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POLLUTION OF SEA WATER

Report by the Secretary-General

I. INTRODUCTION

At its fourth session the Commission considered a report prepared by the Secretary-General on the pollution of sea water by oil (E/CN.2/68), a problem which had been studied at the inter-governmental level by the Preliminary Conference on Oil Pollution of Navigable Waters held in June 1926 in Washington at the invitation of the Government of the United States of America, and by the League of Nations in 1934 and 1935. On the recommendation of the Commission, the Economic and Social Council at its eleventh session adopted resolution 298 C (XI) instructing the Secretary-General to request the views of Member Governments on several points, in particular whether, pending the establishment of the Inter-Governmental Maritime Consultative Organization (IMCO), preliminary action should be taken, and if so, what procedure should be followed, whether the draft convention prepared in 1935 under the auspices of the League of Nations could serve as a working basis, and whether they would wish to give priority to the consideration of any one of the several consequences of the pollution of sea water. Governments possessing the technical facilities to do so were invited to undertake research studies on this problem forthwith, and to establish between them such collaboration as might be useful and possible.

At its fifth session the Commission discussed a report by the Secretary-General (E/CN.2/100, E/CN.2/100/Add.1, E/CN.2/100/Add.2 and E/CN.2/100/Add.3) containing the replies of Governments. It was noted that while a considerable

number of Governments had expressed great interest in the examination of the problem, there was some difference of opinion as to its urgency and as to whether a meeting of experts should be convened before IMCO started functioning. The Commission noted that a number of Governments had undertaken studies of the subject and recommended the Economic and Social Council to invite other Governments which possessed the facilities to do so to undertake similar studies, to invite Governments to communicate the results of such studies to the Secretary-General, to request the Secretary-General to transmit the results of these studies to IMCO if it had started functioning by the middle of 1952, and, if IMCO had not started functioning by that time, to convene, in consultation with the chairman of the Commission, a meeting of competent experts appointed by Governments to take place during the second part of 1952.

At the thirteenth session of the Economic and Social Council (Geneva, July-September 1951), the Council's Economic Committee[1/] considered the resolution recommended by the Commission. After considering the prospect of IMCO starting to function in the near future, it discussed two amendments which had been put before it. Under the first amendment, if IMCO had not started functioning by the middle of 1952, the Council would have considered at that time what alternative action should be taken. The second amendment eliminated any reference to the possible convening of a meeting of experts and referred the problem to IMCO for consideration. The Committee finally took the latter course and adopted the second amendment, and on 11 August 1951 the Council adopted the text as thus amended (resolution 379 F (XIII)) which reads as follows:

"The Economic and Social Council,

Noting that, as requested under Council resolution 298 C (XI) on pollution of sea water, some Governments have already undertaken studies on the subject,

1. Invites other Governments which possess the technical facilities to do so to undertake similar studies;

2. Invites Governments to communicate the results of such studies to the Secretary-General; and

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1/ See Documents E/AC.6/SR.118 and E/AC.6/SR.119.

3. Instructs the Secretary-General to transmit the results of these studies to the Inter-Governmental Maritime Consultative Organization when it starts functioning."

The Secretary-General circulated the text of this resolution to Member Governments requesting them to communicate to him the results of their studies.

Replies have so far been received from the Governments of the following countries. The date of each reply is given after the name of the country:

Afghanistan	20 February 1951 8 September 1952
Australia	25 April 1952
Belgium	26 March 1952 8 September 1952
Bolivia	20 February 1952
Burma	8 September 1952
Canada	29 May 1952
China	17 September 1952
Czechoslovakia	8 October 1952
Denmark	20 September 1952 4 October 1952 18 October 1952
Egypt	25 August 1952 6 October 1952
El Salvador	21 October 1952
Ethiopia	10 June 1952
France	16 September 1952
Greece	5 September 1952
Haiti	12 February 1952
Honduras	19 March 1952
India	9 September 1952
Iran	17 September 1952
Luxembourg	18 January 1952
Netherlands	8 October 1952
New Zealand	25 March 1952 28 October 1952
Nicaragua	30 January 1952
Norway	30 September 1952

Pakistan	27 February 1952
Thailand	3 October 1952
United Kingdom	13 October 1952
Union of South Africa	17 October 1952
United States of America	2 April 1952 10 September 1952

In addition, Venezuela's reply to the previous enquiry conducted by the Secretary-General under Economic and Social Council resolution 298 C (XI) has been received. The reply which points out that the pollution of sea water is a problem of great concern to Venezuela is reproduced in document E/CN.2/100/Add.4.

II. INFORMATION PROVIDED BY MEMBER STATES ON STUDIES UNDERTAKEN

The French and Netherlands Governments have communicated the results of general studies of oil pollution carried out by inter-ministerial commissions. The reports of the commissions are analysed in section III below. The reply of the French Government also states that "the competent French services are continuing the examination of this question, to which they attach particular importance".

The Government of New Zealand states that no new studies have been initiated as a result of the request contained in Economic and Social Council resolution 298 C (XI) in view of the fact that, at the time the request was received, both national and local aspects of pollution of coastal and inland waters were receiving increased attention from the New Zealand Government. A survey of pollution of both types of waters dealing with the extent, nature and causes of pollution and the effectiveness of the legislation for dealing with it has been completed. The report of the Inter-departmental Committee on Pollution of Waters in New Zealand, containing the results of the survey, has been communicated by the Government of New Zealand. The report, which reviews the legislation adopted in New Zealand and certain other countries, is principally concerned with the pollution of inland waters by industrial or agricultural activities and by waste.

