is inspected, and if found to be in order the inspector proceeds to the examination of the sanitary condition of the vessel, pointing out any defects and suggesting the remedy to be adopted. It has been found that the shipping companies are always ready and willing to remedy any defects in their vessels which have been pointed out to them by the port sanitary inspectors.

Motor Launch "Moyles."

The motor launch "Moyles" has continued to give satisfactory service during the year and except for the period of annual overhaul has been on continuous duty. The launch, which is able to develop a speed of over eleven knots, enables the medical officers to deal expeditiously with vessels arriving from infected ports.

Arrangements for disposal of cases of Infectious Disease and for observation or surveillance of contacts.

Cases of smallpox, plague, cholera or yellow fever are removed from the vessel before docking by the motor launch "Moyles," and conveyed to the Port Sanitary Hospital, New Ferry, by water. Cases of

infectious disease other than the above are removed, usually after the vessel docks, to one of the city hospitals by means of the Health Committee's motor ambulances. Contacts with infectious cases living at addresses in the city, if not removed to hospital, are kept under observation by the city sanitary inspectors, and in the event of any contact proceeding to an address outside the city, the medical officer of health of the district concerned is advised.

Mooring Stations.

Outer Mooring Station. That part of the River Mersey known as the *Sloyne* and situated in Tranmere Bay has been designated the Liverpool Outer Mooring Station.

Inner Mooring Stations. Every discharging and loading berth within the docks has been designated an Inner Mooring Station.

Particulars of any standing exemptions from the provisions of Article 14.

The following notice in the form of a leaflet has been issued to all customs officers with regard to exemptions from the provisions of Article 14.

PORT OF LIVERPOOL SANITARY AUTHORITY

PORT SANITARY REGULATIONS, 1933.

Article 14 (1).

Where a ship arrives in a district from a foreign port, and it appears to the customs officer from answers to questions in the **Declaration of Health** or from answers to inquiries made by him or otherwise,

(*a*) that during the voyage (or where the voyage has lasted more than 6 weeks, during the last 6 weeks) there has been on the ship a death from illness suspected to be of an *infectious nature or of a case of such illness;

or

*Plague, Cholera, Yellow Fever, Smallpox or Typhus.

(*b*) that during the voyage the ship has called at a port or seaboard included in the list of infected ports (see local list as supplied to customs officers and pilots);

or

(*c*) that during the voyage (or where the voyage has lasted more than 6 weeks, during the last 6 weeks) Plague has occurred or been suspected among rats or mice on the ship, or sickness or death not attributable to poisoning or other measures for destruction has occurred among the rats or mice on the ship;

he shall direct the ship to be taken to and detained at a mooring station unless the medical officer or other authorised person of the Sanitary Authority otherwise allows.

For the purpose of this article, standing **exemption** from detention is granted for the following diseases, in which case the medical officer should be immediately notified:—

Acute Polio-Encephalitis.
Cerebro-Spinal Meningitis (Cerebro Spinal Fever).
Chickenpox.
Continued Fever.
Diphtheria.
Dysentery.
Epidemic Infantile Paralysis (Acute Poliomyelitis).
Encephalitis Lethargica.
Erysipelas.
German Measles (Rubella).
Measles.
Malaria.
Membranous Croup.
Pneumonia (either Primary or Influenzal).
Relapsing Fever.
Scarlatina or Scarlet Fever.
Trench Fever.
Tuberculosis (all forms).
Typhoid or Enteric Fever.

N.B.—Standing Exemption means that unless exceptional circumstances occur, vessels are to be cleared in the usual manner without the attendance of the boarding medical officer.

Restriction on Boarding or Leaving Ship (Article 16).

(*a*) *Vessels from Infected Ports, or Infected or Suspected Vessels.*—No person is allowed to board or leave any such vessel until it has been cleared by the assistant port medical officer and a certificate stating that "pratique may be issued" has been given.

(*b*) *Vessels from Non-Infected Ports.*—No person is allowed to board or leave any such vessel until the customs officer has satisfied himself that there are no reasons requiring the attendance of the port medical officer.

No difficulty has been experienced in carrying out the provisions of Article 16.

Premises and Waiting Rooms for Medical Inspection.

A room has been suitably equipped on the Prince's Landing Stage for use of the medical officers for medical examinations.

Arrangements for disinfection of Infected Quarters, Bedding, Clothing, etc.

Infected quarters are disinfected as soon as possible by means of liquid sulphur dioxide (sulphume) or by spraying with disinfectant by the staff of the Port Sanitary Authority. The bedding, clothing, etc., are removed by vans to the Charters Street disinfecting station and there disinfected by steam.

Arrangements for Cleansing of Persons.

This is carried out at either the City Hospital, Sparrow Hall, or the City Hospital North, Netherfield Road, to which the persons are conveyed by motor ambulance and where temporary accommodation is available.

The Port Isolation Hospital.

The Isolation Hospital was erected in 1877 at New Ferry, in the County of Cheshire, on land adjoining the River Mersey, and close to the quarantine station in the Sloyne anchorage ground. A slipway extends from the hospital to the water edge, and is available for the landing of patients from half-tide to high water.

The hospital was extended in 1901 and 1902 by the addition of a new pavilion, a suitable laundry and steam disinfector, also additional nurses' quarters.

The premises are chiefly used for the isolation of sea-borne cases of infectious disease, but from time to time cases have been received

on behalf of neighbouring authorities, under special agreement, when accommodation has been available. By the agreement with the Manchester Port Sanitary Authority signed December 6th, 1933, arrangements are made by which suitable cases may be admitted from vessels lying in the Ship Canal. On the other hand, owing to the different types of infectious disease occurring in vessels coming into the Mersey, and the necessity of providing separate accommodation for men, women and children, it has been advantageous to admit cases of ordinary infection to the city hospitals where cases of a similar character are already accommodated.

Arrangements for Ambulance Transport.

The motor ambulances of the Liverpool Corporation are available for this purpose.

Supervision of Contacts.

All contacts remaining in the City and Port of Liverpool are inspected daily during the incubation period of the disease. In the event of contacts proceeding to other districts the medical officers of health of destination are informed and particulars concerning the history of the case are also forwarded.

Arrangements for detection and treatment of Venereal Disease among sailors.

Careful enquiry is made by the boarding medical officers and the port sanitary inspectors into the history of cases that may have been reported during the voyage. This is usually obtained from responsible officers of the ship, e.g., captain, surgeon or chief engineer.

Leaflets, stating the times of attendance at the various venereal disease clinics in the city (attention being especially drawn to the Seamen's Dispensary), are distributed freely to masters of vessels; treatment at these clinics is obtained free of cost to the patient, and in all instances the masters of vessels are advised to arrange for the attendance of the patients at one of the clinics.

For further details relating to the treatment of Venereal Disease, see pp. 34-38.

Arrangements for bacteriological examination of rats.

The systematic examination of rats caught by the Port Sanitary staff is carried out by the Liverpool City Bacteriologist.

During the year 4,207 rats and mice were examined for possible plague infection, 978 being from ships, and 3,229 from the sheds and quays at the docks.

INFECTIOUS DISEASE.

Infectious Diseases.

The number of cases of infectious disease *landed from vessels* arriving in the Port of Liverpool and those occurring in Liverpool bound ships which were disposed of *prior to the arrival* of the vessels at the port, together with the average for the preceding five years, are shown in the following tables :—

Cases of Infectious Sickness Landed from Vessels.

Diseases.	No. of Cases during 1935.		No. of Vessels concerned.	Average No. of Cases for previous 5 years.
	Passengers.	Crew.		
Plague	—	—	—	—
Cholera...	—	—	—	—
Yellow Fever...	—	—	—	—
Smallpox	—	—	—	0·2
Typhus Fever	—	—	—	—
Scarlet Fever...	1	1	2	6
Enteric Fever and Paratyphoid Fever	—	1	1	4
Diphtheria	2	—	1	3
Measles	5	—	5	8
Chickenpox	3	4	7	12
Tuberculosis	7	20	25	59
Pneumonia	—	5	5	11
Dysentery	—	1	1	2
Malaria	4	48	35	34
Cerebrospinal Fever	—	—	—	1
Erysipelas	—	1	1	1
	22	81	83	141

Cases of Infectious Sickness occurring on Vessels during the Voyage but Disposed of Prior to Arrival.

Diseases.	No. of Cases during 1935.		No. of Vessels concerned.	Average No. of Cases for previous 5 years.
	Passengers.	Crew.		
Plague	—	—	—	—
Cholera	—	—	—	2
Yellow Fever...	—	—	—	—
Smallpox	—	—	—	6
Typhus Fever	—	—	—	0.2
Scarlet Fever...	—	1	1	6
Enteric Fever and Paratyphoid Fever	3	9	10	10
Diphtheria	—	7	6	5
Measles and German Measles ...	25	1	16	30
Chickenpox	12	15	13	22
Tuberculosis	8	10	16	30
Pneumonia	3	19	21	29
Dysentery	—	8	8	10
Malaria	5	119	85	172
Cerebrospinal Fever...	—	—	—	1
Erysipelas	—	1	1	1
	56	190	177	324

In all these diseases it is not only a fatal issue which is dreaded, but there are some diseases, e.g., malaria and venereal disease,* which, if left untreated will become chronic or incurable. The reasons why sailors are more exposed to such diseases than other men are plain enough. Their calling continually brings them into contact with countries where infective diseases are prevalent, often in epidemic form, and when ashore they mix with that part of the population which is frequently infected.

* There were 167 cases of venereal disease reported on board 123 vessels arriving in the port during the year. These were referred where circumstances required, for treatment at the Seamen's Dispensary. (See page 35).

Smallpox.

No case of smallpox was landed at Liverpool during the year, and no cases were reported to have been landed elsewhere from Liverpool-bound vessels.

Suspected Smallpox—s.s. "Laconia".

On March 11th, 1935, information was received from the Cunard-White Star Company that a wireless message had been received from the s.s. "Laconia", cruising from the Mediterranean and Egypt, stating that a lady passenger, aged 22 years, was suffering from suspected smallpox. The ship's surgeon had advised all persons on board to be vaccinated, and was carrying this out on the way to Liverpool.

The vessel arrived in the Mersey at 8 a.m. on March 13th, and was boarded in the river by the assistant port medical officers. The patient was examined and the case diagnosed as chickenpox, and removed by the Port Sanitary Launch "Moyles" to the Port Sanitary Hospital, New Ferry. All persons on board were inspected by the assistant port medical officers, and the names and addresses were checked, but in view of the diagnosis of chickenpox, were not forwarded to the medical officers of health of destination.

The cabin occupied by the patient, and the ship's hospitals were fumigated by the Port Sanitary Authority. The vaccination history of the patient was of particular interest: she was vaccinated when eleven years old and had two marks on the left arm, but had not been vaccinated since.

On admission to the Port Sanitary Hospital, vaccination by the intra-dermal method was performed; there was no immune reaction after 24 hours and the vaccination took in the ordinary way, thus

confirming the diagnosis of chickenpox. The patient made an uninterrupted and uneventful recovery.

Yellow Fever.

No cases of yellow fever were reported in Liverpool-bound vessels during the year.

Anthrax.

The importation of large amounts of animal products, which are handled in transit to stores or manufactories, has associated with it the risk of human infection with the anthrax bacillus, causing a condition known as malignant pustule or cutaneous anthrax.

The fatal cases frequently quoted in these reports emphasise the importance of early diagnosis and serum treatment in all cases of this disease, and the Health Department has taken steps to make facilities for diagnosis available for the public.

Posters have been printed on the subject and are affixed in suitable places. A pocket card has also been issued containing full information regarding the appearance and symptoms of cutaneous anthrax and advice on the action to be taken. Arrangements are also made to admit all cases of anthrax or suspected anthrax direct to Fazakerley hospital.

Two cases of anthrax infection came under treatment at the City Hospital, Fazakerley, during 1935. Both patients were Liverpool residents working in the city, one being employed as a warehouseman by a firm of wool brokers, and the other as a wool sorter by a local wool merchant. The first of these, that of an elderly man, was moderately severe, but the second was of marked severity and required an exceptionally large amount of anti-anthrax serum (2355 ccs.) to effect recovery.

Anthrax.

Cases treated at Liverpool City Hospital, Fazakerley, during 1935.

Series No. continued from 1934.	Age.	Sex.	Occupation.	Days ill on admission.	Site of Infection.	Clinical Notes.	Serum injected daily. Each dose expressed in ccs.	Complications.	Result.
61	59	M.	Wool broker's warehouseman	4	Side of neck behind ear.	Incipient disphagia much induration.	300 150 300 300 300	Tardy response to treatment.	Recovery.
62	19	F.	Wool sorter ...	2	Side of throat below angle of jaw.	Very extensive swelling from ear to nipple line; toxæmia marked.	270 250 } 325 } 250 } 300 } 310 } 90 } 300 260 (90 ccs. hæm. streptococcus serum also given.)	Swelling from above ear to lower costal margin, dyspnœa, dysphagia, delirium.	Recovery.

All serum was given intravenously except the 90 ccs. on the fourth day in case 62 which was injected intramuscularly owing to the delirious state of the patient. In addition to serum, each patient was given 0.3 mgm. and 0.45 mgm. neokharsivan intravenously on the first and third days respectively.

Injections of serum bracketed were given on the one day

In the course of the year eighteen persons attended at the hospital for investigation under anthrax suspicion. These were mainly employees at the docks or local tanneries, etc. One man was found to be suffering from that disease and was detained for treatment. The others were cases of local septic infection, boils, carbuncles, etc.

Special arrangements have also been made for the treatment of cases coming from districts outside Liverpool.

The question of the disinfection of hides and skins is still under consideration, but there are difficulties in evolving a method which will be successful, not only in destroying the anthrax spores without damaging the material, but one which can be utilised on a commercial scale. A method has recently been evolved depending upon a selective action of hydrogen sulphide upon anthrax spores, but has so far not led to a commercially practicable method of treatment.

In order to eliminate as far as possible the handling of hides by dock labourers and others, the hide trades connected with this port have agreed not to open bales of China hides at the docks beyond what is necessary for sampling purposes.

The disinfection of imported dangerous wools is carried out at the Government Wool Disinfecting Station, Love Lane, and the Liverpool Port Sanitary Authority assists by having samples of the untreated wools and those which have passed through the disinfecting process, examined by the City Bacteriologist; this helps to confirm and control the Duckering disinfecting process. During the year 356 samples of treated and untreated wool, hair, etc., were examined and 82 untreated samples showed positive evidence of anthrax infection. Those treated were all found to be free from anthrax infection.

The Ministry of Agriculture has drawn attention to the danger to farm animals in Great Britain in connection with the shipment in foreign ports of commodities containing the spores of anthrax. The disease is prevalent in animals in many parts of the world from which supplies of raw hides, hair, wool and feeding stuffs, e.g., cattle cake and its ingredients, are drawn. Infection may be conveyed to the farm by means of such animal substances from foreign countries, especially those places where inadequate or no precautions are taken.

Anthrax spores may be shaken from the above-mentioned animal products and may become mixed with foodstuffs or hold-sweepings, and thus infection may be indirectly conveyed to animals of the farm.

The spores of the anthrax bacillus have great resisting power, and may remain active for years unless measures are taken to destroy them.

The suggestion is made that special precautions should be adopted so that dried hides, wool, hair, etc., should not be carried, mixed with, or be placed on top of grain or feeding stuffs, and that the holds which have contained animal products of this nature should be thoroughly disinfected; further, that the sweepings of holds containing grain, etc,. should not be mixed with other foodstuffs.

Rodent Plague.

Two rats, which were found dead in a dockside grain warehouse, were reported by the City Bacteriologist to be plague-infected.

History of the outbreak.

Shortly before noon on 4th December, 1935, a rat officer of the Port Sanitary Authority found a dead rat on the top of some planks on the ground floor of a large block of grain warehouses. The rat was brought to the Port Sanitary Offices, labelled as "Suspected" with a special type of red label, and taken immediately to the City Bacteriologist for examination.

