

JOINT SUB-COMMISSION
ON MEDITERRANEAN FORESTRY PROBLEMS
"Silva Mediterranea"

SIXTH SESSION
FINAL REPORT

Held in Madrid 17-21 April 1958

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

FINAL REPORT

JOINT SUB-COMMISSION
ON MEDITERRANEAN FORESTRY PROBLEMS
"Silva Mediterranea"

6TH SESSION

(Madrid, Spain, 17-21 April 1958)

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. ADOPTION OF AGENDA	2
III. ADOPTION OF THE RULES OF PROCEDURE	2
IV. SECRETARIAT PROGRESS REPORT	2
V. LAND USE	3
VI. MANAGEMENT AND SILVICULTURAL TREATMENTS OF MEDITERRANEAN FOREST.....	4
VII. REPORT OF THE WORKING PARTY ON ECOLOGY	5
VIII. REPORT OF THE WORKING PARTY ON EUCALYPTUS	6
IX REPORT OF THE WORKING PARTY ON CORK-OAK	6
X. REPORT OF THE AD HOC WORKING PARTY ON AFFORESTATION TECHNIQUES	7
XI. RESIN TAPPING - ITS ADVANTAGES AND ITS DRAWBACKS	8
XII MEDITERRANEAN DEVELOPMENT PROJECT	8
XIII. ELECTION OF OFFICERS	9
XIV. DATE AND PLACE OF THE NEXT SESSION	9
<u>ANNEX 1</u> LIST OF PARTICIPANTS	10
<u>ANNEX 2</u> AGENDA	15
<u>ANNEX 3</u> LIST OF DOCUMENTS	16
<u>ANNEX 4</u> RULES OF PROCEDURE	19
<u>ANNEX 5</u> GENERAL LAND-USE SITUATION THE MEDITERRANEAN REGION AND ITS TRENDS - ROLE OF THE FOREST- NOTE OF THE SECRETARIAT	24
<u>ANNEX 6</u> MANAGEMENT AND SILVICULTURAL TRAITMRNTS OF THE MEDITERRANEAN FOREST - NOTE OF THE SECRETARIAT	43
<u>ANNEX 7</u> DELIMITATION MAP OF THE EU-MEDITERRANEAN REGION AND THE TRANSITIONAL ZONES	53

JOINT SUB-COMMISSION
ON MEDITERRANEAN FORESTRY PROBLEMS
"Silva Mediterranea"

6TH SESSION

(Madrid, Spain, 17-21 April 1958)

FINAL REPORT

I. INTRODUCTION

1. On the invitation of the Government of Spain, the Joint Sub-Commission on Mediterranean Forestry Problems held its 6th Session at Madrid, from 17 to 21 April 1958.
2. The following countries were represented: Argentina, Chile, France, Iran, Israel, Italy, Libya, Morocco, Portugal, Spain, Sudan, Tunisia, Turkey, United Kingdom U.S.A. and Yugoslavia. Greece and Switzerland expressed their regrets at being unable to attend this meeting. The following international organizations sent observers: the European Confederation of Agriculture, the International Union of Forest Research Organizations, the Organization for European Economic Co-operation. The list of participants constitutes annex 1 of this report.
3. Professor A. Pavari (Italy), Chairman assisted by Professor E. Gonzalez Vazquez (Spain), Vice-Chairman, presided over the discussions Mr. Leloup, Director of the Forestry Division, represented the Director General of FAO, Mr Glesinger, Deputy Director of the Forestry Division and Director of the Mediterranean Development project and Mr. T. Balogh, Economic Consultant to the Director General for the Mediterranean Development Project, attended some meetings of the Sub-Commission. Messrs. Fontaine and Gimenez-Quintana(FAO) constituted the Secretariat.
4. The Session was opened at the Forest Engineering School, Madrid, at 11,30 a.m. on 17 April in the presence of Mr. Pardo Canalis, under-secretary of State for Agriculture, representing the Minister of Agriculture. At this opening Session, the following took the floors Mr. Pavari, Chairman of the Sub-Commission; Mr. Leloup, representative of the Director General of FAO and Mr. Hermosilla, Director General of the Department of Forests of Spain. The Working sessions were hold at the Institute of Forest Research at Madrid.
5. Before beginning its work, the Sub-Commission observed one minute of silence in memory of Mr. Boudy, a founding member of 'Silva Mediterranea' and honorary member of the Sub-Commission, who died during the year 1957.

II. ADOPTION OF AGENDA

6. The Sub-Commission studied the provisional Agenda submitted and commented on by the Secretariat (Annex 2).
7. Before unanimously adopting it, the Sub-Commission decided to delay setting up the permanent Working Party on Afforestation Techniques, which was to have met during this Session, and merely conveyed an ad hoc Working Party.

Having been informed by the Secretariat of the joint meeting planned for 1959, between the various FAO agencies concerned with land use (Working Party on Afforestation and Reforestation and Working Party on Torrent Control and Protection from Avalanches, of the European Forestry Commission, and the Sub-Commission on Land and Water use of the European Commission on Agriculture), in compliance with the recommendation of the 1957 FAO Conference, it deemed it preferable to await the results of the meeting before formally setting up a Working Party.

However, the Sub-Commission considered that the setting up of such a specialised Working Party was essential and that it should be established in the future, possibly within another larger working party that might be recommended by the above mentioned joint meeting.

8. The list of documents submitted on the various items of the Agenda constitutes Annex 3 of this report.

III ADOPTION OF THE RULES OF PROCEDURE

9. The Rules of Procedure, drawn up by the Secretariat according to the instructions given by the FAO Conference and taking into account the previous rules of procedure and amendments made thereto by the Sub-Commission at its previous Sessions, were adopted unanimously without changes by the Sub-Commission (Annex 4).

IV. SECRETARIAT PROGRESS REPORT

10. The Secretariat made a report on the progress of its work since the last Session and indicated that it had endeavoured to be ready to draft the documents which the Sub-Commission might be led to take in conformity with the trend it had adopted. It has established or maintained liaison with the Secretariats of other agencies concerned with the Mediterranean Basin, notably the Advisory Committee on Arid zone Research of UNESCO, the Working Party on Mediterranean Pasture and Fodder Development and the Sub-Commission on Land and Water Use of the European Commission on Agriculture. It is also participating in the survey of requested by FAO on world resources for the "Tigris-Euphrates" pilot zones.

11. The Secretariat also reported on the implementation of the report of the 5th Session at Nice, and availed itself of the opportunity to express its thanks to the French Government for kindly publishing a printed report of the Session, and to the General Directorate of Forests in Paris for the manner of presentation.

Such a complete report will make it possible not only to disseminate very widely the view expressed during the meeting of the Sub-Commission, but further to provide experts with a source of documents easy to consult and of great use for the future work of the Sub-Commission.

12. Finally, the secretariat reported on the work done in pursuance of the recommendation on the Mediterranean Development Project and on its participation in the writing of the Interim Report.

V. LAND USE

13. The Sub-Commission took note of the report submitted by the various delegations and the Secretariat's Note (Annex 5), as well the comments made on them during the meeting. It felt that the Secretariat's Note, subject to a few details that have to be given on certain points, namely on irrigation prospects and the importance of certain by-products, gave a good general picture of the land use situation and trends in this region.

14. The role of the forest and of grazing in land use is closely connected with agricultural policy and agrarian structure.

The expansion of forests very often depends on the abandonment of marginal farmlands, irrigation may help in this respect by absorbing surplus population. The enlargement of irrigated areas therefore has considerable repercussion on the possibilities of forest conservation and expansion. These irrigated areas also offer possibilities of tree growing. This tree cultivation, to be undertaken also on non-irrigated lands, raises the problem of competition with farm crops, which in certain instances must be anticipated, due not only to the effect of tree cultivation on agricultural productions, but also to the income which it provides.