Other Governments have undertaken general studies which are not yet completed or the results of which have not yet been communicated. The Belgian shipping

administration has on previous occasions made various studies of the pollution of sea water by oil, in particular in connexion with the acceptance by Belgium of the Washington Convention of 1926 and the discussion of the problem by the League of Nations in 1935. At the present time, it is making an inventory of the technical facilities provided in Belgium by port installations, oil companies, tanker companies, ship repair yards, etc. for treating oil-polluted water from the flushing of ships' tanks and similar operations. The shipping administration is also considering possible action to deal effectively with the pollution of water.

The Government of China reports that in April 1952 the Ministry of Economic Affairs appointed a group of experts and that the result of its studies will be transmitted to the Secretary-General in due course.

The Government of Iran states that the subject is still under study and that it will communicate the replies furnished by experts as soon as possible.

The Norwegian Government reports that it is at present studying the problem of the pollution of sea water by oil and expects to finish its report on the subject before the end of October 1952.

The Government of the United Kingdom has communicated a statement concerning the action it has taken in the matter of sea pollution. In 1950 the Government of the United Kingdom started an investigation to ascertain the present extent of oil pollution of the United Kingdom coast and coastal waters, the steps which have already been taken to meet the problem and what further action is practicable. A questionnaire, the text of which is reproduced in Annex I of this report, was sent to 265 local authorities with coastal boundaries. Enquiries have also been made about:[1/]

(a) The extent and character of oil pollution in the vicinity of docks and harbours.

(b) Facilities provided in docks and harbours for the use of shipping in separating oil from sea water.

(c) The provision of separators on board ship.

1/ At the fifth session of the Commission, the United Kingdom representative submitted a memorandum on the enquiries being made by the Government of the United Kingdom (E/CN.2/100/Add.3).

(d) Types of separators and cost of separators.

(e) The chemical treatment of oil to render it innocuous if discharged in the sea.

(f) The types and probable sources of oil washed up on the beaches.

(g) The effect of oil pollution on bird and fish life.

Following these enquiries, the United Kingdom Government appointed a committee consisting of representatives of the shipping and oil industries, the Government Departments concerned and other appropriate bodies "to consider what practical measures can be taken to prevent pollution by oil of the waters around the coasts of the United Kingdom, and to report." When the committee has reported and the United Kingdom Government has considered its recommendations, a further communication will be sent.

A number of Governments have communicated data compiled by their competent departments on the problem as a whole or on particular aspects. The Government of the United States of America has sent a report of studies by the United States on the subject of pollution of sea water by oil. In addition, it has transmitted a number of studies on the pollution of sea water carried out in the United States in recent years. They may be useful as source material to the United Nations Secretariat and to IMCO when it starts functioning. The studies are listed in Annex II.

The Australian Government has sent the text of an address given in 1935 to the Interstate Conference of Australian Harbour Authorities by Mr. E.W. Austin, then President of the Sydney Harbour Trust. The Australian Government states that although the address dates back to 1935, it continues to be the best review of the subject available from the Australian authorities.

The Belgian Government has communicated the text of the legal provisions adopted in Belgium to prevent the discharge into sea and river water of substances likely to pollute or contaminate it. These provisions are still in force. The Belgian Government has also sent the text of the memorandum prepared in 1935 in reply to the League of Nations questionnaire on the pollution of sea water by oil. In addition, it has provided information concerning the Port of Antwerp.

While possessing the technical facilities to do so, the Canadian Government has not found it practicable, up to the present, to undertake broad studies on the subject of pollution of sea water. In its reply, it has communicated the observations of some of its departments on various aspects of the problem.

The Danish Government has communicated a memorandum, compiled by the Ministry of Fisheries on the basis of the experience acquired by Danish authorities such as the Danish Biological Station, concerning the damage to marine plants and animals resulting from pollution by waste oil from ships, and concerning measures which Danish biologists consider could be employed to deal with the nuisance. The Danish Government has also sent a map prepared by the Ministry of Commerce and showing the places along the Danish coast where sea water has been polluted by waste oil from ships. In addition, the Danish Government has sent a memorandum prepared by the Danish Association of Steamship Owners containing the Association's views with regard to problems connected with the discharging of oil and oily wâter, and information regarding the extent to which Danish ships are equipped with separators.

The Government of Haiti stated that its services lacked facilities for undertaking the enquiries recommended by the Economic and Social Council with a view to reaching a solution of the problem. Nevertheless, it communicated information on various aspects of the problem.

The Government of India stated that the pollution of sea water by oil did not present a problem in India, either to fisheries or in regard to shipping and that, therefore, it was not proposed to make a special study of the subject. The matter remains, however, under the observation of the Government of India.

The Government of El Salvador has communicated information on pollution by waste water.

The information given in the replies from the Governments mentioned above is analysed in Section III of the present report.

The Government of Burma replied that it had no information to communicate concerning the pollution of sea water.[1/]

The Government of the Union of South Africa stated that it did not have available the technical staff to undertake research into the pollution of sea water. It did not, moreover, consider the problem sufficiently developed in the Union to warrant the provision of additional special staff for its study.

1/ In its reply to the previous enquiry (see Document E/CN.2/100), the Government regretted that it was unable to conduct research into the problem at the present time as it did not possess the necessary technical facilities.

The Governments of Ethiopia, Honduras, Nicaragua, Pakistan and Thailand stated that, not having the necessary technical facilities at their disposal, they were unable to undertake studies concerning the pollution of sea water.

The Governments of Afghanistan, Bolivia, Czechoslovakia and Luxembourg replied that, since their countries had no coastline, they were not in a position to study the problem of the pollution of sea water.

