

The background of the cover is a stylized map of the Amoco Cadiz oil spill area. It shows the coastline of France and the British Isles, with a large area of the Atlantic Ocean shaded in a light green color, indicating the spill's extent. The map is rendered in a monochromatic green color scheme with varying shades and textures.

REPORT ON A VISIT TO FRANCE ON ACCOUNT OF THE AMOCO CADIZ  
OIL DISASTER

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REPORT ON A VISIT TO FRANCE ON ACCOUNT OF THE AMOCO CADIZ OIL  
DISASTER

by  
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1. INTRODUCTION

On 16 March 1978 the supertanker Amoco Cadiz wrecked on the northwest coast of Brittany. Within a period of two weeks its cargo of 230 000 tons of a light crude oil was spilled into the sea and caused the till now largest oil-pollution disaster recorded. In the days following the stranding of the tanker it became clear that many seabirds were endangered in the coastal area. On the evening of 23 March the French embassy in The Hague requested me to advise governmental and private nature conservancy bodies in France on possible measures to safe the endangered seabirds in the polluted area. A subsequent visit to France

included a short stay in Paris and in the affected area in Brittany, especially in Perros Guirec where the famous seabird colonies on the Sept Iles are situated.

This report gives a brief account on the various topics discussed in France and gives a survey of the observations on seabirds and other marine organisms made during my visit to Brittany.

## 2. CHRONOLOGY OF MY VISIT

- 26 March. Conference in Paris with Mr. Huet of the Ministry of Environment. Visit to some places in the Baie de Lannion.
- 27 March. Conference in Perros Guirec with Colonel Ph. Milon, president of the Ligue française pour la protection des oiseaux, and conservator of the Sept-Iles reserve. Visits to some reception centres for oiled seabirds and to coastal areas in the surrounding of Perros Guirec.
- 28 March. Visits to some reception centres for oiled seabirds and to coastal areas between Perros Guirec and Portsall.
- 29 March. Visits to reception centres for oiled seabirds in Perro Guirec, St.-Pol-de-Léon and Brest and to the coast in the surrounding of Portsall.

## 3. SOME ITEMS DISCUSSED

Mr. Huet gave me information about the situation along the coast of Brittany. The tanker Amoco Cadiz had lost most of its oil. The oil was of a rather light variety, and stayed in long strokes off the coast for a length of about 150 km. Much of the

oil had been trapped in bays. The seabird colonies on the Sept Iles, being within the polluted area, seemed to be threatened.

Three topics were discussed:

1. The possibility of capturing, cleaning and rehabilitating the oiled birds and subsequently returning them to their normal life.
2. The possibility of deterring the birds temporarily from the polluted sea-area or at least from the breeding places on the Sept Iles.
3. The possibility of capturing the still healthy but threatened birds, by keeping them in captivity and releasing them at the same places after the oil would be disappeared.

Ad 1. It was pointed out, that experiments on the rehabilitation of oiled seabirds showed that skilfull people working with a good equipment could successfully recover about 50% of the oiled birds in an apparently good condition. However, the mortality rate of such birds after liberation was found to be still many times as high as in normal birds. Moreover, rehabilitation of oiled birds is very labour intensive, while in Brittany as anywhere else good equipment to deal with large numbers of oiled birds is lacking. As, moreover trained people to do the work are few, hardly anything can be expected for the endangered populations by bird hospitals. The best primitive hospitals can do for the oiled birds, is to help them out of their suffering. Besides the hospitals can assist in investigating number and species of the victims. However, Mr. Huet and I agreed on me giving information about the treatment, even when the results were likely to be very doubtful, so as to give guidance to those who wanted to aid individual birds.

Ad 2. Seabirds cannot be repelled from an area as large as the oil-infested region by known methods. Driving the birds away

from the breeding colonies on the Sept Iles seemed rather dangerous as the possibility that they would land on the polluted sea around the isles, could not be excluded and they are safe in the colony. Moreover, no certainty existed on their return to the isles after being chased away. Therefore, in view of the unpredictability of the consequences of deterring the birds from their colonies it seemed advisable not even to try to drive them off.