At 3 p.m. the same afternoon a telephone communication was received through the Public Health Department to the effect that the City Bacteriologist reported that the examination of this rat had shown organisms suggestive of bacillus pestis, and that the rat had been forwarded to the Ministry of Health Laboratories for confirmation of the diagnosis.

Measures taken to combat the outbreak.

The assistant port medical officers, the chief sanitary inspector, and a party of rat officers proceeded to the warehouses and an intensive rat-catching and rat-searching campaign was commenced, both in the warehouses and the surrounding district. By 5-30 p.m. 40 traps had been baited and set, and the next day these were augmented. On

December 6th another rat was found dead on the ground floor of the same section: it was brought immediately to the Port Sanitary Offices, labelled "Suspected", and sent at once to the City Bacteriologist for examination. At 4 p.m. a telephone communication was received through the Public Health Department that this rat had been reported to be suspicious of plague infection; the diagnosis was subsequently confirmed by the Ministry of Health.

All rats trapped in the warehouses and the surrounding districts since the discovery of the outbreak were examined by the City Bacteriologist, but no further infection was discovered. Up to 31st December, 1935, the number of rats and mice which were found dead, trapped, and killed in this area were as follows:—

	Found Dead.		Trapped.		Killed.	
	Rats.	Mice.	Rats.	Mice.	Rats.	Mice.
Grain Warehouses	8	14	35	31	9	21
Surrounding Area	—	1	23	1	1	—

Grain Warehouses.

Total Rats found dead, trapped, and killed.....	52
Total Mice ,, ,, ,, ,, ...	66
	118

Surrounding Area.

Total Rats found dead, trapped, and killed.....	24
Total Mice ,, ,, ,, ,, ...	2
	26

Rats found to be plague-infected	2

Up to the time of printing, no further plague-infected rats have been discovered in the Port or City, and it can be definitely stated that the infection has been localised and overcome.

The buildings of the grain warehouses, which were constructed about one hundred years ago, are solidly built of brick, divided into ten sections, and each section consists of a basement, ground floor, and

five upper storeys. The basements have a false board flooring supported on joists about six inches from the earth and thus provide a permanent harbourage for rats.

Various kinds of grain in bulk are brought by barge from vessels in the various docks, to the warehouse; the grain is sucked up from the barge and eventually stored either in one of the upper floors or in the basement. When required it is transferred to the ground floor by means of chutes, where it is weighed and bagged, ready for distribution by motor lorries or carts.

The following details show how the grain was disposed of when the infection was discovered :—

	Floor.	Type of Grain.	Country of Origin.
Section 1 ...	Basement ...	Empty.	—
	Ground Floor ...	Bags of Dari seed	Persia.
		Bags of flour ...	Local (Liverpool and Ellesmere Port).
		Bags of white maize ...	South Africa.
	1st Floor ...	Bulk wheat	Canada.
	2nd ,, ...	Bulk barley	,,
	3rd ,, ...	Bulk oats	,,
	4th ,, ...	Bulk oats	,,
	5th ,, ...	Bulk oats	,,
Section 2 ...	Basement ...	Bulk white maize ...	South Africa.
	Ground Floor ...	Bags of Dari seed ...	Persia.
		Bags of flour	Local.
		Bags of meal	South Africa.
	1st Floor ...	Bulk Dari seed ...	,,
		Bulk white corn ...	,,
	2nd ,, ...	Bulk barley	Russia.
	3rd ,, ...	Bulk Dari seed ...	Persia.
	4th ,, ...	Bulk wheat	Canada.
	5th ,, ...	Bulk wheat	,,
Section 3 ...	Basement ...	Bulk white maize ...	South Africa.
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bulk maize	River Plate.
	2nd ,, ...	Bulk barley	Russia.
	3rd ,, ...	Bulk barley	,,
	4th ,,	Bulk barley	,,
	5th ,, ...	Bulk barley	,,
Section 4 ...	Basement ...	Bulk white maize ...	South Africa.
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bulk peas	Russia.
	2nd ,, ...	Bulk maize	River Plate.
	3rd ,, ...	Bulk white maize ...	South Africa.
	4th ,, ...	Bulk white maize ...	,,
	5th ,, ...	Bulk white maize ...	,,

	Floor.	Type of Grain.	Country of Origin.
Section 5 ...	Basement ...	Does not exist	—
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bags of flour	,,
	2nd ,, ...	Bulk yellow maize ...	South Africa.
	3rd ,, ...	Bulk yellow maize ...	,,
	4th ,, ...	Bulk yellow maize ...	,,
	5th ,, ...	Bulk white maize ...	,,
Section 6 ...	Basement ...	Does not exist	—
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bulk corn	River Plate.
	2nd ,, ...	Bulk corn	,,
	3rd ,, ...	Bulk corn	,,
	4th ,, ...	Bulk corn	,,
	5th ,, ...	Bulk maize	South Africa.
Section 7 ...	Basement ...	Various bags of maize	Not known.
	Ground Floor ...	Bags of meal	South Africa.
		Bags of maize	,,
	1st Floor ...	Bulk white maize ...	,,
	2nd ,, ...	Bulk barley	Canada.
	3rd ,, ...	Bulk barley	Russia.
	4th ,, ...	Bulk white maize ...	South Africa.
	5th ,, ...	Bulk white maize ...	,,
Section 8 ...	Basement ...	Empty	—
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bulk yellow maize ...	South Africa.
	2nd ,, ...	Bulk white maize ...	,,
	3rd ,, ...	Bulk white maize ...	,,
		Bulk yellow maize ...	River Plate.
	4th ,, ...	Bulk white maize ...	South Africa.
	5th ,, ...	Bulk maize	River Plate.
Section 9 ...	Basement ...	White maize	South Africa.
	Ground Floor ...	Bags of flour	Local.
	1st Floor ...	Bags of yellow maize ...	South Africa.
	2nd ,, ...	Bags of white maize ...	,,
	3rd ,, ...	Bags of white maize ...	,,
	4th ,, ...	Bags of yellow maize ...	River Plate.
	5th ,, ...	Bags of white maize ...	South Africa.
Section 10. ...	Basement ...	Mixed sacks of various corns.	—
	Ground Floor ...	Miscellaneous bags of various corns.	—
	1st Floor ...	Bags of yellow maize ...	South Africa.
	2nd ,, ...	Bags of white maize ...	,,
	3rd ,, ...	Bags of white maize ...	,,
	4th ,, ...	Bags of white maize ...	,,
	5th ,, ...	Bags of wheat	Canada.

Measures taken to prevent the spread of the infection to vessels in the neighbourhood.

It was extremely fortunate that at the time of the outbreak there was only one vessel in the vicinity, and that in the next dock. Steps were immediately taken to prevent any ingress or egress of rats by affixing efficient rat-guards, tarring and parcelling mooring ropes and wires, and raising the gangway at night. Since the vessel was due to sail on December 10th, and in order that loading should not be delayed, it was arranged that constant supervision should be exercised, and breasting-off six feet from the quayside dispensed with.

Measures taken to deal with rat harbourage.

Temporary rat harbourage.

Each floor of the warehouses was systematically examined; the basement areas were found to contain large accumulations of refuse, a large proportion of which had been blown in from the roadway. These were all cleaned out and the refuse removed to the destructor. Heaps of old sacks, a quantity of scrap-iron and rubbish were also removed.

On every floor all corners and under-stairways were cleared of everything likely to afford harbourage for rats. Before and after the removal of any refuse it was sprayed with an emulsion of Vermijelli by one of the officers of the Port Sanitary Authority.

In an adjoining warehouse a large collection of old books and papers was found, which afforded good harbourage for rats: these were removed and burnt. In the open space at the rear of the warehouse all refuse was removed, and a quantity of timber re-stowed; the open space beneath the offices of the Grain Warehouse Company was cleaned out and all refuse removed. Altogether, over 17 tons of refuse and 5 tons of old books were removed to the destructor.

Permanent rat harbourage.

The whole of the basement of the warehouse was found to be covered with a false wooden flooring supported on wooden joists, and with a space of about six inches between the flooring and the earth. The presence of rat holes and other evidence showed that this space was being used by rats as a permanent harbourage.

Strong representation was made that this flooring should all be taken up and six inches of concrete substituted, and this work is now in progress. It is hoped that the whole of the basement will have a concrete floor early in 1936.

There can be no doubt that the prompt action taken prevented a very serious outbreak of rodent plague in the Port, and demonstrates the importance of the routine measures which are constantly carried on, whereby regular examinations of samples of the rat population are carried out. In particular it emphasises the importance of the policy of the Port Sanitary Authority of paying special attention to the finding of dead rats.

Malaria.

During the year, 63 new cases of malarial fever were notified, which were either landed in Liverpool or had recovered abroad, in 31 vessels. The names and addresses of the patients, with particulars of the treatment given, together with the movements of the vessels, were forwarded to the Ministry of Health.

Psittacosis.

The Parrots (Prohibition of Imports) Regulations, 1930, are still in force, and during the year 1935 the number of orders issued was 38.

The Sanitary Authority enforce the Regulations, Sections 4 and 5 which state as follows :—

Section 4. A person shall not import any *parrot into England or Wales whether for sale or otherwise :

Provided that nothing in these regulations shall be deemed to prohibit the importation of any parrot which is proved to the satisfaction of the Medical Officer of Health to be required for purposes of medical or veterinary research, or which is consigned to the Zoological Society of London or to a person for the time being specially authorised by the Minister (Health) to import parrots otherwise than for sale.

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* "Parrot" means a bird of the order Psittaciformes, and includes any of the birds commonly called parrots, parrakeets, lovebirds, macaws, cockatoos, conures, caiques, lories and lorikeets.

Section 5. The master of every ship approaching any port shall, if he has reason to believe that a parrot is on board, bring these regulations to the notice of the person having the custody or control of the parrot, and shall immediately on the arrival of the ship notify the proper officer of Customs and Excise accordingly.

VENEREAL DISEASES.

Venereal Diseases.

A very important subject which has close association with seafaring life is the prevalence of venereal diseases. As a result of the Report of the Royal Commission, the Public Health (Venereal Diseases) Regulations were passed in 1916, which came into force in Liverpool in 1917. The object of the regulations was to ensure that the treatment of affected persons should be carried out so as to effect their cure and to prevent the further spread of infection. The various county and borough councils were required to prepare schemes for free treatment at or in hospitals or institutions of persons suffering from these diseases and for the free distribution of suitable drugs to properly qualified medical practitioners. By a scheme of educational propaganda the public generally were to be informed of the dangers of these diseases and also of the facilities for free treatment which were available. The Government originally paid 75 per cent. of the expenditure, but this payment is now included in the Block Grant and subject to revision from time to time.

The scheme has had an extensive trial and very good results may be claimed for it. The free facilities and supply of special drugs have been fully taken advantage of by many classes of patients and their medical advisers. The accompanying graph facing page 38 shows the total number of new cases of the two principal venereal diseases year by year. The Central Clinic at Mill Road Infirmary is now well established. The total attendances of all patients during the year was 27,270, which represents an increase of more than 7,000 over the previous year. There are two clinics daily for both males and females.

The clinics operated by the Corporation during 1935 were as follows:

Seamen's Dispensary (Males only).
Mill Road Infirmary Special Clinic (Males and Females).
Royal Infirmary (Males and Females).
Edge Lane Medical Home (Females only).

To face page 35.

Services rendered at the Venereal Diseases Treatment Centres during the Year, 1935.

	Syphilis.		Soft Chancre.		Gonorrhœa.		Conditions other than Venereal.		Totals.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Totals.
1. Number of cases on 1st January under treatment or observation	692	230	20	...	728	252	16	4	1,456	486	1,942
2. Number of cases removed from the register during any previous year which returned during the year under report for treatment or observation of the same infection	161	16	8	...	207	8	...	...	376	24	400
3. Number of cases dealt with for the first time during the year under report (exclusive of cases under Item 4) suffering from :—											
Syphilis, primary	115	7	...	...	...	...	...	...	115	7	122
,, secondary	48	21	...	...	...	...	...	...	48	21	69
,, latent in 1st year of infection	16	13	...	...	...	...	...	...	16	13	29
,, all later stages	191	129	...	...	...	...	...	...	191	129	320
,, congenital	34	49	...	...	...	...	...	...	34	49	83
Soft Chancre	...	...	130	...	...	...	...	...	130	...	130
Gonorrhœa, 1st year of infection ...	...	...	...	...	1,231	104	...	...	1,231	104	1,375
,, later	...	...	...	...	105	47	...	...	105	47	152
Conditions other than venereal ...	...	...	...	...	...	...	1,338	254	1,338	254	1,592
4. Number of cases dealt with for the first time during the year under report known to have received treatment at other Centres for the same infection	261	61	19	...	271	52	...	...	551	113	664
	1,518	526	177	...	2,542	503	1,354	258	5,591	1,287	6,878
5. Number of cases discharged after completion of treatment and final tests of cure	73	11	65	...	619	70	1,331	244	2,088	325	2,413
6. Number of cases which ceased to attend before completion of treatment and were, on first attendance, suffering from :—											
Syphilis, primary	70	9	...	...	...	...	...	...	70	9	79
,, secondary	30	25	...	...	...	...	...	...	30	25	55
,, latent in 1st year of infection	5	8	...	...	...	...	...	...	5	8	13
,, all later stages	138	61	...	...	...	...	...	...	138	61	199
,, congenital	12	14	...	...	...	...	...	...	12	14	26
Soft Chancre	...	...	23	...	...	...	...	...	23	...	23
Gonorrhœa, 1st year of infection ...	...	...	...	...	470	92	...	...	470	92	562
,, later	...	...	...	...	69	11	...	...	69	11	80
7. Number of cases which ceased to attend after completion of treatment but before final tests of cure	39	1	8	...	106	20	...	...	153	21	174
8. Number of cases transferred to other centres or to institutions, or to care of private practitioners	211	37	30	...	352	36	...	...	593	73	666
9. Number of cases remaining under treatment or observation on 31st December ...	940	360	51	...	926	274	23	14	1,940	648	2,588
	1,518	526	177	...	2,542	503	1,354	258	5,591	1,287	6,878
10. Number of cases in the following stages of syphilis (*included in Item 6*) which failed to complete one course of treatment :—											
Syphilis, primary	9	6	...	...	...	...	...	...	9	6	15
,, secondary	3	4	...	...	...	...	...	...	3	4	7
,, latent in 1st year of infection	1	3	...	...	...	...	...	...	1	3	4
,, all later stages	33	26	...	...	...	...	...	...	33	26	59
,, congenital	6	7	...	...	...	...	...	...	6	7	13
11. Number of attendances :—											
(*a*) for individual attention of the medical officers	14,742	7,563	874	...	28,973	5,540	2,576	678	47,165	13,781	60,946
(*b*) for intermediate treatment, e.g., irrigation, dressing	526	69	1,184	...	66,919	14,223	18	9	68,647	14,301	82,948
TOTAL ATTENDANCES ...	15,268	7,632	2,058	...	95,892	19,763	2,594	687	115,812	28,082	143,894
12. In-patients :—											
(*a*) Total number of persons admitted for treatment during the year ...	78	35	6	...	56	12	11	...	151	47	198
(*b*) Aggregate number of "in-patient days" of treatment given	3,491	862	191	...	1,958	529	148	...	5,788	1,391	7,179

	Under 1 year.		1 and under 5 years.		5 and under 15 years.		15 years and over.		Totals.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
13. Number of cases of congenital syphilis in Item 3 above classified according to age periods	3	4	...	6	9	13	22	26	34	49

	Approved Arsenobenzene Compounds.	Mercury.	Bismuth.
14. Total number of injections given (out-patients and in-patients) ...	8,272	1,241	11,505

	Microscopical		Serum Tests		
	for spirochetes.	for gonococci.	Wassermann.	Others for Syphilis.	for Gonorrhœa.
15, **Pathological Work :—**					
(*a*) Number of specimens examined at, and by the medical officer of, the Treatment centre	237	2,633	...	...	...
(*b*) Number of specimens from patients attending at the Treatment Centre sent for examination to an approved laboratory ...	182	8,671	5,425	1,030	1,506

The following summarises the work of the treatment centres for the year 1935:—

	Seamen's Dispensary Males only.	†Royal Infirmary. Males and Females.	*Royal Southern Hospital. Males and Females.	†Mill Road Infirmary Spl. Clinic. Males and Females.	†Edge Lane Medical Home. Females.	TOTAL. Males and Females.
New Cases	2,259	1,242	8	1,035	90	4,634
Old and new patients						
Total attendances	52,804	63,820	361	27,270	—	144,255
In-patient Days	—	75	4	7,104	5,475	12,658

The Seamen's Dispensary, Mill Road Special Clinic and the Royal Infirmary are open all day for treatment of these diseases for males, while Mill Road Special Clinic is also open afternoon and evening for females. At the Royal Infirmary treatment for females is provided each day at hours convenient to the greatest number of patients.