The Government of Egypt stated that its remarks would be confined to the observations contained in its reply to the previous enquiry.[1] It further suggested that, when the many consequences of the pollution of sea water were examined, "the effect of the pollution of sea water on the estuaries of rivers" should be included.

The Greek Government stated that since its reply to the previous enquiry,[1] there had been no new developments in connexion with the matters covered by the resolution on the pollution of sea water.

It should be added that the various aspects of the problem of the pollution of sea water which are considered in section III of this report were referred to by the Governments of Member States in their replies to the previous enquiry,[2] as follows:

(1) Extent of pollution. Information given by the Governments of India, New Zealand and Norway;

(2) Damage caused by pollution. Information given by the Greek Government;

(3) Causes of pollution. Information given by the Canadian Government;

(4) Remedies for pollution;

(a) Separators on board ship. Information given by the Canadian Government.

(b) Facilities on vessels or ashore for discharging polluted water. Information given by the Canadian Government.

(c) Other methods adopted or recommended. Information given by the Governments of Chile and New Zealand.

1/ See Document E/CN.2/100.

2/ See Documents E/CN.2/100 and E/CN.2/100/Add.1 and E/CN.2/100/Add.2.

(5) Need for international measures. Information given by all Governments replying to the previous inquiry.

III. ANALYSIS OF INFORMATION PROVIDED BY STATES MEMBERS

1. Extent of Pollution

Australia

In the case of the Port of Sydney, Mr. Austin's report states that in 1920, when the number of oil-burning vessels began to show a marked increase, numerous complaints were received from the owners of launches and other private craft and from residents on the waterfront that they were suffering much inconvenience and expense as the result of damage to their property by oil from vessels. An Oil in Navigable Waters Act was passed in 1927. Thanks to this legislation and the exercise of constant vigilance, pollution in the Port of Sydney was reduced to a minimum, despite the continuing increase in the number of oil-burning and oil-carrying vessels which use the port (1935).

Denmark

The oil pollution of Danish coastal waters has considerably increased during the last twenty-five years owing to the growing number of large oil-burning vessels and tankers. A map prepared by the Ministry of Commerce shows constant and heavy pollution along the greater part of the west coast and part of the north-east coast of Jutland, as well as on part of the east coast of Zealand, and occasional and sporadic pollution on part of the north-west coast of Jutland, on various parts of the east coast of Jutland, on the south-west part of the coast of the Isle of Funen, and on certain points of the north, north-east and east coasts of Zealand.

United States of America

The pollution of the coast by oil discharged from passing vessels does not present any serious problem. There may be some local beach pollution owing to the fact that many oil tankers which were sunk during the war are now disintegrating. It is also possible for a ship to cause coastal fouling through rupture of a compartment which contains or has contained oil, due to stress of weather or to stranding. Such an occurrence is infrequent and cannot be legislated against. Pollution in harbours and enclosed waters may occasionally be found, usually in small areas and due to local spillage. National legislation and municipal regulation adequately penalize negligence and are

rigidly enforced. Pollution by industrial wastes or raw sewage probably exceeds, in many cases, that by oil. The competent authorities in the United States are agreed that pollution of territorial waters by oil is not serious and shows no sign of increase.

India

The pollution of sea water by oil and its consequent effects on fisheries and ships do not present a problem in India.

New Zealand

The report of the Inter-Departmental Committee on the Pollution of Waters in New Zealand shows that the pollution of ports and territorial waters is mainly due to oil. There is an Oil in Territorial Waters Act of 1926.

Netherlands

There are seventy Netherlands oil-burning vessels over 500 gross registered tons and 583 under 500 tons. In spite of the substantial increase in the number of oil-carrying and oil-burning vessels, there are no indications that the pollution of sea water has increased.

United Kingdom

A summary of the replies to the questionnaire circulated to local authorities shows that pollution occurs in varying degrees all round the coasts of Great Britain and that the position has deteriorated in recent years. Local amenities have been seriously affected.

El Salvador

The Directorate-General of Health does not consider that the pollution of sea water raises any problem of public health, since there are no large centres of pollution in coastal waters as the waste discharged at the ports of Acajutla, La Libertad and La Union is relatively small in volume and is subjected to a process which ensures its immediate dilution.

2. Damage Caused by Pollution

(a) Damage to birds.

Belgium

Birds undoubtedly suffer from the pollution of sea water (1935).

Denmark

Damage to sea birds increased considerably during the years preceding the Second World War. Great numbers of sea birds died as a result of oil pollution

in 1935, 1936 and 1938, especially in the Kattegat. No information is available for the war years. Since the War, pollution has increased, and practically every year thousands of sea birds are affected by it, particularly in the northern part of the Kattegat. Most cases are recorded during the winter months from November to March.

United States of America

If heavy oil is spread from any source upon stagnant water such as a marsh, waterfowl alighting on it will undoubtedly be unable to rise again.

Netherlands

As a rule, contact with oil is fatal to birds. The oil makes the feathers stick together so that they cease to protect the bird's body from the water. Consequently some of the birds contaminated by oil may die of pneumonia, although exhaustion may also be a cause of death. It is not possible to say whether the danger to birds is increasing or decreasing. Although the number of oil-burning vessels has increased considerably in recent years, there are no data available which indicate that the number of victims is increasing. From the economic point of view, sea-birds are not important in the Netherlands as they are in the Northern countries, where the birds and their eggs are used for consumption and their skins are sometimes dried to serve as fuel. Information on the damage to birds caused by oil pollution is contained in the Annex to the special commission's report.

(b) Damage to plant life.

Belgium

Fuel oil has harmful effects on plant life (1935).

