PORT OF LIVERPOOL

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

TO THE

PORT SANITARY AUTHORITY

FOR THE YEAR

1931

BY

W. M. FRAZER, M.D., M.Sc., D.P.H.,

Port Medical Officer of Health,

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PORT SANITARY AUTHORITY

OF

LIVERPOOL.

REPORT FOR THE YEAR 1931,

BY THE

MEDICAL OFFICER OF HEALTH.

The report of the operations of the Liverpool Port Sanitary Authority for the year 1931, is submitted herewith.

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

(*a*) Measures adopted under the Cholera, Plague, and Yellow Fever and Allied Orders of the Government, and under the Port Sanitary Authorities (Infectious Diseases) Regulations, 1920, and the Public Health (Deratisation of Ships) Regulations, 1929.

(*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, etc.

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

together with observations on various aspects of Port Sanitary Administration.

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

AMOUNT OF SHIPPING ENTERING THE PORT SANITARY DISTRICT DURING THE YEAR 1931.

Class of Vessels.	Number.	Tonnage.	Number Inspected.		Number reported to be defective.	Number of vessels on which defects were remedied.
			By the Medical Officer.	By the Sanitary Inspector.		
	(1)	(2)	(3)	(4)	(5)	(6)
SAILING FOREIGN—						
Steamers	6,790	11,504,235	856	3,678	557	518
*Motor	471	1,566,278				
Sailing	18	4,690	—	2	—	—
Fishing	—	—	—	—	—	—
TOTAL FOREIGN	7,279	13,075,203	856	3,680	557	518
SAILING COASTWISE—						
Steamers	6,562	1,803,518	10	1,451	162	141
*Motor	1,061	643,763				
Sailing	28	3,326	—	6	—	—
Fishing	—	—	—	—	—	—
TOTAL COASTWISE	7,651	2,450,607	10	1,457	162	141
TOTAL FOREIGN AND COASTWISE	14,930	15,525,810	866	5,137	719	659

* (Includes mechanically-propelled vessels other than steamers.)

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

Character of Trade of Port.

PASSENGER TRAFFIC DURING 1931.

No. of Passengers ...	1st Class.	2nd Class.	3rd Class.	Tourist Class.	Transmigrants.
Inwards	6,878	12,256	23,011	12,678	4,618
Outwards	13,816	14,962	10,973	14,107	2,220

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.

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 on 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 through the assistance of the pilots. 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, and 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, and during the year 1931, were as follows :—

Port of Liverpool Sanitary Authority

To Pilots, and Masters of Inward Bound Vessels.

1. All Pilots should carry this booklet when on duty and immediately on boarding any inward bound ship should instruct the Master to read these directions carefully and to answer the following questions :—

(i) Have you during the voyage had on board any case of INFECTIOUS DISEASE, or any sickness which may be of an infectious nature ?

(ii) Have you, within the previous two months called at any of the ports mentioned on the opposite page ?

If the answer to either question is " Yes," or if the Master is in any doubt as to the nature of any sickness or the cause of any death which has occurred on board, the Pilot should instruct the Master as follows :—

(i) To send a wireless message to " STORM, LIVERPOOL," giving name of vessel, expected time of arrival in the Mersey, whether for Liverpool (North or South), Birkenhead, Garston or Manchester, and stating that the Doctor is required.

(ii) To report Formby Lightship for the Doctor.

(iii) To hoist the Quarantine Flag by day and the Quarantine Light by night.

NOTE.—The strict observance of the directions will greatly facilitate the clearance of vessels.

Pilots should, therefore :—

(1) Carry out these directions in regard to every inward bound ship.

(2) See that this booklet contains the latest list of infected Ports.

(3) Immediately apply to the Port Sanitary Authority, Prince's Pier Head, Liverpool, if they lose this booklet.

LIST OF

INFECTED PORTS.

DURING THE YEAR 1931.

JAVA PORTS
RANGOON
INDIAN PORTS
COLOMBO
ALEXANDRIA
BEYROUT
GRECIAN PORTS
MADAGASCAR
LAGOS
PERUVIAN PORTS
GUAYAQUIL
RIVER PLATE PORTS
DAKAR
BAHIA.

Other ports are added or deleted from time to time according to the prevalence of disease.

PORT SANITARY AUTHORITY.

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 693 vessels were boarded in the river by the assistant port medical officers, and in addition 173 vessels were visited for the purpose of alien and other inspection. Of the vessels boarded in the river, 93 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 deratisation exemption certificate (whichever the case may be) 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.

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 of 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.

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, and by this means a considerable saving of time with consequent saving of expense is effected; this saving of time and expense has been appreciated by the shipping companies and members of the various trades, for without the assistance of the launch unavoidable delay with resultant expense must have occurred. During the year 1931 the crew of this vessel were instrumental in saving no less than five persons from drowning.

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 is well placed for the admission of cases from the river, and it is also quite convenient of access by road, being less than a quarter of a mile away from a main road.

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.

On the other hand, owing to the different types of infectious disease occurring on vessels coming into the Mersey, and the necessity for 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 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; 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 patients are conveyed by motor ambulance.

Arrangements for Ambulance Transport.

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

Arrangements for detection and treatment of Venereal Disease among sailors,

Careful enquiries are 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 or engineer.

Leaflets, stating the times of attendance at the various venereal disease clinics in the city, attention being specially 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 patient at one of the clinics.

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 3,280 rats were examined for possible plague infection, 1,644 being from ships, and 1,636 from the sheds and quays at the docks, with the result that no evidence of the bacillus of plague was found (see page 77).

INFECTIOUS DISEASE.

The numbers of cases of infectious disease *landed from vessels* arriving in the Port of Liverpool and those occurring on Liverpool bound ships and 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 1931.		Average No. of Cases for previous 5 years.	No. of Vessels concerned.
	Passengers.	Crew.		
Smallpox	—	—	0·4	—
Scarlet Fever...	3	3	10	6
Enteric Fever and Paratyphoid Fever	3	2	8	5
Diphtheria	1	4	4	5
Measles and German Measles ...	3	3	15	6
Chickenpox	8	5	16	8
Tuberculosis	56	21	68	61
Pneumonia	4	10	16	14
Dysentery	—	4	4	3
Malaria	6	36	37	26
Cerebrospinal Fever	—	1	—	1
Erysipelas	1	2	2	3
	85	91	180	138

CASES OF INFECTIOUS SICKNESS OCCURRING ON VESSELS DURING THE VOYAGE BUT DISPOSED OF PRIOR TO ARRIVAL.

Diseases.	No. of Cases during 1931.		Average No. of Cases for previous 5 years.	No. of Vessels concerned.
	Passengers.	Crew.		
Smallpox	4	1	8	3
Typhus Fever	—	1	0·2	1
Scarlet Fever...	—	1	6	1
Enteric Fever and Paratyphoid Fever	2	4	23	6
Diphtheria	—	2	4	2
Measles and German Measles ...	25	1	44	11
Erysipelas	—	1	3	1
Chickenpox	10	9	32	8
Tuberculosis	24	13	42	30
Cerebrospinal Meningitis	1	1	0·4	2
Pneumonia	6	19	43	23
Cholera	—	6	2	1
Dysentery	4	5	12	8
Malaria	36	206	234	82
Mumps	1	—	0·2	1
	113	270	454	180

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

* There were 171 cases of venereal disease reported on board 119 vessels arriving in the Port during the year. These were referred where circumstances required, for treatment at the Seamen's Dispensary.

Smallpox.

No cases of smallpox were landed at Liverpool during the year. Three vessels landed smallpox cases elsewhere, but as the incubation period had expired before the arrival of the vessels at Liverpool, and vaccination and disinfection had also been carried out, it was only necessary to inspect all persons on board to ensure that no secondary cases had been overlooked.

Yellow Fever.

No cases of yellow fever were reported on 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.

During the year 1931, three cases of this disease were notified to the Health Department and admitted to the Liverpool City Hospital, Fazakerley. Of these patients two were associated with work in Liverpool, one of whom was engaged at the dock side, whilst one came from Preston.

It is of interest to note that owing to the facilities now available, many workers, when they develop signs of suspected anthrax, avail themselves at once of these opportunities for prompt diagnosis.

During the course of the year several persons voluntarily came to the Fazakerley Hospital for examination of suspicious "pimples" and the like.

Conditions sent in as suspect anthrax infections included carbuncle, boils, simple pustules, cellulitis, etc.

The site of the pustule was usually on an exposed part of the person. In two cases on the back of the neck, and in one behind the ear.

The occupations followed were as follows:—One was a tallyman and checker at the dockside associated with the discharge of ships, landing dry hides from S. America; the other was employed

in a tannery and had handled hides from various countries. He was engaged in dehairing hides in the lime yard. Another patient was a horse slaughterer and was not aware that he had dealt with an infected animal.

It is the wish of the Health Authorities that cases or suspected cases of anthrax be sent without delay to this hospital for admission, when the necessary steps will be taken to diagnose the illness and if necessary place the patient under serum treatment.

The fatal cases frequently quoted emphasise the importance of early diagnosis and serum treatment in all cases of this disease.

The business firms connected with the hide and skin trade in Liverpool and neighbourhood have recognised the importance of the points above enumerated in regard to the early diagnosis and serum treatment of cases of anthrax, and have conferred with the Liverpool Health Authorities with the object of taking further measures to educate the workers as to the risks involved in handling goods of animal origin, particularly hides and skins, and the precautions to be observed.

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.

Special arrangements have 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.

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 at the Government Wool Disinfecting Station, Love Lane, is still in progress, 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, 68 samples were examined after disinfection, and all were found to be free from anthrax; two of the original untreated samples showed evidence of positive 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 the ingredients thereof, are drawn. Infection may be conveyed to the farm by means of these and other animal substances from foreign countries, especially those places where inadequate precautions are taken or where none exist.

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 suggestion is made that special precautions should be adopted so that dried hides, wool, hair, &c., 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.

The Ministry of Agriculture recommends the following process for disinfection :—

" Thoroughly sprinkle the compartment to be disinfected with an antiseptic solution to prevent the raising of dust. Sweep down the

sides and floors; carefully collect all dust and refuse therefrom and destroy by fire. Then wash the sides and floors with strong solution of miscible carbolic acid (not less than 5 per cent. of acid) or a 3 per cent. solution of formalin, which contains not less than 40 per cent. of formaldehyde. Persons employed on the work should wear indiarubber gloves as a protection against inoculation, and also respirators."

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

TABLE GIVING PARTICULARS OF THE INCIDENCE OF ANTHRAX CASES IN THE UNITED KINGDOM, NOTIFIED TO THE CHIEF INSPECTOR OF FACTORIES, UNDER SECTION 73 OF THE FACTORY AND WORKSHOP ACT, 1901.