Ad. 3. An attempt to catch most of the important species on the Sept Iles (Guillemots, Razorbills, Puffins, Shags and Gannets) in a period when the birds have no eggs or chicks, did not look very promising. Moreover, even when successful, the important question arises how to keep the birds in captivity for a few weeks. Healthy seabirds kept for a short time in the normal bad accommodations with quickly deteriorating surface-conditions, will soon lose the water-repellency of their feathers and are doomed to die when they are set free again.

Colonel Ph. Milon provided information about the protected seabird colonies on the Sept Iles. These colonies have lost the major part of their population of auks due to the Torrey Canyon disaster. This tanker wrecked 11 years before the Amoco Cadiz on the coast of Cornwall. Discussing the methods of cleaning and rehabilitating oiled birds, I demonstrated the proper use of detergents. Colonel Milon disclosed his intention to built a pen for seabirds in Perros Guirec, to be used as reception centre for small numbers of oiled seabirds after cleaning them. It was his idea to give the public in this way the opportunity to observe individual seabirds in more detail. In this connection the principles of the seabird basins of the Institute on Texel were explained, where the importance of preventing accumulation of surface-active substances was shown. This was

achieved by continuous pumping in clear sea-water and skimming off the surface layer of the swimming pool (as I described in Ibis 120: 112-113, and in the booklet Laboratory Research on Sea birds (1977)).

Colonel Milon also expressed his intention to import chicks of Puffins from the Faroe Islands in order to raise the breeding population on the Sept Iles in the future. The intended method seems to be well considered and already tested in 1972. Provided that the work will be carried out with great care, the plan offers good prospects. However, I expressed some reservations upon the proposed origine of the Puffin chicks, as it is known that the species shows a clinal variation. So important differences may be expected between birds originating from the Sept Iles, the most southern breeding place, and birds of the Faroes, being half way the distributional range. Chicks from more adjacent colonies might be a better choice. Further preliminary scientific advice, especially concerning the taxonomic question, seems to be desirable.

Besides, in the absence of more detail about recent trends in the population, in particular since the Torrey Canyon disaster, made it difficult to judge the effect of such an introduction of chicks from elsewhere. I further informed whether it was possible to improve the breeding grounds (like the ledges for the Guillemots, the soil for the Puffins) on the Sept Iles and in the archipelagos off the west coast of Brittany. Also I suggested that an improvement of protection measures against human disturbance and against fishing nets around the Sept Iles and other potential breeding islands could be helpful.

#### 4. OBSERVATIONS

##### a. Centres for reception of dead and alive oiled seabirds

In most of the villages along the coast the location of local reception centres were indicated on notice-boards and in shops. All centres I visited kept list of the birds which were brought in. In a few centres some bird-species were noted with collective names (plongeur = all species of divers, cormorant = Shag and Cormorant).

In most of the centres people tried to rehabilitate the still alive victims. In some I could give some advices on how to improve methods, or give a demonstration in the proper use of detergents to clean a bird. Often the knowledge of the needs of a bird was minimal. Sometimes all sorts of medicines were available but no good food. Only in St.-Pol-de-Léon small fishes were offered to the birds, in other centres only parts of big fishes could be fed. Usually the quantity of fish available was too small. The equipment to clean and accomodate oiled seabirds was generally insufficient. Only in Brest there was knowledge, equipment and space to deal with the victims.

##### b. Birds affected by oil

Most victims belonged to the Alcidae, Phalacrocoracidae and the Gaviidae (Auks, Cormorants and Divers). The numbers of Laridae, Podicipiidae and Anatidae (Gulls, Grebes and ducks) were very low.

##### Alcidae

*Fratercula arctica*. The Puffin was the most numerous victim, making up about 50% of the total number of oiled birds.

Only few of them had a complete nuptial plumage and could be considered as adults. I observed also a few Puffins born in the last summer. Most of the birds, however, were probably subadults. In these birds the cere on the bill was not or not completely developed. The feathers between eyes and bill were still black. Besides, many of these birds were in wing-moult. A few bodies opened by me showed an excellent fat condition. Some of the Puffins wore British rings, so that at least part of the victims do not belong to the breeding birds of the Sept Iles.

*Uria aalge*. Some tens of Guillemots had been found. Most of them were still in winter plumage, these birds must be considered as immatures. Only a few were in the nuptial plumage, and belonged perhaps to the breeding population of the Channel area.