(c) Damage to fisheries, fish, shellfish and molluscs.

Belgium

It would be difficult to prove that the depletion of marine resources observed off the Belgian coast and throughout the southern part of the North Sea is due to a film on the surface caused by the discharge into the sea of oil or oily mixtures. Mussels gathered near the normal high-water mark taste of oil to such an extent as to be unfit for sale. Those gathered at the low-water mark of spring tides are not affected. Owing to oil on the surface of the water, fishing tackle and nets may be covered with an oily film when hauled in, and this may even affect the catch of fish or shellfish (shrimp) (1935).

Canada

The Department of Fisheries has found that there is no damage from oil pollution to fish or fisheries in open waters off the Canadian coasts. In restricted harbours over shallow reefs, damage may result to shellfish and species which are local in distribution. Such damage as has occurred appears to have been limited to cases where wrecks have taken place or where extensive dumping has occurred in extreme emergencies.

Denmark

No research has yet been done on the harm which may be caused to plankton by contact with waste oil at the surface of the sea. Presumably the waste oil can in certain instances cause extensive damage to fish eggs, shellfish etc.

United States of America

A sufficiently heavy contamination of open water would probably have a deleterious effect on upper-level fish. Such concentrations are unusual and generally the result of a casualty to a ship. The Government of the United States does not feel that further investigation in such cases is necessary. In the case of relatively minor contamination, no serious effect has been perceived on fish or shellfish.

Netherlands

No serious damage to oyster and mussel cultivation. Floating oil has little harmful effect on plankton, fish eggs, larvae or fish. If, however, considerable quantities of oily waste gather on the bottom of the sea this may in the long run constitute a threat to the fauna of the sea bottom and, consequently, to fish stocks.

(d) Damage to beaches.

Belgium

Belgian seaside resorts are hardly affected by oil on the surface of the sea off shore because of the almost straight coast, which suffers less from the steady accumulation of drifting objects than a broken coast with many bays and creeks. Oily matter discharged at sea may, however, occasionally drift inshore and pollute the coast (1935).

Denmark

The pollution of bathing beaches by oil is becoming increasingly serious each year. This summer (1952) it was particularly widespread and unpleasant along the North Sea coast.

Netherlands

The pollution of beaches by oil occurs at irregular intervals and may cause considerable damage and losses. The frequency with which such pollution occurs suggests that considerable quantities of oily waste are present in the North Sea.

(e) Danger to ports (danger of fire).

Belgium

Harbours, rivers and waterways in general are more seriously affected (than beaches) by waste matter floating on the surface. Despite police regulations and constant vigilance, stagnant deposits of oily matter have been found in docks and on waterways where the shape of the channel encourages the accumulation of floating matter. Small fires have occurred in sea ports as well as in the Scheldt docks, but have been brought under control without difficulty. Pollution is a real hazard in this respect (1935).

Canada

The Department of Transport has found that oil pollution is not a hazard to navigation. That Department is interested chiefly in the fire hazard to shipping, public harbours and facilities, and damage to vessels, floating equipment and harbour works.

United States of America

There have been instances of harbour fires due to oil on the surface of the water. In all cases these have been due either to casualties or to neglect in observing prescribed precautions.

Haiti

There is very little danger of fire in view of the small tonnage of vessels plying in Haitian waters and the amount of oil delivered there. The present tendency to replace sailing boats by motor boats using diesel oil may create a fire hazard which will be the more serious because Haitian ports have no equipment for dealing with large fires. Consideration must also be given to measures to protect wooden vessels, which often carry cargoes of inflammable fluids in drums in addition to their oil fuel.

3. Causes of Pollution and Conditions under which it takes place

Belgium

The matter (drifting of polluted water) is under consideration and the Institute of Oceanographic Studies (Institut d'études océanographiques) will

shortly publish a paper summarizing the study of the flow of surface water in harbours and their approaches and off shore (1935).

Denmark

In a few cases pollution can be traced to the discharge of oil from particular vessels (e.g. stranded vessels), but more often it is impossible to discover the vessel which discharged the waste oil. The great disasters which occur in winter-time[1/] are evidently caused by vessels coming from the inner waters, which discharge their waste oil as soon as they arrive at the open waters of the northern Kattegat. As is well known, oil can drift with wind and currents for a long time over great distances (sometimes more than 500 miles).

Recent Danish investigations have shown that, besides the discharge of waste mineral oil from vessels, biological oil pollution may occur in the North Sea. The oil is liberated as small droplets when the diatoms die, and may be the cause of the death of several sea-birds, especially guillemots. Extensive pollution of this kind has, in our time, been observed only in 1933 and in 1947 in the North Sea. Owing to the fact that this oil is destroyed rather quickly, the damage it causes will be of much shorter duration than that caused by waste mineral oils. Analyses of both sorts of oils were carried out. Man can do nothing to prevent the destructive effect of biological oil pollution on the animal life of the high seas.

United States of America

The United States has no data with respect to the distance which oil or oily water may drift and still appreciably contaminate beaches or affect fisheries. This would presumably vary with the nature of the oil and the degree of its dilution at discharge, as well as with wind and surface currents.

France

The technical report communicated by the French Government refers to the increase in the consumption and transport of oil. After discussing the degree of concentration at which a mixture of oil and water becomes harmful, it deals with the circumstances in which lubricating and fuel oils are usually discharged at sea. Bunkers are often filled with sea water as ballast when the fuel oil has been consumed. This is particularly common in the case of large passenger liners which

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1/ See above: Damage to birds.

travel long distances at high speeds. When the water is discharged, it is mixed with the oil clinging to the sides of the bunkers, thus causing pollution of the sea. Waste is also discharged into the sea from the centrifugal separators used for removing as much as possible of the impurities and water in fuel.

