



## Activities of the United Nations Environment Programme for the protection and development of the Mediterranean region

Pour un ordre méditerranéen

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# Activities of the United Nations environment programme for the protection and development of the Mediterranean region

## THE MEDITERRANEAN ACTION PLAN

The Mediterranean region was selected by UNEP as a "concentration area" where UNEP has attempted to fulfill its catalytic role to assist states in this region in an ambitious and consistent manner.

After extensive preparatory activities involving a number of UN bodies, UNEP convened the Intergovernmental Meeting on the Protection of the Mediterranean (Barcelona, 28 January to 4 February 1975). The meeting was attended by representatives of 16 States bordering on the Mediterranean Sea (1). At the end of the two-week meeting they approved an Action Plan (2) consisting of four components:

- legal (framework convention and related protocols).
- scientific (research and monitoring).
- integrated planning.
- institutional and financial arrangements.

All components of the Action Plan are interdependent and provide a framework for comprehensive action to assist both the protection and the continued development of the Mediterranean ecoregion. No component is an end in itself. Each activity is intended to help the Mediterranean Governments to improve the quality of the information base on which national development policies are formulated; to improve the ability of each Government to identify various options and to make rational choices among alternative patterns of development, and appropriate allocations of resources.

Set forth below in Section I is a general description of the components of the Action Plan. Section II is a more detailed review of the scientific component. Section III briefly outlines future activities.

(1) Algeria, Egypt, France, Greece, Israel, Italy, Lebanon, Libyan Arab Republic, Malta, Monaco, Morocco, Spain, Syrian Arab Republic, Tunisia, Turkey, Yugoslavia.

(2) Report of the Intergovernmental Meeting on the Protection of the Mediterranean, UNEP/WG.2/5, Annex.

## ENVIRONMENTAL LEGISLATION

During preparatory meetings for the 1972 UN Conference on the Human Environment the value of a regional approach to marine pollution problems was stressed and the representatives of many governments bordering the Mediterranean Sea recognized the value of agreements among interested States to secure international co-operation in order to deal with common environmental problems (3). Intergovernmental consultations began in 1973 at FAO towards an agreement on guidelines to be taken into account in the negotiation of an international framework convention for the protection of the Mediterranean Sea. On the basis of the agreed guidelines, a tentative text of a framework convention and of two protocols was presented to Governments at the Barcelona Conference in January 1975, and this text, according to the Governments' directives, was further revised by UNEP and FAO, together with legal experts from Mediterranean Governments (4).

In accordance with the request of the Mediterranean Governments, the Executive Director of UNEP convened the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region on the Protection of the Mediterranean Sea in Barcelona, 2-16 February 1976. Governments attended and approved the texts (6) of three legal instruments listed below, after which 12 Governments (6) signed them:

- Convention for the Protection of the Mediterranean Sea against Pollution.
- Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft. (This protocol was signed by 11 Governments.)
- Protocol concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency.

On the basis of national processes of ratification now underway it can be expected that these legal instruments will enter into force in 1978.

(3) Report of Intergovernmental Working Group on Marine Pollution, London, June 1971. A/CONF.48/IWGM.1/5, 21 June 1971.

(4) Report of the Intergovernmental Meeting on the Protection of the Mediterranean, UNEP/WG.2/5, Annex, page 4, para. III.A.4.

(5) Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libyan Arab Republic, Malta, Monaco, Morocco, Spain, Syrian Arab Republic, Tunisia, Turkey, Yugoslavia.

(6) Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Malta, Monaco, Morocco, Spain, Turkey. Greece did not sign the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft. As of 15 September 1976, Tunisia, Yugoslavia, and the European Economic Communities have signed the Convention and Protocols in Madrid.

For each particular source of marine pollution a number of specific actions are contemplated, including the preparation of additional protocols to be associated with the Convention. As a first effort to develop other protocols UNEP will convene an Intergovernmental Consultation in Athens, Greece (7-11 February 1976) to discuss principles for a draft protocol for the protection of the Mediterranean Sea from land-based sources of pollution.