15. The development of the land in the plains therefore entails the possibility of restoring the mountain areas on the basis of a mainly sylvo-pastoral vocation, possibly in association with light industries, the tourist trade, local handicrafts, and mixed cropping for subsistence purposes. However, the definitive place of the forest is closely connected with local circumstances, which shows the importance of land management on a community basis and of the integrated management of watershed areas.

16. The discussion also showed the influence of land use techniques and evolution on the cost of afforestation operations and consequently on the prospects for this work.

17. The problem of grazing especially on steps and in zones of transition towards the steppes, was also raised and formulated for decreasing the number of head of livestock were suggested, namely on a progressive tax on excess, flocks and herds (Morocco) and by the extinction of registered rights of use that are not exercised (Tunisia).

18. In conclusion, the Sub-Commission requested that the subject of land use be placed on the agenda of the next Session, during which it would examine both the recent work making possible the quantitative expression of the various physical, economic and social factors, and the technical, economic and institutional factors, that influence the framing of forestry program and determine the measures to be taken.

VI MANAGEMENT AND SILVICULTURAL TREATMENTS OF MEDITERRANEAN FORESTS

19. The Sub-Commission examined a Note by the Secretariat on this subject (Annex 6) and the reports submitted by various delegations.

20. It proceeded to general discussion of this matter, during the which the delegation showed themselves fully in agreement to the trend of Mediterranean silviculture as it is set up forth in the Secretariat's Note.

However the following points in the comments of certain delegations:

a) Regarding softwood species, interesting results have already been obtained by the use of seeds resulting from hybridization, which enables advantage to be taken of the vigueur of the first generation hybrids. This subject should therefore be studied and included in the research programs.

b) In all cases, where the conversion of natural maqui into stands richer in more economically valuable species is not possible, one should investigate the possibility of using the products of the maqui for pulp and paper making. Such utilization add to the important protective role of the maqui an appreciably important economic role. This point is all the more interesting in view of the slump in fuelwood prices.

c) Pilot forests in the Mediterranean area are of particular importance and their number should be increased. The same applies to agricultural Extension service.

21. In conclusion the Sub-Commission, felt that it was advisable to:

a) Conserve the natural forests that have a recognised protective role and to raise this role to its maximum, while at the same time, if possible, allowing the work of these stands for financial returns. Because of the protective role of such forests, Government supervision of restocking operations is absolutely essential.

b) Improve the other existing forests through intensive silviculture by using species of greater economic value, or by undertaking partial or total conversion of maquis.

c) Develop afforested areas and plantations in which intensified silviculture is practised on the base of fast-growing species, either in stands properly so-called or in association with agricultural crops.

d) Regulate the conduct of the forms of transition from forestry to agriculture (if any such exist), taking into account the market for special products, and take all the necessary measures to conserve soil fertility in accordance with certain biological principles.

VII REPORT OF THE WORKING PARTY ON ECOLOGY

22. The Sub-Commission unanimously approved the report of this Working Party, submitted by its Chairman, Professor H. Gaussen (France) and congratulated it on the work accomplished.

23. As regards the delimitation of the Eumediterranean area, the Working Party definitely adopted the map prepared by Messrs Gaussen and de Philippis, in which the limit of the Eumediterranean corresponds to the limit of the olive zone (Annex 7)

As regards to the over-all ecological map for the Mediterranean region, the Working Party recommend that it be drawn up in close collaboration with all interested parties and in liaison with UNESCO.

24. Finally the Working Party, feeling that it had accomplished the task entrusted to it and that its maintenance on a permanent basis was no longer necessary, proposed to the Sub-Commission that the question of the ecological map be studied at each Session of the Commission by an ad hoc Working Party.

VIII REPORT OF THE WORKING PARTY ON EUCALYPTS

25. The Sub-Commission unanimously approved the report of this Working Party, submitted by its outgoing Chairman, Mr. Métro (France) and congratulated him and the members of this Working Party on the work accomplished.

26. Having reviewed the progress report of the National Working Team on Eucalypts of various countries of the region, the report also note with satisfaction the achievements of the World Eucalypts Conference and hopes that collaboration between Australia and the countries of this region will be firmly established and that FAO will publish the bibliography made available to it during this Conference.

27. It then emphasizes the value of researches done by this Working Party on the influence of eucalyptus stands on soil development and the floral biology of the eucalypt species used in the Mediterranean region.

In connection with the first point, the report draws the attention of the Member countries to the value of the studies on ploughing of the soil in forests with underbrush and the use of fertilisers and ameliorators in eucalyptus plantations for the purpose of maximum nitrogen fixation and acceleration of the process of humus formation.

Regarding the second point, the report indicates the importance of the time when the capsules of various eucalypt species are gathered in order to obtain the best yield of viable seed.

28. The report also studies the problems raised by acclimatisation trials and, after having considered the great increase in the number of trials undertaken throughout the region, emphasizes the need for the continuity of such acclimatisation in trials, of devoting the greatest attention to the provenance of seed of species with a very wide distribution area. These trials are concerned mostly with research on species resistant to cold,

drought and lime. The report recommends particularly the intensification of research on chlorosis on Eucalyptus camaldulensis and E. cladocalyx in view of the sometimes contradictory nature of the observations assembled.

29. The report emphasizes the importance of the results achieved in Spain through the use of the technique of periodic cultivation, which can double yields in the stands established. It also notes that plantation irrigation makes possible the obtention of yields of 47 m³ per hectare, according to Moroccan experiments. Fertilizers applied even in small quantity in comparatively unfavourable soil conditions can significantly increase the take and early growth of eucalypts plantations.

30. The report also mentioned the numerous studies submitted on the utilization of eucalypt wood, for instance Eucalyptus camaldulensis for paper pulp, temporarily being hold as filler pulp to paper mills, and the possibility of practically perfect drying of the wood of E. camaldulensis and E. Globulus, for use as packaging. The report also stressed the value of starting studies on the possible industrial use of essential oils and barks of Eucalypts.

31. Finally, the report announces the decision of the Working Party to set up a collective herbarium for Eucalypts cultivated in the Mediterranean region; Italy's proposal to have this central herbarium set up in that country was unanimously approved by the Working Party.

32. After having approved the report, the Sub-Commission recommended particularly that customs exemptions be granted by the different countries to facilitate the exchange of seed, and that studies on the utilization of Eucalyptus wood for the manufacture of fibreboard be begun. Having learned from the Chairman of the Sub-Commission, speaking in the name of the International Union of Forestry Research Organization (IUFRO), that credit was still available for research on the influence of eucalypts on soil development, it also recommended that such credit be granted to the Institute of Forestry Research at Madrid, which is already making studies in this field; in turn, the Institute agreed to undertake any work entrusted to it by IUFRO.

IX REPORT OF THE WORKING PARTY ON CORK-OAKS

33. The Sub-Commission, unanimously approved the report of this Working Party, submitted by its outgoing Chairman, Prof. Natividade (Portugal) and congratulated it on the work accomplished.

34. The report covers, on the one hand, policies with regard to cork-oak and, on the other, to technical matters.

a) As regards policies relating to cork and the cultivation of cork-oak, the Working Party recognizes the need for maintaining and improving existing, cork-oak stands, but opinion differ about expanding them because of disagreement as to marketing prospects. The Working Party therefore declared itself convinced of the need to undertake a thorough study of production and consumption trends and charged the Secretariat with the task of examining how such a study, in which both producer and consumer countries would participate, could be carried out within the framework of FAO.

b) As regards technical matters, the Working Party recommends research on certain points, particularly: the employment of insecticides and the livestock of treated stands; reproduction techniques and the use of selected clones; the problem of thinning cork-oak stands and the effects of this practice on the underwood and the soil; regeneration of cork-oak from stump-sheets; and cork-oak selection and genetic improvement work.

35. In view of the proposed study and of the advisability for the producer countries of comparing their points of view before approaching consumer countries, the Sub-Commission requested the Working Party to meet as soon as possible, towards the end of 1958 or the beginning of the 1959, in a countries selected by the Director General of FAO in consultation with the Chairman of the Working Party and the countries concerned.