*Alca torda*. About 15 Razorbills were collected. Most of them in complete nuptial plumage.

#### Phalacrocoracidae

*P. aristoteles*. About 100 Shags were found, most of them in juvenile plumage.

*P. carbo*. Only a few Cormorants were found, all in juvenile plumage.

#### Caviidae

Most of the victims belonged to the large species: *Gavia immer* (Great Northern Diver) and *G. adamsii* (White-billed Diver). I did not expect to see White-billed Divers so far south. The divers were in wing-moult or had only half grown flight-feathers.

Besides a few Gulls, one Great Skua, 3 Slavonian Grebes and only 2 Common Scoters were seen among the victims. It was obvious that immatures dominated among the oiled birds. Further that a remarkable number of the birds were in wing-moult (Divers and Puffins), suggesting that reduced flight-capacity enhanced chances to become victim of the oil. I expect that a complete list of the victims will be published by the French ornithologists.

c. Birds observed along the shore

1. *Sula bassana*. As far as could be observed from the coast near Trélévern, the colony on Ile Rouzic (the most southern breeding place in Europe) seemed to be completely intact. The birds were flying to and fro in a normal manner. Some Gannets fishing in the sea off Perros Guirec dived in parts of the sea without oil.
2. *Phalacrocorax carbo*. Two adult Cormorants with white patches were seen diving in an area free of oil off Perros Guirec. Afterwards they flew towards the Sept Iles.
3. *P. aristoteles*. On 27 and 28 March in the early morning several Shags were observed fishing in clean parts of the bay east of Perros Guirec. Diving times of 30-55 seconds were noted. If a bird surfaced near an oil patch it always rapidly swam back before diving again. One bird flew back when it came in the vicinity of an oil patch. It passed two other bands of oil before landing in a clean area. After fishing most of the Shags flew to Ile Tomé and some of them to the Sept Iles. One of the Shags ruffled its feathers occasionally while flying, possibly because it had some oil on them. All other ones behaved quite normally. Off Portsall flying and diving Shags

were seen between the wreck of the tanker and the shore on 28 and 29 March. Also here the birds seemed to avoid the oil along the coast and the oil patch coming from the tanker.

4. *Melanitta nigra*. On 29 March two times a small flock of Scoters were observed flying along the coast off Portsall.

5. *Haematopus ostralegus*. On 28 March during low tide a flock of 5 Oystercatchers were observed on clean sandy beach in the heavily polluted rocky coast near Portsall. When disturbed by people who pumped oil from the water in tanks, they flew to an other unpolluted place near the low water mark. One of the birds had some oil on the feathers. This one flapped with its wings during rain showers.

6. *Arenaria interpres*. Small groups of Turnstones were observed on several places in the tidal zone (Perros Guirec, St.-Pol-de-Léon, Roscoff and east of Portsall). The birds always stayed on oil-free parts.

7. *Calidris alba*. A group of 15 Sanderlings was observed in a creek in the heavily polluted estuary near Dozen. The birds behaved very restless, possibly because they did not find any food. They always alighted on the clean sands along the creek. None of the birds was oiled.

8. *Larus marinus*. Some Greater Black-backed Gulls were observed flying over the sea off Perros Guirec, Trégastel, Roscoff and Portsall. Only one bird had some oil on the feathers.

9. *Larus argentatus*. Many pairs of Herring Gulls were present in the colony on Ile Tomé. These birds were further observed in the same places as *L. marinus*, but were more abundant. Only few Herring Gulls appeared to be lightly stained by oil.

10. *Larus canus*. A heavily oiled Common Gull was seen in a flock of Common Gulls and Blackheaded Gulls on a field near Lesneven.

11. *Rissa tridactyla*. Between Perros Guirec and Trégastel-Plage several Kittiwakes were seen flying over the sea. None of these birds had oil on its feathers.

12. *Sterna sandvicensis*. On 28 March some Sandwich Terns were seen diving in oil-free parts of the sea between Perros Guirec and Ile Tomé.