### Environmental assessment

It was as early as 1969 that the General Fisheries Council for the Mediterranean (GFCM) of FAO formed a Working Party on Marine Pollution in the Mediterranean and its Effects on Living Resources and Fisheries (later renamed as the Working Party on Marine Pollution in Relation to the Protection of Living Resources). In co-operation with the International Commission for the Scientific Exploration of the Mediterranean (ICSEM) in 1972 this Working Party produced the first comprehensive review on the state of marine pollution in the Mediterranean (7).

The next important step towards action was the UNEP sponsored International Workshop on Marine Pollution in the Mediterranean (8) which was convened in Monaco (9-14 September 1974) by IOC, GFCM and ICSEM. This meeting, attended by 40 scientists from Mediterranean research centres, defined pollution of coastal waters as the main environmental problem in the Mediterranean Sea and attributed it to the general lack of adequate systems for the treatment and disposal of domestic and industrial waste, to the input of pesticides and petroleum hydrocarbons, and to the presence of pathogenic microorganisms. The Workshop reviewed information on current sub-regional programmes as well as existing research and monitoring facilities in the Mediterranean.

Based on the recommendation of the Monaco Workshop and a subsequent feasibility study of the capabilities of existing national research institutions, conducted by IOC on behalf of UNEP, the 1975 Intergovernmental Meeting in Barcelona approved a Co-ordinated Mediterranean Pollution Monitoring and Research Programme consisting of seven pilot projects and requested UNEP's Executive Director to implement it in close collaboration with the relevant specialized UN bodies (GFCM of FAO, IOC of UNESCO, WHO, WMO and IAEA).

Following governmental approval for the creation of seven networks of co-operating national research centres to carry out the work on the seven pilot

projects, a number of technical meetings have been held at which operational documents for the pilot projects have been drawn up, and at present work has started in the cooperating institutions.

The seven pilot projects of the Co-ordinated Mediterranean Pollution Monitoring and Research Programme deal mainly with the coastal waters of the Mediterranean. An additional pilot project dealing with pollution levels of the open waters of the Mediterranean and the biogeocycle of the most important pollutants, its also under preparation.

Throughout the period of planning, and in particular during the two-year pilot project phase, a high degree of co-operation will be maintained between UNEP, acting as overall co-ordinator, and the specialized UN bodies (GFCM, IOC, WHO, WMO and IAEA) which have major roles in the implementation of the pilot projects.

The pilot projects are being executed primarily through activities of existing national institutions. Participation in the projects is open to all institutions in the region, subject to approval from their national authorities. At present 63 research centres from 14 Mediterranean countries have been identified as active participants in the projects. Support has already been provided to some of them so as to enable their full participation in the agreed projects. To date, this support includes a large training programme, distribution of sophisticated analytical instruments, organization of an inter-calibration exercise, and provision of common maintenance services. As an aid to participants several technical guidelines are under preparation and a Directory of Mediterranean Marine Research Centres, describing more than 100 institutions has been prepared and issued by UNEP.

The first results of the two-year pilot projects will be reviewed in 1977, when a decision will be taken on more permanent arrangements to produce on a regular basis evaluated information for the Mediterranean Governments on the state of pollution in the Mediterranean Sea.

A related project was recently initiated by UNEP on Pollutants from Land-Based Sources in the Mediterranean. This project is a concrete example of the linkage between environmental assessment and management as it is intended to produce data which will assist governments in the negotiation of the regional protocol on land-based pollutants. The project, which will be executed in close co-operation with the Governments of the region and a number of specialized UN bodies (including ECE, UNIDO, FAO, UNESCO, WHO, IAEA) has, as its ultimate objective, to provide the Governments of the Mediterranean coastal States with appropriate information on the type and quantity of pollution inputs from major land-based sources and through rivers, and on the present status of waste discharge and water pollution management practices. The project also provides for the preparation of an inventory of land-based sources of pollutants being discharged into the Mediterranean.

(7) GFCM, The State of Marine Pollution in the Mediterranean and Legislative Controls. Stud. Rev. 51. GFCM, 1972.

(8) Intergovernmental Oceanographic Commission, Workshop Report No. 3, UNESCO, 1975.

Since 1975 UNESCO and UNEP have been undertaking a project on the role of sedimentation in the pollution of the Mediterranean Sea with special emphasis on the assessment of current knowledge in this field and on the development of guidelines for environmental impact assessment.