ANTHRAX.	1930	1929	1928	1927	1926	1920	1910
Cases Notified ...	*43-(6)	40-(5)	45-(8)	31-(2)	38-(3)	48-(11)	51-(9)
Wool	13-(1)	16-(2)	14-(2)	18-(1)	15-(2)	25-(7)	28-(3)
Horsehair	1	3	4-(1)	3-(1)	8-(1)	5-(1)	6-(1)
Hides and Skins ...	24 -(4)	20-(3)	24-(3)	9	12	17-(3)	14-(3)
Other Industries ...	5-(1)	1	3-(2)	1	3	1	3-(2)

Extracted from the Annual Report of the Chief Inspector of Factories for the year 1930

*The principal figures relate to cases and the bracketed figures to deaths.

Malaria.

During the year 1931 53 new cases of malarial fever were notified, which were either landed in Liverpool or had recovered abroad, in 18 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.

Cholera.

S.S. "City of Hereford." The s.s. "City of Hereford" arrived at Liverpool from Basrah via Avonmouth on October 10th, 1931, and was visited on arrival by the assistant port medical officer. The captain reported that the vessel left Bushire on July 30th, 1931, with 91 extra coolies who were carried for the purpose of working cargo at Basrah and other ports. On arrival at Basrah on August 8th, 1931, all persons on board were inoculated against Cholera owing to an epidemic of that disease in the port, and a further inoculation was given six days later.

Between August 18th and August 26th six of the extra coolies were removed to hospital suffering from suspected cholera. In four cases the diagnoses were confirmed and all proved fatal : the remaining two were found to be negative. No further sickness occurred during the voyage either among the permanent crew or the extra coolies, and the latter were landed at Hartah Point on 3rd September, having been in the vessel for 36 days. All water tanks used for drinking, with the exception of a small port domestic tank containing 13 tons of water from Port Said was chlorinated and emptied at Avonmouth. The small port domestic tank was pumped out between Avonmouth and Liverpool, and as the vessel was proceeding almost immediately to Glasgow, cementing and cleansing were carried out at that port. The crew's quarters, latrines, w.c.'s, and bilges had been disinfected at Avonmouth. The crew were examined at Liverpool but nothing of a suspicious nature was discovered. The vessel sailed for Glasgow on October 12th, 1931, and a full report of the circumstances was forwarded to the Medical Officer of Health of that port for his guidance.

Typhus Fever.

S.S. "Brandon. The s.s. "Brandon" arrived in the Mersey on August 22nd, 1931, from Buenos Aires via St. Vincent and was boarded in the river by the assistant port medical officer. The captain reported that an able seaman was landed at Porto Praia on June 19th, 1931, and it had since been reported to him by the consul at St. Vincent that the

man had died on June 30th, 1931, from Typhus Fever. With the exception of two cases of venereal disease no further sickness occurred during the voyage. Disinfection was carried out at Cape Verde, and on arrival at Liverpool the crew were medically examined but nothing of a suspicious nature was discovered.

Plague.

No case of human plague was landed at Liverpool during the year. No rodent plague was discovered among the rat population during the year either in ships or on quays.

International Sanitary Convention of Paris, 1926.

Article 28.

Article 28 of the International Sanitary Convention of Paris has now been in force for three and a quarter years (the first certificate issued by the Liverpool Port Sanitary Authority was on October 5th, 1928) and it is now possible to analyse to some extent the effect this Article has had on the rat population in ships. Before 1928 vessels were fumigated either because of requirements of foreign countries to which they sailed, or because in the opinion of a sanitary inspector of a Port Sanitary Authority they were heavily rat-infested, or as it was then termed "ratty." In the latter case representation was made to the owners or agents of the vessel, and in the event of their refusal to carry out the requirements of the Port Sanitary Authority and fumigate the vessel, an order was served under either the Plague, Cholera and Yellow Fever Order, 1907, or the Rats and Mice (Destruction) Act, 1919; by this means the owner was forced to fumigate or otherwise deratise the vessel.

Even by these methods the rat population in ships was gradually decreasing, and an examination of the conditions in the years 1923 to 1927 in Liverpool shows that the average number of rats per vessel in 1923 was 58·83; in 1924, 55·96; in 1925, 40·47; in 1926, 22·00; and in 1927 16·52; this improvement was probably due also to the fact that from 1923 onwards the question of making vessels "rat proof" was engaging the attention of both Port Sanitary Authorities and shipowners, and

during these years a number of large liners on the North Atlantic trade were "rat-proofed"—largely owing to pressure from the American Port Sanitary Authorities. Improvement in conditions ashore in certain foreign ports may also have assisted in diminishing the number of rats exported.

This improvement, however, has been completely overshadowed by the results obtained during the past three years in Liverpool : in 1928 the average number of rats per vessel was 12·79; in 1929, 7·80; in 1930, 3·50; and in 1931, 2·02.

In 1923, 90 fumigations produced 5,295 rats, while in 1931, 162 fumigations only produced 966 rats. In 1931 also 162 vessels were examined, which showed no evidence of rats whatever.

Although rat-proofing and general improvement in conditions ashore were making headway before the International Sanitary Convention was brought into force, there seems to be little doubt that the greatest improvement has been due to Article 28 of the Convention, which requires all vessels, except certain coastwise vessels, to undergo periodic examination every six months in order to ensure that the rat population is kept down to a minimum. The marked improvement in Liverpool vessels may also be due in a greater or lesser degree to the fact that unless a vessel shows no evidence of rats, it is not accepted that the rat population has been kept down to a minimum, in other words Deratisation Exemption Certificates are only granted to vessels which show on examination no traces or evidence of rats.

If the numbers of rats in ships likely to convey plague infection can be reduced to a minimum and so maintained, the gravest cause for the necessity of detaining shipping and interfering with commerce on account of the danger of plague, will be removed. It will, therefore, be necessary and indeed self-evident that the methods which have proved so successful should be continued with the same vigour and persistence as heretofore.

The Examination of Vessels for Deratisation or Deratisation Exemption Certificates.

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 old 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 then 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. Every lifeboat 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, of course, 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.

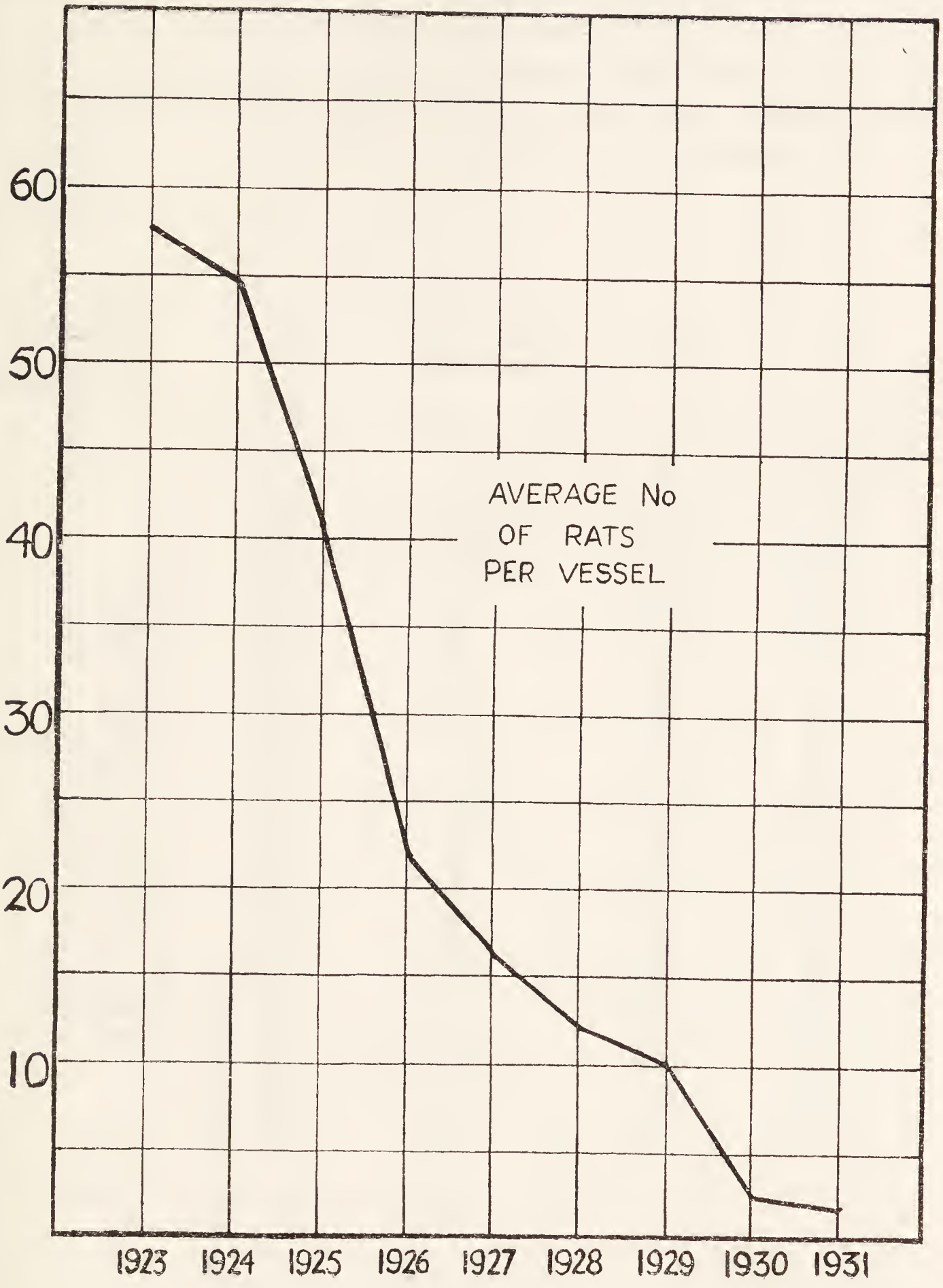
After all fumigations, an independent rat searcher is sent to search for dead rats, in order to check the estimate made before the fumigation was carried out. The time taken over this search is similarly checked by a sanitary inspector, and in cargo vessels, not carrying passengers, this usually takes 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,

The following Table shows the number of Fumigations of Vessels during the past nine years and the number of Exemptions for 1928-1931, 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	1·46
1929	221	114	2,614	292	7·80	1·32
1930	187	316	1,762	75	3·50	0·40
1931	162	314	966	182	2·02	0·38

* 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 nine years :—



The following table shews examples of the improvement that has taken place in 27 vessels during the past few years. Column No. 3 shews the number of rats found after fumigation in the year mentioned in Column No. 2, while Column No. 5 shews the number of rats found in the same vessel after fumigation during the year stated in Column No. 4. Vessels which were exempted in 1930 or 1931 shewed no evidence of rat infestation on preliminary examination.