36. Finally, the Sub-Commission warmly thanked Prof. Navidade for his work, at the head of this Working Party ever since it was set up in 1951 and for the results achieved.

X REPORT OF THE AD HOC WORKING PARTY ON AFFORESTATION TECHNIQUES

37. The Sub-Commission approved the report drawn up by this ad hoc Working Party and submitted by its Chairman, Mr. Monjauze (France), and congratulated it on the work done, expressing the hope that permanent body able to pursue the work begun by this Working Party on a continuity basis would be set up as soon as possible.

38. This report examines the most recent developments in modern afforestation techniques and problems raised by their application. After having noted that the expansion of wood lands towards arid zones seems to depend on the power of the means used and that there is some relation between the quantity of energy invested in the soil and the rapidity of take and initial growth of trees, it proposes that surveys be made to determine the effects of rapid initial growth on later increment and stands yields.

39. The report then deals with the problems posed by the use of mechanisation. In this connection, it recommends that detailed studies be made to:

a) determine in which case it is practically impossible to have soil preparation work done by hand.

b) define the minimum conditions required for the use of each type of machinery;

c) provide information on the saving in time and the gain in products likely to be attained as a result of the use of machinery.

However, it is already possible to indicate that machinery can be used, generally speaking, on slopes of up to 30% and, exceptionally, up to such as 70%, although, for economic reasons, the use of heavy equipment is only advisable on areas larger than 20 hectares.

40. The report also studies the problem of growing young planting stock and in particular, the containers. It points out that many difficulties could overcome by the use of polyethylene tubes. It therefore recommends the rapid conclusion of the experiments under way in order to determine of using this very promising plastic material.

41. Finally, the report studies the financial repercussions of the methods of growing young planting stock and soil preparation, and states that it is not possible to appreciate these repercussions without cost price analyses which must be made according to principles accepted by all member countries in this region. The same methodological spirit must in study of capitalization and yields of stands throughout the region. The report therefore, recommends the study and adoption of specific methodology in order that the studies on this problem may be carried out successfully. It stresses that these studies should not be delayed until the next session of the Sub-Commission.

XI RESIN TAPPING - ITS ADVATAGES AND DRAWSBACK

42. The Sub-Commission took cognizance of a certain number of reports submitted on resin-tapping, as well as the comments made during the meetings. Discussions showed certain differences of opinion with regard to the value of resin tapping, and it was decided to place this topic in the agenda of the next session. This question could be examined either before or during the session by an ad hoc Working Party composed of producer Countries of the Sub-Commission, and in which USA observers could also participate.

XII MEDITERRANEAN DEVELOPMENT PROJECT

43. The Sub-Commission took cognisance of Conference's recommendations on Mediterranean Development Project, following its own recommendations made at its late session at Nice in 1956, reproduced in document FAO/SCM/68.

44. It heard the exposition by Mr. Glesinger, leader of the Project, concerning the pursuance of this recommendation of the Conference, and noted with satisfaction the work already being done with FAO, the United Nations and other specialized agencies to make facilities available for the most rapid possible of the programme envisaged.

45. The Sub-Commission unanimously agreed as to the principles and purposes of the Project, as stated. It stressed in particular the need for drawing up forestry projects within the framework of overall economic and land use programs, since the very often condition possibilities for implementing certain portions of agricultural and pre-industrial programs. In no case should it be thought that there is any opposition ,between agriculture and forestry. They are two complementary activities which have the purposes: better land use with a view to soil and water conservation, increasing production in line with the over-all economic situation and the provision of full employment.

46. It asserted, however, that forestry projects, because of their long-term aspects and their indirect benefit to the community, should cover a longer period than that set for economic and social development plans, and be the subject of special financing measures. The forestry plan then becomes a phase of, and is integrated into, the over-all program of work.

47. As regarded the outlines mentioned in the Mr. Glesinger's report, which are intended to guide the drafting of the national reports and facilitate the regional synthesis; the Sub-Commission therefore felt that the principles set forth above should never be lost from sight.

48. In this connection, the Sub-Commission noted that part V of the Interim Report constitutes a good starting point both from the standpoint of the objectives defined and the criteria adopted. It should, however, be supplemented in certain points, especially, among other: selection and genetic improvement, rationalization of plantings and exploitations, total utilization of forest products, methods of calculating the profit earning capacity, manner of financing, etc.

49. The Sub-Commission decided to set up, under Article 8 of its Rules of Procedure, an ad hoc Committee to help with the Mediterranean Development Project, in liaison with FAO bodies created for this purpose. This Committee should be presided over by the Chairman of the Sub-Commission, and should include, in addition to the countries whose representatives are among the officers of this Sub-Commission, France and Italy, and a limited number of other countries to be selected by the Chairman.

XIII SELECTION OF OFFICERS

50. Before proceeding to elect new officers, the Sub-Commission expressed its gratitude to the outgoing Chairman, Prof. Pavari, for having led the work of the Sub-Commission in such a distinguished manner over since its creation in Rome in 1948, and requested him to accept the title of Honorary Chairman.

51. In accepting this appointment, Prof. Pavari wished to recall the name of Prof. Guinier, the first Honorary Chairman of the Sub-Commission with whom he will continue to work to promote "Silva Mediterranea".

52. The Sub-Commission the proceeded to elect its new officers: Messrs Paulino M.Hermesilla (Spain), Vieira Natividade (Portugal) and Mr.Badra (Tunisia) were unanimously appointed Chairman, first Vice-Chairman and second Vice-Chairman respectively.

XIV DATE AND PLACE OF THE NEXT SESSION

53. The Sub-Commission decided to leave the Director-General of FAO, in agreement with the Chairman, to set the date and place of its next session.

LIST OF PARTICIPANTS

Chairman : Prof. PAVARI (Italy)

Vice-Chairman : E. GONZALEZ-VAZQUEZ (Spain)

Secretary : R.G. FONTAINE (FAO)

Assistant Secretary : GIMENEZ-QUINTANA (FAO)

Mr. LELOUP, Director of the Forestry Division of FAO, represented the Director General of the Organization

A) COUNTRIES

Argentina

- YACUBSON, Dora, Ingegnere Agronomo, Dirección de Investigaciones Forestales, Buenos Aires.

Chile

- ARTEAGA, Luis, Ministre-Conseiller de l'Ambassade du Chili, Madrid.

France

- GAUSSEN, Henri, Professeur à la Faculté des Sciences de Toulouse.
- METRO, André, Conservateur des eaux et forêts, Station de recherches forestières de Nancy.
- MONJAUZE, Alexis, Conservateur des eaux et forêts, Algiers, Algérie.
- VAISSIERE, de, Jean, Inspecteur général des eaux et forêts, Direction Générale des eaux et forêts, Paris.

Iran

- DJAZIREY, Muhammed-Hussein, Directeur-Adjoint, Service forestier de l'Iran, Teheran.

Israel

- GOOR, Amihud, Director of forest, Nathanya, Israel.
- KARSCHON, René, chargé des Recherches, Station de Recherches forestières, Ilaneth, Israel.

Italy

- BASSI, Vincenzo Directeur de la Societé "Terra Apuliae", Foggia.
- BENVENUTI, Valerio, Inspecteur principal à la Direction générale pour l'économie de la montagne et les forêts, Rome.

- CAMAITI, Alberto, Directeur Général pour l' économie de la montagne et des forêts, Rome.
- GIORDANO, Guglielmo, Directeur de l'Institute du bois à Florence.
- MOGGI, Guido, Chargé de recherches au "Centro di sperimentazione Agricola e forestale, Rome.
- MORANDINI, Riccardo, Chargé de recherches à la Station Expérimentale de Sylviculture, Florence.
- PAVARI, Aldo, Directeur de la Station Expérimentale de Sylviculture, Florence.

Lybia

- BOND, W.F., Forest Adviser USCM/L.

Morocco

- CHAILLOT, J. P., Sous-Directeur des Administrations Centrales, Chef de l'Administration des eaux et forêts, Rabat, Morocco.