Additional projects to study the input of airborne pollutants into the Mediterranean, and to assess the potential fisheries resources in the Mediterranean and the effects of pollutants on this potential are also planned.

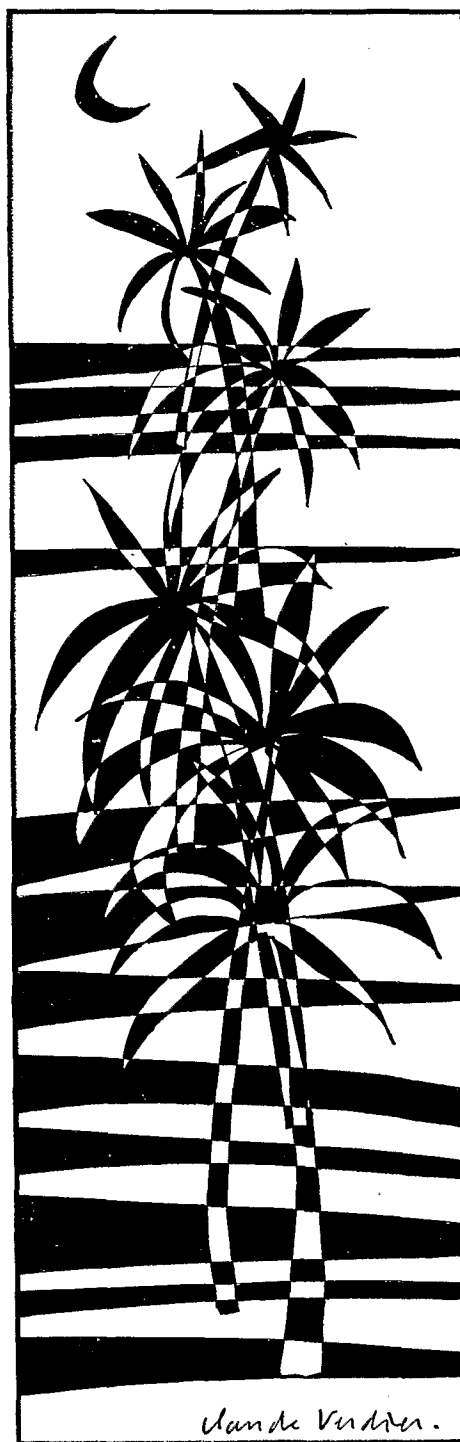
### Environmental management

A large number of present and planned activities around the Mediterranean have impacts on the quality of the environment. Efforts are under way to identify those activities and to learn how to evaluate the severity of their likely impact, and, where indicated, how to apply additional measures to reduce either the risk or the severity of the effect. Many such activities are financed through UNDP, the World Bank and other sources of international aid. UNEP, in close co-operation with such sources of assistance and the States concerned, is studying the means to assess the likely environmental impacts, and to design and apply appropriate safeguards. Many internationally supported projects which have clearly beneficial environmental impacts are already under way, such as the various fisheries projects of FAO, the environmental sanitation activities of WHO, and the assistance in industrial waste treatment provided through UNIDO. Projects of a similar nature are also being carried out by intergovernmental organizations, such as OECD, as well as by non-governmental organizations.

In connexion with the problem of accidental spills of oil or other harmful substances in the Mediterranean, Governments at the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region on the Production of the Mediterranean Sea (Barcelona, February 1976) decided to establish a regional oil-spill control centre on Malta. The primary objective of the centre is to help coastal States of the region take co-operative and timely steps to prevent damage to their coastal resources from massive and accidental pollution. The Malta Centre is expected to become operational in October 1976. IMCO has been entrusted with the responsibility as co-operating agency for the establishment and operation of the centre, which at present is being funded by UNEP.

In co-operation with IUCN steps are also under way to assist Mediterranean States to identify marine parks and wetland areas which deserve greater attention and protection. Information in the form of guidelines for the management of these areas will be generated so that their protection may be secured while their potential for tourism and scientific research is simultaneously realized.

Through such means as illustrated



above, national governmental and non-governmental institutions around the Mediterranean are encouraged to co-operate in attacking common problems as they arise.