In oil tankers, the distribution of weight is such that it is never necessary to put sea water into their oil bunkers to ensure stability, but the cargo tanks must always be filled with sea water when the vessels are proceeding empty to the loading port. As this is a normal requirement, special methods have been devised and adopted by owners with the result that tankers which might at first sight be thought to be the principal cause of the pollution of sea water can largely be exonerated from blame. The report goes on to describe the normal procedure for the ballasting of oil tankers. In principle tanks are cleaned at over 50 miles from the coast, and in practice at a distance not less than 20 miles (United States tanker companies instruct their masters to clean tanks at over 100 miles from the American coast). The Butterworth method, which according to seamen is effective, is universally employed for this purpose. The report also describes the method of effecting the operations (complete cleaning and removal of gas from tanks) which are necessary when a tanker is docked for repairs. The report concludes as follows: "It would appear that the danger of pollution comes from oil-burning vessels rather than from oil tankers. This point was stressed at the Preliminary Conference of 1926."

The report also discusses the subject of the spreading of oil and the persistence of its harmful effects. The conditions vary with the nature of the oil products involved (light refined products, such as petrol, fuel oil or crude petroleum). While fuel and lubricating oils appear to stagnate indefinitely, petrol evaporates rapidly and crude petroleum when spread over the surface of the water may disappear fairly quickly. The report discusses the question of the speed with which a patch of oil spreads and the distance it may travel. "From the evidence collected it appears that it is normal for an oil patch to drift a distance of 50 to 100 miles. Various reports indicate, however, that the distance may be as much as 500 miles. Whenever the establishment of prohibited zones has been discussed, a depth of 150 miles has been most frequently recommended, but the depth obviously depends to a great extent on local wind and

current conditions." The report refers to the results of experiments published in 1941 by the American Petroleum Institute on the appearance of oil layers in relation to their thickness.

Netherlands

It is very probable that one of the causes of the pollution of the coast by oil is the breaking up of the bunkers of the many ships sunk in the North Sea. If this is the case, the phenomenon will pass. It is also possible, however, that the discharge of oil or oily water by ships near the coast is one of the causes of such pollution.

4. Remedies for Pollution

(a) Separators on ships

Australia

Mr. Austin's address contains detailed information (drawn in part from the United Kingdom Government's reply to the League of Nations) on the use of separators on ships. It also contains information on installations on special vessels or ashore for the discharge of polluted water. Lastly, it describes the position with regard to shipping visiting the Port of Sydney. It concludes by proposing the following resolution: "That, in view of the meagre use of oil-separating equipment provided by port authorities in the United Kingdom, the port authorities of the Commonwealth should refrain from providing such equipment, and that this Conference urges that the provision of oil-separating equipment should be made compulsory on oil-burning and oil-carrying vessels."

Belgium

The Belgian Government could not consider making it mandatory for oil and water separators to be fitted on board its oil-carrying or oil-burning vessels within a prescribed period. The advantages of separators are very much open to question. If their installation were made compulsory an additional burden would be placed on the shipping industry at a time when it is faced with serious economic difficulties with which it is barely able to cope. As yet there are no Belgian manufacturers specializing in the construction of separators (1935).

Most new tankers and all large Belgian tankers are already equipped with oil separators. This is not, however, the case with other types of vessels and

it would be difficult to require the installation of separators on all vessels before the requirement had been made universal under an international convention (1952).

Denmark

According to the information furnished by the Danish Association of Steamship Owners, separators are installed on fifty-two of the vessels belonging to that organization: (fifty dry-cargo ships and two tankers). The capacity of the separators is between 30 and 100 tons an hour, although one vessel is equipped with a separator with a capacity of 100-150 tons an hour.

United States of America

There are several types of shipboard oil separators, the costs of which are in the neighbourhood of $18,000 - $20,000. The usual capacity is 50 tons per hour. Substantial numbers were installed in United States ships built during the Second World War. Such separators are designed to remove all but 0.05 per cent of oil from the water efflux.

France

The report of the interministerial commission reviews the various existing types of shipboard separators, their principal features and their prices. The separators are gravitational but centrifugal separators should also be considered. The report states that "at the present time about half the larger vessels are equipped with separators. Some companies have separators on all their ships, while others are unwilling to install them. The fact is that the effectiveness of the separators is far from being generally recognized." The report adds: "It might be thought that tankers would use separators before discharging into the sea the water used for cleaning their tanks. This is not the case, and it appears that no tanker is equipped with a separator. This is due in the first place to the fact that it is the practice for tankers to clean their tanks on the high sea, a practice against which there is at present no regulation, and also to the fact that the sludge left by the crude oils might completely block the separators. Moreover, very high capacity separators would be needed to deal with the water used in the cleaning process... In any event,

it would seem almost impossible to use the residue obtained from the separator as fuel. Boilers or motors require extremely pure fuel, and the residue from separators is not pure."

Haiti

Owing to their size and cost, the installation of separators on coasters and in ports cannot be considered.

Netherlands

A study of the separation of oil from water is annexed to the special commission's report. The conclusion is that, because of the large quantities of ballast water which have to be treated in tankers and the great variety of types of oil carried by oil-carrying and oil-burning ships, it would be impracticable to install separators with sufficient capacity and efficiency to guarantee satisfactory separation under all conditions. As a rule pre-treatment of the oil-polluted water in order to speed up the process of separating oil and water by means of separators cannot easily be achieved in ships. Small quantities of oil-polluted water can be treated efficiently in centrifugal separators but the latter are expensive and require thorough maintenance. Even if proper separation is attained, the problem of the disposal of the residue remains as in most cases it cannot be used as fuel for boilers or motors.