Laboratory services for the diagnosis and control of treatment are provided at the City Laboratories, the Thompson Yates Laboratory of the University and the Mill Road Infirmary Laboratory.

At the city laboratory, Wassermann reaction tests are done three times weekly, rapid diagnosis obviating delay in treatment.

Wherever possible an effort is made to ascertain the person responsible for the patient's infection, with a view to bringing him or her under observation and treatment.

Experience has shown that it is the close personal touch with the patient and the interest in his case which helps to stimulate the sufferer to continue treatment, but the absence of any feeling of ill-health or discomfort may cause the development of a sense of indifference and the desire to avoid the irksome routine of attendance.

*** Closed as from 31st January, 1935.**
†Beds for In-patients are reserved at these Institutions.

Many patients who are suffering from gonorrhœa unfortunately do not report for treatment until a few weeks have elapsed and the disease has extended considerably from the original point of infection, in many cases having complications, and involving important organs. This neglect or inability to seek medical advice may be attributed to the nature of employment or absence on ship at sea, but those who reside locally frequently can and do come for treatment at an earlier stage; the disease, however, is well established in the majority before they present themselves for treatment.

An analysis of the various types of the total actual number of new cases of venereal disease met with at the clinics is as follows :—

	Percentage of total cases of diagnosed Venereal disease.
Syphilis	32·1%
Soft chancre	5·0%
Gonorrhœa	62·9%

The figures for Liverpool correspond to those for the country generally.

Seamen's Dispensary.

The primary function of this clinic is to provide free and expert treatment for seamen of all nations, to act in an advisory capacity to medical officers of ships, ships' captains, and foreign consulates, and to provide a laboratory service for rapid diagnosis. Although the majority of the patients are seamen, other classes of occupation are also dealt with.

The staff consists of four part-time medical officers and four highly trained orderlies.

Excellent results have been recorded both in the treatment of gonorrhœa and of syphilis, and special schemes of treatment particularly suited to the needs of the seafaring population have proved efficient.

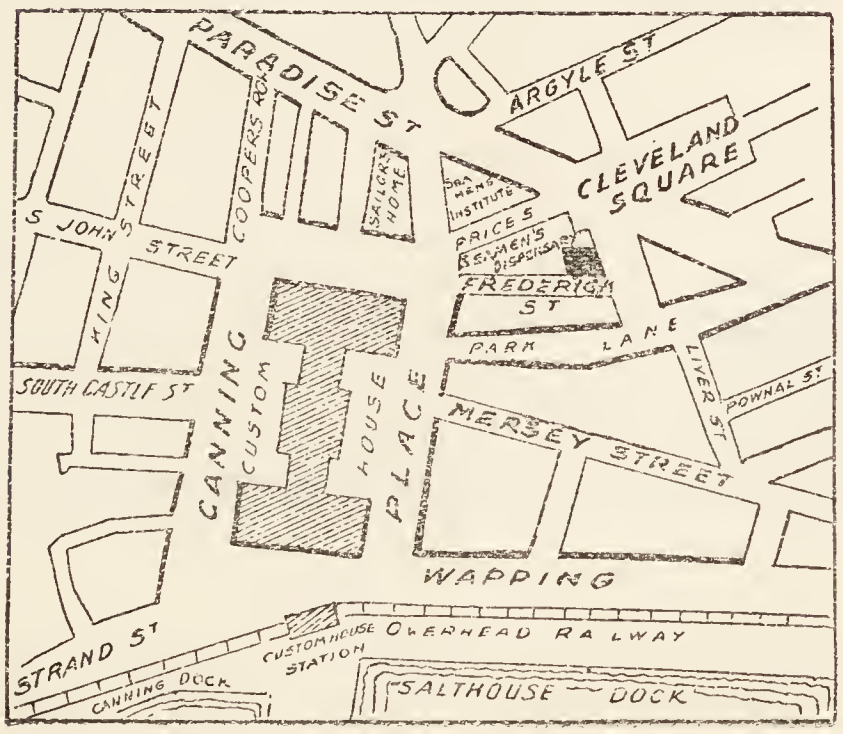
During the year under review, 3,248 cases have been advised and treated, of whom 2,259 reported for the first time. Of these, 780 were found not to be suffering from venereal disease.

The classification of the cases dealt with at the Seamen's Dispensary for the first time during the year, and also for the five previous years, was as under :—

	1930	1931	1932	1933	1934	1935
Syphilis	419	346	293	304	354	380
Soft Chancre... ...	141	92	106	136	128	131
Gonorrhœa	1,113	970	834	918	1,019	968
Non-Venereal Cases...	589	563	440	586	698	780
	2,262	1,971	1,673	1,944	2,199	2,259

SEAMEN'S DISPENSARY.

CLEVELAND SQUARE.



Venereal Diseases.—Time Table of Treatment Centres

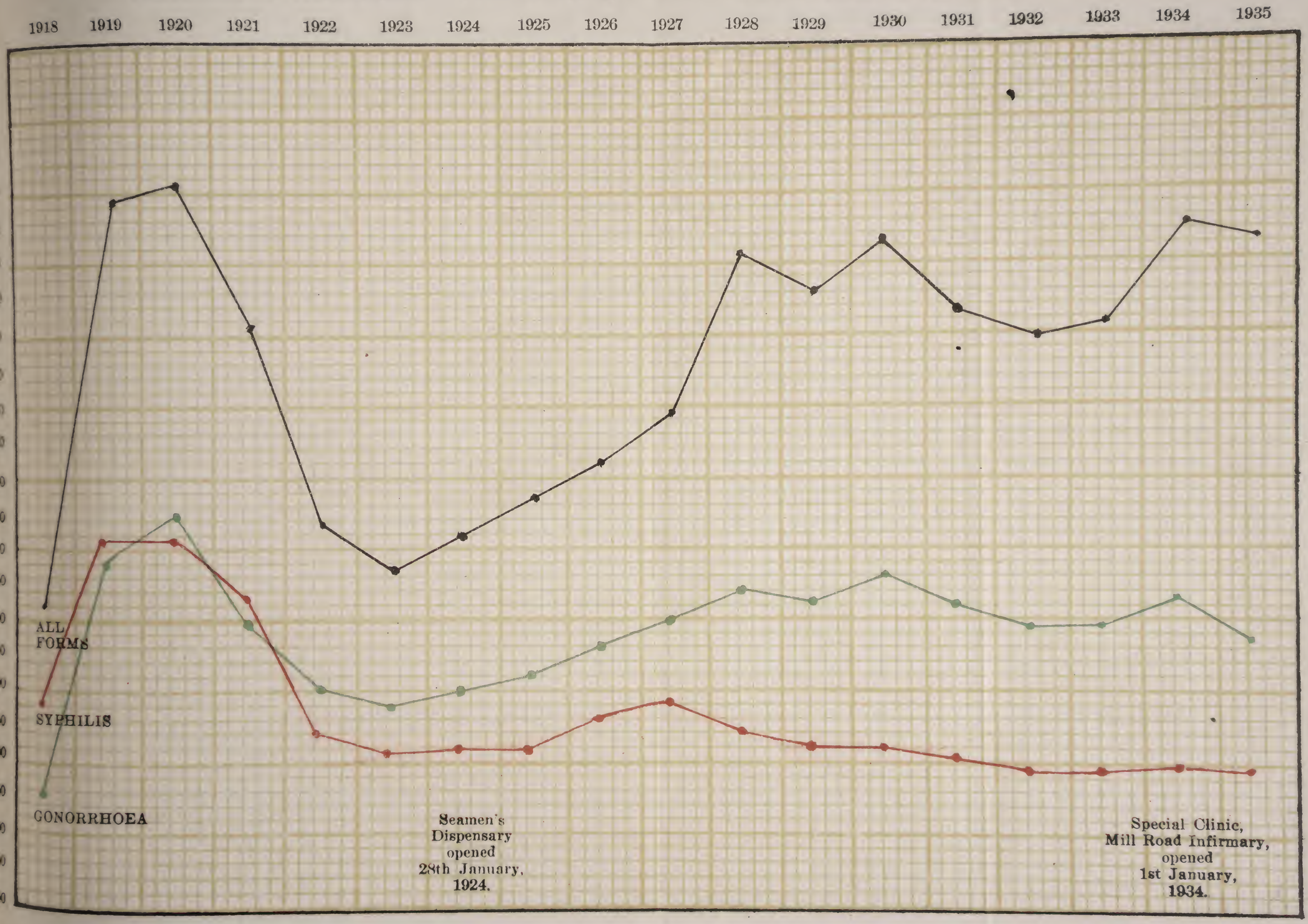
Monday :	Seamen's Dispensary	9.30 a.m. to 1 p.m. and 3 to 8 p.m.
	Royal Infirmary	10 a.m. to 1 p.m. and 5.30 to 6.30 p.m.
	Mill Road Infirmary...	10 a.m. to 1 p.m. and 6 to 8 p.m.
Tuesday :	Seamen's Dispensary	9.30 a.m. to 1 p.m. and 3 to 8 p.m.
	Royal Infirmary	10 a.m. to 1 p.m.
	Mill Road Infirmary...	10 a.m. to 1 p.m. and 6 to 8 p.m.
Wednesday :	Seamen's Dispensary	9.30 a.m. to 1 p.m. and 3 to 8 p.m.
	Royal Infirmary	10 a.m. to 1 p.m. and 5.30 to 6.30 p.m.
	Mill Road Infirmary...	10 a.m. to 1 p.m. and 6 to 8 p.m.
Thursday ..	Seamen's Dispensary	9.30 a.m. to 1 p.m. and 3 to 8 p.m.
	Royal Infirmary	5 to 6 p.m.
	Mill Road Infirmary...	10 a.m. to 1 p.m. and 6 to 8 p.m.
Friday ::	Seamen's Dispensary	9.30 a.m. to 1 p.m. and 3 to 8 p.m.
	Royal Infirmary	10 a.m. to 1 p.m. and 7 to 8 p.m.
	Mill Road Infirmary...	10 a.m. to 1 p.m. and 6 to 8 p.m.
Saturday ::	Seamen's Dispensary	9.30 a.m. to 1 p.m.
	Royal Infirmary	By arrangement.
	Mill Road Infirmary...	10 a.m. to 1 p.m.

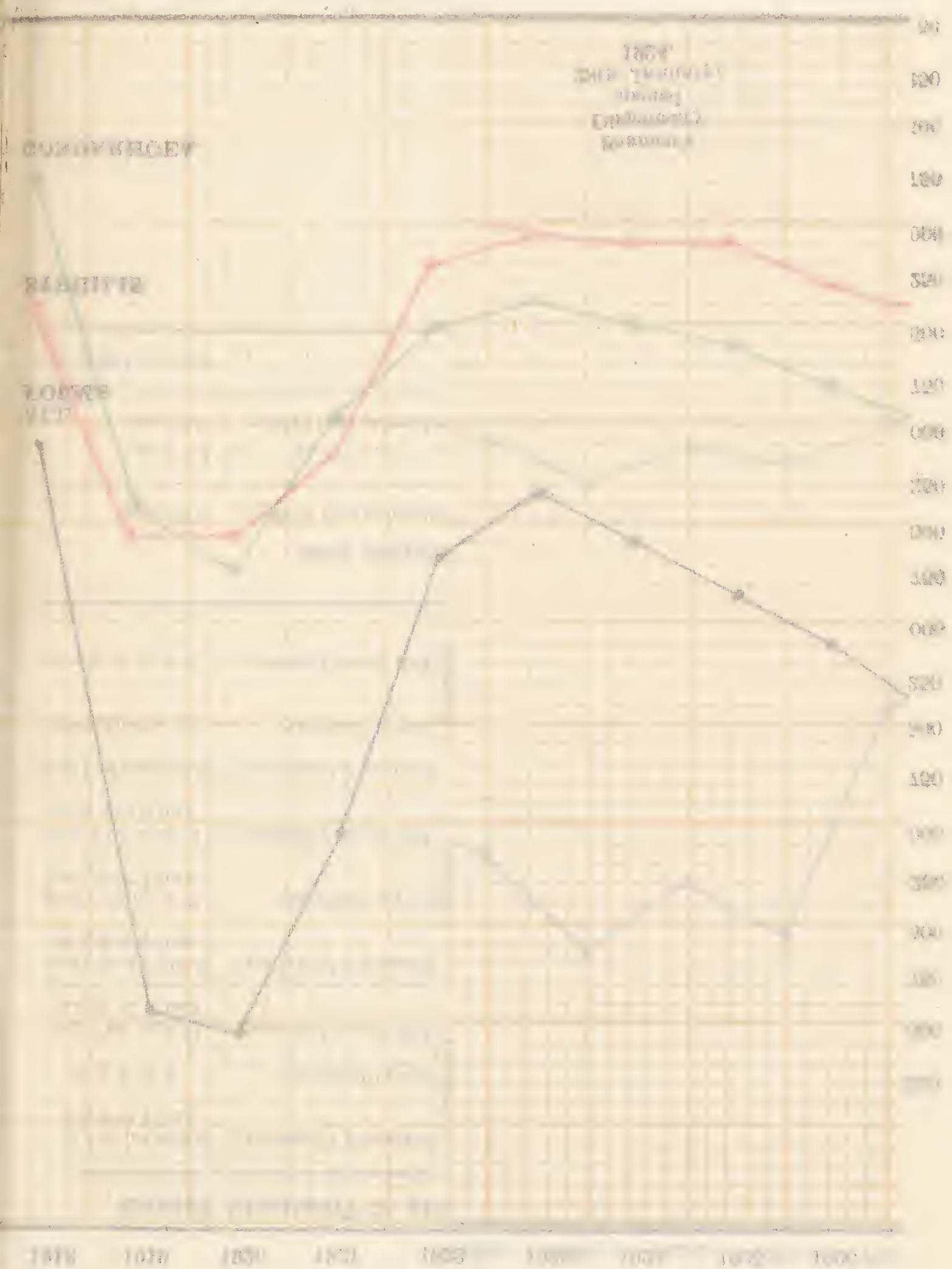
Clinics in Other Merseyside Areas.

Birkenhead General Hospital ...	Monday, Wednesday and Friday...	5.30 p.m.
Bootle General Hospital ...	Monday	5.0 p.m.
	Tuesday, Wednesday and Friday	6.0 p.m.
Wallasey, Mill Lane Hospital ...	Wednesday...	7.30 to 8.30 p.m.

CITY OF LIVERPOOL.

VENEREAL DISEASES. Chart shewing number of **New Cases** from **1918** to **1935.**





MEASURES AGAINST RODENTS.

Measures against Rodents.

The importance of rats as the agents which convey plague is well known, and requires no emphasis. It is, therefore, of the utmost value that the rat population both in ships and on the dock estate should be reduced to a minimum, and the following pages detail the measures which are adopted for this purpose, and also for the detection of plague amongst rats.

(*a*) All vessels trading with foreign countries have since 1928 been required under Article 28 of the International Convention of Paris to be provided with a certificate, not more than 6 months old, either of deratisation by an approved process, or of exemption after a thorough inspection which has revealed no evidence of rats;

(*b*) All vessels arriving from abroad are examined soon after arrival and during the discharge of cargo by trained rat-searchers. These men not only examine for evidence of rat infestation, but also search for dead rats, which are forwarded to the City Bacteriologist. This practice has been carried out in Liverpool since 1901, and has resulted in the discovery of a number of epizootics of rat plague on shipboard, which would probably otherwise have been overlooked;

(*c*) A trained staff of rat-catchers is employed who catch rats in incoming vessels, especially those from plague-infected ports, and also upon the docks and warehouses, etc. A large proportion of the rats and mice so caught—65·2 per cent. in 1935—is sent to the City Bacteriologist for examination for plague. Two rats were found to be plague infected. (See Rodent Plague, pp. 26-31.)