Vessel.	Year.	Number of Rats found after Fumigation.	Year.	Number of Rats found after Fumigation, or Ship exempted.
(1)	(2)	(3)	(4)	(5)
No. 1	1925	166	1931	15
,, 2	1923	59	1930	12
,, 3	1925	651	1931	22
,, 4	1923	115	1930	40
,, 5	1923	68	1931	Exempt
,, 6	1923	72	1931	Exempt
,, 7	1923	39	1930	Exempt
,, 8	1924	228	1930	12
,, 9	1924	111	1931	Exempt
,, 10	1923	154	1931	16 mice
,, 11	1923	226	1931	2 rats and 37 mice
,, 12	1924	105	1931	Exempt
,, 13	1924	438	1930	19
,, 14	1924	308	1931	7
,, 15	1924	102	1931	Exempt
,, 16	1924	46	1931	Exempt
,, 17	1924	78	1931	Exempt
,, 18	1924	115	1931	Exempt
,, 19	1924	439	1930	6
,, 20	1924	137	1930	Nil
,, 21	1924	309	1931	32
,, 22	1925	74	1931	Exempt
,, 23	1924	78	1931	Exempt
,, 24	1924	123	1931	5
,, 25	1925	84	1931	3
,, 26	1925	37	1931	3
,, 27	1925	44	1931	14

PARTICULARS RELATING TO PLAGUE " INFECTED " OR " SUSPECTED " VESSELS ARRIVING IN THE PORT DURING 1931.

Name of Vessel.	Date of Arrival.	Whether " Infected " or " Suspected."	Methods of Rat Destruction Employed.	Number of Dead Rats Recovered.			Whether a Certificate of Deratisation was Issued.	Remarks.
—	—	—	—	—	—	—	—	—
No vessels of	this character	arrived.						

MEASURES OF RAT DESTRUCTION ON VESSELS FROM PLAGUE INFECTED PORTS (OTHER THAN THOSE INCLUDED IN ABOVE) ARRIVING IN THE PORT DURING 1931, AND NUMBER OF CERTIFICATES ISSUED IN RESPECT OF SUCH VESSELS.

Total Vessels from Plague Infected Ports.	Number of such Vessels Fumigated by $S.O_2$.	Number of Dead Rats Recovered.		Number of such Vessels Fumigated by H.C.N.	Number of Dead Rats Recovered.		Number of such Vessels Fumigated by Salfurkose	Number of Dead Rats Recovered		Number of such Vessels on which Trapping, etc., were Employed.	Number of Dead Rats Recovered.		Number of such Vessels on which Measures of Rat Destruction were not carried out.	Number of Fumigation Certificates Issued on Form 11.		Number of other Certificates Issued.
														Deratisation.	Exemption.	
		Rats.	Mice.		Rats.	Mice.		Rats.	Mice.		Rats.	Mice.				
590	13	109	3	18	202	64	4	26	16	571	1116	25	19	35	67	—

MEASURES OF RAT DESTRUCTION ON VESSELS OTHER THAN THOSE IN ABOVE TABLES, AND NUMBER OF CERTIFICATES ISSUED IN RESPECT OF SUCH VESSELS DURING 1931.

Number of Vessels Fumigated by $S.O_2$.	Number of Dead Rats Recovered		Number of Vessels Fumigated by H.C.N.	Number of Dead Rats Recovered		Number of Vessels Fumigated by Salfurkose	Number of Dead Rats Recovered		Number of Vessels on which Trapping, etc., were Employed.	Number of Dead Rats Recovered		Number of Certificates Issued on Form " Port 11."		Number of other Certificates Issued.
													Deratisation.	Exemption.	
	Rats	Mice		Rats	Mice		Rats	Mice		Rats	Mice			
69	338	70	47	288	29	11	3	—	826	869	32	127	247	—

TABLE SHOWING THE NUMBER OF RATS AND MICE OBTAINED ON SHIPS AND QUAYS BY THE AUTHORITY'S RAT-CATCHERS DURING THE YEARS 1922-1931.

Year.	NUMBER OBTAINED.			NUMBER					
				EXAMINED.			DESTROYED.		
	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.
1922	10,642	2,830	13,472	5,520	2,519	8,039	5,122	311	5,433
1923	12,097	1,625	13,722	5,629	1,460	7,089	6,466	167	6,633
1924	13,509	1,963	15,472	4,981	1,658	6,639	8,528	305	8,833
1925	11,088	2,508	13,596	4,882	2,065	6,947	6,206	443	6,649
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
Total.....	85,721	22,107	107,828	41,404	18,567	59,971	44,315	3,542	47 857

* 294 mice are included in these figures.

NUMBER AND SPECIES OF RATS CAUGHT IN THE CITY AND PORT OF LIVERPOOL, DURING THE YEAR 1931.

1931.	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 ...	54	113	—	434	22	467	76	1,014	174	—	55	7	18	5	247	12
February ...	71	151	—	445	43	475	114	1,071	205	—	83	18	15	5	303	23
March	92	114	—	458	39	600	131	1,172	251	3	58	63	42	25	351	91
April	109	166	—	448	58	481	167	1,095	162	—	44	28	25	19	231	47
May	140	158	—	591	25	628	165	1,377	289	—	31	24	34	7	354	31
June	155	197	—	536	61	629	216	1,362	215	—	94	22	31	36	340	58
July	98	158	—	600	58	412	156	1,170	237	—	67	25	36	26	340	51
August ...	56	84	—	506	20	387	76	977	251	1	111	8	45	17	407	26
September ...	96	192	—	557	34	564	130	1,313	190	—	166	58	27	20	383	78
October ...	156	133	—	594	48	564	204	1,291	327	—	94	6	61	38	482	44
November ...	45	514	—	456	44	586	89	1,556	360	—	115	19	32	6	507	25
December ...	43	137	—	383	13	257	56	777	286	—	95	11	26	16	407	27
TOTAL ...	1,115	2,117	—	6,008	465	6,050	1,580	14,175	2,947	4	1,013	289	392	220	4,352	513

NUMBER AND SPECIES OF RATS EXAMINED OR DESTROYED IN THE CITY AND PORT OF LIVERPOOL, DURING THE YEAR 1931.

1931.	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	22	181	54	833	154	11	93	1	1,349
February	24	204	90	867	200	22	103	1	1,511
March	36	234	95	938	224	86	127	5	1,745
April	19	221	148	874	155	41	76	6	1,540
May	32	256	133	1,121	237	28	117	3	1,927
June	46	280	170	1,082	237	52	103	6	1,976
July	27	254	129	916	210	34	130	17	1,717
August	13	221	63	756	243	25	164	1	1,486
September	21	290	109	1,023	322	42	61	36	1,904
October	48	301	156	990	347	30	135	14	2,021
November	14	261	75	1,295	338	24	169	1	2,177
December	7	165	49	612	201	17	206	10	1,267
TOTAL	309	2,868	1,271	11,307	2,868	412	1,484	101	20,620

RATS DESTROYED DURING 1931.

(1) ON VESSELS.

	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
... ...	174	205	251	162	289	215	237	251	190	327	360	286	2,947
... ...	—	—	3	—	—	—	—	1	—	—	—	—	4
amined ...	92	108	138	107	183	130	112	102	132	203	221	116	1,644
ound in- with Plague	—	—	—	—	—	—	—	—	—	—	—	—	—

(2) QUAYS, WHARVES AND WAREHOUSES.

	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
... ...	73	98	100	69	65	125	103	156	193	155	147	121	1,405
... ...	12	23	88	47	31	58	51	25	78	44	25	27	509
amined ...	73	114	172	89	82	159	132	166	232	174	141	102	1,636
ound in- with Plague	—	—	—	—	—	—	—	—	—	—	—	—	—

Number of Mice destroyed on vessels 239
Do. do. do. on quays 55
Do. do. examined on vessels and quays 77

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 1931, are as follows :—

	Rats.	Mice.	Rats.	Mice.
PORT—				
In vessels	12,743	239		
On quays	1,914	55		
			14,657	294
CITY—				
In warehouses	3,232	—		
In sewers and from other sources ...	12,523	46		
			15,755	46
		TOTAL ...	30,412	340

Number of Visits to **Vessels** by Rat Catchers					4,969
Do.	do.	do.	Rat Searchers		5,329
Do.	do.	**Quays, Sheds, etc.**, by Inspectors ...			758
Do.	do.	do.	do.	Rat Searchers	1,734
Do.	do.	do.	do.	Rat Catchers	11,360

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, the passengers and crews are examined 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.

(*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 is carried on.

Proposed Electric Rat Guards.

At the suggestion of the Ministry of Health, through the Association of Port Sanitary Authorities, experiments were carried out a short time ago at this and other ports with the object of testing the effect of electricity in killing rats or in preventing them by means of a rat-guard from gaining the shore. From the experiments which were made in Liverpool the authorities have not been satisfied that an electric rat-guard would be a practical proposition in the port. The experiments with the use of electricity for this purpose with various types of appliances are always associated with certain practical difficulties; for example, it would be difficult to obtain a sufficiently powerful current (400-600 volts) on shipboard, for as a rule, ships have only a continuous current of 120 volts at their disposal. The use of an interrupter and a suitable transformer giving to a secondary coil a sufficient current would be expensive, and it would also be necessary to have such power available in port during the night as well as in daytime whilst in dock.

Again, a considerable amount of wiring for the apparatus to both ends of the vessel would be necessary: this might be interfered with for various reasons. The experiments were disappointing in that whilst several rats, especially of small size, were killed, others were simply stunned and frequently recovered after a few minutes. From experiments carried out elsewhere it has been shown that a voltage of 440 was not sufficiently powerful to produce an instantaneously fatal shock.

Once having detected the presence of the electric current by contact or other means, the rats would not voluntarily approach the traps. This would seem to be in favour of an electric rat-guard which would prevent the rats crossing by means of ropes, but the voltages on board ship were too low to be effective. The use of electricity in the forms in which it was used in these tests did not seem to be a practical proposition for the purposes mentioned.

Methods of Deratisation of Ships.

Deratisation of ships is carried out by fumigation with either sulphur dioxide, hydrocyanic acid gas or salfurkose. 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 capaeities of the spaees 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 eaeh 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 burned, it is advisable that a small quantity of wood wool or shavings dipped in methylated spirit should be added to each receptaele.

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

Deratisation by means of hydrogen cyanide.

Fumigation of vessels by means of this gas is exceedingly dangerous to human life, and may only be earried out by firms whieh have a specially trained staff and the necessary 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 eubic feet of air spaee is required, and for living quarters, superstruetures and other spaces not used for stores, 1 oz. per 1,000 cubic feet. The minimum time of exposure in both eases is two hours.

(2) *Zyklon B.* is kieselguhr, a very absorbent infusorial earth impregnated with a mixture of hydrogen cyanide (97½ per eent.) and tear gas (2½ per eent.). 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 plaeed near the holds in numbers necessary for fumigation of the particular cubie capacity. Each tin is opened by a speeial apparatus whieh prevents the escape of gas during the proeess. 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*) By this process hydrocyanic acid gas is liberated from a stabilised liquid hydrogen cyanide on exposure to the atmosphere. The liquid 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, and the operators then proceed to remove the metal caps and release the liquid into special containers.