Portugal

- ALVES, José, President of the "Junta Nacional da Cortiça", Lisbon.
- FRITO DOS SANTOS, Jorge, Directeur des Services techniques de la "Junta Nacional da Cortiça", Lisbon.
- CALHEIROS E MENEZES, José, Ingénieur des forêts à la Direction Générale des eaux et forêts, Lisbon.
- DA SILVA REIS GOES, Ernesto, Ingénieur des forêts à la Direction Générale des eaux et forêts, Lisbon.
- EDUARDO CANEIRO, Antonio, Chef de Direction forestière de la Section forestière de la "Junta Nacional dos Resinosos", Lisbon.
- FELIZ RODRIGUES, Joaquim, Ingénieur des forêts à la Direction Générale des eaux et forêts, Lisbon.
- FREIRE THEMUDO, J.C., President de la "Junta Nacional dos Resinosos", Lisbon.
- RODRIGUES PEDRO, Egberto, Inspecteur Chef, Direcion générale des forêts, Lisbon.
- SUSA LARA, Luiz Filipe, Chef de la région forestière de Beja.
- VIEIRA NATIVIDADE, Joaquim, Directeur du Département de Pomologie à la Station agronomique nationale, Alcobaça.

Spain

- CASADO, Lorenzo J., Director del Patrimonio Forestal del Estado, Madrid.
- DE LUQUE, José, Jefe de Plano del Patrimonio Forestal del Estado, Madrid.
- ELORRIETA ARTAZA, José, Ingeniero de Montes, Instituto Forestal de Investigaciones y Experiencias, Madrid.
- FIGUEROA REGODON, Sub-Director General de Montes, Madrid.
- FOXA, de, Jaime, Jefe del Servicio de Pesca Fluvial y Caza, Dirección General de Montes, Madrid.
- GONZALES VAZQUEZ, E., Dirección General de Montes, Madrid.
- LOPEZ CADENAS de LLANC, Filiberto, Ingeniero de Montes, Patrimonio Forestal del Estado, Madrid.
- MANTARAS CASANOVA, Leopoldo, Ingeniero-Jefe de la 4a División Hidrológica-Forestal, Patrimonio Forestal del Estado, Madrid.
- MARTIN-BOLAÑOS, Manuel, Ingeniero de Montes, Instituto Forestal de Investigaciones y Experiencias, Madrid.
- MARTIN LOBO, Manuel, Ingeniero de Montes, Ingeniero en la Secretaría Gestora del Plan de Badajez, Madrid.
- MARTINEZ-HERMOSILLA, Paulino, Director General de la Dirección General de Montes, Madrid.
- MARTINEZ-HERMOSILLA, J.M., Ingeniero de Montes, Patrimonio Forestal del Estado, Madrid.
- MARTINEZ-MATA, Florentino, Instituto Forestal de Investigaciones y Experiencias, Madrid.
- NEIRA, Manuel, Director de l'Instituto de Investigaciones y Experiencias, Madrid.
- NICOLAS, Antonio, Profesor de la Escuela Ingenieros de Montes o Instituto Forestal, Madrid.
- RADA, de, Ricardo, Ingeniero de Montes, Jefe de Relaciones de la Dirección General de Montes, Madrid.
- RAMOS, J.L., Profesor de Selvicultura, Escuela Superior Técnica de Ingenieros de Montes, Madrid.
- ROBLES, Salvador, Ministerio de Comercio, Madrid.

Sudan

- SHAWKI, Mohammed Kamil, Director of forests, Department of forests, Khartoum.

Tunisia

- BADRA, Mahmud, Chef du Service de forêts, Secrétariat d'Etat à l'Agriculture, Tunis.
- SCHOENENBERGER, Antoine, Directeur de la Station de Recherche Forestières, Ecole Supérieure d'Agriculture, Tunis.

Turkey

- ASAL, Fazil, Conseiller commercial de l'ambassade de Turquie à Madrid.

United Kingdom

- BERESFORD-PEIRSE, Sir Henry, Deputy Director-General, Forestry Commission, London.

U.S.A.

- KERNAN, Henry, Forestry Adviser, U.S. operation Mission to Spain

Yugoslavia

- KLEPAC, Dusan, Professeur à l'Université de Zagreb.

B. INTERNATIONAL ORGANIZATIONS

European Confederation on Agriculture

- RADA, de, Conseiller de la "Junta Nacional de Hermandades"

Organization for European Economic Co-operation (O.E.E.C.)

BERAUD, Daniel, Administrator

International Union of Forestry Research Organization (I.U.F.R.O.)

NEIRA, Manuel, Director of the Forest Research Institute at Madrid.

C. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

- LELOUP, M., Director of the Forestry Division

- GLESINGER, E., Deputy Director of the Forestry Division and Leader of the Mediterranean Development Project.

- BALOGH, T., Economic Consultant to the Director General for the Mediterranean Development Project.

- FONTAINE, R.G., Chief of the Special Forest Policies Section, Forestry Division

- GIMENEZ-QUINTANA, L., Forestry Officer, Forestry Division.

AGENDA

1. Adoption of Agenda
2. Adoption of Rules of Procedures
3. Secretariat Progress Report
4. General Land-use Situation in the the Mediterranean Region and its trends - Role of the forest
5. Management and silvicultural treatments of the Mediterranean forests
6. Resin-tapping - Its advantages and drawbacks - Technical and Economic Aspects
7. Delimitation and Ecological Maps of the Mediterranean Region - Report of the Working Party
8. Eucalypts - Report of the Working Party
9. Cork-Oak - Report of the Working Party
10. Afforestation techniques - Report of the Working Party
11. Mediterranean Forestry Project
12. Other business
13. Election of Officers
14. Date and place of the next session.

LIST OF DOCUMENTS

A) Documents submitted to the Sub-Commission

Item 1 of the agenda

- Provisional Agenda (Doc.FAO/SCM/62, English, French and Spanish)

Item 2 of the agenda

- Adoption of the Rules of procedure - Note by the Secretariat (Doc. FAO/SCM/63: English and French)

Item 3 of the agenda

- The General Land-use Situation in the Mediterranean Region and its trends
- Role of the forest - Note by the Secretariat (Doc. FAO/SCM/65: English and French)
- Situación y tendencias de la utilización general de tierras en la Cuenca Mediterránea - Papel que desempeña el bosque: ESPAÑA (Doc. FAO/SCM/65 French and Spanish)
- The General Land-use Situation in the the Mediterranean Region and its trends - Role of the forest - SUDAN (Doc. FAO/SCM/65: English only)
- Situation et tendances de l'utilisation générale des terres dans le Bassin Méditerranéen - Rôle de la forêt, FRANCE (Doc. FAO/SCM/65: French only)
- Les méthodes de défense et de restauration de soil, en Algérie (Doc. FAO/SCM/65-C Add 1: French only)
- Rapport sur les tendances et la situation algérienne (Doc. FAO/SCM/65-C Add 2.: French only)
- The General Land-Use Situation in the Mediterranean Region and its Trends - Role of the Forest, ISRAEL (Doc.FAO/SCM/65-D: English only)
- Situation et tendances de l'utilisation générale des terres dans le Bassin Méditerranéen - Rôle de la forêt, ITALIE (Doc.FAO/SCM/65-E: French only)
- Situation et tendances de l'utilisation générale des terres dans le Bassin Méditerranéen - Rôle de la forêt, YOUGOSLAVIE (Doc.FAO/SCM/65-F: French only)
- Situation et tendances de l'utilisation générale des terres dans le Bassin Méditerranéen, GRECE (Doc. FAO/SCM/65-G: French only)
- The General Land-Use Situation in the Mediterranean Region and its Trends - Role of the Forest, TRIPOLITANIA (Doc. FAO/SCM/65-H: English only)