(*d*) Rat-proofing of ships. During the routine inspection of ships for certificates or otherwise, harbourage for rats which is capable of elimination is often found. Representations are then made to the owners or agents and such harbourage is either eliminated or the certificate endorsed;

(*e*) Rat-proofing of docks. Under the Rats and Mice (Destruction) Act, 1919, it is an offence to permit any premises to act as a

Labelling and dispatch to Laboratory of rats for examination for Plague.

("*Daily Dispatch*" *Photograph*.

breeding ground for rats. The Liverpool docks are of solid construction and generally speaking present a minimum of rat harbourage. Certain places, such as engineers' stores, accessory structures of a temporary or semi-permanent character, etc., are liable to harbour rats. As a result of long-continued action such premises have been made ratproof, and by constant supervision are so maintained;

(*f*) In order to prevent rats passing to and from vessels, ratguards are placed on the ropes between the ships and the quays.

As the result of these measures it may be affirmed that the risk of the introduction of rat plague has now been very greatly reduced.

International Sanitary Convention of Paris, 1926.
Article 28.

During the year, 172 fumigations were carried out for the purpose of obtaining Deratisation Certificates, and in addition 390 vessels were granted Deratisation Exemption Certificates, making a total of 562 examinations of vessels under Article 28. The table facing page 44 shows the number of rats which have been obtained after fumigation of vessels trading between Liverpool and the various ports of the world. This table covers the years 1932-1935:—

The Examination of Vessels for Deratisation or Deratisation Exemption Certificates.

In view of the importance of a systematic inspection of vessels for rat infestation and the numerous inquiries made for details of the procedure adopted at Liverpool, it has been deemed useful to repeat the methods of procedure which were published in last year's report.

It is the routine procedure in the Port of Liverpool to examine and make estimates of the degree of rat infestation of all vessels, as soon as an application is made by the owners for either a Deratisation or Deratisation Exemption Certificate.

The examination for either form of certificate is identical, and the best results are obtained when the vessel is completely empty. Representation is made to the owners of the vessel that all holds should be

swept up and cleaned 24 hours before the examination; by this means all old excreta are removed and only 24-hour excreta are present at the time of the examination. This fresh evidence, though small in amount, is recognised readily by the trained observer in situations where it would be overlooked by crew or dock workers employed about the vessel. Consequently the possibility of removal of this fresh evidence either by accident or design is minimised.

The examination is carried out by a sanitary inspector assisted by a rat searcher who are accompanied by a ship's officer, and is done systematically from stem to stern. The forepeak, stores, crew's quarters, and any other rooms in this vicinity are examined first. The rats obtain their food from the crew's quarters, and their nesting material and harbourage in the forepeak. The next compartment to be examined is the boatswain's store, which is of importance owing to the nature of its contents, which consist of ropes, canvas and other working gear. Particular attention is paid to any damage to ropes, or canvas, any gnawings of the woodwork and the presence of any excreta. Dirty marks of rat-runs may also be observed. If, as is often the case, it can be established definitely that this store contains an abundance of both fresh and stale excreta, two important facts are at once evident:—

(1) that the stores have not been properly cleaned for some considerable time and consequently may prove to be one of the headquarters of the rats in the ship; and

(2) that as shown by the presence of fresh excreta the rats have not forsaken this particular compartment.

The number, shape, colour, size and consistency of the fresh excreta are noted and efforts are made to discover what food has been available for the rats. By carefully weighing up the whole of the evidence obtained, an estimate of the number of rats inhabiting this part of the vessel is made. The holds are then examined in turn, working from forward to aft, estimates of the number of rats in the individual holds being made at the conclusion of each examination.

The lower hold is visited first, the nature of the cargo which has been carried is observed in order to determine the possibility of its being used by the rats for food. Search is then made for any definite evidence of rat-runs in the ceilings, and feet and tail marks on the stringers and

sparring. The number and characteristics of the excreta are noted carefully as before. On the completion of the examination of the holds the afterpeak is undertaken. The examination of this compartment is of importance as it is used in many ships as a provision store. The examination is conducted on the same lines as that of the forepeak.

Bunkers, engine room and tunnel are then examined in that order. In the bunkers, feet and tail marks in the coal dust are all that can be looked for. The runs to and from the bunkers can usually be found without much difficulty, as the constant passage of rats to and fro will keep the places of ingress and egress quite clear and free from coal dust. It is not at all usual to find rats in either the engine room, stokehold, or shaft alley, and if excreta be found it is difficult to distinguish their age owing to the heat of these particular compartments and the fact that they become dried up rapidly.

The main examination of the lower parts of the vessel is now complete and the examination of the quarters of the officers, petty officers, engineers and stewards, wireless and chart rooms, galleys, pantry, bakery, provision store rooms, and finally the lifeboats is proceeded with. In the living quarters, settee lockers, wardrobes, drawers and wash-bowl cupboards are examined for excreta, gnawings, nests and runs. In galleys, all food lockers, utensil cupboards, drawers and spaces behind stoves are examined. The runs and means of access to these places must be ascertained in order that they may ultimately be made rat-proof. Lifeboats should be inspected carefully because they are very liable to become headquarters for rats owing to the fact that they will remain undisturbed there for long periods. The evidence found in lifeboats consists of excreta and damage to ropes and canvas. It has been stated that in order to preserve the ropes and canvas, balls of newspaper have at times been thrown into the lifeboats so that the rats may have their nesting material all to hand. In passenger-carrying vessels, the passenger accommodation is examined in a similar manner to the officers' quarters already described. It is perhaps necessary to point out, that whilst the foregoing method is adhered to as far as possible as a routine practice, there are many occasions when the bunkers are examined first in order to allow the vessel to proceed with coaling, or again it may happen that owing to the cargo not being discharged as expected the top hamper is examined first and the holds examined as the discharge of cargo is completed. Many causes may

result in varying the routine procedure, but these are dealt with according to the particular circumstances.

The time taken over the search is checked carefully in each case by the sanitary inspector. The time varies according to the size and type of vessel, the amount of cargo present at the time of the search, and whether the cargo is being worked or not. For a thorough search of a cargo vessel from 4,000 to 5,000 tons by one man, the time required is approximately four hours, and a larger vessel, or one carrying both passengers and cargo, will require from four to six hours.

After all fumigations, an independent rat searcher is sent to search for dead rats, in order to check the estimate made before the fumigation is carried out. The time taken over this search is similarly checked by a sanitary inspector, and in cargo vessels, not carrying passengers, this usually takes from two to three hours. In vessels with passenger accommodation a further hour is necessary to make a complete search. It is not an easy matter to make an accurate estimation of the number of rats in a vessel when all sorts and conditions of cargo are carried. It has been observed that the rats will eat certain food in preference to any other. In such a case the excreta will have the characteristics of the particular diet which is being eaten, and the estimate can be based accordingly. If the excreta do not show any marked characteristics and it is not possible to determine what type of food the rats have been taking, a fairly accurate estimate may be obtained by the assumption that the average number of droppings from one rat in 24 hours is from 45 to 50. Examinations and inspections are only carried out in daylight, and any dark places must be adequately lighted.

Charges for Deratisation Certificates and Deratisation Exemption Certificates.

The Minister of Health has decided that the fee payable to the Port Sanitary Authority for the issuing of either form of certificate shall be as follows :—

	£	s.	d.
Ships up to 300 tons	0	10	6
,, from 301 tons to 1,000 tons	1	1	0
,, ,, 1,001 tons to 3,000 tons	2	2	0
,, ,, 3,001 tons to 10,000 tons	3	3	0
,, over 10,000 tons	4	4	0

COMPARATIVE STATEMENT FOR THE YEARS 1932-1935.

Number of Rats and Mice recovered from Vessels employed in the various Trade Routes, together with the number of Vessels examined and exempted or fumigated.

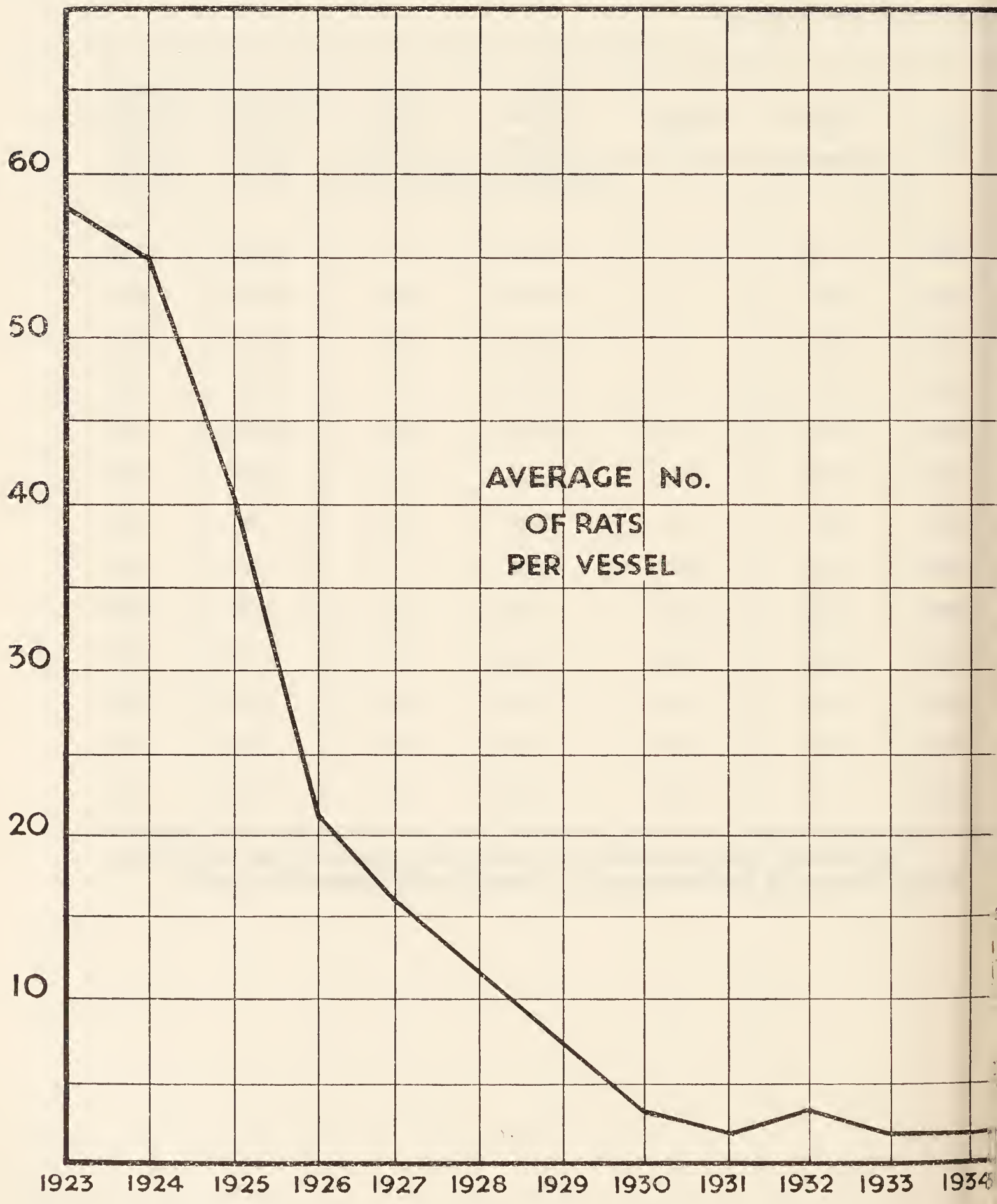
Trade.	1932							1933							1934							1935						
	Number of Ships.			Rats and Mice found after fumigation.		Average number per ship.		Number of Ships.			Rats and Mice found after fumigation.		Average number per ship.		Number of Ships.			Rats and Mice found after fumigation.		Average number per ship.		Number of Ships.			Rats and Mice found after fumigation.		Average number per ship.	
	Examined.	Exempted.	Fumigated.	Rats.	Mice.	Rats.	Mice.	Examined.	Exempted.	Fumigated.	Rats	Mice.	Rats.	Mice.	Examined.	Exempted.	Fumigated.	Rats.	Mice.	Rats.	Mice.	Examined.	Exempted.	Fumigated.	Rats.	Mice.	Rats.	Mice.
River Plate	76	41	35	487	55	6·40	0·72	60	39	21	114	90	1·90	1·50	68	39	29	352	18	5·17	0·26	62	35	27	232	2	3·74	0·03
W.C.S. America (Chili and Peru)	17	8	9	14	2	0·82	0·11	9	4	5	—	—	—	—	12	3	9	—	—	—	—	13	8	5	—	1	—	0·07
Argentine	5	1	4	4	—	0·80	—	2	1	1	5	—	2·50	—	3	2	1	—	—	—	—	6	2	4	83	1	13·83	0·16
Brazils	10	6	4	18	28	1·80	2·80	12	7	5	73	—	6·08	—	22	15	7	83	61	3·77	2·77	27	23	4	36	33	1·33	1·22
North America	19	13	6	26	65	1·36	3·42	23	18	5	55	61	2·39	2·65	25	14	11	11	—	0·44	—	17	10	7	5	—	0·29	—
Mexico	2	2	—	—	—	—	—	7	4	3	—	—	—	—	9	8	1	—	—	—	—	8	6	2	7	2	0·87	0·25
India	16	14	2	6	11	0·37	0·68	32	28	4	33	27	1·03	0·84	39	33	6	73	86	1·87	2·20	23	18	5	19	9	0·82	0·39
Mediterranean	17	14	3	—	—	—	—	52	45	7	27	22	0·51	0·42	51	39	12	71	20	1·39	0·39	44	34	10	62	15	1·40	0·34
Alexandria	21	12	9	76	37	3·61	1·76	13	6	7	105	5	8·07	0·38	9	5	4	3	—	0·33	—	13	10	3	26	6	2·00	0·46
Spain	6	6	—	—	—	—	—	9	8	1	—	11	—	1·22	5	4	1	35	—	7·00	—	5	5	—	—	—	—	—
Portugal	3	3	—	—	—	—	—	8	8	—	—	—	—	—	2	2	—	—	—	—	—	5	4	1	—	—	—	—
Grecian	22	15	7	29	71	1·31	3·22	10	6	4	36	29	3·60	2·90	7	5	2	9	3	1·28	0·42	9	7	2	4	17	0·44	1·88
China and Japan	13	12	1	—	—	—	—	22	18	4	2	—	0·09	—	28	24	4	13	12	0·46	0·42	24	21	3	5	8	0·20	0·33
West Indies	41	29	12	101	—	2·46	—	38	26	12	44	—	1·15	—	35	22	13	66	—	1·88	—	35	21	14	44	8	1·25	0·22
East Indies	1	1	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	—	—	—	—	2	2	—	—	—	—	—
Java	14	4	10	1	13	0·07	0·92	10	5	5	41	—	4·10	—	8	7	1	—	—	—	—	7	5	2	3	—	0·42	—
Madagascar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mauritius	1	—	1	6	—	6·00	—	3	2	1	—	32	—	10·66	1	—	1	8	—	8·00	—	1	1	—	—	—	—	—
Fiji Islands	3	2	1	—	—	—	—	2	2	—	—	—	—	—	2	1	1	—	—	—	—	2	1	1	—	—	—	—
Australia	53	42	11	51	124	0·96	2·33	59	41	18	113	45	1·91	0·78	69	49	20	77	27	1·11	0·39	75	44	31	49	18	0·65	0·24
Canada	29	20	9	73	7	2·51	0·24	37	25	12	102	1	2·75	—	31	21	10	88	—	2·83	—	44	27	17	168	7	3·81	0·15
New Zealand	—	—	—	—	—	—	—	1	1	—	—	—	—	—	2	1	1	7	—	3·50	—	1	1	—	—	—	—	—
W. C. Africa	31	19	12	442	4	14·25	0·12	43	26	17	379	1	8·81	—	53	37	16	283	11	5·33	0·20	45	25	20	356	1	7·91	0·02
East Africa	2	1	1	12	3	6·00	1·50	7	6	1	—	—	—	—	6	5	1	3	—	—	—	5	3	2	58	—	11·60	—
South Africa	4	4	—	—	—	—	—	9	9	—	—	—	—	—	4	4	—	—	—	—	—	15	8	7	12	1	0·80	0·06
North Africa	—	—	—	—	—	—	—	3	3	—	—	—	—	—	4	4	—	—	—	—	—	—	—	—	—	—	—	—
Canary Islands	11	10	1	10	—	0·90	—	10	10	—	—	—	—	—	9	9	—	—	—	—	—	11	9	2	9	—	0·81	—
Persian Gulf	3	3	—	—	—	—	—	3	3	—	—	—	—	—	1	1	—	—	—	—	—	5	5	—	—	—	—	—
South Georgia	—	—	—	—	—	—	—	5	5	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—	—	—	—	—
Black Sea	4	2	2	83	—	20·75	—	3	3	—	—	—	—	—	2	1	1	—	—	—	—	4	3	1	—	6	—	1·50
Russia	13	12	1	8	—	0·61	—	13	13	—	—	—	—	—	19	19	—	—	—	—	—	13	12	1	—	—	—	—
Baltic	4	4	—	—	—	—	—	3	3	—	—	—	—	—	6	6	—	—	—	—	—	2	2	—	—	—	—	—
Norway	8	8	—	—	—	—	—	10	8	2	6	—	0·60	—	7	7	—	—	—	—	—	11	11	—	—	—	—	—
Sweden	4	4	—	—	—	—	—	6	5	1	—	—	—	—	3	3	—	—	—	—	—	2	2	—	—	—	—	—
Finland	7	6	1	—	—	—	—	7	7	—	—	—	—	—	5	5	—	—	—	—	—	6	6	—	—	—	—	—
Germany	1	1	—	—	—	—	—	2	2	—	—	—	—	—	4	3	1	—	—	—	—	2	2	—	—	—	—	—
Belgium	9	9	—	—	—	—	—	2	2	—	—	—	—	—	2	2	—	—	—	—	—	2	2	—	—	—	—	—
France	9	9	—	—	—	—	—	16	16	—	—	—	—	—	9	9	—	—	—	—	—	10	10	—	—	—	—	—
Denmark	—	—	—	—	—	—	—	1	1	—	—	—	—	—	1	1	—	—	—	—	—	1	—	1	—	—	—	—
Holland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	—	—	—
Central America	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	1	—	1·0	—	—	—	—	—	—	—	—
Danzig	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—
Latvia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—
Antarctic	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	—	—	—	—