Meanwhile a separate, longer-term planning exercise is being prepared: the "Blue Plan". As the result of an initiative by the Government of France, UNEP and Mediterranean Governments are engaged in consultations on proposals to launch a series of prospective studies by national research institutions that would specify the likely developments until the year 2000 in a variety of sectors, including urbanization, industrialization, agricultural development, transportation (maritime and coastal), offshore exploration and exploitation, and energy production and use. An Intergovernmental Meeting will be convened in Split, Yugoslavia (31 January-4 February 1977) to discuss and decide upon content and proposed phases of the Blue Plan. The first phase would involve the completion of sectoral studies by networks of co-operating national institutions in such a way that the results of each study could be interrelated with the results of the others. A second phase would call for an analysis based on the earlier findings of the likely impacts on the Mediterranean, in whole or in part, of an aggregation of the predicted effects. For example, an analysis of the results of the combined impacts on a part of the Mediterranean of forecast demographic increase, tourism development, intense agricultural activity, etc. Such studies, properly conducted and supported by Governments would aid national planners and decision makers by improving the quality of information on which their actions are based. Preliminary results from the "Blue Plan" should be available in approximately two years time.

### Supporting activities

A review of present and planned activities reveals numerous examples of the need for initial support to institutions and Governments, especially those of developing countries, to enable them to participate in environmental activities so that in due course they can take on fuller responsibility. In accordance with the wishes of the Mediterranean Governments, national institutions have been helped to participate in regionally co-ordinated activities in all parts of the Mediterranean, despite the economic conditions in many Mediterranean States which do not yet permit adequate national funding. UNEP is also financially supporting the establishment of the Regional Oil-Combating Centre in Malta the Secretariat serving the Convention and Protocols, and the Unit co-ordinating the research and monitoring programme in the early stages of these activities. This support by UNEP rests on the assumption that the Governments of the region will themselves gradually cover the operating costs of such activities as UNEP's initial catalytic role is completed.

Supporting measures for the pollu-



Photo UNESCO



*Médinet el Fayum (Égypte) : le canal de Bahr el Yussuf.  
construit sous la 12<sup>e</sup> dynastie des pharaons.*



tion research and monitoring programme include the provision of technical assistance in the form of education and training, and the provision of research equipment, such as equipment needed to sample and analyze water and marine organisms. Of equal importance in this area is the intercalibration of equipment used for research and monitoring to ensure compatibility of results obtained by various means, as well as the organization of common maintenance services for sophisticated analytical instruments.

Supporting measures are also required for training in the area of integrated planning, to assist officials of developing countries to include environmental dimensions in their economic development programmes and projects and to secure the proper management of natural resources on a sustainable basis.

### **CO-ORDINATED MEDITERRANEAN POLLUTION MONITORING AND RESEARCH PROGRAMME**

The following is a short description of the seven pilot projects which constitute the Co-ordinated Mediterranean Pollution Monitoring and Research Programme.

#### **Joint IOC/WMO/UNEP Pilot Project on Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters**

The pollution of the Mediterranean by oil and petroleum hydrocarbons is a serious problem for beaches and other coastal, recreational areas, and as yet too little is known about the present levels of the pollution and about its effects on the Mediterranean ecosystem. So far as the levels of pollution are concerned, it appears appropriate to initiate a regional monitoring programme as a contribution to the pilot project for the monitoring of marine pollution by petroleum of the Integrated Global Ocean Station System (IGOSS) of the IOC and the World Meteorological Organization (WMO). The pilot project will involve initially the visual observation of oil slicks and other floating pollutants by ocean weather ships, research vessels, voluntary observing ships, fishing vessels and their supporting ships, and by observers on suitable offshore platforms and aircraft; tar ball sampling by ocean weather ships, research vessels and other vessels designated by Member States, and by staff at coastal stations, on islands and offshore platforms; survey of tar on beaches by staff of participating institutions of Member States; and sea water sampling by research vessels, ocean weather ships and other vessels suitably staffed and equipped. Although the pilot project calls for the sampling of seawater for the determination of dissolved petroleum hydrocarbons, some problems of sampling and, in particular, of chemical analysis have yet to be resolved.