Item 5 of the agenda

- Management and silvicultural treatments of the Mediterranean Forests - Note by the Secretariat (Doc. FAO/SCM/66: English, French and Spanish)
- Tratamiento y ordenación de los montes mediterraneos: ESPAÑA (Doc. FAO/SCM/66: French and Spanish)
- Tratamiento y ordenación de los montes mediterraneos: ESPAÑA - Aplicación de los tratamientos a los montes mediterraneos previa experimentación sobre sus regeneraciones (Doc. FAO/SCM/66-ab: Spanish only)
- Traitement et aménagement des forêts Méditerranéennes: FRANCE (Doc. FAO/SCM/66-B: French only)
- Traitement et aménagement de la forêt Méditerranéenne: YUGOSLAVIE (Doc. FAO/SCM/66-C: French only)
- Traitement et aménagement de la forêt Méditerranéenne: GRECE (Doc. FAO/SCM/66-D: French only)

Item 6 of the agenda

- Resinación de los pinares de la Cuenca mediterranea: ventajas o inconvenientes y aspectos técnico y económico de este aprovechamiento: ESPAÑA (Doc. FAO/SCM/67-A: French and Spanish)
- Le gemmage - ses avantages et ses inconvénients - Aspects technique et économiques: ITALIE (Doc. FAO/SCM/67-Bb: French only)
- Contribution à l'étude de l'influence du gemmage sur les caractéristiques du bois des pins (Italie) (Doc. FAO/SCM/67-Bb: French only)
- Remarques sur quelques aspects anatomiques du gemmage: (Italie) (Doc. FAO/SCM/67-Bb Add.1: French only)
- Différences macroscopiques et anatomiques entre deux échantillons de bois de Pinus Laricio Veuille et normal (en vue d'établir s'ils ont une différente activité au gemmage) (Doc. FAO/SCM/67-Bb Add.2: French only)
- Le gemmage - Ses avantages et ses inconvénients - Aspects technique et économiques: les gemmage dans les landes de Gascogne: FRANCE (Doc. FAO/SCM/67-C: French only)
- Le gemmage - Ses avantages et ses inconvénients - Aspects technique et économiques: PORTUGAL (Doc. FAO/SCM/67-D: French only)

Item 7 of the agenda

(See Annex 3: List of Documents, to the Report of the Working Party on Ecology (Doc. FAO/SCM/EC/5 Rev.1)

Item 8 of the agenda

(See Annex 3: List of Documents, to the Report of the Working Party on Eucalypts (Doc.FAO/SCM/EU/17 Rev.1)

Item 9 of the agenda

(See Annex 3: List of Documents, to the Report of the Working Party on Cork-oak Doc.FAO/SCM/LG/5 Rev.1)

Item 10 of the agenda

(See Annex 3: List of Documents, to the Report of the Working Party on Afforestation Techniques (Doc.FAO/SCM/TE/5 Rev.1)

Item 11 of the agenda

Mediterranean Development Project (FAO/SCM/68 : English and French)

Item 12 of the agenda

- Tratamientos de los encinares españoles (Doc. FAO/SCM/69-A: Spanish only)
- Tratamientos de la procesionaria del pino (Spain) (Doc. FAO/SCM/69-Bs)
- Observaciones de la lucha contra el Diprion Pini (L.) en 1957 (Spain) (Doc. FAO/SCM/69-C: Spanish only)
- El servicio de explotación y mejora de las zonas aridas del sud-este español (Doc.FAO/SCM/69: Spanish only)
- El chopo y los cultivos agrícolas en terrenos de rogado (Spain) (Doc. FAO/SCM/69-E: Spanish only)
- Los pestizales y el Patrimonio Forestale del Estado en la cuenca del Rio Ebro (Spain) (Doc. FAO/SCM/69-F: Spanish only)
- El esparto de la zona Mediterranea (Spain) (Doc. FAO/SCM/69-G: Spanish only)
- Estudio economico del Pino Carrasco en la Provincia de Alicante(Spain)(Doc. FAO/SCM/69-H: Spanish only)
- L'alfa dans la zone méditerranéenne (Spain)(Doc. FAO/SCM/69-I: French only)

B) Documents distributed during the study tour

- Voyage d' études on Espagne dans l'Andalousie (printed brochure published by the "Dirección General de Montes, Cazo y Pesca Fluvial, Madrid)

RULES OF PROCEDURES

Rule I Membership

Membership in the Joint Sub-Commission on Mediterranean Forestry Problems is open to all Member Nations and Associate Member of the African, European and Near East Forestry Commissions of the Food and Agriculture Organization of the United Nations, whose territories are situated wholly or in part in the Mediterranean basin proper or whose forests agricultural and grazing economies are intimately associated with those of the Mediterranean Region Membership shall comprise such eligible Nations as have notified the Director-General of the Organization of their desire to be considered as Members.

Rule II Officers

1. The Sub-Commission shall elect a Chairman and two or three Vice-Chairman from among the delegates at the end of each session, who shall remain in office until the election of the new Chairman and now Vice-Chairman at the next session. The outgoing Chairman and Vice-Chairman shall be eligible for re-election.

2. The Chairman, or in his absence a Vice-Chairman, shall preside at meetings of the Sub-Commission and comprise such other functions as may be required to facilitate the work of the Sub-Commission. The Vice-Chairman acting as Chairman shall have the same powers and duties as the Chairman.

3. In the event that both the Chairman and the Vice-Chairman are unable to serve the Director General of the Organization or his representative shall act as Chairman, until the officers have been elected.

4. The Director-General shall appoint from among the staff of the Organization a Secretary of the Sub-Commission who shall be responsible to him. The Secretary shall perform such duties as the work of the Sub-Commission may require.

5. The Sub-Commission may elect from among the delegates one or more rapporteurs.

Rule III Sessions

1. The Sub-Commission shall normally hold one session every two years unless otherwise requested by a majority of the Members of the Sub-Commission as considered necessary by the Director-General.

2. The sessions of the Sub-Commission shall be convened and the place where they are to be held shall be determined by the Director-General in consultation with the Chairman of the Sub-Commission.

3. Notice of the date and place of the session shall, at least two months before the session, be communicated to all the Members of the Sub-Commission.

4. Each Member of the Sub-Commission shall have one representative who may be accompanied by an alternate and advisers. An alternate or adviser shall not have the right to vote except when substituting for the representative.

5. Meetings of the Sub-Commission shall be held in public unless the Sub-Commission decides otherwise.

6. A majority of the Members of the Sub-Commission shall constitute a quorum.

Rule IV

Agenda

1. The Director-General, in consultation with the Chairman, shall prepare a provisional agenda for each session of the Sub-Commission.

2. The first item on the provisional agenda shall be the adoption of the agenda.

3. Any Member of the Sub-Commission may request the Director-General to include specific items in the provisional agenda.

4. The provisional agenda shall be circulated by the Director-General to all the Members of the Sub-Commission at least two months before the opening of the session.

5. Any Member of the Sub-Commission and the Director-General, may, after the dispatch of the provisional agenda, propose the inclusion of specific items in the Agenda with respect to matters of an urgent nature. These items shall be placed on a supplementary list which, if time permits before the opening of the Session, shall be dispatched by the Director-General to all Members of the Sub-Commission, failing which the items shall be communicated to the Chairman for submission to the Sub-Commission.

6. After the agenda has been adopted, the Sub-Commission may, by a two-thirds majority of the votes cast, amend the agenda by the deletion, addition or modification of any item. No matter referred to the Sub-Commission by the Conference or Council of the organization may be emitted from the agenda

7. Documents to be submitted to the Sub-Commission at any session shall be furnished by the Director-General to the Members of the Sub-Commission, the other Member Nations of the Organization attending the session and to the non-member nations and international organizations invited to the session at the time the agenda is dispatched or as soon as possible thereafter.