The following table shows the number of fumigations of vessels during the past thirteen years and the number of exemptions for 1928-1935, together with the number of rats and mice discovered after fumigation during the same period and the average number of rats and mice per vessel :—

Year.	Number of Fumigations.	Number of Exemptions.	Total Number of Rats found after Fumigations.	Total Number of Mice found after Fumigations.	Average Number of Rats per Vessel.	Average Number of Mice per Vessel.
1923	90	—	5,295	57	58·83	0·63
1924	132	—	7,388	300	55·96	2·27
1925	119	—	4,817	257	40·47	2·15
1926	156	—	3,433	111	22·00	0·71
1927	119	—	1,967	130	16·52	1·09
1928*	130	11	1,804	190	12·79	1·34
1929	221	114	2,614	292	7·80	0·87
1930	187	316	1,762	75	3·50	0·14
1931	162	314	966	182	2·02	0·38
1932	142	347	1,434	428	2·93	0·87
1933	137	416	1,137	324	2·05	0·58
1934	154	419	1,183	238	2·06	0·41
1935	172	390	1,178	135	2·09	0·24

* In 1928 the first International Certificate was issued—on the 5th October. During that year 25 Deratisation and 11 Exemption Certificates were issued.

Graph illustrating the decline in the average number of rats per vessel examined at Liverpool during the past 13 years :—



Measures of Rat Destruction on Plague-"Infected" or "Suspected" Vessels or Vessels from Plague-Infected Ports during the Year 1935.

Total Vessels Arriving.	No. Fumigated with SO_2.	No. of Rats Killed.	No. Fumigated with HCN.	No. of Rodents Killed.	No. Fumigated with both HCN. & SO_2	No. of Rodents Killed.	No. Fumigated with Salforkose.	No. of Rodents Killed.	No. of such vessels on which Trapping was employed.	No. of Rodents Killed.	No. of such vessels on which measures of Rat Destruction were not carried out.
*684	34	314 Rats 74 Mice	14	131 Rats 1 Mouse	1	8 Rats 1 Mouse	1	5 Rats	536	612 Rats 10 Mice	46

* Including 100 vessels bound for Manchester.

Deratisation Certificates and Deratisation Exemption Certificates issued during the Year 1935.

Net Tonnage.	No. of Ships.	Number of Deratisation Certificates issued after Fumigation with				After Trapping, Poisoning, etc.	Total.	No. of Deratisation Exemption Certificates issued.	Total Certificates issued.
		H.C.N.	Sulphur.	H.C.N. and Sulphur.	Salforkose.				
Up to 300 Tons	7	1	—	—	—	Nil	1	6	7
From 301 to 1,000 Tons ...	60	2	1	—	—	Nil	3	57	60
From 1,001 to 3,000 Tons ...	166	20	23	—	—	Nil	43	123	166
From 3,001 to 10,000 Tons ...	306	52	57	1	2	Nil	112	194	306
Over 10,000 Tons	23	10	3	—	—	Nil	13	10	23
Totals ...	562	85	84	1	2	Nil	172	390	562

Table showing the number of rats and mice obtained on ships and quays by the Authority's rat-catchers during the years 1926-1935.

Year.	NUMBER OBTAINED.			NUMBER EXAMINED.			NUMBER DESTROYED.		
	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.
1926	8,827	2,800	11,627	4,493	2,312	6,805	4,334	488	4,822
1927	8,134	2,496	10,630	4,836	1,945	6,781	3,298	551	3,849
1928	7,351	2,414	9,765	4,145	1,918	6,063	3,206	496	3,702
1929	7,036	1,456	8,492	3,408	1,271	4,679	3,628	185	3,813
1930	3,847	2,046	5,893	1,841	1,731	3,572	2,006	315	2,321
1931	3,190	1,969	5,159	1,669	1,688	3,357	1,521	281	1,802
1932	3,743	2,268	6,011	1,457	1,961	3,418	2,286	307	2,593
1933	2,820	2,454	5,274	1,165	2,158	3,323	1,655	296	1,951
1934	3,043	2,976	6,019	1,253	2,464	3,717	1,790	512	2,302
1935	2,514	3,938	*6,452	978	3,229	4,207	1,536	709	2,245
Total.....	50,505	24,817	75,322	25,245	20,677	45,922	25,260	4,140	29,400

* 397 mice are included in these figures.

Number and species of rats caught, in the City and Port of Liverpool, during the year 1935.

1935	Warehouses.		Sewers.		Other Places.		Total.		Ships.		Quays.		Other Sources.		Total.	
	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.
January ...	63	130	—	859	19	298	82	1,287	264	1	127	8	54	65	445	74
February ...	61	95	—	753	19	273	80	1,121	120	1	154	12	38	33	312	46
March	78	116	—	810	6	279	84	1,205	266	—	162	12	60	13	488	25
April	44	113	—	774	5	356	49	1,243	249	—	197	24	90	51	536	75
May	64	138	—	845	10	512	74	1,495	230	9	154	13	96	78	480	100
June	28	106	—	795	3	442	31	1,343	145	—	128	13	106	52	379	65
July	86	93	—	987	62	362	148	1,442	145	1	208	1	78	32	431	34
August ...	12	89	—	769	38	320	50	1,178	112	—	113	14	99	34	324	48
September ...	27	48	—	901	41	372	68	1,321	297	—	97	21	156	47	550	68
October ...	82	86	—	927	95	403	177	1,416	147	—	186	9	170	30	503	39
November ...	41	114	—	862	38	265	79	1,241	169	—	143	2	155	24	467	26
December ...	32	42	—	739	16	119	48	900	176	—	172	4	131	57	479	61
Total ...	618	1,170	—	10,021	352	4,001	970	15,192	2,320	12	1,841	133	1,233	516	5,394	661

Number and Species of Rats examined or destroyed in the City and Port of Liverpool during the year 1935.

1935.	Examined (City).		Destroyed (City).		Examined (Port).		Destroyed (Port).		Total Caught. City and Port.
	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black.	Brown.	Black and Brown.
January	3	215	79	1,072	263	63	182	11	1,888
February	15	220	65	901	245	46	67	—	1,559
March	18	257	66	948	269	25	219	—	1,802
April	13	273	36	970	325	64	211	11	1,903
May	17	318	57	1,177	263	82	217	18	2,149
June	7	291	24	1,052	240	60	139	5	1,818
July	26	308	122	1,134	272	33	159	1	2,055
August	9	228	41	950	201	41	123	7	1,600
September	20	283	48	1,038	292	67	258	1	2,007
October	39	301	138	1,115	339	37	164	2	2,135
November	20	278	59	963	322	26	145	—	1,813
December	26	216	22	684	335	57	144	4	1,488
TOTAL	213	3,188	757	12,004	3,366	601	2,028	60	22,217

Rats destroyed during 1935.

(1) In vessels:—

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
ack	264	120	266	249	230	145	145	112	297	147	169	176	2,320
own	1	1	—	—	9	—	1	—	—	—	—	—	12
ecies not recorded ...	—	—	—	—	—	—	—	—	—	—	—	—	—
ts examined ...	103	90	78	96	72	58	59	31	76	81	96	96	936
ts found infected with Plague	—	—	—	—	—	—	—	—	—	—	—	—	—

(2) In Docks, Quays, Wharves and Warehouses:—

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
ck	181	192	222	287	250	234	286	212	253	356	298	303	3,074
wn	73	45	25	75	91	65	33	48	68	39	26	61	649
cies not recorded ...	—	—	—	—	—	—	—	—	—	—	—	—	—
s examined ...	223	201	216	293	273	242	246	211	283	295	252	296	3,031
s found infected with Plague	—	—	—	—	—	—	—	—	—	—	—	2	2

Number of Mice destroyed on vessels	182
Do. do. do. on quays	215
Do. do. examined on vessels and quays	240

The combined returns of all rats and mice caught and destroyed by shipping firms employing their own rat-catchers, by rat catching companies, and by the Public Health Authority, during the year 1935 are as follows :—

	Rats.	Mice.	Rats.	Mice.
Port—				
In vessels	7,519	182		
On quays	3,723	215		
			11,242	397
City—				
In warehouses	1,788	7		
In sewers and from other sources ...	14,374	25		
			16,162	32
		Total ...	27,404	429

Number of Visits to **Vessels** by Rat Catchers 7,380

Do. do. do. Rat Searchers 3,776

Do. do. **Quays, Sheds, etc.,** by Inspectors ... 2,601

Do. do. do. do. Rat Searchers 1,731

Do. do. do. do. Rat Catchers 13,483

Measures against Rodents.

Steps taken for detection of rodent plague.

Liverpool trades extensively with many ports where plague is always present. All vessels arriving from such ports are boarded, and careful enquiry made as to any evidence of the existence of plague among the rats on board. Medical inspection alone is not sufficient, as rodent plague may exist on board without having given rise to any human cases, and without any sick or dead rats having been seen. Consequently, as soon as the vessel berths, it is necessary—

(1) to catch samples of the rat population in all parts of the vessel;

(2) to examine the vessel in all parts, and at various times during the discharge of cargo, for sick or dead rats.

All rats so obtained are sent to the City Bacteriologist for examination for plague infection.

Samples of the rat population from the dock quays, sheds and warehouses are obtained daily, and all rats so caught are submitted to the City Bacteriologist for examination. The success of plague preventive measures depends entirely on the detection of the infection at the earliest possible moment, followed by the adoption of energetic measures to destroy every infected rat. Rodent plague when once established is most difficult to eradicate, and in addition to the possibility of causing human cases, it leads to the imposition of restrictions on our ships in foreign ports. In order that this work may be carried out efficiently the Port Sanitary Authority employs a staff of eleven full-time rat-catchers and rat-searchers, and one part-time rat-catcher.

Measures taken to prevent the passage of rats between ship and shore.

All vessels with the exception of coastwise vessels must have rat-guards affixed to their moorings during their stay in the port. The rat-guard used and approved of by the Port Sanitary Authority consists of a disc of galvanised sheet iron, 1/16th in. thick and three feet in diameter. The edge is left raw, i.e., not wired or turned over. In the lower half is cut a door, hinged and so fastened when shut that no foothold is afforded to rats. The door slit leads to the central hole

through which the rope passes. Round the central hole is placed a strong collar projecting about 4 in. on each side and riveted to the disc. In the collar is a strong steel spring clip, which can be adjusted by means of a winged nut and bolt. To apply the guard, the door is opened and the guard put over the rope so that the latter passes up into the central hole, where a little force is necessary to overcome the spring of the clip. The guard will now hold quite firmly and the bolt and screw closing the opening of the clip gives additional security. The door is then closed and fastened, the upper edge being fitted with a piece of thick sheet rubber attached so as to close completely the central hole whatever the size of rope in use.

A rat-guard to be effective should be placed at the ship end of the mooring and as far as possible away from the ship's side.

When vessels loaded with cargo are infected with either human or rodent plague the following procedure is adopted in order to prevent the passage of rats from the ship to the shore:—

If the vessel is loaded a preliminary fumigation may be undertaken to destroy the rats, the nature of the cargo would, however, determine whether this procedure should be followed. The measures enumerated below are enforced pending discharge of cargo, when a complete and thorough deratisation takes place by fumigation with hydrocyanic acid gas.

(*a*) The vessel is breasted off six feet from the quayside.

(*b*) Rat-guards are adjusted on all moorings.

(*c*) One gangway only is allowed, and a watchman is stationed there day and night.

(*d*) The gangway must be lifted at sunset and not lowered until sunrise.

(*e*) The cargo must be discharged under supervision of the Port Sanitary staff.

(*f*) Trapping and examination of rats caught in the neighbouring sheds are carried on.

Methods of Deratisation of Ships.

Deratisation of ships is carried out by fumigation with either sulphur dioxide, or hydrocyanic acid gas. Fumigations in the Port

of Liverpool are carried out, as a rule, by private firms under the supervision of the Port Sanitary Authority. At least twenty-four hours' notice in writing must be given to the Port Sanitary Authority before the commencement of any fumigation. This notice must be on the official form, which sets out the cubic capacities of the spaces and the fumigant to be used.

Deratisation by means of sulphur dioxide gas.

(1) *Sulphur dioxide.* This gas is generated by burning sulphur in buckets. Only sulphur of good quality must be used, and not more than 9 lbs. of sulphur to each bucket: 3 lbs. of sulphur to every 1,000 cubic feet of air space is required, with a minimum time of exposure of six hours. In order to ensure that the whole of the sulphur is burnt, it is advisable that a small quantity of wood-wool or shavings dipped in methylated spirit should be added to each receptable.

(2) *Liquid sulphur dioxide* (*sulphume*). 6 lbs. of liquefied gas are required for every 1,000 cubic feet of air space, with a minumum time of exposure of six hours.

(3) *Salforkose.* This process consists of burning an inflammable liquid in double jacketted iron containers which are fitted with a baffle plate and hood in order to control the flame. The containers are of three sizes, small, medium and large, holding five pints, 10 pints and 15 pints, respectively, adequate for the fumigation of spaces of 4,200, 8,500 and 12,800 cubic feet. The time of exposure is three hours after which ventilation for a further four hours is required before the spaces can be entered with safety.

Deratisation by means of hydrogen cyanide.

Fumigation of vessels by means of this gas is exceedingly dangerous to human life, and may only be carried out by firms which have a specially trained staff and the necessary respirators and life saving appliances.