The measurement of present levels of petroleum in all its forms in the Medi-

terranean assumes greater importance in view of the reopening of the Suez Canal to the passage of oil tankers. The value of initiating the pilot project in the Mediterranean region rests mainly on three facts: (i) the observational system has already been developed (IGOSS); (ii) by using a common system of observations the various subregions of the Mediterranean can be readily compared; and (iii) within a common system of observation, the Mediterranean can be truly compared with other areas (e.g. the North Atlantic) with quite different oceanographic regimes, in which the possibilities of evaporation generally lower.

The operational document for this pilot project was developed at a joint IOC/WMO/UNEP Expert Consultation (Malta, 8-13 September 1975) which was attended by 36 participants from 12 Mediterranean countries.

At present 11 countries have expressed a wish to participate in the pilot project, nominating 25 national laboratories as participants in the network dealing with the pilot project.

Work on this pilot project will start this autumn.

#### **Joint FAO (GFCM)/UNEP Pilot Project on Baseline Studies and Monitoring of Metals, particularly Mercury and Cadmium, in Marine Organisms**

Metals, and particularly heavy metals like mercury, are more or less toxic to man. They can reach man through the food chain, and the source of greatest concern is, therefore, the level of concentration of such metals in fish, shell-fish and other edible marine organisms.

It is recognised that the Mediterranean is a tectonically rich region and that some metals manifest high natural levels and great variations in their concentration in sea-water and sediments. The bluefin tuna, as well as other tuna, is known to accumulate mercury and, although there is no strong evidence that the Mediterranean stock is separate from the Atlantic stock as a whole, Mediterranean tuna apparently have much higher levels than those from the Atlantic.

The pilot project will deal only with the concentration of selected metals, particularly mercury and cadmium in marine organisms. In addition to these the measurement of the levels of copper, lead, manganese, selenium and zinc are recommended, particularly when detection methods providing for multi-elemental analysis are used. The striped mullet, the Mediterranean mussel and the bluefin tuna are selected for the monitoring programme so that representatives of different ecotypes are included. The sampling frequency is seasonal.

The operational document for this pilot project was formulated at a joint FAO (GFCM)/UNEP Expert Consultation (Rome, 23-27 June 1975) attended by 35 participants from 13 Mediterranean countries.

13 countries have expressed a wish to take part in the pilot project nominating 36 national laboratories as participants in the network dealing with the pilot project.

Work on this pilot project started in late autumn 1975.

#### **Joint FAO (GFCM) UNEP Pilot Project on Baseline Studies and Monitoring of DDT, PCBs and Other Chlorinated Hydrocarbons in Marine Organisms**

Similar arguments to those advanced for the monitoring of metals apply to chlorinated hydrocarbons; they are persistent; they are usually accumulated by organisms; they are usually harmful to man indirectly, through effects on the stocks of marine organisms he exploits. Even less is known about the present concentrations of these chemicals than about the concentrations of heavy metals. Since virtually all chloro-hydrocarbons are generated by man, natural background levels of these substances are not a problem in baseline studies.

The pilot project will deal with levels of selected organochlorine compounds which are considered as specially relevant to representative members of the Mediterranean ecosystem. DDT, PCBs, dieldrin and their metabolites are singled out as falling into this category. Whenever possible, other persistent organic compounds will also be identified in analysed samples. The organisms selected as monitoring targets (striped mullet, Mediterranean mussel, pink shrimp) are representative of the different Mediterranean ecotypes, are of great economic importance and are almost ubiquitous for the whole Mediterranean. The sampling frequency is seasonal.

The operational document for this pilot project was developed by the same Expert Consultation which formulated the preceding pilot project.

Currently 12 countries have nominated 25 national laboratories to participate in the pilot project.

Work on this pilot project started in late autumn 1975.

#### **Joint FAO (GFCM) UNEP Pilot Project on Research on the Effects of Pollutants on Marine Organisms and their Populations**

The marine environment is characterized by relatively constant physical and chemical conditions. Most marine organisms are therefore not adapted to sudden changes in their environmental conditions, to certain substances not normally present in sea water, or to unusually high concentrations of substances which normally appear only as sea water microconstituents.