It follows from the above that the compulsory installation of separators in ships is inadvisable, and that the problem of the disposal of oil-polluted water remains to be solved.

If the discharge of oil is forbidden in extensive zones along certain coasts, the most important ports in the area must be equipped with special facilities, either ashore or on barges.

The foregoing confirms the drawbacks of separators mentioned on page 3 of the report drawn up by the League of Nations Committee of Experts dated 26 October 1935, No. C/449/M/235 - 1935 - VIII.

Separators have been installed on board sixty-six Netherlands vessels. These separators are of various makes, and their capacities vary from 10 to 200 tons. Opinions differ as to their efficiency.

(b) Facilities on barges or ashore for the discharge of polluted water

Belgium

In Belgian sea and inland ports there are no barges for the treatment of water from the bilges and tanks of vessels. The lack of such barges has never been the subject of complaint by the authorities or by those using Belgian ports and waterways. The question of providing such facilities in some ports is, however, under consideration (1935).

In the Port of Antwerp fixed oil and water separators have been provided in the oil installations on the south side of the Port and the oil refineries and the new tanker dock on the north side of the Port; water discharged from these installations is thus free of oil.

Water in the docks and the Scheldt is, however, occasionally polluted by the oil in bilge water discharged by ships in spite of the regulations. In such cases, the harbour services clean the water by skimming it. As the equipment available for this operation is very limited, the results are not very satisfactory, and the Port Authority is at present considering the possibility of providing mechanical equipment to collect floating oil.

One ship repair yard is provided with mobile equipment and uses a special barge to collect oil and bilge water during repair work. In other yards the oil is collected in drums.

Pollution is often caused by the flushing of the tanks of oil tankers or the discharge of their water ballast. In the case of vessels proceeding to the new tanker dock, this will be prevented as tankers will be required to discharge oily water into the slop-tanks provided (1952).

Denmark

All waste oil ought to be cleaned in separators in larger vessels or in separators in ports; all large ports should have separators to deal with waste oil from small and large vessels.

United States of America

In most of the principal ports sludge barges are generally available for receiving contaminated water discharges. In the case of tanker terminals the

oil company usually provides a slop-main into which oily water is discharged directly from the tanker.

France

The report of the interministerial commission states that a barge equipped to carry out all cleaning and gas-removal operations on tankers undergoing repairs after unloading will be placed in service at Le Havre in the near future.

The report adds that in France there are no fixed shore installations of the type used in certain United States ports. In discussing the basis on which such facilities could be installed in the large French ports, the report notes that the customs authorities levy duties on waste based on the amount of fuel oil that could be extracted from it. It accordingly suggests that international regulations on the pollution of water might be accompanied by national regulations concerning the importation of oil waste at reduced rates. It also points out that there can be no question of completely prohibiting the discharge of oil on the high seas before there are effective means of providing for its destruction or disposal ashore.

Netherlands

The special commission's report lists the facilities at Rotterdam and Amsterdam. The other Netherlands ports have no special equipment. Tests have recently been carried out at Rotterdam with equipment which sucks floating oil from the water. Results were satisfactory in calm water.

The commission noted the report of the Chemical Laboratory of the United States Navy Department regarding tests of various methods of controlling water pollution in ports.

(c) Possibilities of treating oil sludge by physical or chemical processes

United States of America

Certain solvents are available for the treatment of oil and sludge. Their primary use seems to be to soften and remove residual deposits in oil tanks. It is claimed that they render the oil soluble in water if used in sufficient quantity. The use of such solvents does not seem to be widespread.

France

The treatment of oil sludge by physical or chemical processes would appear to be the most convenient method, particularly in the case of small vessels, where it would make the installation of cumbersome separating apparatus unnecessary. The report of the interministerial commission notes that, although such processes have been under discussion for some time, none seems to have received the final approval of experience. The report refers to the recent introduction into France of an American made product intended to emulsify the oil in the water so that it ceases to cause pollution. In principle, the product is intended to clean patches of polluted water, and tests carried out in a port have shown that it is effective but expensive. Its agents state, however, it can be used both for cleaning the tanks of tankers (to supplement the Butterworth method), and for cleaning the compartments of ships. It is desirable that tests of the product should be carried out as soon as possible as offered by the agents.

Netherlands

A study of chemical additives is annexed to the special commission's report. Although it might be assumed on theoretical grounds that these additives may prevent the deposition of sludge or dissolve it, it is questionable whether all the results claimed by their manufacturers can be obtained. A product which may be effective in dealing with one type of oil will probably not be effective when applied to other types. Besides the problem of preventing the deposition of sludge by means of chemical treatment, there remains the problem of separating oil from oily water mixtures, e.g. bilge and ballast water. From inquiry it has been learned that a number of Netherlands shipping companies are making experiments with additives to be used in the liquid fuels used by their ships. The effectiveness of this procedure cannot yet be assessed.

(d) Limiting the spread of oil discharged at sea

France

The interministerial commission's report mentions the use of floating dams to prevent the spreading of oil from places where it may be discharged such as

tanker ports, although in France dams of this kind are used almost exclusively for fire-fighting purposes, or to protect places where pollution is particularly undesirable (e.g. beaches, provided that the sea is not too rough).

For the cleaning of patches of polluted water, the report says that in addition to the simpler processes, which seem the most effective (skimming by barges, raking and other mechanical methods of removing the oil layer), there are various immersion processes.