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

(4) *Salfurkose.* This process consists of burning an inflammable liquid in double jacketed 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. The small containers hold a maximum of five pints of salfurkose, which is sufficient to fumigate spaces up to 4,200 cubic feet. The medium containers hold a maximum of 1 gallon 2 pints of salfurkose, which is sufficient to fumigate spaces up to 8,500 cubic feet. The large containers hold a maximum of 1 gallon 7 pints of salfurkose, which is sufficient to fumigate spaces up to 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.

The two following modifications of hydrogen cyanide gas generation were tested by the Port Sanitary Authority during the year :—

(1) *Safti-Fume Fumigant.*

Safti-fume fumigant is made in the form of briquettes which have the following composition :—

Cyanogen content—not		less	than	19%
Active ingredients	,,	,,	,,	47-50%
Inert ingredients—				
Silica ...	,,	,,	,,	23%
Sodium Chloride	,,	,,	,,	2·5%
Calcium Oxide	,,	,,	,,	3·5%
Sodium Carbonate	,,	,,	,,	2·3%
Water ...	,,	,,	,,	16·7% to 21·7%

The briquettes each weigh $1\frac{3}{4}$ lbs., sufficient to fumigate 2,000 cubic feet. The process consists of sliding the briquettes gently into wooden pails containing equal parts of hydrochloric acid and water (one briquette requires one quart of acid and one quart of water) when a gas known as cyanogen chloride mixture is given off.

For the purpose of the experiment, live rats, bed bugs, and cockroaches were used. After four hours' exposure all were killed with the exception of two bed bugs and one cockroach.

The following conclusions were arrived at:—

(1) That this form of fumigant appears to be satisfactory for the killing of rats, bugs and cockroaches.

(2) The briquettes are convenient to handle and can be transported with little difficulty.

(3) The necessity of transporting quantities of hydrochloric acid and also a large number of wooden buckets are distinct disadvantages.

(4) The gas takes two or three minutes to generate, but the use of a gas mask is essential if more than one briquette is used, and in all cases for the fumigation of holds or other places requiring any number of ladders.

(5) A very powerful warning gas is given off simultaneously with the generation of the hydrocyanic acid gas, and owing to its action on the mucous membrane of the nostrils and eyes it is unlikely that anyone could enter the gas unwittingly.

(6) At the conclusion of the experiment the pail contained a residue of green coloured liquid and a deposit of bluish-grey sand. When stirred, a fresh generation of tear gas and cyanide was noticed.

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

Deratisation of premises—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.

(1) WHARVES AND WAREHOUSES.—With the exception of a few of the old docks on 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 sets 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.—The Mersey Docks and Harbour 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 the point where they pass through bulkheads or from one compartment to another.

PSITTACOSIS

The number of orders issued during the year 1931 under The Parrots (Prohibition of Import) Regulations, 1930, was 39.

No cases of this disease were reported in this City or Port during the year. The following short account of the occurrence of this disease may be of interest.

The existence of acute illness in man due to the infection from sick parrots, or similar birds, has been recognised for a long time, and its frequent association with birds of the parrot tribe has caused the condition to be named " Psittacosis " (Lat. psittacus—parrot).

A considerable number of cases of this disease has occurred in England and Wales during the last few years. The disease is unfamiliar to the majority of medical practitioners, but nothing in the shape of an epidemic has been previously recorded. It is possible that a few unsuspected cases have occurred.

In July, 1929, and subsequent months, an outbreak of human cases of the disease occurred in the Argentine, and it was noticed that the cases were mostly associated with sick parrots presenting signs of nasal catarrh or diarrhœa. Enquiries showed that a large consignment of parrots had been imported into the Argentine from Brazil, and that there had been great mortality amongst them. Later, cases of illness in men occurred in various parts of the world, including Europe.

The first suspected human case in England occurred near Birmingham.

The onset of the disease is usually fairly acute, the symptoms being vague and consisting of malaise, feverishness, headache and chilliness. The lungs were involved in almost every case.

Liverpool had only six human cases, five of which were resident in one institution in the city. The cases were reported in January, 1930, some of them being severe and requiring hospital treatment: all recovered. With one exception all the Liverpool cases were associated with the handling of a green Amazon parrot which died.

Of the total cases (117) reported on by the Ministry of Health, and occurring in this country, 25 were fatal, giving a case mortality rate of 21·3 per cent.

The occurrence of these cases throughout the country resulted in the Ministry of Health prohibiting the importation of birds of the parrot species under the Parrots (Prohibition of Import) Regulations, 1930.

It would appear desirable that birds of this character should not be kissed or caressed or fed from the mouth owing to the grave danger of transmitting disease.

Prompt enquiry was made into all cases by the staff of the Health Department and there was no extension of the outbreak.

VENEREAL DISEASES.

A very important subject which has close association with seafaring life is the prevalence of venereal diseases. These diseases as we all know attack only the human species and unless well and speedily treated may pursue a very chronic, painful and crippling course, leading to permanent incapacity and early death.

The scheme arranged by the Ministry of Health in 1917 has now had a long spell of trial and very good results may be claimed from it. The treatment offered free of charge with full facilities for diagnosis and a supply of special drugs has been taken full advantage of by many classes of patients.

Seamen have been specially catered for at centres placed near docks or in the vicinity of offices where seamen congregate or sign off. There are several venereal diseases clinics in Liverpool, but one centre near the docks named the Seamen's Dispensary, established specially for the treatment of this disease in sailors has proved a great success. It was opened in 1924, and now has a high average attendance.

For those patients who have to go to sea or to another port the usual Form V44, with a full history and details of the treatment already received, is very valuable.

The weakness in the system is that more expert treatment is required than can usually be given on board ship, and so in many cases the men continue to go to sea and the disease may relapse.

Such uncured cases should, under these circumstances, remain ashore for continued treatment, or after short voyages return for continuation treatment at the dispensary or clinic.

Where a seaman is found on medical examination before signing on to be suffering from venereal disease he should be referred for medical treatment to a clinic and should not be re-engaged until it is certified that he is fit for sea.

The purpose of the establishment by the Corporation of venereal disease schemes is to afford facilities for the diagnosis and treatment

of these diseases in accordance with the recommendations of the Royal Commission in 1917.

The recommendations may be summarised as follows :—

1. That opportunities should be afforded to sufferers to have free and expert treatment.

2. That extended facilities should be provided for the diagnosis of these diseases.

3. That information as to the dangers of venereal diseases should be disseminated, and particulars given to the public as to the facilities provided for free treatment.

Clinics have been established as under :—

Seamen's Dispensary—Males only.

*Royal Infirmary—Males and Females.

David Lewis Northern Hospital—Males and Females.

*Royal Southern Hospital—Males and Females.

*Stanley Hospital—Males and Females.

Edge Lane Medical Home—Females.

* Beds are reserved for in-patients at these Institutions.

The following summarises the work of the treatment centres for the year 1931 :—

ETURN SHOWING THE NUMBER OF NEW CASES ATTENDING THE VENEREAL DISEASES CLINICS DURING THE YEAR 1931, ALSO TOTAL ATTENDANCES AND IN-PATIENT DAYS OF OLD AND NEW PATIENTS DURING SAME PERIOD.

	Seamen's Dispensary Males only.	Royal Infirmary. Males and Females.	Royal Southern Hospital. Males and Females.	David Lewis Northern Hospital. Males and Females.	Stanley Hospital. Males and Females.	Edge Lane Medical Home. Females.	TOTAL. Males and Females.
Cases	1,667	1,036	353	248	296	127	3,727
nd new patients							
al attendances	54,164	43,791	13,858	8,766	9,425	—	130,004
patient Days	—	65	3,303	—	130	9,020	12,518

Seamen's Dispensary.

This clinic for males is open all day, and has proved to be a very useful centre for the treatment of venereal disease.

The staff consists of three 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.

By careful interrogation of patients and the keeping of records over several years it has been established that the average seaman who becomes infected has not practised any prophylaxis, and that the taking of alcohol to excess is not such a contributory factor in the acquisition of venereal disease as is generally supposed. It would appear, however, that in men over thirty years of age, venereal disease is frequently associated with the taking of alcohol, not necessarily to excess.

During the year under review 2,953 cases have been advised and treated, of whom 1,971 reported for the first time. Of these 563 were found not to be suffering from venereal disease.

During the year all shipping companies with offices in Liverpool, whose ships carry surgeons, were circularised with a view to having more modern methods of treatment of venereal disease instituted at sea. As a guide in this matter reprints of an article (published in "The Lancet") by the medical officer of the dispensary on practical methods of treatment at sea and on shore, were issued, and the numerous requests for further copies of the article indicated the interest aroused in the subject.

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

	1927	1928	1929	1930	1931
Syphilis	459	435	413	419	346
Soft Chancre	157	131	150	141	92
Gonorrhœa	931	1,031	1,112	1,113	970
Non-Venereal Cases	295	446	446	589	563
	1,842	2,043	2,121	2,262	1,971

The figures given above show a decline in the number of patients suffering from venereal disease during 1931; this is especially so in the case of gonorrhœa. The reason for this drop is not evident. The decline in shipping and other occupations with the accompanying lack of employment for workers may have had an effect.

Evening clinics are held twice weekly at the dispensary, and during the year there were 87 new cases and approximately 2,000 attendances. These patients have satisfied the medical officer that they cannot attend at the usual clinic hours.

This clinic is availed of by patients of all classes of occupation, but the majority are seafaring men.

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.

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.

With regard to syphilis, it is found, from figures compiled at the Seamen's Dispensary, that only 25 per cent. of the syphilitic cases attending there appear for treatment in the pre-Wasserman reaction stage, and 24 per cent. appear as early syphilis with primary sore and positive Wasserman test. Those with syphilis in the secondary stage, with rash, sore throat, &c., form only 8 per cent. of the total. The important point, however, is that fully 40 per cent. of patients are in the stage of later or latent syphilis, including treated cases of more than two years' duration.

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

	Percentage of total cases of diagnosed Venereal disease.
Syphilis	40·8%
Soft Chancre	2·4%
Gonorrhœa	56·8%

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

Educational Propaganda.

At the inauguration of the venereal diseases scheme the Ministry of Health approved of certain educational work being conducted to acquaint the general public and those likely to come into contact with venereal disease of the dangers arising therefrom. After several years' effort in Liverpool, the work has culminated in the merging of the various Merseyside boroughs into a scheme for this and general health purposes under the Merseyside Boroughs Health Education Committee.

Lectures and addresses have been delivered in the districts mentioned by Dr. Hall, the lecturer-organiser of the Committee.

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SERVICES RENDERED AT THE VENEREAL DISEASES TREATMENT CENTRES DURING THE YEAR 1931.