#### d. Marine animals and plants

26 March. Bay near St.-Efflam: Only some traces of oil were observed on the sand flat. Here and there specimens of *Cerastoderma edulis* emerged from the sand, some lying on the sand were moribund or dead. *Echinocardium cordatum*, living near low water mark, showed similar phenomena. Empty shells of *Lutraria lutraria*, *Pharus legumen* and *Ensis* spec. were found in the tidal area. However, faeces of *Arenicola* numbering up to  $10/m^2$ , indicated active specimen, while *Patella vulgata*, *Littorina spec* and some Trochidae were observed alive on a rock.

St.-Michel-en-Grève: Sandflat covered with a 5-10 cm thick layer of oil. Not a single mollusc or worm was seen alive.

27 March. Coast between Perros Guirec and Trestel: Only small patches of rather thick oil, some very thin oil slicks on the water were visible: apparently healthy specimens were observed of *Arenicola marina*, *Nereis* spec., *Anemonia sulcata*, *Actinia equina*, *Patella vulgata*, *Littorina littorea*, *Harmothoë* spec, *Carcinus maenas*, and amphipoda. No mortality in marine animals was observed.

27 March. Trégastel-Plage: A thick layer of "mousse" covered a part of the bay 3 km southwest of the village. The oil did not adhere to most of the boulders and the sand when the water receded during ebb. In the area with oil: *Arenicola marina*, *Nereis* spec., *Cerastoderma edulis* and *Venerupsis* spec. were seen emerging from the sand and dying. Some specimens of *Patella vulgata* had spontaneously detached and lay on the mud. Some others on the rocks gave a rather weak adhesive reaction, but most of the specimens could not be detached by hand.

In the lower tidal zone no oil was visible: many specimens of *Arenicola marina* were seen crawling on the surface, although also normal *Arenicola* faeces could be found in some places. Many dead specimens of *Carcinus maenas* were observed without a single one alive. No Amphipods and Isopods could be detected below the stones or under the *Ascophyllum* vegetation. All specimens of *Littorina littoralis* in the area lay inactive and partly retracted on the sand. Not a single one was observed between the algae on the rocks. The larger brown algae (*Fucus*, *Ascophyllum* and *Laminaria*) were only somewhat darker in places where they had been in contact with oil.

28 March. Same place: Only a few *Arenicola* faeces could be found. More specimens of *Patella vulgata* lay detached on the mud. *Littorina littoralis* showed no reaction when touched.

28 March. Between Roscoff and Ile de Batz: Specimens of *Patella vulgata* and some Pagurids appeared to be entirely normal. Under stones remarkably few amphipods and

isopods could be found and no specimens of Harmothoë.

- 28 March. Small sandy estuary south of Dosen: A thin layer of oil was deposited in the spring tide region. Salt marsh vegetation (*Halimone portulacoides*, *Cochlearia* spec., *Vaucheria* spec.) showed discoloration. No specimen of insects, arachnoids, molluscs or other evertebrates could be found alive between the vegetation.
- 28 March. Grève de Goulven: Only some traces of oil could be detected. Specimens of *Arenicola*, *Nereis*, *Patella*, *Carcinus* and Pagurids appeared to be normal. No mortality was observed.
- 28 March. Estuary between St. Pabu and Tariec: A thick layer of brown oil. Vegetation on saltmarsh discoloured. No evertebrates alive in the creek and on the marsh.
- 29 March. St.-Pol-de-Léon: No traces of oil. *Nereis*, *Arenicola*, *Patella* and also *Littorina* were active. In fishing net *Onos mustellus*, *Blennius* spec., *Ammodytes* spec., some *Labridae* and *Gammarids* all in good condition.
- 29 March. Portsall: More than one hour spend searching in the tidal zone during low tide. Dead or dying were found: Many specimens of *Grantia compressa*, *Arenicola marina*, *Nereis* spec., *Nephtys* spec., *Gibbula* spec., *Patella* spec., *Nassarius reticulatus*, *Littorina littoralis*, *Carcinus maenas* and *Cancer pagurus*. Also some dead *Pleuronectidae*, *Labridae* (cf. *Labrus bergylta*), *Gobius niger*, *Paguridae*, and *Holethuroids*.  
Absent in normal habitate between and under stones: *Pycnogonida*, *Isopoda*, *Amphipoda*, free living *Polychaetae*, *Ophiuroidae*, *Nudibranchia*, *Blennidae* or other fishes.