(1) *Liquid hydrogen cyanide.* The hydrogen cyanide gas is generated by the vaporisation of liquid hydrogen cyanide, the latter being contained in steel cylinders.

For holds, provision store rooms and peaks, 2 oz. per 1,000 cubic feet of air space is required, and for living quarters, superstructures and other spaces not used for stores, 1 oz. per 1,000 cubic feet. The minimum time of exposure in both cases is two hours.

(2) *Zyklon B.* consists of kieselguhr, a very absorbent infusorial earth, to which is added a mixture of hydrogen cyanide (97½ per cent.) and tear gas (2½ per cent.). The mixture is packed in strong hermetically sealed tins or canisters containing 500, 1,000, 1,200 and 1,500 grammes of cyanide. These canisters are placed near the holds in numbers necessary for fumigation of the particular cubic capacity. Each tin is opened by a special apparatus which prevents the escape of gas during the process. On removal of the lid, a thin rubber cap is placed over each tin unless the contents are to be used immediately.

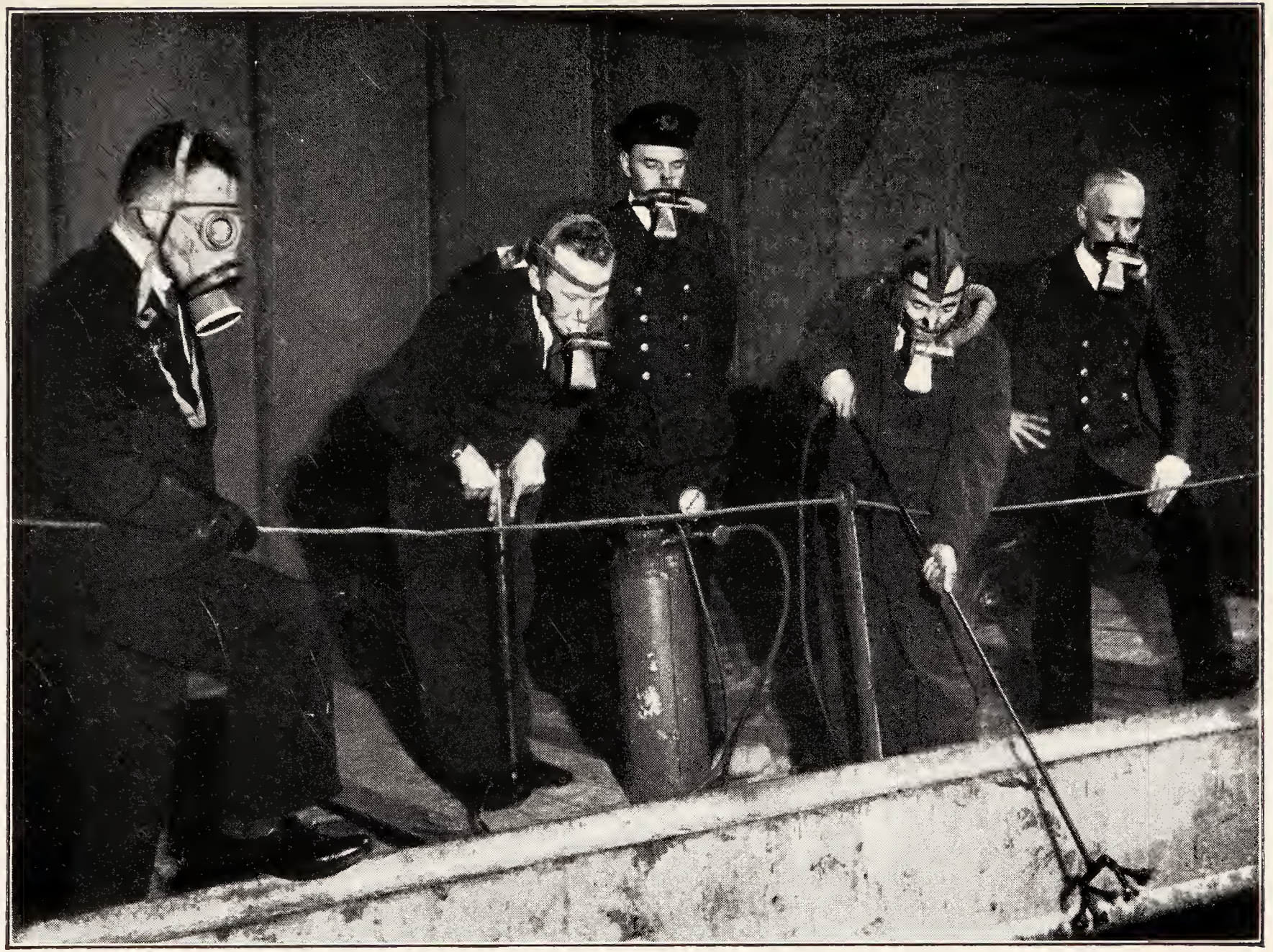
When fumigation is started the tarpaulins covering the hatches are raised and the contents of the required number of tins are scattered over the bottom of the hold from the deck. The tarpaulin is then replaced and the hold closed for two hours. At the end of that time the hold is opened up and ventilated.

For holds, provision store rooms and peaks, 50 grammes of HCN content per 1,000 cubic feet is required, and for living quarters and superstructures not used as storerooms 25 grammes per 1,000 cubic feet.

(3) *Liquid hydrogen cyanide* (*Gallarde process*). The liquid HCN is contained in strong glass bottles fitted with a metal cap. Each bottle contains 400 grammes of available hydrogen cyanide. The requisite number of bottles are placed in position, the ship having previously been prepared for fumigation; the operators then proceed to remove the metal caps and pour the liquid into special containers. By this process hydrocyanic acid gas is liberated from a stabilised liquid hydrogen cyanide on exposure to the atmosphere.

The contents of one bottle is sufficient to fumigate 8,000 cubic feet, and the minimum time of exposure is two hours.

(4) *Liquid Cyanide* (*Barton Process*). This process is very similar in procedure to the Gallarde process previously described, except that the liquid hydrogen cyanide is contained in steel cylinders each containing 7 lbs. The requisite number of containers are placed at the



Fumigation with liquid Hydrogen Cyanide by the Spray Method.

(" *Daily Dispatch* " *Photograph.*)

various distributing centres and the liquid is either sprinkled on the deck, or emptied into large tins if the decks are covered with linoleums or carpets in order to prevent any damage to the fabric.

(5) *Unit Method.* By this method hydrocyanic acid is impregnated into circular discs of papier mache six inches in diameter, and $\frac{3}{8}$ inches in thickness. The discs, or "units", each contain the equivalent of one ounce of liquid hydrocyanic acid, and are packed in hermetically-sealed tins of 32. The requisite number of units, depending on the cubic capacity, are distributed in the compartment to be fumigated. The minimum time of exposure is two hours, and after ventilation the discs can be collected with safety and re-impregnated.

Deratisation of premises in the vicinity of docks or quays.

This is carried out by the setting of traps, the laying down of poisoned baits and occasionally by fumigation with hydrogen cyanide.

Rat Proofing.

WHARVES AND WAREHOUSES.—With the exception of a few of the old docks in the central district, the wharves on the dock estate are of rat-proof construction, made with ferro-concrete and stone.

The roadways and pavings of the sheds are setts on a concrete foundation.

The sheds are built of brick and reinforced concrete. All sheds in the new Gladstone Dock are constructed solely of reinforced concrete, and there are no ledges, beams or angle iron on which rats may run.

All offices and wooden huts in the sheds are made rat-proof either by being lifted 18 inches clear of the ground or sheathed with iron or cemented round the base.

New offices or other buildings are either built on brick or concrete piers clear of the ground or the base is built hard and close to the paving of the shed.

ACTION TAKEN TO EXTEND RAT-PROOFING ON SHORE.—During the year two large buildings in the Canada Yard, Birkenhead, which have been disused and locked up since 1918, were found to have become infested with

rats and pigeons. Representation was made to the Mersey Docks and Harbour Board with the result that both buildings have been razed to the ground. The Board and the various shipping companies are fully alive to the necessity and benefit of rat-proofing, and practically all sheds, huts, offices and warehouses on the dock estate have now been made rat-proof. Constant supervision is required, however, in the case of stores, otherwise they tend to become harbourages for rats.

It is the duty of the sanitary inspectors to see that all stores are kept clean and tidy, and that no rubbish is allowed to accumulate. Old rope, dunnage, wood, etc., must be stacked neatly on platforms raised 18 inches from the ground, and the space beneath the platform must be kept clean and free from rubbish.

Rat-proofing in ships.—In the course of their routine examinations of vessels the port sanitary inspectors bring to the notice of the responsible officials any particular part which in their opinion is in need of rat-proofing. In order to make a vessel rat-proof there must be no place where rats may remain undisturbed and make their nests, and also no available food nor water supply. It should also be impossible for rats to travel freely from one part of a vessel to another. In order to accomplish this, skeleton casings are adopted for pipes in place of the older type of box casing; expanded metal is fitted round pipes, telephone wires, electric wires, etc., at a point where they pass through bulkheads or from one compartment to another, or at openings necessary for light and ventilation. There is a steady increase in the number of vessels which have been rendered rat-proof.

HYGIENE OF CREWS' SPACES.

The Hygiene of Crews' Spaces.

During the year careful attention has been paid to the inspection of crews' spaces by the port sanitary inspectors. All vessels entering the port are visited as soon as possible after docking, and enquiries are made concerning the health of the crew, the occurrence of any sickness during the voyage, the source of the water supply, the condition of all tanks and bilges, the condition of storerooms, and whether any sick or dead rats have been found.

After making these enquiries the sanitary inspector, accompanied by a ship's officer, visits the crew's quarters, and their condition is noted, particular attention being paid to cleanliness, structural defects, rat-harbourages, accumulations of rubbish, etc. The attention of the officer is called to any defects that are found, and a request made that they should be remedied. These instructions are generally carried out by the shipping company concerned without any difficulty. The inspector re-visits the vessel from time to time, and notes when the defects have been made good.

An important part of Public Health work in connection with the welfare of seamen and the hygiene of vessels consists in efforts to improve the conditions of the environment of the sailor. It is not only of value to the men themselves but is our first line of defence against imported disease.

During recent years, although much time and thought have been devoted to improving the efficiency of ships, inspection of the crew's quarters in the majority of vessels, whether recently constructed or not, has failed to show a corresponding improvement. On some occasions, however, vessels are visited which have been designed to include the comfort of the crew; it is worthy of note that the majority of these vessels have been designed and built by foreign firms.

During the past twelve months it was possible to examine and compare two vessels, both of recent construction, one British, the other foreign. The crew's quarters of both vessels amply conformed to regulations laid down under the Merchant Shipping Act, and this feature was the best that could be said of the British-owned vessel. The dominant note of the crew's quarters of the foreign-owned vessel was

that of comfort and cleanliness due to the care and imagination which had been used in the planning and furnishing of them. For the purpose of clarity, these vessels will be designated "A" and "B".

VESSEL "*A*". This vessel was foreign-owned. The crew were housed in four-berth cabins, each man being provided with a full-length wardrobe and locker constructed of polished wood. Other furnishings of the cabins were a small table, and chairs of comfortable design matching the wardrobe, etc. The bunks and scuttles were fitted with curtains similar in appearance and quality to those found in the tourist accommodation of a modern passenger liner; the table was covered with a cloth, and a centre-piece, matching the design of the curtains. All furnishings were provided by the company, and the bareness of the ship's side was relieved by the use of polished plywood.

To maintain the cleanliness of their quarters, the crew changed from their working clothes, bathed, and resumed other clothing before entering their cabins; this was done in a common-room at the entrance of the quarters. The bathing was done under shower-baths, and a constant supply of hot fresh water was obtainable from a large cistern containing 400-500 gallons, which was electrically heated and thermostatically controlled.

Mess-room Accommodation. The mess-room accommodation was situated amidships and consisted of a galley, mess-room, and scullery; the food and dishes were passed from one room to the other through serving hatches, facilitating the cooking and serving of meals.

Sanitary Arrangements. The lavatories were of the wash-down pedestal type.

The impression gained by this inspection was that the owners and men had successfully co-operated to achieve a standard of comfort which should be provided as a routine measure for those who are compelled to pursue a maritime life.

VESSEL "B". This vessel was built and launched in 1935. Inspection of the crew's quarters was noteworthy only by the fact that the quarters so closely resembled those provided for the crew in British ships 20-30 years ago.

The crew were housed forward, the rooms containing six to eight bunks of the tubular type. In contrast to the wardrobes and lockers provided for the crew of Vessel "A", small galvanised iron lockers were provided for the crew.

The sanitary arrangements of the two vessels bore the most striking contrast. In Vessel "B" the taps supplied cold salt water, all hot water having to be carried from the galley which was situated aft. Included among the lavatory accommodation were trough-closets; these were destined for the use of the stewardesses, and it is difficult to conceive why this type of closet should be found in a recently-built vessel.

The features of the mess-room accommodation differed in no great respect from those found in other British vessels, the mess-rooms being furnished with plain wooden tables and seats, and being situated at an inconvenient distance from the galley.

Various theories have been advanced to explain the continuation of these abuses in the provision of crews' quarters. An obvious objection is that of increased cost in shipbuilding, but this added expenditure assumes negligible proportions in comparison with the total cost of the vessel, provided that the improvements of the crew quarters are considered in the original designing of the vessel. A second objection sometimes raised is, that although comfortable quarters are provided, the men, either through ignorance or carelessness, fail to take advantage of these improvements. This may be obviated by efficient discipline, entailing at least a daily inspection of the crew's quarters by the master or chief officer.

Vermin in Crews' Quarters.

The usual procedure adopted by the inspector when the quarters are found in a verminous condition is to draw the attention of the captain or chief officer to it, and a memo. is served pointing out where the infestation exists. When the crew has been paid off, the vessel is revisited in order to ascertain what action is being taken to deal with the complaint. With slightly infested quarters disinfestation is carried out by spraying with a recognised

To face page 62.

The following Table shows the number and Nationalities of the Vessels on which Defects were detected during the year 1935.

NATIONALITY.	Number of Ships.	Dirty Forecastles.	Verminous Quarters	Dirty Wash-houses, Store-rooms, etc.	Foul Water Casks and Tanks	Foul Bilges.	Foul W.C's.	Accumulations of offensive refuse.	Gear stowed in Crew's Quarters.	Damp Quarters.	Water lodging on top of Forepeak Tank.	Animals kept, causing nuisance	Leaky Decks overhead.	Defective Stoves.	Defective Bulkheads.	Defective Ports and Sky-lights.	Defective Ventilators.	Defective Flooring Boards	Defective Hatches and Lockers.	Defective Chain Pipes.	Defective Hawse Pipes.	Defective W.C. Fittings.	Defective Soil Pipes.	Inadequate Ventilation.	Inadequate Lighting	Inadequate Drainage.	Bare Iron not Sheathed	W.C's. deficient in Ventilation and situation bad.	Total number of Defects.	Total Remedied.
British ...	496	1,015	573	11	...	...	184	4	1	1	3	...	79	14	14	77	5	2	...	1	6	27	4	...	...	3	2	...	2,026	1,779
Greek ...	12	16	2	1	...	...	1	...	1	...	...	...	4	...	3	1	...	...	...	1	...	...	...	...	...	...	...	...	30	27
Spanish ...	7	12	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	15	11
Norwegian ...	9	1	3	1	...	...	2	...	...	...	...	...	4	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	14	8
German ...	3	4	4	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	10	10
Danish ...	3	...	10	...	...	...	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	21	9
Swedish ...	2	2	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4
Dutch ...	2	2	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	7	3
Finnish ...	2	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	4	4
Yugoslavia ...	2	4	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	6
Egyptian ...	2	2	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	5
Latvian ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	..	...	...	...	...	3	3
Hungarian ...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
Total ...	542	1,058	594	15	...	...	191	4	3	1	3	...	93	16	20	95	5	2	...	2	6	27	4	3	...	3	2	...	2,147	1,871

insecticide. This is carried out by the owners by spraying into all crevices of woodwork and the crew's bunks. With pronouncedly infested quarters fumigation is carried out. This is done either by burning sulphur—5lbs. of sulphur to the 1,000 cubic feet for a period of 12 hours; or the application of hydro-cyanic acid gas—4ozs. of HCN to the 1,000 cubic feet for a period of from 4 to 6 hours. In addition, the bunk boards and iron framework of the bunks are dismantled and the blow-lamp is used. These methods have proved effective.