The project will not deal with acute toxicity experiments unless the organisms cannot be kept long enough under culture conditions to allow long-term toxicity

tests. Instead, long-term experiments are envisaged with the aim of investigating the sub-lethal effects of potential pollutants, and functional as well as morphological changes.

The experiments will not be limited to individual organisms but should rather cover populations where subtle changes in the behavioural pattern could serve as early warning signs and lead to the possibility of predicting the moment at which the organisms will be harmed at the population level. The influence transmitted through the trophic chains, particularly in experiments on populations, will not be neglected.

Due attention will be paid to establish the most sensitive stages in the life cycle of the tested organisms. Physiological and biochemical studies will be conducted in order to provide information on the mechanisms involved in the effects and transport of pollutants.

Damage to the genetic material of individuals and their populations will be studied.

The ultimate aim of all these tests is to develop the necessary background for biological monitoring and to contribute data required for the development of water quality criteria. Naturally, these criteria cannot be based solely on biological tests but the expected results might provide a basis for a better understanding of the potential hazard for the ecosystem, including man, from the increased level of pollutants in the marine environment.

The operational document for this pilot project was developed at a joint FAO (GFCM)/UNEP Expert Consultation (Rome, 30 June-4 July 1975) attended by 25 participants from 13 Mediterranean countries.

Until now, 10 countries have expressed a desire to participate in the pilot project nominating 22 national laboratories as participants in the network dealing with the pilot project.

The work on this pilot project started in late autumn 1975.

### Joint FAO (GFCM) UNEP Pilot Project on Research on the Effects of Pollutants on Marine Communities and Ecosystem

Theoretically several types of marine communities and ecosystems could be studied in the frame of the proposed pilot project. For practical purposes, the project will deal with natural marine communities and ecosystems under stress in coastal waters, including lagoons and brackish coastal lakes, in areas where ecosystem changes may be anticipated as a consequence of man's activities and with ecosystems in relatively unpolluted areas, such as marine parks, for reference.

Ecosystems will be particularly investigated in areas which were repetitively studied in the past in order to detect long-term changes.

To the largest possible extent the ecosystems will be studied as integral units taking into account the dynamic interactions among their various components.



*Claude Vernet*

Special attention will be paid to the role of those organisms which will be used in the monitoring pilot projects in the transport of pollutants through the trophic levels.

The parameters and effects to be studied will vary depending on the studied community and ecosystem. The most common ones will be: community structure, functional indices and body burden of pollutants.

The operational document for this pilot project was formulated at the same Expert Consultation which developed the previous pilot project.

Until now, 11 countries expressed a wish to participate in the pilot project nominating 21 national laboratories as participants in the network dealing with the pilot project.

Work on this pilot project started in late autumn 1975.

### Joint IOC/UNEP Pilot Project on Problems of Coastal Transport of Pollutants

The general pattern of sea surface transport in the Mediterranean is cyclonic (counterclockwise) in both the eastern and western basins. Pollutants discharged into coastal waters tend to be transported along the coasts, thus restricting advection from the coasts towards the open sea. At the same time, floating marine litter and tar balls in the open sea will tend to be centrifuged towards the coasts. Water leaves the Mediterranean at depth and enters at the surface through the Straits of Gibraltar.

Since most pollutants are most abundant in the upper layers of the sea, the loss by transport through the Straits is relatively small. The average residence time of entering seawater is estimated to be about 80 years, on the basis of the general hydrography of the Mediterranean and of mass transport measurements in the Straits, though the duration probably ranges from a few years to several hundred.

Although the general nature of the mass transport of seawater in the Mediterranean is reasonably well understood, our knowledge of local circulation patterns is still sparse. The former may serve in studies of the distribution of pollutants entering the sea via the atmosphere, but the latter is much more important in studies of the distribution of pollutants entering the sea via rivers.

The main objective of this pilot project will be the investigation of water circulation in coastal areas and exchange of water between the coastal and offshore regions, in order to provide the necessary information on the physical processes contributing to the transport of pollutants in the Mediterranean Sea.

The operational document for this pilot project was developed by the same Expert Consultation which formulated the pilot project on Baseline Studies and Monitoring of Oil and Petroleum Hydrocarbons in Marine Waters.