Animals found alive: one big specimen of *Carcinus maenas*, one specimen of *Asterina gibbosa*, two specimens of *Tealia felina*, a few specimens of *Actinia equina*. On some sandy spots faeces of *Arenicola* up to 3/m<sup>2</sup>. Also a few of the yellow and red sponges appeared to be still healthy.

#### Conclusions of observations on marine fauna and flora

The larger brown algae were only somewhat discoloured in places where they had been covered by oil. Perhaps most of them were not (yet) affected. The plants on the salt-marshes which had been in contact with oil, were discoloured and apparently died. A high mortality of marine animals was observed in places covered with oil.

Also in places where no oil had settled, but where oil was in the neighbourhood, mortality was sometimes striking, perhaps by dissolved toxic components of the oil. As far as known no detergents were used in the coastal areas. *Actinia equina* seems to be surviving rather well. In places where no oil had been in the vicinity (i.e. St.-Pol-de-Léon) no mortality was observed. No fishes or other animals from offshore water were washed up on the beaches visited.

### 5. DISCUSSION AND PRELIMINARY CONCLUSIONS

During my visit to Brittany (26-29 March, 1978) most of the oil of the Amoco Cadiz was still floating in the sea. Therefore only provisional conclusions can be drawn concerning the damage done to birds and the marine environment.

1. Mortality of evertebrates and fishes in the tidal zone was detectable around places where oil washed up. In many

localities the oil had bypassed the bay without causing any apparent mortality to the marine fauna. However, in other situations mortality was observed without visible traces of oil. As no detergents were used in the zone directly adjacent to the shore, this mortality probably had been caused by dissolved components of the crude oil.

No indications could be found of mortality occurring in animals living off shore. Birds have been seen successfully diving for food in clean spots within the oiled area. The food supply of the birds did not seem to be seriously affected.

2. Newspaper-reports that all breeding birds within the area had been killed could not be confirmed. In any case the colonies of the Gannets on Ile Rouzic and of the Herring Gulls on Ile Tomé was still intact. Also Shags seemed to be still numerous on these islands.

3. When I left France about 1 000 oiled birds had been collected. Although it seems possible that many more were yet to come, the fact that the wind was continuously on-shore and the oil remained rather close to the coast seems to make this doubtful.

Press-reports that in the early days of the oil disaster already 30 000 birds had been killed seem highly unlikely and certainly premature. Nevertheless a serious mortality among seabirds was obvious, in particularly in Puffins.

4. On various occasions I observed that birds evaded oil-polluted areas, both on sea and on the beach. The victims concerned mainly moulting birds, not able to escape the oil spreading over the sea-surface. This ability of the birds to evade oil-polluted areas, at least by day, will have minimised the number of victims.

5. Concerning the origin of the victims the Guillemots,

Razorbills and Puffins in nuptial plumage will probably belong to the colonies of the Channel area (Les Sept Iles). A large proportion of the victims concerned sub-adults. Therefore the full extent of the disaster to the colonies can only be determined after some years. At least a part of the sub-adults originated from elsewhere (as indicated by British rings in the Puffins and by the colour-pattern in the Guillemots). Part of the victims (the divers) have their breeding grounds in high latitudes. The catastrophe is therefore of more than local importance.

5. The best estimates about the extent of the bird mortality is to be expected from the birds dead or alive collected in centres. This was well organized in Brittany.

6. In case of an oil disaster at sea the best help one can give bird populations to survive is to remove the oil from the sea surface quickly by collecting, dispersing or sinking the oil. From the newspapers I understood international help to remove the oil was offered. However, no activity was observed in this respect and nobody could tell me what was done with the oil at sea. In any case the removal of oil stranded on the beach seemed well organized.

7. For different reasons the work in bird hospitals can only be of marginal importance for the bird populations. Bird- and animal protection organizations ought to consider, whether placing oiled or recently cleaned birds in small boxes in which they cannot stand upright, administering medicines and vitamins to the birds, providing insufficient food, handling birds by untrained hands, etc. until they die after some days or weeks can be justified on humanitarian grounds.

8. To many reasons, including scientific, touristic, aesthetic, and educational aspects, the restoration of the

former rich breeding colonies on the coasts of Brittany should be promoted, in case the colonies have suffered severe losses due to disasters caused by man.