

March 27, 1962

OIL POLLUTION ON BEACHES

Demonstration of new methods of cleaning

Britain's beaches should be cleaner this year if local authorities apply the results of research by the D.S.I.R.'s Warren Spring Laboratory.

The pollution of beaches with oil has grown over the years into a national problem. It was in the autumn of 1960 that Lord Hailsham, Minister for Science, handed over to the newly opened Warren Spring Laboratory the problem of devising methods for cleaning them. By the spring of 1961 some preliminary results had already been obtained and a report on these was sent to coastal local authorities.

The Laboratory is now confident that there is an answer to the greater part of the problem. The result of this work is being demonstrated today and a separate programme of the demonstrations is available. A report by the Laboratory, which recommends procedures for cleaning beaches, will soon be available and will be sent to coastal local authorities. Representatives of these authorities have been invited to Brighton tomorrow to see the demonstrations.

There are widely differing varieties of oil contamination and beach surfaces and no single method of cleaning can be adopted. Beaches may consist of mud, fine sand, coarse sand, shingle, small pebbles, large pebbles and rocks. In addition there may be artificial structures (groynes, walls, piers, etc.). The oil, too, can vary from the free flowing variety to heavier oil which is still liquid and to solid oil, normally called "tar". (From information which the Warren Spring Laboratory has collected from local authorities, it appears that solid "tarry" lumps of oil represent the most widespread and recurrent type of pollution.)

A number of treatments have been studied which may be applied to both liquid and solid oils. These have included burning, and dispersing the oil in water by means of an emulsifying agent.

The only practical method of dealing with large lumps of solid oil is to pick them up. In many cases it will be possible to do this only by hand, but for beaches which are accessible to a wheeled vehicle the Laboratory has developed a toothed roller - this is being demonstrated today. The apparatus which is being shown today is having an experimental run and the Laboratory is, therefore, taking this early opportunity of demonstrating it to the Press. It consists of a series of toothed discs mounted on a shaft. A comb-like device scrapes off any of the oil which is skewered by the points of the disc.

The roller can be pulled by a tractor in a similar way to the gangmowers used for cutting grass in parks, but it is better if it is pushed in front of the tractor so that the latter does not drive over the polluted area.

For dispersing liquid oils, the Laboratory considers that the most effective method is, firstly, to treat the oil with a mixture which will enable it to form an emulsion in water, and then to disperse it by hosing down the beach with fresh or salt water. In some cases it will be sufficient to leave the treated oil to be dispersed by tidal or wave action. Oil can be removed from fixtures such as groynes and promenades in the same way.

The selection of suitable emulsifying mixtures was made as a result of tests carried out initially in the laboratory on a specially constructed model beach and, finally, on the beaches at Eastbourne and Shoeburyness. One of the most effective mixtures evolved will be demonstrated at Brighton.

Treatment with emulsifiers and dispersion in the sea is a method which can be used to remove liquid oil even when the contamination is considerable. The method is, however, unsuccessful with solid lumps of oil since the emulsifying mixture runs off the lump before it has time to soak in.

Tests carried out in collaboration with the Ministry of Agriculture, Fisheries and Food, have shown that these emulsifier/solvent mixtures can be poisonous to shellfish and marine life, and some precautions in their use may be necessary. Local authorities will receive guidance on this point.

To summarise: if the problem is to remove contamination by liquid oil, treatment with an emulsifier/solvent mixture followed by hosing down will give effective cleaning in many cases. If the problem is to remove solid or semi-solid oil then a mechanical device may be used but hand picking is the only complete answer.

In charge of programme and demonstration

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DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

WARREN SPRING LABORATORY

Programme of beach demonstration at Brighton

on Tuesday, March 27th.

## PROGRAMME

These demonstrations are intended to show the Press some of the results of the work of the programme of beach cleaning which has been carried out by the Warren Spring Laboratory of the Department of Scientific and Industrial Research. The demonstrations fall into two parts. First a demonstration of cleaning liquid oil from a beach on which it could have been deposited by the previous tide and, secondly, removal of solid or semi-solid lumps of oil (tar) of the type which is frequently found at high tide line.

### Removal of Liquid Oil

A strip of liquid oil about 4 feet wide has been laid across the beach parallel with the tide line. The oil consists of fuel oil and crude oil in the proportion of 2:1 and has been deposited at a rate of  $\frac{1}{2}$  gallon per square yard.

The oil will be sprayed with a solvent/emulsifier mixture. This consists of one part Lissapol NX in nine parts coal tar naphtha. It is being applied by a spray pump capable of spraying a 6 foot width and will be deposited at the rate of  $\frac{1}{4}$  gallon per square yard.

This solvent/emulsifier mixture will then be left for about 30 minutes to mix with the oil. At the end of this time the beach will be hosed down into the rising tide. The tide will then cover the area and it will be observed that the oil is dispersed and carried away.

### Removal of Semi-Solid Material

For this purpose the Laboratory has designed a toothed wheel arrangement. This will be demonstrated drawn by a tractor. Three independently mounted units will be drawn across the beach picking up lumps of oil which have been placed upon it.

## Time-Table

- 1.30 p.m. Spraying oil with cleanser
- 2.15 p.m. Hosing with water
- 2.30 Tidal washing. Roller demonstration  
(3.30 p.m. High Tide)

### Equipment Used

1. The spray nozzles on the lance are ceramic nozzles, size No. 7, supplies 60 galls. of liquid per hour each, provided by Cooper Pegler, Burgess Hill, Sussex.
2. The pump used is a Mono pump driven by a Villier engine purchased from Cooper Pegler.
3. The tractor is a Fordson Super Major loaned by Roadless Traction Ltd., Hounslow.
4. Front loader loaned by H. Cameron Gardner Ltd., Reading.

Arrangement for items 3 and 4 were made through Ford Motor Co., Mechanized Farming Centre, Boreham, Essex and Ford Co., Agricultural Domestic Sales Division, Ilford.

### Spray material

Coal Tar Naphtha - crude heavy naphtha purchased from North Thames Gas Board.

Lissapol NX purchased from I.C.I. Ltd., Dyestuffs Division.

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