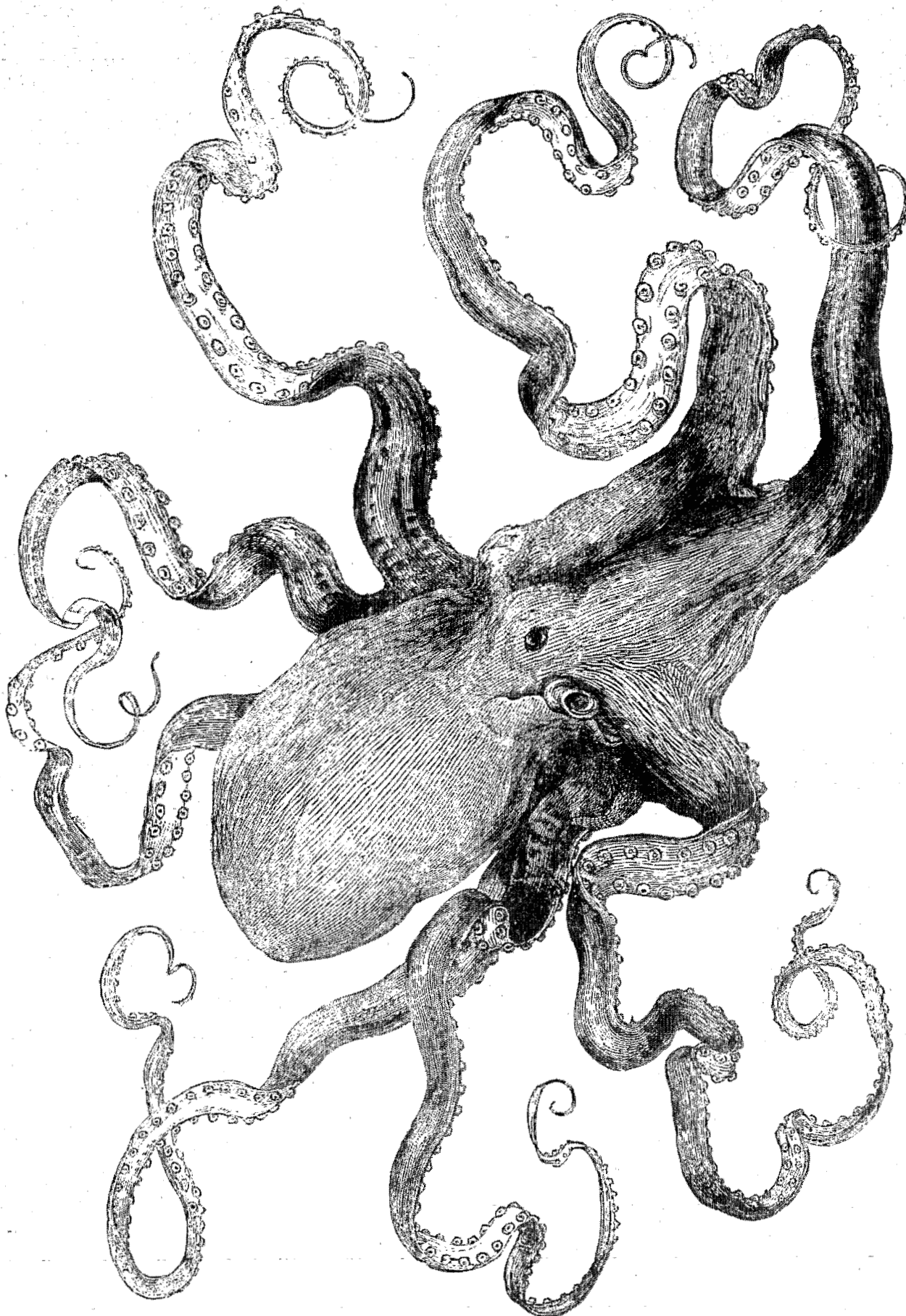
Until now, 12 countries expressed a desire to participate in the pilot project

Photo Roger - Viollet



*Pins maritimes dans l'île de Sainte Marguerite (France).*





*Poulpe (gravure du XIX<sup>e</sup> siècle).*

nominating 23 national laboratories as participants in the network dealing with the pilot project.