5. Need for International Regulation

Australia

The discharge of oil in mid-ocean cannot be prevented by the legislation of any one country, and international action is necessary for that purpose (Mr. Austin's address).

Belgium

The Belgian Government is prepared to join in international action. Everything possible has been done to prevent pollution by shipping regulations 1/ and constant vigilance. Moreover, in accordance with the resolutions adopted at the Washington Conference of 1926, Belgian shipowners have made a considerable effort to prevent practices on board their vessels likely to cause sea pollution; in particular, drastic regulations are being enforced on tankers flying the Belgian flag (1935).

Canada

The Department of Transport would be interested in any international action which might be taken to control practices leading to oil pollution. While various aspects of the question are of interest and concern to different Departments of the Canadian Government, the problem has not been of proportions to require broad investigation and study on an inter-Departmental basis. In

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1/ The Belgian Government has communicated the text of the legal provisions against water pollution in force (article 11 of the Royal Order of 22 January 1929 concerning police supervision of navigation in Belgian coastal and harbour waters; article 19 of the Royal Order amending the police regulations governing the maritime portion of the Scheldt River from a point one kilometre above the Antwerp wharves to the Netherlands frontier).

these circumstances it will be appreciated that the undertaking of such studies cannot be accorded a high priority at the present time. The Secretary-General may rest assured, however, of the continuing interest of the Canadian Government in this subject, and in whatever action may be taken in the future, through the Economic and Social Council and IMCO in connexion with sea water pollution.

Denmark

The discharging of waste oil ought to be prohibited by international law in all North-European seas, including the North Sea east of Great Britain from the Shetland Islands to the Straits of Dover.

In the opinion of the Danish Association of Steamship Owners, the discharging of oil should be prohibited within 50 miles of the coast, as was proposed at the Washington Conference in 1926. The Danish Association of Steamship Owners has accordingly instructed the masters of their vessels to observe the fifty-mile limit.

United States of America

In conclusion, the Government of the United States is of the opinion that the question of the pollution of national or territorial waters is one to be met as requisite by national action. For waters of the United States this has been done with satisfactory efficacy. In respect of the pollution of the high seas the United States has insufficient evidence that this is of such seriousness as to require international action. The Government of the United States stands willing, however, to participate in any further joint studies that may be deemed desirable or necessary.

France

The interministerial commission's report briefly surveys the position with regard to regulation in various countries. In France, the discharging of oil in or in the neighbourhood of ports is not allowed, and penalties may be inflicted for violations of this rule. There are no regulations, however, extending beyond territorial waters, i.e. more than three miles from the shore. It is the practice, particularly in tankers, not to carry out operations which may result in water pollution within fifty miles of the coast, but no authority is responsible for the application of this rule.

The high seas do not belong to anyone, and experience shows that oil discharged on the high seas may move inshore and pollute the coast. Hence the need for regulation, which must necessarily be international, since the problem cannot be dealt with by regulations adopted by each nation individually and invalid beyond the limits of its territorial waters. It should also be pointed out that as a result of the normal flow of ocean currents and of the fact that the traffic on certain sea routes is particularly heavy, some countries, including France, are more seriously affected than others. Furthermore, such regulations would protect fishing on the high seas for all countries.

In the light of the various works referred to in this report it is concluded that "it would be going too far to prohibit the discharge of oil anywhere on the high seas." Consequently, sea-going vessels should not be required to install separators. The enquiry made in 1935 showed that most countries were in fact opposed to such action. It is considered, on the other hand, that it would be in the interests of the nations concerned to require vessels to refrain from discharging oil in their coastal waters. This would make it necessary either to equip all such vessels with separators (which are, it has been seen, relatively expensive, cumbrous and inconvenient), or to perfect some other technique for the purification of bilge and ballast water, or to equip all ports, including fishing ports, with fixed or floating port installations to deal with waste discharged from vessels. All such regulations, on which it is in the interests of every country to exchange as much technical information as possible, are, however, international only to a limited extent.

In this matter, the chief difficulty will be the application of the regulations to small craft.

It is accordingly considered that the work of an international commission would be to delimit the prohibited zones. The zones would be drawn round the coasts at an agreed distance (50 or 100 miles). Their boundaries would then be adjusted to take into account the following local factors: currents and prevailing winds which, in some areas (e.g. the East Atlantic) are landward so that the depth of the zone would have to be increased; sea routes which, although the traffic is heavy, pass close to uninhabited coasts so that the depth of the zone could be decreased; and the special case of narrow seas (the English Channel and the Mediterranean).

In France, it would then be necessary to give consideration to zones for all territories of Metropolitan France and the French Union.

In any case, the international convention, if adopted, should include transitional provisions to enable shipowners to adapt their fleets gradually. It should also deal with naval vessels, and possibly with the measures in war-time.

Haiti

Legislation on the matter is necessary, as suggested by the United Nations.

Netherlands

Good "oil discipline" on board ships, and the establishment of zones where ships would not be allowed to discharge oil would no doubt greatly reduce pollution.

IV. ACTION TAKEN AT THE INTERNATIONAL OR NATIONAL LEVEL

In connexion with a study of the regime of the high seas, the International Law Commission, which is an organ of the United Nations, considered the question of the conservation of the resources of the sea from various points of view including that of the pollution of waters of the high seas. At its third session (16 May - 27 July 1951), the Commission expressed the view that the pollution of waters of the high seas presented special problems, not only with regard to the conservation of the resources of the sea but also with regard to the protection of other interests. It noted that the Economic and Social Council had taken an initiative in the matter (resolution 298 C(XI) of 12 July 1950). 1/

At a meeting held in London on 16 January 1952, the International Chamber of Shipping, appreciating the seriousness of the sea pollution by oil, considered what further action could be taken by shipowners, e.g. whether it would be possible to draw up codified rules, perhaps along the lines of those already used by certain large groups of shipowners, which the International Chamber of Shipping might recommend for general adoption. It was decided that a study of this matter would be pursued.