Rule V Voting and Procedures

1. Each Member of the Sub-Commission shall have one vote.
2. Decisions of the Sub-Commission shall be taken by a majority of the votes cast unless otherwise provided in the rules.
3. Upon the request of any member of the Sub-Commission, voting shall be by roll-call, in which case the vote of each Member shall be recorded.
4. When the Sub-Commission so decides, voting shall be by secret ballot.
5. Formal proposals relating to item I of the agenda and amendments thereto shall be introduced in writing and handed to the Chairman who shall circulate copies to the representatives.
6. In addition to the above Rules 9 the provisions of Rule XII of the General Rules of the Organization shall apply mutatis mutandis.

Rule VI Observers

1. Member Nations of the Organization that do not qualify for membership in the Sub-Commission under the provisions of Rule I-1 but in whose territories ecological conditions similar to those obtaining in the Mediterranean Region prevail, may be invited by the Director-General to participate in the Sub-Commission's activities as appropriate and to attend in an observer capacity sessions of the Sub-Commission and its subsidiary bodies.
2. Any Member Nation of the Organization that is not a Member of the Sub-Commission and any Associate Member that has a special interest in the work of the Sub-Commission may, upon request communicated to the Director-General, attend as observer sessions of the Sub-Commission and its subsidiary bodies. It may submit memoranda and participate without vote in the discussions.
3. Nations which, while not Member Nations or Associate Members of the Organization, are Members of the United Nations, may upon their request and subject to the provisions relating to the granting of observer status to nations adopted by the Conference of the Organization, be invited to attend in an observer capacity sessions of the Sub-Commission and its subsidiary bodies. The status of nations invited to such sessions shall be governed by the relevant provisions adopted by the Conference of the Organization.
4. Subject to the provision of Rule VII-5 of these Rules, the Director-General may invite international organizations to attend sessions in observer capacity.
5. Participation of international organizations in the work of the Sub-Commission and the relations between the Sub-Commission and such organizations shall be governed by the relevant provisions of the Constitution and the General Rules of the Organization as well as by the general regulations of the Organization on relations with international organizations. All such relations shall be dealt with by the Director-General of the Organization.

Rule VII Records and Reports

1. At each session, the Sub-Commission shall approve a report embodying its views, recommendations and decisions, including, when requested, a statement of minority views. Such other records for its own use as the Sub-Commission may on occasion decide shall also be maintained.
2. The conclusions and recommendations of the Sub-Commission shall be transmitted at the close of each session to the Director-General of the Organization, who shall circulate the to Members of the Sub-Commission, nations and international organizations that were represented at the session for their information, and, upon request, to other Member Nations and to Associate Members of the Organization.
3. Recommendations having policy, program or financial implications for the Organization shall be brought by the Director-General to the attention of the Conference or Council of the Organization for appropriate action.
4. Subject to the provisions of the proceeding paragraph, the Director-General may request Members of the Sub-Commission to supply the Sub-Commission with information on action taken on the basis of recommendations made by the Sub-Commission.

Rule VIII Subsidiary Bodies

1. The Sub-Commission may establish such subsidiary bodies as it seems necessary for the accomplishment of its tasks.
2. Membership in these subsidiary bodies shall comprise such Members of the Sub-Commission as have notified the Director-General of the Organization of their desire to be considered as Members of the subsidiary bodies or shall consist of selected Members of the Sub-Commission as determined by the Sub-Commission itself.
3. The representatives of the Members of subsidiary bodies shall, insofar as possible, be specialists in the fields of activity of their respective subsidiary bodies
3. The terms of reference and reporting procedures of the subsidiary bodies shall be determined by the Sub-Commission.
5. The establishment of subsidiary bodies shall be subject to the availability of the necessary funds in the relevant chapter of the approved budget of the Organization. Before taking any decision involving expenditure in connection with the establishment of subsidiary bodies, the Sub-Commission shall have before it a report from the Director-General on the administrative and financial implications thereof.
6. Each subsidiary body shall elect its own officers, who shall be eligible for re-election.
7. The Rules of the Sub-Commission shall apply, mutatis mutandis to its subsidiary bodies.

Rule IX Expenses

1. Expenses incurred by representatives or Members of the Sub-Commission and by their delegates or advisers when attending sessions of the Sub-Commission, the Executive Committee and the subsidiary bodies, as well as the expenses incurred by observers at sessions, shall be borne by the respective governments or organizations. Expenses incurred by additional person, invited by the Chairman of the Executive Committee to attend Sessions of the Executive Committee in accordance with the provisions of Rule III-1 shall not be borne by the Organization. Should experts be invited by the Director-General to attend sessions in their individual capacity, their expenses shall be borne by the Organization.

2. Any financial operations of the Sub-Commission and its subsidiary bodies shall be governed by the appropriate provisions of the Financial Regulations of the Organization.

Rule X Languages

1. English, French and Spanish shall be the official languages of the Sub-Commission.

2. The Sub-Commission shall, at the beginning of each session, decide which of the official languages shall be used as working language or languages any representative using a language other than one of the working languages shall provide for interpretation into one of the working languages.

Rule XI Suspension and amendment of Rules

1. Amendment of, or additions to these Rules may be adopted by a two-thirds majority of the Membership of the Sub-Commission, provided that 24 hours' notice of the proposal for the amendment or addition has been given. Amendments or additions to these Rules shall come into force upon approval by the Director-General of the Organization, subject to confirmation by the Conference or Council, as appropriate.

2. Any of the above Rules of Procedure of the Sub-Commission, other than Rule I-1, Rule II-4, Rule III-2 and Rule V-6, Rule VI-2, Rule VII, Rule VIII-3 and 4, Rule IX-4, Rule X and Rule XII-1, may be suspended by the Sub-Commission by two-thirds majority of the votes cast, provided that 24 hours' notice of the proposal for the suspension has been given. Such notice may be waived if no representative of the Members of the Sub-Commission objects.

GENERAL LAND-USE SITUATION IN MEDITERRANEAN REGION
AND ITS TRENDS - ROLE OF THE FOREST

(Item 4 of the Provisional Agenda)

NOTE BY THE SECRETARIAT

I. INTRODUCTION

1. At its inception, the Sub-Commission was formally requested to lay the groundwork for a Mediterranean forest policy directly promoting first soil conservation and reforestation, then, on a long-term basis, timber production taking into account not only technical question, but also the agricultural economic and administrative problems that might arise.

2. Then main findings of the Sub-Commission, with regard to land use that have been summed up in Document FAO/SCM/57, submitted by the Secretariat to the Sub-Commission at its last session. These findings refer to the physical, economic and social functions in the Mediterranean forests and their relative importance, grazing in forests, afforestation, methods of soil conservation other than afforestation, accessory forest products and plantations outside the forest.

3. This is interesting to examine, on the basis of these early studies, the present situation as regards land use, to bring out the trends in such use and their causes and, lastly, after having specified the criteria to be followed in land use, to define the desirable orientation to be given to the use of forest in the future.

II GENERAL LAND USE SITUATION

4. The situation as regards land use in the Mediterranean basin is confused due largely to the inadequacy of good statistics, but also to a large extent to the fact that, more so in the Mediterranean region than elsewhere, forest, grazing land and farmland cannot be clearly divided, even on the spot.

5. Multiple uses either in time or space, are in fact very frequent and it is often difficult to assign a specific use to a given site; nearly all the forests are grazed and in some of them crops are grown, some grazing lands which are used as forest are still nearly well wooded, or else are grown to crops at regular intervals; farmlands laid fallow periodically constitute large pasture areas varying in site or if they have row plantations or old

forest stands which have developed into orchard type plantations, they produce a substantial quantity of timber or accessory products. This situation is often the outcome of intensive human action rendered necessary to make the limited resources more productive.

6. The Secretariat has endeavoured to collect a certain number of tables mostly taken from the interim report on the Mediterranean Development Project which show land use in the Mediterranean basin.

7. Table 1. contains general data on land use and Table 2. shows the possibilities of extending the cultivated area by indicating the extent of fallow and irrigable land.