	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	1,260	733	62	...	1,555	606	58	24	2,935	1,363	4,298
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	114	13	2	...	122	9	...	...	238	22	260
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	197	21	...	...	...	...	...	...	197	21	218
,, secondary	43	27	...	...	...	...	...	...	43	27	70
,, latent in 1st year of infection	28	22	...	...	...	...	...	...	28	22	50
,, all later stages	209	110	...	...	...	...	...	...	209	110	319
,, congenital	18	44	...	...	...	...	...	...	18	44	62
Soft Chancre	...	...	99	1	...	...	...	...	99	1	100
Gonorrhœa, 1st year of infection ...	...	...	...	...	1,302	215	...	...	1,302	215	1,517
,, later	...	...	...	...	222	32	...	...	222	32	254
Conditions other than venereal ...	...	...	...	...	...	...	925	85	925	85	1,010
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	195	24	18	...	194	29	...	...	407	53	460
	2,064	994	181	1	3,395	891	983	109	6,623	1,995	8,618
5. Number of cases discharged after completion of treatment and final tests of cure	108	25	90	...	755	29	957	95	1,910	149	2,059
6. Number of cases which ceased to attend before completion of treatment and were, on first attendance, suffering from :—											
Syphilis, primary	135	15	...	...	...	...	...	...	135	15	150
,, secondary	46	15	...	...	...	...	...	...	46	15	61
,, latent in 1st year of infection	24	12	...	...	...	...	...	...	24	12	36
,, all later stages	179	96	...	...	...	...	...	...	179	96	275
,, congenital	15	39	...	...	...	...	...	...	15	39	54
Soft Chancre	...	...	33	...	...	...	...	...	33	...	33
Gonorrhœa, 1st year of infection ...	...	...	...	...	629	119	...	...	629	119	748
,, later	...	...	...	...	105	23	...	...	105	23	128
7. Number of cases which ceased to attend after completion of treatment but before final tests of cure	49	18	7	...	184	13	...	...	240	31	271
8. Number of cases transferred to other centres or to institutions, or to care of private practitioners	214	18	24	...	251	33	...	...	489	51	540
9. Number of cases remaining under treatment or observation on 31st December ...	1,294	756	27	1	1,471	674	26	14	2,818	1,445	4,263
	2,064	994	181	1	3,395	891	983	109	6,623	1,995	8,618
10. Number of cases in the following stages of syphilis included in Item 6 which failed to complete one course of treatment :—											
Syphilis, primary	51	5	...	...	...	...	...	...	51	5	56
,, secondary	17	6	...	...	...	...	...	...	17	6	23
,, latent in 1st year of infection	7	4	...	...	...	...	...	...	7	4	11
,, all later stages	49	32	...	...	...	...	...	...	49	32	81
,, congenital	2	22	...	...	...	...	...	...	2	22	24
11. Number of attendances :—											
(*a*) for individual attention of the medical officers	15,639	6,536	634	7	29,807	5,857	1,912	307	47,992	12,707	60,699
(*b*) for intermediate treatment, e.g., irrigation, dressing	1,022	139	1,260	...	65,132	1,748	4	...	67,418	1,887	69,305
TOTAL ATTENDANCES ...	16,661	6,675	1,894	7	94,939	7,605	1,916	307	115,410	14,594	130,004
12. In-patients :—											
(*a*) Total number of persons admitted for treatment during the year ...	12	6	3	...	21	30	7	...	43	36	79
(*b*) Aggregate number of "in-patient days" of treatment given	223	571	31	...	707	1,951	15	...	976	2,522	3,498

	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	...	11	4	8	7	14	7	11	18	44

	Arsenobenzene Compounds.	Mercury.	Bismuth.
14. Treatment of Syphilis :			
(*a*) Total number of injections given (out-patients and in-patients) ...	11,022	88	9,489
(*b*) Number of injections *included in* (*a*) given to patients who on first attendance were suffering from primary and secondary syphilis	2,978	5	3,725

	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 officers of the treatment centres	58	4,332	...	...	...
(*b*) Number of specimens from patients attending at the centres sent for examination to an approved laboratory	70	2,833	4,779	...	...

Education in Health for Seamen.

Cadets and others who intend to join the Mercantile Marine should receive a training in hygiene on training ships and qualify in ambulance and first aid work, and all should receive some instruction in the dangers of venereal disease. Some years ago a circular on the Health of Seamen was drawn up with the object of directing the attention of sailors to the dangers of venereal diseases and directing them if infected to the various clinics in the City of Liverpool, where free treatment could be obtained. The subject was introduced by starting with other dangers to health than venereal disease which might arise in the course of the voyage; the following is the text of the notice :—

"Liverpool Port Sanitary Authority.—Health of Seamen.

"Many of the ailments and illnesses which are associated with a "seafaring life may be avoided by attending to a few simple rules of "health. If you would avoid these ailments attend to the following :—

"(1) Do not drink water from polluted or doubtful sources. Ice "cream and uncooked shell-fish frequently cause typhoid fever and "dysentery.

"(2) When taken at all, spirits should be consumed in the strictest "moderation, care being especially taken as to the quality of the liquors "obtained in bars in foreign ports.

"(3) Avoid exposure to the direct rays of the tropical sun and unduly "prolonged exposure to high temperatures.

"(4) When in tropical ports, avoid sleeping uncovered on open decks "or in quarters where mosquitoes are likely to bite you, as malaria "is frequently contracted in this way. When mosquitoes are prevalent, "sleep under cover of a mosquito curtain.

"(5) Serious lifelong illness may be contracted by sexual intercourse "with loose women.

"Any form of venereal disease, if untreated, may last a life-time, "and be transmitted to wife and children. If either of these diseases, "syphilis or gonorrhœa (pox or clap) should be contracted, do not "delay in consulting a properly qualified doctor at the earliest moment. "Avoid all quacks and patent medicines.

"It is commonly believed that when the temporary pain and discom-
"fort are relieved, and the sore or discharge has disappeared, the
"disease is cured. This is a great mistake, and neglect of treatment
"is a very common cause of prolonged illness, including stricture or
"paralysis.

"Persons suffering from any form of venereal disease should,
"immediately they arrive in Liverpool, visit one of the Treatment
"Centres at once, where up-to-date attention by specialists in these
"diseases, may be had free of charge, and without any fear of
"disclosure.

"It is especially important that attendances for treatment should be
"regular, until the specialist considers that the disease has been
"cured."

This notice has been invaluable to the men, and when placed in crews' quarters has been eagerly read and respected.

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. Great strides have been made by shipowners since the War to improve the planning of vessels from a hygienic standpoint, but much remains to be done. Recently the Board of Trade and the Ministry of Health have formed a joint Committee to consider what can be done to remedy matters. The Association of Port Sanitary Authorities has also had the subject under consideration, and the suggestions put forward by the Association have been carefully considered by the Shipping Federation. There have been certain divergencies of opinion in matters of principle between the various bodies, but many suggestions have been upheld while others are still under consideration, e.g., the question of the substitution of wooden berths by metal berths, improvement in w.c. accommodation and the removal of all trough closets, removal of rubbish and greater cleanliness of the quarters. The foregoing only relate to existing ships, and while these improvements have only been recommended as being necessary it has not been possible to get compulsory regulations issued. As was remarked in last year's annual report a large percentage of vessels built since the War have shown a marked improvement in the situation of the quarters, provision of cubicles, mess-rooms, wash-houses and hospitals.

Vermin in crews' quarters.—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.

Rat-proofing.—There is a steady increase in the number of vessels which are being made rat-proof. Unnecessary linings are being removed, and skeleton casings substituted for the old box casings; expanded metal is being used more extensively to protect openings which are necessary for light, ventilation, and the passage of pipes, etc.

INSPECTION OF SHIPPING.

Year 1931.

Nationality.	Visits.	Re-visits.	Total.
British	4,156	1,158	5,314
Norwegian ...	150	38	188
Swedish... ...	99	21	120
Spanish... ...	96	28	124
Danish	173	25	198
Japanese ...	39	19	58
Italian	26	7	33
Portuguese ...	4	3	7
Russian	19	1	20
French	17	7	24
Dutch	77	11	88
Greek	42	20	62
American ...	96	16	112
Belgian ...	3	1	4
German	79	21	100
Esthonian ...	4	—	4
Finnish	32	4	36
Jugo Slav ...	7	4	11
Latvian ...	11	3	14
Hungarian ...	2	—	2
Lettish	1	—	1
Egyptian ...	1	—	1
Argentine ...	2	—	2
Panama ...	1	—	1
Total ...	5,137	1,387	6,524

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THE FOLLOWING TABLE SHOWS THE NUMBER AND NATIONALITIES OF THE VESSELS ON WHICH DEFECTS WERE DETECTED DURING THE YEAR 1931.

NATIONALITY.	Number of Ships.	Dirty Forecastles.	Dirty Wash-houses, Store-houses, etc	Foul Water Casks.	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 Hose 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 number
British ...	655	1924	17	6	8	264	10	3	22	23	1	69	43	6	78	12	...	2	1	7	17	...	...	...	2	...	...	2515	2371
Norwegian ...	8	8	1	...	..	4	...	...	...	...	...	1	...	1	...	...	...	...	...	...	1	1	...	...	...	...	...	17	16
Spanish ...	21	38	1	...	...	5	...	...	...	...	...	2	...	...	6	...	...	...	...	...	1	...	...	...	...	...	...	53	47
Greek ...	17	17	...	...	...	2	...	...	...	...	...	4	2	...	14	...	...	1	1	1	...	...	...	...	...	...	...	42	9
French ...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	1	1
Italian ...	5	11	...	...	...	2	...	...	...	...	...	2	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	19	11
American ...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	2
Japanese ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	2	2
Dutch ...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
Portuguese ...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
German ...	3	12	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	15	15
Jugo-Slav ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	3	2
Danish ...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Total ...	719	2016	21	6	8	278	11	3	25	23	1	79	45	7	102	12	...	3	2	8	22	2	...	...	2	...	...	2676	2498

Summary of Insanitary Conditions during the year 1931.

Class of Vessels.	Number Inspected.	Number on which Nuisances were found.	Per cent.
SAILING FOREIGN—			
Steamers	3,678	557	15·14
Sailing	2	—	—
Total...	3,680	557	15·13
SAILING COASTWISE—			
Steamers	1,451	162	11·16
Sailing	6	—	—
Total...	1,457	162	11·11

Nationality.	Number Inspected.	Number on which Nuisances were found.
British	4,156	655
Foreign	981	64
	5,137	719

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
2	0·07	282	10·54	2,392	89·39

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 659 boats were inspected, of which 14 were found to have some condition contravening the regulations.

MEDICAL INSPECTION OF ALIENS.

The following table gives the total number of aliens arriving in the Port of Liverpool during 1931, and the number in each of the categories under which alien passengers are classified by the Immigration Department of the Home Office :—

Medical Examination of Aliens.

Total aliens	Transmigrants	Residents returning	In transit
16,830	4,618	227	1,851

Visitors of 6 months or less		Diplomats & persons on Foreign Govt. Missions.	Seamen
On holiday, tourists, &c.	On Business		
8,847	364	61	283

Seamen under Contract to join ships in British Waters.	Ministry of Labour Permits	Other Aliens
63	28	488

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 1931 medical certificates were issued in respect of six aliens, two for mental deficiency, three for venereal disease, and one for cerebral haemorrhage.

Transmigrants.