1/ See Official Records of the General Assembly, Sixth Session, Supplement No. 9 (A/1858), Page 19.

At its meeting on 12 June 1952, the Chamber of Shipping of the United Kingdom set up a special committee to consider, as a matter of urgency, the best practical measures to be taken to deal with the question of oil pollution. The president of the Chamber said that the pollution of sea water by oil showed no signs of diminishing, and, in fact, was getting worse. At the same time modern scientific research had brought to light fresh information about the problem, and it was those two factors which had led the shipping industry to set up the committee. But it must be emphasized, he had added, that oil pollution was an international problem, and in the end must be dealt with on international lines. The International Chamber of Shipping will be kept informed of the work done by British shipping firms, so that foreign shipowners can benefit from the results which it is hoped to obtain.

In July 1952, three tanker companies owned by major oil concerns announced their intention of carrying out tests on the lines of the Kon Tiki experiment. Shipping and oil experts and scientists aboard an observation vessel were to follow the drift of both crude oil and fuel oil discharged into the sea as part of normal tank cleaning operations at distances exceeding 50 miles from the coast. They were to determine the rate and direction of the flow and take samples at intervals for analysis, to determine the consistency of the oil, whether it coagulated, broke up or sank - in fact, the observers were to attempt to find out exactly what happened to the oil from the moment it was first discharged into the sea. It was expected that the whole experiment, which would be watched by representatives of Government departments, would take about two months to complete. The experiment has taken place and the observations have been made, but, at the time of writing, the results have not been published.

At its Conference held at Bologna from 14 to 15 March 1952, the European Continental Section of the International Committee for Bird Preservation adopted a resolution recommending its national sections to complete, as a matter of urgency, their researches into the nature and sources of oil pollution harmful to birds.

The World Federation for the Protection of Animals has informed the Secretary-General of the United Nations of an oil-burning apparatus made in

Britain by means of which waste oil can be pre-heated and pumped into a furnace for instant conversion into spray-heat. The Council of the Federation considers that if IMCO could make an inquiry into this procedure and thereafter help to make it more widely known, there would be an inducement to ship-masters to bring their waste-oil to dock, where it would be found to have a residual value. In that way man would benefit economically and bird-life would be spared mortal sufferings.

ANNEX I

Questionnaire sent by the Government of the United Kingdom to local authorities

The Government of the United Kingdom sent the following questionnaire to 265 local authorities with coastal boundaries:

(a) What is the extent of the pollution by oil of the coast and coastal waters within and adjacent to your district?

(b) How does the extent of the pollution at the present time compare with that in December 1933, December 1945 and December 1949, and is any information available about the type of oil causing the pollution then and now?

(c) To what cause is the increase or decrease attributable? Is the increase (if any) attributable to war causes, e.g., the breaking up or dispersal of vessels sunk during the war?

(d) What adverse effects has the pollution on the fishing or other industries, amenities etc. of the neighbourhood?

(e) Have any fires occurred in your district which were caused by oil floating on the water? If so, please furnish particulars of the incidents and of the type of oil involved.

(f) Has your Council undertaken any prosecutions in connexion with oil pollution under the Oil in Navigable Waters Act, 1922, or otherwise, and did any such prosecution indicate unusual features, e.g., possible weaknesses in the Act referred to?

(g) Has your Council any other comments to make on the subject?

ANNEX II

Studies on sea water pollution undertaken in the United States of America in recent years and communicated by the Government of that country

Effects of Pulp Mill Pollution on Oysters

Effects of Crude Oil Pollution on Oysters in Louisiana Waters

Ecological and Physiological Studies of the Effect of Sulphate Pulp Mill Wastes on Oysters in the New York River, Virginia

Conditions affecting Shellfish Production in Lynnhaven Bay, Virginia and the Possibilities of Improving them by Increasing Tidal Flow

Effects of Oil mixed with Carbonized Sand on Aquatic Animals

A Survey of the Sports Fishery of the Middle Atlantic Bight in 1948

Observations of the Effect of Acid-Iron Waste Disposal at Sea on Animal Populations

Drift Bottle Releases off New Jersey - A Preliminary Report on Experiments begun in 1948

A Study of the Disposal of Chemical Waste at Sea

Typical Methods and Devices for handling Oil-Contaminated Water from Ships and Industrial Plants

Pollution by Oil of the Coast Waters of the United States

Pollution of Everett Harbor

Annotated Bibliography of Pollution Surveys of the Coastal Waters of the United States with Special Reference to Sanitary Quality of Shellfish Growing Areas

Bacteriological Studies of Oyster Conditioning

Reaction of Oysters to Chlorination

California Drainage Basins

Pacific Northwest Drainage Basins

New England Drainage Basins

Colorado River Drainage Basin

North Atlantic Drainage Basins

ANNEX II
(continued)

Water Quality Survey of Hampton Roads Shellfish Areas

Manual of Recommended Practice for Sanitary Control of the Shellfish Industry

Investigation of the Pollution of Certain Tidal Waters of New Jersey, New York and Delaware

Report on Pollution of the Waters of the State (Rhode Island)

Sources of Pollution - Merrimack River Valley

A Study of the Pollution of the Waters of Hampton Roads and Vicinity and Report on Sewerage and Sewage Disposal for the Adjacent Communities

Symposium on the Role of Ecology in Water Pollution Control