It may be pointed out that the disinfestation of crews' quarters whilst the men are still on board is a more difficult matter to deal with and several such cases have occurred. The difficulty arises in providing accommodation for the crew. The usual practice is to allow the vessel to proceed to her home port, the complaint being forwarded to the medical officer of the port concerned.

It is the practice of many shipping companies to fumigate the crews' quarters every voyage, and, in addition, to spray with an insecticide; a supply of the latter is also available for use during the voyage; in such vessels there is a marked improvement in the condition of the crews' quarters.

Inspection of Shipping.

Year 1935.

Nationality.		Visits.	Re-visits.	Total.
British ...	...	3,515	614	4,129
Norwegian	...	238	23	261
Swedish...	...	123	6	129
Spanish...	...	62	—	62
Danish ...	...	153	6	159
Japanese	...	25	4	29
Italian ...	...	5	—	5
Russian ...	...	19	2	21
French ...	...	12	—	12
Dutch ...	...	98	5	103
Greek ...	...	70	20	90
American	...	156	5	161
German ...	...	79	2	81
Finnish ...	...	49	8	57
Danzig	...	8	1	9
Esthonian	...	9	2	11
Yugoslavian	...	20	1	21
Latvian	...	36	5	41
Rumanian	...	1	—	1
Hungarian	...	2	2	4
Egyptian	...	9	2	11
Panama	...	4	—	4
Belgian	...	1	—	1
Portuguese	...	1	1	2
Brazilian	...	1	2	3
Total	...	4,696	711	5,407

Summary of Insanitary Conditions during the year 1935.

Class of Vessels.	Number Inspected.	Number on which Nuisances were found.	Per cent.
SAILING FOREIGN—			
Steamers	3,845	460	11·96
Motor	439	38	8·66
Sailing	3	—	—
Total	4,287	498	11·62
SAILING COASTWISE—			
Steamers	384	44	11·46
Motor	23	—	—
Sailing	2	—	—
Total	409	44	10·76

Nationality.	Number Inspected.	Number on which Nuisances were found.
British	3,515	496
Foreign	1,181	46
Total ...	4,696	542

Nuisances arising through

Defects of Original Construction. (*a*)	Per cent. of Total Defects.	Structural Defects through wear and tear. (*b*)	Per cent. of Total Defects.	Dirt, and other conditions prejudicial to health. (*c*)	Per cent. of Total Defects
8	0·37	270	12·58	1,869	87·05

Canal Boats.

The port sanitary inspectors have been appointed inspectors under the Canal Boats Acts, 1877 and 1884. An inspector devotes one day each week to the inspection of canal boats plying in the river or docks, and during the year 646 boats were inspected, of which 38 were found to have some condition contravening the regulations.

ALIENS' INSPECTION AND MIGRATION.

Medical Inspection of Aliens.

The following table gives the total number of aliens arriving in the Port of Liverpool during 1935, and the number of each of the categories under which alien passengers are classified by the Immigration Department of the Home Office :—

Total aliens	Transmigrants	Residents returning	In transit
8,668	1,175	134	1,120

Visitors of 6 months or less		Diplomats and persons on Foreign Govt. Missions.	Seamen
On holiday, tourists, &c.	On Business		
5,447	236	79	66

Seamen under Contract to join ships in British Waters.	Ministry of Labour Permits	Other Aliens
59	51	301

The medical inspection and examination of aliens is carried out by the assistant port medical officers. The objects of the inspection are to ascertain whether any of the alien passengers are :—

(1) suffering from any disease likely to be a danger to the public health of this country ;

(2) suffering from any disease or deformity likely to cause such aliens or their dependents to become a public charge.

No alien is allowed to take up employment in this country without a special permit from the Ministry of Labour, so that it is rare for the medical inspector to have to consider the earning capacity of an alien. The procedure with regard to the medical inspection and examination of aliens entering the Port of Liverpool is as follows :—

The medical officer boards the vessel immediately on arrival with the view of obtaining information as to the health of all persons on board from the ship's surgeon, and also of making a rapid preliminary inspection of all classes of immigrants. This latter may be completed before the immigration officers start their examination, or may occur simultaneously with it, depending upon the circumstances. Note is made of any alien who in the opinion of the medical officer should require a more detailed examination, irrespective of the time that the alien may wish to remain in the country.

The medical officer attends during the examination made by the immigration officers, when a further opportunity is afforded to inspect the aliens more closely. All aliens who wish to stay in this country more than three months are referred to the medical inspector for examination.

During the year 1935 no alien was rejected on medical grounds.

Transmigrants.

All second and third-class passengers bound for the United States, whether from the Continent or British Isles, are inspected by an Officer of the U.S. Public Health Service immediately before sailing, and if any are found to be in a verminous condition they are sent to the city disinfecting station, where suitable accommodation is available for the destruction of vermin in the clothing and belongings of each person. The cost of the disinfection is defrayed by the shipping company concerned.

Emigration.

The number of passengers (emigrants and others) leaving the Port of Liverpool during the year 1935 was 52,469, a decrease compared with the previous year, when the number was 58,380. The following return shows the number during the last ten years :—

Year		Year	
1926	116,672	1931	53,858
1927	123,801	1932	58,819
1928	116,083	1933	62,452
1929	113,116	1934	58,380
1930	91,493	1935	52,469

The following Tables relating to Emigration and Immigration have been kindly supplied by the Board of Trade.

Statement showing the number of passengers (*emigrants* and others), distinguishing British subjects and aliens, who left the port of Liverpool for places out of Europe in the year 1935:—

Destination.	British Subjects.	Aliens.	Total.
British North America ...	11,877	2,103	13,980
Australia and New Zealand	520	—	520
British South Africa ...	974	25	999
India (including Ceylon)...	4,830	71	4,901
Other parts of the British Empire ...	6,725	314	7,039
Total British Empire ...	24,926	2,513	27,439
United States	4,723	5,639	10,362
Foreign South America ...	1,457	358	1,815
Other Foreign Countries	1,212	266	1,478
Total Foreign Countries...	7,392	6,263	13,655
Pleasure Cruises (to places out of Europe)	11,298	77	11,375
Grand Total ...	43,616	8,853	52,469

Number of passengers (*emigrants* and others), distinguishing British subjects and aliens, who left the port of Liverpool in each month of the year 1935 :—

Month.	British Subjects.	Aliens.	Total.
January	2,177	277	2,454
February	1,473	194	1,667
March	2,093	411	2,504
April	3,000	274	3,274
May	3,734	461	4,195
June	3,741	521	4,262
July	4,784	826	5,610
August	7,953	2,888	10,841
September	5,878	1,427	7,305
October	4,921	781	5,702
November	2,528	513	3,041
December	1,334	280	1,614
Total	43,616	8,853	52,469

Statement showing the number of passengers (*immigrants* and others), distinguishing British subjects and aliens, who arrived at the port of Liverpool from places out of Europe in the year 1935;—

Countries in which the Passengers embarked.	British Subjects.	Aliens.	Total.
British North America	13,788	2,103	15,891
Australia and New Zealand ...	323	7	330
British South Africa	396	4	400
India (including Ceylon)	2,287	65	2,352
Other parts of the British Empire	1,903	116	2,019
Total British Empire ...	18,697	2,295	20,992
United States	5,959	5,161	11,120
Foreign South America	1,170	377	1,547
Other Foreign Countries	638	134	772
Total Foreign Countries ...	7,767	5,672	13,439
Pleasure Cruises (from places out of Europe)	11,864	73	11,937
GRAND TOTAL	38,328	8,040	46,368

Number of passengers (*immigrants* and others), distinguishing British subjects and aliens, who arrived at the port of Liverpool from places out of Europe in each month of the year 1935 :—

Month.	British Subjects.	Aliens.	Total.
January	1,061	247	1,308
February	1,029	198	1,227
March	1,679	202	1,881
April	3,972	471	4,443
May	4,859	713	5,572
June	5,229	1,491	6,720
July	5,150	2,435	7,585
August	4,859	777	5,636
September	4,908	560	5,468
October	2,115	334	2,449
November	1,703	268	1,971
December	1,764	344	2,108
Total	38,328	8,040	46,368

Emigrant Inspections.

All emigrants travelling second or third-class on board vessels outward bound are subject to inspection by the medical officers of the Board of Trade. The crews of all such vessels bound for America are also subjected to inspection by these officers. An inspector of the Port Sanitary Authority attended these clearances in order to supervise the removal of any persons rejected on account of actual or suspected infectious disease.

During the year 1935 there were 114 inspections, and 1 person was rejected.

Date 1935	Name of Vessel	Nature of Sickness	Where taken to	Description of Patient
Jan. 4	"Montrose"	Trachoma ...	C. P. S. Boarding House	Child

FOOD INSPECTION.

Supervision of Food Importations, 1935.

The inspection of imported foods has had careful attention throughout the year. This work is carried out in the docks of Liverpool, Bootle, Birkenhead, and the outlying districts of Garston and Bromborough, which all come within the jurisdiction of the Liverpool Port Sanitary Authority.

The inspection of foods is carried out, either after the goods are landed on the dock quays or during the process of discharge overside. In almost every case foods landed within the Port of Liverpool are completely supervised by the port food inspectors and only a very small quantity requiring further examination is passed on to other public health authorities.

The procedure adopted in the first instance is one of sampling, and the percentage examined varies according to the circumstances of landing and the type and condition of the foodstuffs. A certain percentage of each consignment landed is inspected on the quayside, and if none is found to be unsound the whole consignment is released at once. If, however, any part of the consignment be found to be diseased, part diseased, or unsound, and the consignment is too large to be dealt with on the quayside, arrangements are made with the importer for it to be transferred to suitable premises. In the case of frozen meats the consignment is transferred to a local cold store and subsequently dealt with there.

Canned goods, dried box goods, oranges, apples, etc., are usually transferred under guarantee to a local warehouse, but there has been an increasing tendency to sort fruit and other foodstuffs on the quay. In either case the sound goods are removed from the unsound and the former released for sale. Unsaleable foodstuffs are allowed to go for industrial purposes, but great care is always taken that these foods are not marketed for human consumption, and only well-known and reliable firms, approved by the medical officer of health, are allowed to receive them for the purpose of manufacturing animal foods, dog biscuits, melting down for tallow, fat extraction, etc.

Meat Importations.

The glandular examination of carcases of mutton and of lambs weighing over 42 lbs. has been continued. From all countries a preliminary inspection of at least 5 per cent. of all such carcases has been made. A few consignments from the Argentine and Uruguay showing over 2 per cent. caseous lymphadenitis, were fully examined. One consignment, designated Patagonian mutton, consisting of 7,046 wethers, and bearing the recognised official stamp, was subjected to a full examination; 314 carcases were affected with caseous lymphadenitis, and 46 carcases were found with glands taken out, a total rejection of 5·1 per cent. Full examinations of all mutton and lamb cuts have been made. Another shipment of Patagonian mutton of Argentine origin, comprising 19,780 pieces, showed a percentage of 3·34 per cent. rejected for caseous lymphadenitis and glands taken cut.

From the middle of August regular consignments of Argentine chilled beef, frozen carcases of mutton and lamb, and packages of frozen beef offal were landed for account of "The Corporacion Argentina de Productores de Carnes", under the Roca Agreement. One consignment of 144 frozen wethers was fully examined, and 9 per cent. rejected for caseous lymphadenitis.

Chilled beef arrived from the Argentine and Uruguay generally in good condition. Portions of some shipments were reconditioned by trimming, the cause of rejection being principally mould, superficial decomposition, and brine damage, the latter due to leakage from the refrigerating pipes.

Two small consignments of Argentine frozen lamb livers in tins were found to be diseased to the extent of 17·6 per cent. and 22·5 per cent. respectively. Attention was drawn to these goods by reason of small portions of the parenchyma having been cut out. Lamb livers from all countries are now commonly frozen in tins, and a varying percentage of all consignments are defrosted and examined.

One consignment of Argentine frozen boneless beef included eleven bags, weighing 968 lbs, described as boneless bull shins. On examination these proved to be trimmings (scrap meat) and were destroyed.

Several shipments of South American chilled beef have been depreciated by orange taint, arising from the carriage of Brazilian oranges in the same steamers. This condition is undesirable from the consumer's point of view but does not warrant rejection.

Australian chilled beef arrived in small quantities, usually in good condition, but a small quantity was rejected for decomposition due to accidents in transport.

One consignment of Australian frozen boneless beef included eleven bags containing mixed cuts, half of which consisted of very small pieces not readily identifiable with definite parts of the carcase. From a large percentage of the remainder of the cuts the serous membranes had been removed, 151 pieces, totalling 331 lbs. in weight, being rejected.

Canadian chilled beef, frozen boneless beef and offal were landed in smaller quantities than in the previous year. The condition was consistently good.

Frozen quarters of beef, quarters of boneless beef and beef offal arrived from Southern Rhodesia. From Bechuanaland Protectorate frozen quarters of boneless beef were landed. This beef was of somewhat inferior quality, but the condition was good and the quarters were free from disease.

Preserved pork products from Northern Ireland were the subject of representations to the Government of Northern Ireland. Quantities of pickled pork products arrived so cut as not to include their associated lymph glands and bearing no certificates of examination. Interviews took place with officials of the Government of Northern Ireland, and these products now arrive in satisfactory condition.

Frozen pigs from Australia, New Zealand and the Argentine were examined microscopically for trichinosis, with negative results.

Reduced quantities of boracised hams and bacon were imported under bond for re-exportation or use as ship's stores. These importations

came from the United States of America and the Argentine. As in previous years, no boracised products were landed from Canada or Holland.

Canned Foods, etc.

Canned sardines and brisling from Portugal and Spain have been examined for metallic contamination, and further improvement was noted. Isolated consignments of an unsatisfactory character have been re-exported.

Several small consignments of Brazilian canned meats were fully examined and large percentages of blown and burst tins were rejected.

One consignment of 200 cases of Californian canned pears was found to have been reprocessed by puncturing and soldering the sanitary cans on the sides of the cylinders. Over 18 per cent. were found to be blown and burst, and were destroyed, the balance of the parcel being returned to the packers.

A new importation of Hungarian tomato paste consisted of 270 cases, of which 127 cases were found to be stained with their own contents. On examination over 9 per cent. were rejected as burst and pierced tins. This was largely due to the cases being badly made, the nails having penetrated the wood and pierced the cans.

A few consignments of Danish canned jellied veal from one establishment were fully examined. Percentages of blown and burst tins varied from 1·5 per cent. to 37 per cent.

One consignment of Spanish canned tomatoes, 500 cases in all, was fully examined with the following result—3·9 per cent. blown and burst, and 0·6 per cent. repaired cans. These were destroyed and the packer's agent was informed that all repaired cans would be rejected on examination.

Several consignments of Brazilian lard arrived which did not have attached to each package the recognised official certificate. Administrative action effected an improvement, but some recent importations are not satisfactory in this respect although covering certificates of examination for the parcels are always produced.

Inedible Fats and Oils.

Greatly reduced quantities were imported, viz., 23,951 packages of inedible fats, and 177 packages of inedible lard oil. Careful supervision is exercised over these goods, a record being kept of their destination and the purpose for which they are imported.

Sugar.

Records are kept of loose collected dirty sugar which is allowed to go for refining purposes.

Wheat.

A shipment of Manitoba wheat was damaged by water, and after treatment a quantity weighing 1,051½ tons was utilised for animal food. The damage was the result of a collision in the River Mersey.

Several small shipments of French wheat were imported for animal food. This wheat was denatured by colouring red a percentage of the grains, thus making its use for human food impossible.

Fruit Inspection.

The improvement noted in the grading, packing and transport of fruit has been generally maintained. Well-ventilated ships, specially built for the transport of fruit, landed their cargoes in better condition than some of the general cargo steamers.

Large quantities of fruit were sorted to meet the trade's demand for sound goods, but the average percentage of waste was small.