Work on this pilot project will start this autumn.

### Joint WHO/UNEP Pilot Project on Coastal Water Quality Control

The serious and rapidly growing pollution of the coastal waters of the Mediterranean is having an increasing impact on the social and economic well being of the countries bordering it. In addition to the millions of inhabitants living along the coastline of the Mediterranean, millions of tourists spend their holidays on the shores of this sea, and there is a considerable potential for exchange of pathogenic agents. The present situation constitutes a significant health hazard in many places; salmonellosis, dysentery, viral hepatitis and poliomyelitis have all been endemic in the Mediterranean area, and during recent years there have been a number of cholera outbreaks. There is a distinct need for better statistics concerning correlation between diseases and water pollution. There is ample evidence that contaminated shellfish are an important concern to public health. It is also certain that contamination of seafood by chemicals and heavy metals has to be taken into consideration, but this aspect is dealt with by other pilot projects within the framework of the Co-ordinated Mediterranean Pollution Monitoring and Research Programme. The risk of infection from swimming and other recreational activities in coastal waters is enhanced in certain areas because of the absence or inadequacy of beach sanitary facilities. Thus the subsequent actual and potential health effects are of prime importance.

The overall objective of the pilot project is to produce statistically significant data, scientific information and technical principles which are required for the assessment of the present level of coastal pollution as it concerns human health. The most important immediate objectives are to design and implement a programme for the sanitary and health surveillance of coastal recreational areas and of shellfish growing waters in selected coastal areas and to initiate a scientific study on the epidemiological evidence of health effects caused by inadequate sanitary conditions in coastal areas.

The operational document for this pilot project was prepared at a joint WHO/UNEP Expert Consultation (Geneva, 15-19 December 1975) which was attended by 35 participants from 15 countries.

Up to the present, 7 countries have expressed a desire to participate in the pilot project nominating 13 national institutions as participants in the network dealing with the pilot project.

The work on this pilot project will start this autumn.

### FUTURE DEVELOPMENTS

While it is difficult to forecast future developments, particularly in the light of the many political differences among the various States in the Mediterranean region, it is apparent that by 1978 there may be a series of simultaneous developments in various aspects of the Mediterranean Action Plan.

Thus, if progress continues at the present pace, it can be expected that the Barcelona Convention together with one or more of the related protocols will enter into force in 1978. This will bring about the first meeting of the Parties to the Convention and could well coincide with the completion of the pilot project phase on the research and monitoring activities. The meeting should present an opportunity for intergovernmental consideration and decision on the establishment of an operational phase thereafter. At approximately the same time, initial results should be available from both the environment-development activities and the Blue Plan studies, providing national decision makers with an authoritative statement about short and long-term environmental implications of ongoing development activities throughout the region.

In this way an opportunity should be created in several years time for the results of collective assessment activities throughout the Mediterranean to be presented in a form which will be useful to the Mediterranean Governments; governments on whose management decisions rest the responsibility for environmentally sound and sustainable development throughout the region. Increasingly responsible roles will have been assumed by national institutions, on whose co-operative endeavours the successful implementation of the programme depends. Though additional international financial and other support may be sought, the ultimate aim is to make the programme self-supporting within the regional context, that is to say, not only to develop institutional capabilities to perform the required tasks but also to support these activities with training, provision of equipment, and other forms of assistance from within the region.

As the Mediterranean regional activity becomes self-supporting, UNEP will continue to retain a strong interest, due to both its continuing concern with this critical region and to UNEP's global responsibilities, to which the Mediterranean programme is a major contribution. On a continuing basis UNEP will ensure that data and information generated within this region are compatible with those from other regions of the world. Steps have already been taken to initiate comprehensive action plans in other regions: the Persian Gulf, the Caribbean Sea, the Red Sea, the West African coast and East Asian Waters. The Mediterranean approach may be used as a model for a comprehensive programme aiming at the protection and the development of these regional seas. However, it is recognized that the approach used in the

Mediterranean region cannot be copied mechanically in all areas and that each region must develop its own Action Plan based on variations in the state of knowledge, the information and human resources available, and other regional characteristics.