Elaborate precautions are taken by the United States Public Health Service to prevent the occurrence of typhus fever among emigrants from Central Europe to America. Special stations have been erected, through one or other of which all transmigrants must pass. Here they are medically inspected, freed from vermin, and all their clothing disinfected.

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.

The number of transmigrants dealt with under this arrangement during the year 1931 was 243, an increase of 69 over the preceding year.

Emigration.

The number of emigrants leaving the Port of Liverpool during the year 1931 was 53,858, a decrease compared with the previous year, when the number was 91,493. The following return shows the number of emigrants during the last ten years :—

Year	Emigrants	Year	Emigrants
1922	120,691	1927	123,801
1923	159,874	1928	116,083
1924	122,201	1929	113,116
1925	111,918	1930	91,493
1926	116,672	1931	53,858

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 1931:—

Destination.	British Subjects.	Aliens.	Total.
British North America ...	16,365	3,677	20,042
Australia and New Zealand	559	15	574
British South Africa ...	1,072	15	1,087
India (including Ceylon)...	3,656	83	3,739
Other parts of the British Empire ...	6,453	257	6,710
Total British Empire ...	28,105	4,047	32,152
United States	6,508	9,339	15,847
Foreign South America ...	1,863	494	2,357
Other Foreign Countries	3,389	113	3,502
Total Foreign Countries ...	11,760	9,946	21,706
Grand Total ...	39,865	13,993	53,858

Number of passengers (emigrants and others), distinguishing British subjects and aliens, who left the port of Liverpool in each month of the year 1931 :—

Month.	British Subjects.	Aliens.	Total.
January	3,096	551	3,647
February	2,131	429	2,560
March	2,520	660	3,180
April	3,199	555	3,754
May	3,296	802	4,098
June	2,318	836	3,154
July	4,463	2,094	6,557
August	4,544	3,525	8,069
September	5,246	2,294	7,540
October	5,399	1,279	6,678
November	2,108	479	2,587
December	1,545	489	2,034
Total	39,865	13,993	53,858

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 1931 :—

Countries in which the Passengers embarked.	British Subjects.	Aliens.	Total.
British North America	20,374	6,609	26,983
Australia and New Zealand ...	34	1	35
British South Africa	52	2	54
India (including Ceylon)	1,176	40	1,216
Other parts of the British Empire	2,003	83	2,086
Total British Empire ...	23,639	6,735	30,374
United States	9,556	9,122	18,678
Foreign South America	1,954	764	2,718
Other Foreign Countries	2,933	120	3,053
Total Foreign Countries ...	14,443	10,006	24,449
Grand Total	38,082	16,741	54,823

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 1931 :—

Month.	British Subjects.	Aliens.	Total.
January	1,639	621	2,260
February	1,482	461	1,943
March	2,524	654	3,178
April	2,098	709	2,807
May	4,242	1,649	5,891
June	4,850	3,181	8,031
July	3,898	34,94	7,392
August	4,313	1,925	6,238
September	3,742	1,175	4,917
October	3,195	1,121	4,316
November	2,833	954	3,787
December	3,266	797	4,063
Total	38,082	16,741	54,823

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 attends these clearances in order to supervise the removal of any persons who may be rejected on account of actual or suspected infectious disease.

During the year 1931 there were 141 inspections, and 6 persons were rejected.

Date 1931.	Name of Vessel.	Nature of Sickness.	Where taken to	Description of Patient.
April 2	Montrose ...	Chicken Pox ...	Fazakerley Hospital ...	Child
June 19	Laurentic ...	Dermatitis ...	Mill Road Infirmary ...	Adult 1 Children 2
July 3	Duchess of Richmond...	Pneumonia ...	Do.	Child
Sep: 11	Laurentic ...	High Temperature	Returned home	Infant

SUPERVISION OF FOODSTUFFS

The inspection of imported foodstuffs has been carefully attended to throughout the year.

The following items in regard to imported food are of interest :—

The Regulations issued in regard to preservatives in foods have been well carried out; large quantities of boraxed bacon and ham continue to be imported from the U.S.A. and Canada. The bulk of these imports, including 1,029 boxes of hams and 1,021 boxes of bacon, were, however, under bond, and were either exported or utilised as ships' stores, in accordance with the Regulations.

During the year large consignments of sheep and lamb carcases from Argentine and Uruguay have been found to be affected with epizootic lymphadenitis, necessitating the close attention of the food inspectors. The condition has been known to the Authority's officers for a long time, and carcases found to be seriously affected were dealt with, but it is only recently that the affection has become more widespread in the sheep reared in these countries.

There is no evidence that the disease is communicable to man.

Epizootic lymphadenitis occurs most frequently amongst sheep, seldom in lambs. The disease appears as dry caseated areas, chiefly in the superficial skeletal lymphatic glands, e.g., the prescapular, precrural, inguinal or popliteal; it may also be evident in the viscera or muscular system.

The routine inspection of the freshly killed carcase should be carried out by feeling for the enlarged glands or nodules.

The recommendations of the Ministry of Health in regard to this condition are set out under Memorandum on Meat Inspection (Memo. 62 : Foods). These recommendations state that the entire carcase and all the organs shall be condemned if there is any evidence of caseous lymphadenitis.

Strenuous action was taken from November, 1928, to deal with the condition with the object of tightening up the inspection work in the countries of origin, this being the natural place for the elimination of such carcases, and before the mutton is placed in cold store or aboard ship.

The position at the time of the present report is that a great reduction has taken place in the percentage of affected mutton imported.

Evidences of careful inspection are now forthcoming in the case of most firms' imports, the glands affected being cut and exposed for inspection. With regard to one or two firms, improvement is still desirable.

The following are details regarding consignments of sheep carcases from various countries :—

South America.

As stated previously, large consignments of sheep and lambs arrived from Argentine and Uruguay. In the percentage examinations, several consignments were found affected with more than 2% of caseous lymphadenitis. These were fully examined. A few consignments of lambs (under 42lbs. in weight) on examination were found to be over 4% diseased, and these were subsequently examined in full. Many cuts, described as "lamb," were frequently found on examination to be mutton. Isolated consignments of cut mutton have shewn as much as 6% affected with caseous lymphadenitis.

Brazil.

Small consignments of mutton arrived, which were found in very good condition.

Australia.

Importations of sheep and lamb carcases during the year shewed a considerable increase on the previous year. The percentage of sheep rejected for caseous lymphadenitis has been very low.

New Zealand.

A small number of sheep carcases from New Zealand have been rejected for caseous lymphadenitis. It would appear, in some instances, to be due to the fact that the glands have not been incised before inspection.

Patagonia.

There was an increase in the number of vessels arriving with sheep and lamb carcases and cuts of mutton from Patagonia. In a few

instances it was found necessary to examine in detail, as the percentage examination shewed slightly over 2% affected with caseous lymphadenitis.

Cut mutton arrived in very large quantities, and this was fairly sound.

Irish Dressed Meat. Since June, 1930, no diseased or damaged meat has been seized from the Irish Free State.

A certain amount of inspection is now carried out by the Authorities in the Irish Free State, under the Agricultural Produce (Fresh Meat) Regulations, 1930, and similar supervision it is hoped will shortly be exercised in Northern Ireland under a similar Act.

Importations from Northern Ireland of pigs' heads, offal, and pigs' plucks arrived in considerable quantities. These still shew much evidence of want of proper inspection, as during the year it was necessary to obtain as many as 18 Magistrates' Orders for the destruction of diseased organs. The goods seized, in many instances, bore an official certificate. The attention of the authorities in Northern Ireland was drawn to this matter.

Frozen Pig Carcases. A small quantity of frozen pig carcases arrived from Australia, Argentine, New Zealand and Canada; a percentage examination in each case was made for trichinosis. In each instance the result was negative.

Attention has been given to the dirty condition of some imported meats under the Public Health (Meat) Regulations, 1924, but the quantities rejected have shown no increase as compared with previous years.

Large quantities of inedible tallow and lard oil are imported, and a record is kept of the destination and purpose for which it is imported. Consignments may be detained until the necessary information is given. Records are also kept of all loose collected dirty sugar and re-refining is insisted upon.

Boned Briskets of Beef. Several consignments of boned beef briskets arrived from Australia. Each consignment bore the official certificate, but on examination O. Gibsoni was discovered in 13 instances.

Boned Beef. A consignment consisting of 2,568 bags of boned beef arrived from New York. The beef was of New Zealand origin, and on examination it was found extensively perished, having been in a New York Store from April, 1929.

The Importation of Sterilized Meats.

The U.S. Federal Meat Inspection Regulations governing the disposal of articles of food require three important methods to be adopted in the disposal of carcases on post-mortem examination.

1. Carcases may be passed as sound and fit for human food and marked "U.S. Inspected and Passed."

2. Carcases or parts may be condemned, i.e., unsafe or unfit for human food and should, therefore, be destroyed or denatured to prevent sale or use for human food and marked "U.S. Condemned."

3. A carcase or part may be marked "Passed for Sterilisation," meaning that it was passed on condition that it be rendered into lard, tallow or otherwise sterilised by approved methods.

Under U.S. Reglns., Rule D.9 Reg. 11, governing the disposal of carcases, is the following :—"Carcases which reveal lesions more severe "and more numerous than those described for carcases to be passed "but not so severe or so numerous as the lesions described for carcases "to be condemned may be rendered into lard or tallow or otherwise "sterilised in accordance with Regln. 15, if the distribution of the "lesions is such that all parts containing tuberculosis lesions can be "removed.

Regln. 15, Sec. 3, reads : "Carcases or parts passed for sterilisation "and which are not rendered into lard or tallow may be utilised for "food purposes provided they are first sterilised by methods and "handled and marked in a manner approved by the Chief of Bureau. "Any carcases, etc., prepared in compliance therewith, whether canned "or placed in other approved container or not, shall be plainly or con-"spicuously marked 'Prepared from meat passed for sterilisation.'

Regln. 19, Sec. 7, par. 5, states: "Meats passed for sterilisation "may be used for the preparation of such meats and products as canned "meats, sausages, cooked and boiled meats, meat loaves and similar "products, provided all parts of the meat are heated to a temperature "of not less than 170° F. for a period of not less than 30 minutes, and "further that the articles so prepared be marked in accordance with "Bureau requirements."

On one or two occasions canned foods of this character have been landed in our ports. In the years of the War, 1916 and again in 1918, consignments were landed.

The first consisted of lunch tongues and canned pork. The first item bore the label "2nd grade sterilised lunch tongue." The Local Government Board were notified and the importers were served with an export notice which was complied with to Boston, U.S.A. The second consignment consisted of corned beef labelled "Prepared from meat passed for sterilisation." The cans had "STRL" and the establishment number impressed on them. In view of a statement received recently that such products are also imported from Canada, it may be mentioned that the conditions of disposal in Canada read as follows:—

> Reglns. under the Meat and Canned Foods Act, 1927. Regln. 13 re disposal of diseased animals, para. (h). "Any organ shall be "condemned when it contains lesions of tuberculosis or when the "corresponding lymph gland is tuberculous, except in the case of "heads that are rejected. The tongue and other edible parts from "such heads from which the glands and adjacent tissue have been "removed shall be 'held' until thoroughly cooked and placed "in hermetically or other approved sealed containers, and sold "intact to the ultimate consumer. Such containers must be labelled "with an approved label upon which is shown one of the following "statements: 'The products in this can was approved only after "it had been thoroughly cooked under official supervision,' or "'Second quality.'"