8. The forest situation which is presented in Table 3 and 4 is worth studying more attentively because the available statistics could give the wrong idea of its importance. In fact, while the official statistics often count land covered only with brush as forest, they also class fairly well wooded purely forest land as pasture. Further tree plantations on farmland which do not appear in forest statistics provide a substantial timber supply and have the same effect as the forest in soil protection.

8. The entire Mediterranean basin, the statistics indicate that the wooded area represents only 6 % of the total land area and 10% of the land on excluding desert. For the eastern Mediterranean alone: these figures are 5%, and 13% if the desert is not counted, as against an average of 20% in Europe. These figures are probably higher, moreover, than the real ones. A study of seven countries in the region (Yugoslavia, Turkey, Syria, Jordan, Iraq, Libya, and Tunisia) shows that true figure may differ considerably from the official statistics. In the case of Syria, for instance, statistics give 499.000 hectares as wooded, while in reality there can hardly be more than 38.000 ha. In other countries the difference is less. However, in the seven countries considered, the area actually wooded is only 10.7 million ha. while statistics show 21.8 million. In these countries the proportion of wooded area to total area is only 3% and, if deserts are excluded, not more than 7%, or 13 million ha. of forest for 90 million inhabitant.

By contrast, in regard to the countries in the eastern Mediterranean, while true forests cover only 3% of the territory or 5% of productive land, 14% of the total area in the same region, or nearly 35% of the productive land, is covered by degraded forest formations, brush and steppes; namely, in all 67 million ha. which could be made available for forest or permanent pasture.

10. Forest statistics also omit trees outside the forest and tree plantations which have an important action in stabilizing the soil and supply considerable quantities of timber. Such trees outside the forest and plantations are mainly of four types:

a) Primitive forests remaining after partial conversion into cropland or pasture, thus Quercus aegilops is found dispersed over 110.000 of cultivated land in Turkey and there are 2 million carob trees on 20.000 ha. of cultivated land in Cyprus, palm oaks in Spain and chestnut trees in Portugal scattered over pasture or cropland, etc.

b) Shelterbelts and windbreaks, in which the poplar is the main species used.

- c) Orchards often associated with other forms of cultivation;
- d) Woods on farmlands for intensive timber use.

III TRENDS IN LAND USE

11. Having thus examined the general situation in regard to land use, an endeavour will now be made to assess very rapidly the trends in this situation in relation to farming, stock raising and forestry

a) In relation to farming

12. With regard to farming, the main feature of all the countries in the Mediterranean basin is the irregularity of crop harvests due to the erratic climate, made still worse through the lack of storage facilities and poor marketing organization. Further, all the countries show a marked population increase. In the countries of the eastern Mediterranean basin (Turkey, Syria, Jordan, Iraq and Israel) this rise in population is more than offset by the increase in agricultural production since the end of the war. In the rest of the Mediterranean basin, however, although most of the countries, save perhaps Algeria, Tunisia and Spain, since 1950 have attained a higher crop output than that before the war, this increase in production is not always sufficient to ensure, to an over-increasing population, the maintenance of the consumption level per inhabitant and still less the increase of this level.

13. The three main factors underlying the progress made in agriculture are: the increase in cultivated area; a more rational choice of crops from the standpoint of land use and labour and also of profit earning capacity; and the improvement in methods, especially through mechanisation and irrigation.

The cultivated area can be increased in certain countries which have vast areas of semi-desert land - 60% of the land in the middle East is desert - but other countries, like Spain, no longer have any land for opening up to cultivation. Thus there is a spectacular increase in cultivated area in Turkey (statistics indicate an increase of 90% between 1938 and 1955), in Syria (79%) in Greece (42%); in other countries, like Spain, Algeria, Tunisia, Yugoslavia and Morocco there has been practically no increase. This increase in the cultivated area has been mainly for the benefit of cereal crops; other products show a much less rapid increase, such an increase, moreover, is not indefinitely desirable: it implies not only a reduction in pasturage which is not without danger to forests and, therefore, to the conservation of cultivated land itself, but also a danger to this land often developed without all the necessary precautions being taken for its conservation.

Furthermore, this marginal land rarely produces top quality farmland with the result that the increase in agricultural production is less rapid than the extension in land being brought into cultivation. In Turkey, for example, while the index of cultivated area in 1953 was 190 (taking 1933 = 100), the production index was only 172.

14. On the other hand, on the land now being cultivated could be made much more profitable than it is at present. In Morocco for instance, where the cultivated area has only increased 2% since 1938 the agriculture production index is 146. A rational choice of crops makes it possible not only for given area to produce a better harvest, but also, sometimes, to solve at least partially the problem of unemployment, industrial crops are more profitable

than cereals, and require more labour in addition, two harvests are often possible, up to the present, agriculture in the Mediterranean countries has been characterised by a decided predominance of cereals, but in some countries, like Yugoslavia, Greece and Israel, there is a definite tendency to put more land under cotton, tobacco and root crops. Forage crops are valuable in rational crop rotation, besides being, important for stock raising. However, outside the immediate vicinity of large town (Greece, Turkey), where the demand for meat and dairy products is high, forage crops do not appear to have increased as rapidly as certain other crops. Tree crops, which play an important part in the Mediterranean region, are also highly profitable; however, there is a serious risk of a slump in regard to some of their products.

15. Machinery, which makes it possible to intensify crop growing, to improve to distribution of work throughout the year, and which is available aid in extending the cultivated areas is not always easy to use. In some countries, like Greece and Yugoslavia, the use of machinery is very limited, owing to the excessive fragmentation of farmland; in these often over-populated countries, machines are likely to increase unemployment. Also, it is not always easy to find the personnel capable of driving and repairing tractors, thus, in Turkey, for example, where some 20.000 tractors have been imported between 1950 and 1955, many of those are out of use for lack of proper service after they were sold. Lastly, the economic and social structures are sometimes such that investments in machinery are not profitable.

However, in all the countries of the region, a decided effort has been made in connection with mechanisation, in Israel and Italy, the two countries of the region which have the largest number of tractors per thousand hectares of arable land. The number of tractors has doubled between 1948 and 1955. In other countries, the number of tractors has increased to an even more remarkable extent, but as in most cases there were very few to begin with, it can hardly be considered that these countries have an effectively mechanised agriculture.

16. Although machinery can increase yields while having the drawback of sometimes causing unemployment, it is way of intensifying farming, which, on the contrary, creates work: namely, the development of land through drainage and irrigation. Drainage must necessarily be combined with irrigation if the land is to stay productive: large areas in several countries of the region have been reclaimed, but there is still much to do and there are many sectors which cannot be reclaimed without drainage. Trees can be planted along the drainage canals, which could represent 5 to 6% of the area reclaimed.

The agricultural plans of most of the countries have given absolute priority to the extension of irrigation, although it cannot be done on a vast scale in the area in question. Irrigation is now being applied to 8 million ha. but it is not likely to be extended to more than an additional 4 million ha. An expert, in fact, has shown that in a river drainage basin recovering a rainfall of 400 mm. the water available will only irrigate about 2% of the total area of the river basin. Apparently, therefore, irrigation can only contribute to a relatively small extent towards the improvement in land use in the Mediterranean region and the best solution would be a more complete use of the greater part of the rainfall by methods such as tree plantings, pasture management, terracing and appropriate farming techniques.

However, that may be the an area is going to be irrigated, it is important to see that the plots are of such a size that they can be utilized to the maximum effect. Otherwise the water could be wasted and investments

will have been useless. The benefits that can be obtained with irrigation are difficult to calculate because the supplementary construction work may vary according to area and because inside each area different plots may not be able to obtain the benefits all at the same time. One thing is certain, namely that a fairly long-period must always be allowed for completing irrigation projects.

b) In relation to stock raising

17. Most of the countries of the region report an increase in livestock, very marked in the Arab countries. Moreover, this increase do not appear to be accompanied by an improvement in quality. In most of the countries, except Egypt and Yugoslavia, the increase has been mainly in sheep and goats. Apparently, a good many of the large cattle, despite the advance of mechanisation, are still used as draught animals.