Apples and pears from various countries arrived in good condition with the exception of comparatively small quantities which were frosted

and decomposing. This condition may occur when fruit has been carried in close proximity to the refrigerating pipes.

Nova Scotian barrel apples were specially noticeable for a great improvement in quality and grading.

Jaffa oranges were imported in much larger quantities, and the greater portion of the cargoes was sorted. Fungoid growth and decomposition were present in most shipments, but the percentage of waste was small.

Brazilian oranges were imported in greater quantities. Many consignments were sorted, but the percentage of waste was not excessive.

One consignment of Cape Verde Islands oranges, comprising 990 cases, was in unsound condition, 700 cases being rejected after sorting of the parcel.

South African oranges arrived in smaller quantities but more sorting was necessary.

Seville bitter oranges exceeded the demand. Consignments remaining unsold for some time were eventually sorted. Large quantities of grapefruit from various countries were sorted. This commodity is invariably marketed " full and sound ".

Spanish plums and water-melons were landed in partially unsound condition and were sorted.

One consignment of 273 crates of Uruguayan plums was rejected, being frosted and decomposing. These goods arrived via New York.

One shipment of Almerian grapes was in unsound condition due to the lateness of the season for importation.

Two consignments of Spanish lettuce were landed in unsound condition, and were rejected.

Canary Island tomatoes were sounder in condition than in the previous season; comparatively small quantities were rejected.

Table showing the numbers of cattle, sheep and pigs exported from Ireland to Liverpool during the year 1935, and showing the ports in Ireland at which the animals were shipped:—

	Cattle.	Sheep.	Pigs.
Ballina	338	1,161	357
Belfast	35,253	59,249	4,487
Cork	25,827	1,012	4,170
Drogheda	13,936	20,488	61
Dublin	159,658	87,494	739
Dundalk	76	7,904	628
Galway	289	4,414	51
Londonderry	1,978	7,507	69
Limerick	2,404	—	—
Newry	4,921	4,626	7
Rosslare	5,915	11,374	1,128
Sligo	71	2,590	10,871
Waterford...	20,440	2,654	1,167
Westport	210	1,521	2
Wexford	—	—	—
Total	271,316	211,994	23,737

Table showing the total numbers of the several kinds of cattle, sheep and pigs exported from Ireland to Liverpool during the year 1935.

Cattle.	No.
Fat	117,205
Stores (for fattening)	141,635
Milch Cows	9,062
Springers	1,923
Calves	1,491
Total	271,316

Sheep.	No.
Fat	92,785
Stores	—
Lambs	119,209
Total	211,994

Pigs.	
Fat	23,708
Stores	29
Total	23,737

Statement showing the number of live cattle, etc., landed and slaughtered at the Foreign Animals Wharf (Birkenhead, Alfred and Wallasey Lairages) during the years 1926 to 1935, inclusive :—

Year.		Landed.			Slaughtered.		
		Oxen and Calves.	Pigs.	Sheep, Lambs and Goats.	Oxen. and Calves.	Pigs.	Sheep, Lambs and Goats.
1926		**165,187**	**35,785**	**312,745**	**45,876**	**1,681**	**150,378**
	‡	38,870	490	—	28,997	490	—
	†	208	171	4,052	16	—	605
1927		**199,172**	**61,713**	**379,736**	**62,323**	**1,657**	**164,985**
	‡	4,074	—	—	3,712	—	—
	†	351	413	4,635	43	—	332
1928		**249,008**	**47,224**	**365,820**	**73,245**	**2,256**	**144,441**
	‡	444	—	—	170	—	—
	†	280	362	2,630	33	3	561
1929		**238,185**	**48,882**	**325,224**	**67,423**	**1,103**	**122,929**
	‡	693	—	—	693	—	—
	†	266	416	2,789	62	2	714
1930		**262,564**	**65,417**	**310,862**	**53,967**	**1,437**	**99,902**
	‡	1,260	—	—	1,241	—	—
	†	517	234	4,703	160	—	1,050
1931		**256,024**	**87,025**	**372,688**	**43,564**	**3,309**	**147,660**
	‡	20,521	—	—	13,510	—	—
	†	452	197	2,589	98	4	465
1932		**242,672**	**44,490**	**328,522**	**40,814**	**2,747**	**110,591**
	‡	12,259	—	—	8,289	—	—
	†	832	310	33,891	158	1	548
1933		**221,060**	**10,516**	**225,078**	**36,804**	**897**	**69,838**
	‡	34,220	—	—	18,241	—	—
	†	413	164	2,085	47	1	57
1934		**176,274**	**19,646**	**257,328**	**27,603**	**957**	**51,835**
	‡	30,195	—	—	17,826	—	—
	†	217	154	795	12	1	3
1935		**271,650**	**23,734**	**213,639**	**39,478**	**1,146**	**61,430**
	‡	4,500	—	—	2,889	—	—
	†	269	256	1,581	9	2	9

Heavy type represents Irish. ‡Foreign. † Isle of Man.

Table showing the quantity of unsound meats utilised under supervision during the years 1925 to 1935:—

Year.	Beef.				Mutton.				Pork.			
	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.
1925	1,184	15	1	5	7	10	1	1	—	4	1	15
1926	336	0	2	2	4	6	1	1	—	7	2	26
1927	68	8	1	4	161	10	1	19	9	2	0	14
1928	28	2	0	8	46	3	3	5	2	11	3	0
1929	22	18	1	18	178	13	0	21	2	19	0	4
1930	20	8	3	25	58	1	0	2	—	12	1	9
1931	32	6	3	6	45	19	0	26	—	2	0	27
1932	8	4	3	1	28	12	3	15	—	11	2	5
1933	15	2	0	5	9	9	1	25	—	2	2	19
1934	11	15	1	14	8	8	0	10	—	10	0	2
1935	14	13	2	23	18	1	3	8	4	9	1	1

Table showing the quantity of unsound offal utilised under supervision during the years 1925 to 1935:—

Year.	Beef.	Mutton.	Pork.	Veal.
1925	40,160 pieces.	10,129 pieces.	1,883 pieces.	541 pieces.
1926	13,889 ,,	31,217 ,,	1,566 ,,	209 ,,
1927	9,243 ,,	6,725 ,,	2,790 ,,	248 ,,
1928	4,034 ,,	52,312 ,,	778 ,,	39 ,,
1929	6,447 ,,	14,422 ,,	814 ,,	9 ,,
1930	5,268 ,,	24,206 ,,	332 ,,	2 ,,
1931	4,068 ,,	4,491 ,,	2,081 ,,	8 ,,
1932	5,737 ,,	28,669 ,,	531 ,,	1,845 ,,
1933	9,256 ,,	1,541 ,,	2,221 ,,	408 ,,
1934	10,798 ,,	3,165 ,,	1,542 ,,	7 ,,
1935	2,247 ,,	10,647 ,,	6,017 ,,	—

Table showing the quantity and description of unsound meats utilised under supervision* during the year 1935 :

Description.	Total Weight.				Cause of Destruction.											
					Tuberculous.				Brine stained, mouldy and decomposed.				Other causes.			
	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.
Beef	14	13	2	23	—	—	—	—	13	18	2	19	—	15	0	4
Mutton	18	1	3	8	—	—	—	—	2	8	0	2	15	13	3	6
Pork	4	9	1	1	—	—	—	9	4	8	3	2	—	—	1	18
Veal	—	2	1	1	—	—	—	—	—	2	1	1	—	—	—	—
Total	37	7	0	5	—	—	—	9	20	17	2	24	16	9	1	0

* These were destroyed or allowed to go for industrial purposes to the satisfaction of the Medical Officer.

Table showing the quality and description of offal condemned during the year 1935 :—

Name of Organ.	Beef.		Mutton.		Pork.		Veal.	
	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.
Livers	169	2,099	418	492	42	118	—	—
Tongues	71	323	72	40	565	538	—	—
Hearts	51	181	268	73	155	88	—	—
Skirts	1,267	1,722	—	—	—	—	—	—
Cheeks	—	—	—	—	—	—	—	—
Kidneys	617	564	1,164	121	—	—	—	—
Tripe	5	41	—	—	—	—	—	—
Tails	39	75	—	—	—	—	—	—
Feet	—	—	8,725	5,477	1,822	1,822	—	—
Plucks	—	—	—	—	126	808	—	—
Heads	—	—	—	—	1	4	—	—
Udders	—	—	—	—	—	—	—	—
Reeds	28	69	—	—	—	—	—	—
Sweetbreads	—	—	—	—	—	—	—	—
Lungs	—	—	—	—	1,002	2,332	—	—
Maws	—	—	—	—	2,304	3,456	—	—
Totals	2,247	5,074	10,647	6,203	6,017	9,166	—	—

The organs dealt with above were rejected for various reasons, notably, decomposition and diseased conditions, such as cysts,

Table showing quantities of unsound general foodstuffs utilised under supervision during the year 1935:—

Description.	No. of Tins.	Weight in Pounds.	Description.	No. of Tins.	Weight in Pounds.
Canned Goods—					
Apples	344	3,232	Jellied veal ...	536	3,017
Apricots	11	12	Veal and Ham ...	10	60
Apricot Pulp ...	310	3,345	Hams	74	975
Fruit Salad ...	12	15	Bacon	15	127
Grape fruit Juice	9	72	Brawn	15	90
Loganberries ...	1,379	2,758	Pork	214	1,284
Mandarines ...	3,303	3,318	Pork and Tongue	19	114
Peaches	12	18	Pigs' Feet ...	2	12
Pears	2,952	2,007	Liver Paste ...	8	2
Pineapples ...	646	1,096	Crab	3,971	1,985
Tomatoes ...	8,902	22,611	Lobster	84	42
Tomato puree ...	461	2,114	Lobster Paste ...	2	1
Tomato Sauce ...	19	209	Salmon	5,636	4,625
Whole Egg ...	19	836	Chicken	2	1
Beef	279	761	Pigeons	4	2
Tongues	1,639	6,581			

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs.
Fruit (Fresh)—					
Apples...	584	15	5	2	18
,, (loose)	—	—	—	2	4
Bananas	860	24	3	3	22
,, (loose)	—	278	3	2	8
Oranges	74,831	2,684	7	0	17
,, (loose)	—	213	4	3	9
Plums	1,920	17	6	1	23
Pears	1,084	23	2	0	17

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs.
Fruit (Fresh)—*continued*—					
Grape fruit	7,993	279	12	0	16
Lemons	547	17	16	1	9
„ (loose)	—	2	18	3	20
Grapes...	182	3	13	3	12
„ (loose)	—	—	—	1	2
Apricots	32	—	4	3	12
Melons...	1,194	53	14	0	12
Tomatoes	2,359	25	11	2	11
Coconuts	2	—	2	0	0
Brazil nuts (loose)	—	90	17	3	8
Raisins	6	—	2	1	12
Currants	3	—	1	1	8
„ (loose)	—	—	5	0	8
Prunes (loose)	—	—	1	0	3
Figs (loose)	—	—	5	2	14
Vegetables—					
Potatoes	1,319	60	19	2	20
Turnips	170	8	2	0	16
Fresh peas	1	—	—	—	13
Kidney beans...	153	1	7	1	11
Lettuce	106	1	2	1	11
Cereals—					
Wheat	—	1,569	5	2	16
Maize	—	1,302	15	2	11
Rice	—	1	14	0	12
Flour	—	5	0	3	17

Description.	Packages.	Weight.			
Cereals—*continued*—		Tons.	Cwts.	Qrs.	Lbs.
Oats	—	—	1	2	0
Oatmeal	—	4	5	0	0
Barley	—	13	2	1	24
Butter beans	—	—	4	2	24
Peas	—	—	7	3	15
General—					
Bacon (pieces)	—	—	—	—	1
Hams	—	—	—	—	—
,, (loose)	—	—	—	2	17
Devilled ham...	1	—	—	—	2
Frozen salmon	197	—	15	2	14
,, (loose)	—	—	—	—	5
Butter	—	—	—	—	3
Grape fruit juice	1	—	3	3	16
Egg pulp	54	1	—	—	—
Desiccated coconut	4	—	4	2	16
Cheese	—	—	—	—	3
Macaroni	2	—	—	—	10

Table showing the total quantities of the different unsound foodstuffs utilised under supervision during the year 1935 :—

	Tons.	Cwts.	Qrs.	Lbs.
Beef, Mutton, Pork and Veal	37	7	0	5
Offal (Beef, Mutton, etc.) ...	9	2	2	3
Canned Goods	27	7	2	2
Fruit and Vegetables ...	3,802	13	1	—
Cereals...	2,896	17	3	7
General (Fish, Poultry, Rabbits, etc.)	2	5	0	3
TOTAL ...	6,775	13	0	20

The following tables give the particulars of samples sent to the City Analyst and City Bacteriologist for examination during the year 1935 :—

Samples sent to City Analyst.			Samples sent to City Analyst.		
ature of Samples.	Country of Origin.	No. of Samples.	Nature of Samples.	Country of Origin.	No. of Samples.
en egg yolk	China	4	Canned brisling	Spain	16
en whole egg ...	do.	6	Canned ox tongue ...	Uruguay	1
en egg albumen ...	do.	2	Canned liver paste ...	Denmark	8
cated whole egg ...	do.	2	Canned tomatoes ...	Spain	2
d egg albumen ...	do.	1	Canned tomato puree ...	Italy	2
efruit juice	S. Africa	1	Canned pears	U.S.A.	6
on Juice	do.	1	Canned salmon	Canada	1
e juice	do.	1	Pickled peeled shrimps ...	Germany	2
Pectin	Canada	1	Pearl barley	do.	5
efruit pulp	U.S.A.	3	Split green peas	Holland	2
vberry pulp	Bulgaria	2	Hog grease	N. Ireland	1
Do. ...	Canada	2	Raisins	S. Africa	1
Do.	Holland	3	Sultanas	Australia	1
cot pulp	Spain	2	Figs	Turkey	1
eberry pulp	Holland	1	Dried apple rings ...	Australia	1
kcurrant pulp ...	do.	1	Dried pears	U.S.A.	1
ed sardines	Portugal	42	Rice	do.	3
Do. ...	Spain	5	Wheat	Canada	2

Chinese frozen and dried egg was free from prohibited preservatives.

German pickled peeled shrimps were free from borates.

German pearl barley was free from mineral facing and sulphur di-oxide.

Spanish canned brisling showing a large amount of metallic contamination were re-exported.

One consignment of Portuguese sardines showing an excessive metal content is under detention pending re-exportation.

South African fruit juices containing sulphur di-oxide in excess of the quantity allowed, and which were intended for manufacturing purposes were reduced in content before being retailed.

Canadian wheat damaged by river water was utilised for animal food.

Samples sent to City Bacteriologist.		
Nature of Sample.	Country of Origin.	No. of Samples.
Prescapular Gland from frozen Wether	Argentine	1

In addition, 356 samples of goat hair, buffalo hair, black drawn bristle hair and wool were submitted for examination.

The Port Sanitary Authority is also engaged in the issue of certificates of disinfection for foreign governments and other purposes in connection with the exportation of hides, wool, jute sacks and cloth, tailors' cuttings, rags, second-hand bags and clothing, bales of cotton, etc. The number of such certificates issued during the year was 1,172.

The department also endorses under the United States, Canadian and other regulations, certificates regarding wholesomeness of food articles, and the sanitary condition of the premises in which the articles were produced or stored, comprising poultry, game, cheese, bacon, hams, potatoes, preserved fish, picked beef, tongues, sausage skins, lime juice, etc.

The work attached to preparing and recording these certificates is considerable, and takes up a large amount of time of the department.

The Medical Officer to the Port Sanitary Authority desires to express his appreciation of the valuable assistance received from H.M. Collector of Customs and staff, the Mersey Docks and Harbour Board and their officers, and the various shipping companies who have co-operated with the Port Sanitary Authority in the maintenance of Public Health and the prevention of disease in the port. The Consular Bodies have at all times given courteous assistance.

W. M. FRAZER,

Medical Officer of Health,
Port Sanitary Authority.

Municipal Annexe,
Liverpool, 2.
31*st March*, 1936.