During the early part of this year a consignment of canned lunch tongues labelled "Prepared from products passed after cooking," was landed from U.S.A. On consultation with the importers it was agreed not to import any further consignments. During March

further small consignment was imported by another firm. This was also labelled "Prepared from products passed after cooking." These were dealt with similarly. Later requests to bring in the same class of goods were refused. It may be mentioned that these cans of lunch tongues each weigh about 6 lbs. and are usually sold for cutting on the grocers' or restaurant counter, so that the customer never sees the can or attached label. It was pointed out to the importers that these meats being products of diseased animals are not of a character usually sold in this country; that tuberculous pigs' tongues with glands affected, even if the latter were removed, would not be allowed to be cooked and sold as lunch tongues in this country. Memo. 62/Foods, issued by the Ministry of Health for the guidance of meat inspectors in this country has the following *Instructions as to the action to be taken in the event of evidence of tuberculosis being found in Bovines or Swine.* "The head, including the tongue, shall be seized if any of the lymphatic glands of the head are affected." In view of the opinion of the Government officials and the instructions in Memo. 62/Foods, it is evident that we are required to refuse entry to or to seize such food products on importation as unsound and unwholesome and unfit for food.

The importation of Canadian or United States *sterilised* lunch tongues or other meat products is forbidden under Section 6 of the Public Health (Imported Food) Regulations, 1925.

Sterilised Lunch Tongues. Four consignments of canned lunch tongues, prepared from products sterilised and passed after cooking, arrived during the year from the United States of America and Canada. In each instance the goods were exported.

Fruit Inspections.

The general sanitary conditions under which fruits are now shipped show a vast improvement, being wrapped in glazed papers and standardised packings, and carried in special (cool chambered) steamers. More care is now being taken in landing fruit, and some of the new dock sheds have special reserved and limewashed spaces where the fruit cargoes are landed.

Australian apples and pears arrived in large quantities. Two vessels landed part cargoes in unsound condition, viz. :—

May 27th. s.s. "Stirlingshire," at Hobart. Total consignment 9,913 packages of pears, about half of which were destroyed (decomposition).

June 30th. s.s. "Turakina," at Hobart and Beauty Point. Total consignment 37,400 boxes of apples, 9,150 boxes rejected ("brown heart").

Small direct shipments of barrel apples arrived from Nova Scotia and from U.S.A. ports (Virginian). The Nova Scotian apples were in good condition; those from Virginia were frequently in bad condition, considerable quantities being destroyed.

Apples, oranges and dried fruits arrived in good condition from California. The practice of packing dried fruit in cardboard cartons is increasing. Large consignments arrived in satisfactory condition. Pears were not consistently good, considerable quantities being decomposed.

August 15th. s.s. "Narenta," at S. Francisco, etc. 3,223 boxes rejected (decomposition).

October 21st. s.s. "Wenatchee Star," at S. Francisco. 354 boxes rejected on quay and further quantities were sorted at the North Market. This cargo was in over-ripe condition, due to breakdown of refrigeration machinery whilst at sea. Large quantities from other steamers were unsound and sorting of these consignments was supervised.

Californian Grapefruit. There appears to be an increasing tendency to market this commodity in sound condition, consequently large quantities are re-packed after sorting, when the amount of waste is not excessive, notwithstanding the fact that the handling of grapefruit adversely affects its keeping qualities. Delay in disposal necessitates a second sorting before the fruit leaves the dock shed.

Brazilian Oranges were landed in large quantities. The season of Brazilian shipments being extended to December, oranges arrived in larger quantities. Their condition continues to improve. Sorting frequently takes place when the amount of waste is found to be about 10%.

South African Oranges arrived in good condition, well packed and with no waste. Larger quantities were imported than in previous seasons.

Large quantities of Jaffa Oranges and Grapefruit arrived, and were sorted and re-packed as usual.

Jamaican Grapefruit arrived by direct steamers and also in smaller quantities via New York. These consignments were re-packed on arrival, all waste being removed.

Florida and Porto Rico Grapefruit arrived in fair condition, being sorted and re-packed when waste was excessive.

Canary Island Tomatoes arrived in better condition than the previous season, the quantity rejected being small.

Foreign Potatoes were imported in larger quantities, chiefly from Germany, Poland and Danzig, and were found in good condition.

Egyptian and Valencia Onions, Italian Lemons and Seville Bitter Oranges landed in good condition.

Russian and Dutch Fruit Pulp and Fruit Juice was imported in large quantities. This was given special attention, samples were taken and submitted to the City Analyst.

Grecian Currants, Turkish Figs, Sultanas, etc., arrived in sound, clean condition. One sample of sultanas was submitted to the City Analyst for examination for SO2.

Canned Beans. A consignment was landed from Naples, the label stating that they contained sulphate of copper. They were subsequently exported as ship's stores in accordance with the Public Health (Preservatives in Food) Regulations.

During the year 1931 there has been no cause to complain of the conditions of landing and storage of fruit, etc., on the dock quays.

Regulations now require the country of origin of fruit to be stamped on the containers or packages.

Samples of fruits, e.g., apples, pears, oranges, etc., are regularly examined for the presence of chemical substances on the rind or skin.

A large amount of correspondence has been occasioned by the work of the Department on such subjects as the importation of meat, preservatives in food, etc., or the presence of boric acid, &c., in foodstuffs. The Medical Officer of Health and the Deputy Medical Officer of Health have had many interviews with regard to the Food Regulations in force under the Ministry of Health.

During the year the following quantities of unsound or unwholesome foodstuffs have been destroyed or suitably disposed of so as not to be available for human food :—

Beef, mutton, pork, &c., 79 tons; apart from tuberculosis, of which there was only a small amount, the important causes of rejection were: brine staining, mouldiness or decomposition. Offal, 11 tons; fruit and vegetables, 1,253 tons; cereals 1,598 tons. Much of this latter is damp and mouldy, due to damage at sea from sea water, etc. Canned goods 43 tons, chiefly blown and burst containers.

A large quantity of the unsound meat and offal has been utilised for the production of manures, and the cereals for size making or animal food.

TABLE SHOWING THE NUMBERS OF CATTLE, SHEEP, AND SWINE EXPORTED FROM IRELAND TO LIVERPOOL DURING THE YEAR 1931, AND SHOWING THE PORTS IN IRELAND AT WHICH THE ANIMALS WERE SHIPPED.

	Cattle.	Sheep.	Swine.
Ballina	610	12,421	4,602
Belfast	3,490	28,935	54
Cork	29,918	5,057	40,278
Drogheda	21,815	34,419	220
Dublin	146,870	202,226	8,860
Dundalk	6,879	17,174	427
Galway	1,057	12,202	5,146
Londonderry	3,424	9,138	477
Limerick	4,892	471	437
Newry	...	...	...
Sligo	280	14,871	19,215
Waterford...	27,782	11,370	3,186
Westport	29	633	816
Wexford	9,423	23,584	3,307
Total	256,469	372,501	87,025

TABLE SHOWING THE TOTAL NUMBERS OF THE SEVERAL KINDS OF CATTLE, SHEEP AND PIGS EXPORTED FROM IRELAND TO LIVERPOOL DURING THE YEAR 1931.

CATTLE.	No.
Fat	156,823
Stores (for fattening)	81,350
Milch Cows	8,101
Springers	1,203
Calves	8,992
Total Cattle ...	256 469

SHEEP.	No.
Fat	165,199
Stores	761
Lambs	206,541
Total Sheep ...	372,501

PIGS.	
Fat	87,010
Stores	15
Total Swine ...	87,025

STATEMENT SHOWING THE NUMBER OF LIVE CATTLE, &c., LANDED AND SLAUGHTERED AT THE FOREIGN ANIMALS WHARF (BIRKENHEAD, ALFRED AND WALLASEY LAIRAGES) DURING THE YEARS 1921 TO 1931, INCLUSIVE.

Year.	Landed.				Slaughtered.			
	Oxen.	Calves.	Pigs.	Sheep, Lambs and Goats.	Oxen.	Calves.	Pigs.	Sheep, Lambs and Goats.
1921	**195,785**	—	**19,224**	325,982	**63,178**	—	**2,766**	**165,963**
	49,434	—	—	6,706	49,224	—	—	**6,706**
1922	**262,601**	8	31,257	**418,604**	63,002	1	515	**153,381**
	38,648	1	—	—	38,648	1	—	—
1923	**166,994**	7	**77,536**	194,296	**50,432**	—	**4,886**	**90,736**
	39,690	—	—	7,003	37,482	—	—	7,003
1924	**217,176**	—	**58,690**	**358,310**	**54,572**	—	**4,985**	**134,207**
†	417	—	888	4,568	37	—	3	627
‡	52,193	—	—	4,252	42,324	—	—	**4,252**
1925	**159,638**	—	**16,745**	—	**41,332**	—	**883**	**10,608**
†	218	—	366	**253,617**	32	—	2	**349**
§	43,673	—	—	3,919	35,567	—	—	—
1926	**165,187**	—	**35,785**	**312,745**	**45,876**	—	**1,681**	**150,378**
†	**208**	—	171	4,052	16	—	—	**605**
‡	**38,870**	—	490	—	28,997	—	490	—
1927	**199,172**	—	**61,713**	**379,736**	**62,323**	—	**1,657**	**164,985**
†	351	—	413	4,635	43	—	—	332
‡	4,074	—	—	—	3,712	—	—	—
1928	**249,008**	—	**47,224**	**365,820**	**73,245**	—	2,256	**144,441**
†	280	—	362	2,630	33	—	3	561
‡	**444**	—	—	—	170	—	—	—
1929	**238,185**	—	**48,882**	325,224	67,423	—	**1,103**	**122,929**
†	266	—	416	2,789	62	—	2	**714**
‡	693	—	—	—	693	—	—	—
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

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

TABLE SHOWING THE VALUES OF THE IMPORTS OF MEATS (EXCEPT POULTRY AND GAME) INTO THE PORT OF LIVERPOOL DURING THE YEARS 1921 to 1930.

Description	Years.									
	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930
	£	£	£	£	£	£	£	£	£	£
Bacon	13,472,791	8,819,177	8,506,723	7,080,117	8,612,930	7,415,016	4,103,753	3,592,574	4,059,154	2,861,449
Beef, fresh and refrigerated ...	13,430,866	8,016,721	8,561,258	7,771,561	9,992,622	10,333,855	7,223,519	8,345,604	8,182,677	7,645,368
Hams	4,225,544	5,148,303	5,043,264	4,547,822	5,183,481	4,389,201	2,549,153	2,541,186	2,928,657	2,506,887
Mutton, fresh and refrigerated ...	5,842,010	4,262,439	4,879,930	3,337,957	4,314,957	3,498,206	3,503,587	4,140,843	4,028,739	3,524,695
Pork, fresh and refrigerated Pork, salted	920,772	419,018	948,484	555,610	623,824	538,273	345,024	406,868	448,527	485,738
Rabbits	95,873	65,563	77,096	33,092	44,393	67,275	34,322	35,945	34,546	48,260
Unenumerated, fresh, refrigerated and salted ...	678,012	581,442	419,381	403,506	550,386	492,290	474,294	418,762	455,913	600,845
Preserved, otherwise than by salting	1,253,263		1,541,595				1,181,915	1,240,491	1,140,417	1,381,407
Totals	£39,919,131	£27,312,663	£29,977,731	£23,729,665	£29,322,593	£26,734,116	£19,415,567	£20,722,273	£21,278,630	£19,054,649

TABLE SHOWING THE QUANTITY OF UNSOUND MEATS UTILISED UNDER SUPERVISION DURING THE YEARS 1924 TO 1931.

Year.	Beef.				Mutton.				Pork.			
	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.
1924	40	14	1	8	6	17	1	13	1	6	3	13
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

TABLE SHOWING THE QUANTITY OF UNSOUND OFFAL UTILISED UNDER SUPERVISION DURING THE YEARS 1924 TO 1931.

Year.	Beef.	Mutton.	Pork.	Veal.
1924.....	13,468 pieces.	14,574 pieces.	4,998 pieces.	13 pieces.
1925.....	40,160 ,,	10,129 ,,	1,883 ,,	541 ,,
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 ,,

TABLE SHOWING THE QUANTITY AND DESCRIPTION OF UNSOUND MEATS SUPERVISED* DURING THE YEAR 1931.

Description.	Total Weight.				Cause of Destruction.											
					Tubercular.				Brine stained, mouldy and decomposed.				Other causes.			
	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.
Beef	32	6	3	6	0	3	1	22	32	0	3	5	0	2	2	7
Mutton	45	19	0	26		—			10	3	1	2	35	15	3	24
Pork	0	2	0	27		—			0	2	0	27		—		
Veal	1	5	1	14		—			1	5	1	14		—		
Total	79	13	2	17	0	3	1	22	43	11	2	20	35	18	2	3

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

TABLE SHOWING THE QUANTITY AND DESCRIPTION OF OFFAL CONDEMNED DURING THE YEAR 1931.

Name of Organ.	Beef.		Mutton.		Pork.		Veal.	
	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.
Livers	551	5,000	2,951	2,541	602	1,825	3	12
Tongues	20	64	14	3	405	623	—	—
Hearts	257	834	1,366	397	120	114	—	—
Skirts	580	1,011	—	—	—	—	—	—
Cheeks	983	2,700	—	—	—	—	—	—
Kidneys	342	430	—	—	38	9	5	2
Tripe	62	861	—	—	—	—	—	—
Tails	382	690	—	—	—	—	—	—
Feet	626	2,789	160	80	15	9	—	—
Plucks	—	—	—	—	619	3,393	—	—
Heads	—	—	—	—	122	1,926	—	—
Udders	5	17	—	—	—	—	—	—
Shins	134	473	—	—	—	—	—	—
Sweetbreads	126	48	—	—	—	—	—	—
Lungs	—	—	—	—	160	310	—	—
Totals	4,068	14,917	4,491	3,021	2,081	8,209	8	14

inflammation, &c.

TABLE SHOWING QUANTITIES OF UNSOUND GENERAL FOODSTUFFS UTILISED UNDER SUPERVISION DURING THE YEAR 1931.

Description.	No. of Tins.	Weight in Pounds.	Description.	No. of Tins.	Weight in Pounds.
Canned Goods—					
Apricots ...	312	624	Beef	286	1706
Apricot Pulp ...	23	253	Hams	99	882
Apples	191	1146	Ox Tongues ...	11	61
Peaches	528	528	Veal	2	12
Pears	4579	10926	Rabbits ...	70	140
Pines	3727	5625	Lobster ...	295	267
Raspberries ...	674	1181	Crab	6553	3388
Tomatoes	17039	39352	Salmon ...	5650	2825
Egg Pulp	790	27707	Herrings ...	6	3

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs
Fruit (Fresh)—					
Apples	9642	190	14	1	19
,, loose	—	—	5	0	5
Bananas...	778	27	17	0	13
,, loose	—	286	12	2	7
Oranges	5520	191	12	3	22
,, loose	—	165	8	1	18
Plums	93	—	10	3	24
Prunes	19	—	4	1	8
Pears	9531	141	1	1	5
Pineapples	142	3	0	1	27
Grape Fruit	4995	177	16	2	6
Blackcurrants...	57	—	10	0	20
Cantaloups	3	—	1	1	10

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs.
Fruit (Fresh) *continued*—					
Lemons	250	11	0	0	0
,, loose	—	—	5	0	0
Grapes	1163	10	13	0	13
,, loose	—	—	2	0	12
Melons	220	9	10	0	12
,, loose	—	—	12	0	0
Pomegranates	90	4	16	1	20
,, loose	—	—	2	0	0
Tomatoes	138	2	1	2	12
Peaches	219	3	18	0	24
Limes	2	—	1	0	0
Brazil Nuts	54	—	1	3	13
,, loose	—	17	8	0	19
Raisins	8	—	1	1	0
Figs	75	—	13	1	16
Cucumbers	3	—	—	1	10
Potatoes...	121	6	11	0	0
Vegetable Marrows	2	—	—	1	21
Onions, loose	—	—	5	0	—
Cereals—					
Wheat	—	404	6	0	21
Maize	—	661	18	3	3
Barley	—	3	11	2	16
Rice	—	9	15	2	14
Flour	—	511	16	3	20
Rolled Oats	—	1	5	0	26
Beans	—	5	16	0	16
Peas	—	—	3	1	2

Description.	Packages.	Weight.			
General—		Tons.	Cwts.	Qrs.	Lbs.
Bacon	5	—	10	3	16
,, loose	—	—	—	1	1
Hams, single	11	—	1	0	0
Pines in Water	22	3	17	0	0
Pine Syrup	2	—	6	2	12
Butter Scrapings	15	2	13	0	9
Herrings	2	—	—	2	24
Mussels	92	3	5	2	0
Turkeys	6	—	—	2	8
Cheese	1	—	—	1	0

TABLE SHOWING THE TOTAL QUANTITIES OF THE DIFFERENT UNSOUND FOODSTUFFS UTILISED UNDER SUPERVISION DURING THE YEAR 1931.

	Tons.	Cwts.	Qrs.	Lbs.
Beef, Mutton, Pork and Veal...	79	13	2	17
Offal (Beef, Mutton, etc.) ...	11	13	2	9
Canned Goods...	43	2	2	26
Fruit and Vegetables	1253	18	2	20
Cereals	1598	13	3	6
General (Fish, Poultry, Rabbits, etc.)	10	15	3	14
TOTAL ...	2,997	18	1	8

Table Showing comparative Value of the more important Food Stuffs imported at the principal Ports during the year 1930.

	London. 1	Liverpool. 2	Hull. 3	Harwich. 4	Newcastle 5	Glasgow. 6	Bristol. 7	Man-chester. 8	Leith. 9	South-ampton. 10
	£	£	£	£	£	£	£	£	£	£
Animals	—	6,041,064	—	—	—	1,349,553	330,963	414,519	—	—
Butter	21,080,079	1,360,449	3,487,774	2,575,685	4,321,189	561,565	292,261	5,123	3,635,271	783,193
Cheese	9,524,083	653,223	158,992	204,399	241,537	259,779	579,829	110,130	139,250	96,651
Cocoa	1,452,459	872,839	266,011	211,349	7,413	34,690	430,791	—	46,265	—
Coffee	3,845,985	234,590	—	—	—	—	673,310	—	—	13,375
Grain	19,519,336	13,520,987	9,855,769	—	1,562,995	3,976,223	5,874,908	4,901,880	2,515,224	349,788
Eggs	8,798,082	1,522,129	1,099,668	1,154,786	1,191,506	1,320,290	—	59,805	1,355,603	733,566
Fish	4,129,226	3,435,717	633,620	1,316,002	1,102,559	60,313	40,297	61,572	76,806	330,995
Fruit	18,725,416	11,858,360	2,086,362	951,930	568,368	2,643,399	2,885,031	1,122,430	174,761	3,737,158
Lard	1,429,593	1,375,863	395,485	30,388	526,013	179,896	327,127	2,068,054	41,475	161,188
Margarine	887,814	780,511	529,818	460 945	170,976	234,775	—	147,317	311,988	—
MEAT :—										
Bacon	11,498,471	2,861,449	4,315,835	10,154,908	2,948,158	190,665	61,036	209,594	1,169,002	47,827
Beef	20,408,932	7,645,368	28,856	—	22,678	320,542	25,122	290,413	—	1,565,558
Hams	1,140,066	2,506,887	—	—	—	900,903	6,385	94,530	—	6,312
Mutton	14,871,592	3,524,695	22,729	—	—	69,685	450,662	27,214	—	628,273
Pork	876,325	485,738	—	—	—	—	—	—	—	—
Rabbits	578,293	48,260	—	—	—	—	—	—	—	—
Unenumerated	1,285,316	600,845	266,109	54,805	267,375	572,928	134,830	190,115	145,036	91,635
Preserved	3,777,263	1,381,407	41,639	—	—	—	—	—	—	—
Milk, Condensed	2,398,198	482,284	343,007	—	358,846	18,418	98,570	246,967	114,983	37,035
Poultry and Game	1,635,211	51,258	23,964	397,657	—	—	—	—	—	59,930
Sugar	9,255,839	6,459,232	1,345,741	33,235	27,197	133,032	180,915	196,165	32,097	5,828
Vegetables	3,083,578	2,015,329	879,140	358,001	348,578	125,929	66,051	107,927	224,028	1,782,058

The following table gives the particulars of samples sent to the City Analyst and Bacteriologist for examination during the year 1931 :—

CITY ANALYST.

Salforkose	1
Butter Grease	1
Beef in Brine	1
Bacon	1
Canned Peas	2
,, Cherries	1
,, Beans	2
,, Salmon	1
Pineapples in Liquid ...	1
Pineapple Pulp	1
Apple ,, ...	1
Strawberry ,, ...	6
Blackcurrant Pulp	1
Gooseberry ,, ...	2
Raspberry ,, ...	1
Fruit Syrup	1
Apple Juice	1
Cream	1
Sultanas	1
	27

CITY BACTERIOLOGIST.

Wool, Hair and Bristle ...	66
Canned Salmon	1
,, Lunch Tongue ...	2
	69

There were 3,280 rats examined from ships, quays, etc., and no evidence of the bacillus of plague was found in any of them.

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 881.

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, pickled 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,
31*st March*, 1932.