18. By taking the figures in the table on general land use and allowing for the fact that half of the farm land tilled is grazed by livestock during part of the year, after a crop harvest or during fallow, that all permanent grassland, forests and unused land are grazed to some extent, and that unutilisable land is not grazed, the total areas grazed can be obtained; and this area, divided by the number of head of livestock, gives a number of hectares per-head of livestock that averages 3-4, this figure being much higher in countries with extensive pasture land, such as Jordan, Libya or Algeria. A point to be noted is that most of the land is grazed for only part of the year and consequently each head of livestock only has an average of less than 2 hectares. This figure shows that the number of animals is out of proportion to the carrying capacity of the pasture and that stock raising is still kept separate far from production.

c) In relation to forestry

19. The timber production of the Mediterranean forest is given in Table 5. This table, which was drawn up on the basis of reported fellings, shows that felling is in excess of the allowable cut, and also that the annual harvest produces a very high percentage of fuelwood (60-80). The proportion of fuelwood would be still greater if unreported or unauthorized fellings and cuttings outside the forest were included.

Added to this timber production of the Mediterranean forest are the special products and pasture. The special products, such as cork resin, .c-tc.9 represent a value of about \$150 million per year. Pasturage represent an important source of income for the forest, since nearly all the forests are grazed.

The following paragraphs deal with consumption and its trends for saw timber and industrial wood, fuelwood and special products.

20. The production of saw timber and industrial wood is not sufficient to cover the requirements of the region. To meet these requirements considerable quantities have to be imported. For the eastern Mediterranean basin alone imports of timber and wood-base products represent annually \$170 million, that is to say nearly as much as the total value of forest production which comes to \$200 million.

As the apparent annual consumption of the region for saw timber and industrial wood in the eastern Mediterranean basin ranges about 0.07 m³ per inhabitant, it cannot but increase, since world consumption amounts to 0.42 m³ per inhabitant and the consumption of the best supplied countries in the region, such as Yugoslavia and Italy, is 0.2 m³ per inhabitant. The demand for building timber, packing wood for the export of fruit and early season products, and for wood-pulp, mainly to increase education facilities, is in fact becoming greater. The consumption of wood-pulp is 4 kg. per inhabitant, while the average in Europe is 35 kg. and in the United States, 145 kg.

Preliminary estimates show that consumption, which approximates 10 million m³ could attain in the eastern Mediterranean, in the next few decades, 35 million m³ of roundwood, which implies an increase in timber consumption much rapid than the most rapid increase in the national income that can be expected. The question arises, therefore, of ascertaining whether these future needs can be met by an increase in regional production or by an increase in imports.

21. The annual production of fuelwood in the eastern Mediterranean forests now amounts to 23 million m³, which represents the heating equivalent of 5 million tons of coal. Assuming that in the region fuelwood requirements are 1 Kg. Per person per day, or 0.7 m³ per person per year, the total requirements could amount to 67 million m³, and are far from being covered. If account is taken of the rise in population and also of the average living standards of the region, which do not allow of resorting to substitute fuels, the consumption of fuelwood will probably be maintained and even increased if local supplies are available.

22. The trends with regard to other forest product, and to pasturage are not so easy to ascertain. The special products still represent considerable value and emphasise the importance of the social role of the forest, though their markets appear to have declined, especially in the case of cork and resin. With regard to the latter, it is difficult to know whether this decline is temporary or only the first symptom of a more serious falling-off in sales, special studies should be undertaken on cork and resin in order to explore future prospects.

The utilization of forests as a source of forage rather than as a source of timber, must in the main be attributed not only to the natural conditions of the Mediterranean forest, but also to the present agrarian structures. Such utilization will diminish only to the extent that agricultural production is combined with animal production, and that improved permanent pastures are developed.

23. Confronted with the overfelling which threatens future supplies, with erosion damage and population requirements, the Governments of the region have given their attention to working out and applying policies for forest restoration, the extent and success of which vary from one country to another. The policies are on a long-term basis and aim at conserving, improving and developing the forests, and also at bettering their utilization and creating a responsible public consciousness. Most of the countries, in fact have to cope with the serious problem of unauthorised felling and grazing, which can only be regulated by changing the mentality of the settled or nomad population, who often consider the forest as a reserve at the free disposal of all.

24. To apply these policies, the Governments have passed laws, set up forest surveys and developed, or attempted to develop, forest research and instruction. Under such policies, projects for the extension and restoration of forests are being studied or carried out (Table 5). These projects are of a medium or long-term basis and are financed in different ways. In Italy they are covered by a Project Law; in Iraq by a special budget derived from oil royalties; in Libya by foreign aid; in Jordan, Greece, Lebanon, Syria and Tunisia by the regular budgetary funds. Nearly all these projects envisage granting financial aid to private initiative. Loans and subsidies may cover up to 75% of the outlay, as in Spain or else assistance may take the form of supplies of young plants either free of charge or at a low cost as in Libya.

25. The point to be noted, however, in regard to the aforesaid projects, is that they are often drawn up by the national forestry administratives without having been officially approved by the Government. In many cases there are no funds for their implementation. Moreover, the shortage of technicians often prevents a project being carried out. Lastly, in a region characterised by an interdependence of different ways of land use, forestry projects generally are not sufficiently co-ordinated into agricultural programs, the improvement of the forest situation cannot be effected by reducing the available food supplies in the countries in question.

IV THE PLACE OF THE FOREST IN PRESENT LAND USE AND ITS DESIRABLE ORIENTATION

26. There can be no question here of laying down a complete doctrine regarding rational land use and the place of the forest in this system. This is a task that the Working Party on Afforestation and Reforestation of the European Forestry Commission will endeavour to carry out in line with the assignment entrusted to it by the Commission and in following up its early studies.

27. Assuming, however, that the place of the forest in land use is based on three criteria physical (soil conservation and crop protection), economic (supplying of timber to the markets) and social (direct assistance to the inhabitants, salary distribution, amenities,...) it may be said that the Sub-Commission, from the first Session, has emphasized with regard to the Mediterranean forest the priority of the physical criterion, as stated in the report of that session:

"The forest, despite certain differences duo to local conditions, exerts in the Mediterranean region, as in many other regions, three important functions: the first concerned in protecting soil and regulating streamflow; the second in providing the local population and industries with the fuelwood, saw timber and other forest products needed. Although the relative importance of these two functions may vary from one region to another, it is generally the protective function that must be considered as being of cardinal importance".

28. Subsequently, in turning its attention to grazing problems, methods for soil restoration other than afforestation so as to avoid the eviction and resettling of the population, and to accessory products, the Sub-Commission emphasized the importance of the social criterion. While the Sub-Commission therefore uphold the primary importance of first the physical and then the social criterion for the Mediterranean forest, it has not disregarded the economic criterion, since one of its Sessions dealt with tree growing outside

the forest, which represents an extension of the forest in its most dynamic form and which is considered essential for supplying the region with timber in the near future.

29. Consequently, the basis of a program for forest extension and restoration in the region, can be broadly defined from these criteria and the priorities given them, and the relative data can be found in the various reports of the Sub-commission. If, however, a quantitative expression is to be given to the aforesaid criteria which may be regarded from an investment standpoint in forestry work, further studies still have to be made and the Sub-Commission may wish to examine these problems.

While there is no great difficulty in giving a quantitative expression to economic needs, and even in showing them in terms of money (for example, reduction in the sums allocated for the importation of wood necessary to the national economy, in the balance of payments), estimating exactly the physical aid, the social role of the forest is much harder to do.

Nevertheless, it is most important in a long-term forestry program to endeavour as far as possible to calculate these physical and social effects of the forest in order to warrant forest investments, either alone or in relation other possible investments in farming or pasturage, and producing the same effects.

30. Naturally, the Secretariat is fully aware that such an examination of criteria that allows mainly of setting objectives, is not sufficient. Afterwards an analysis will have to be made of the technical, economic or institutional factors which affect the drawing up of a forestry program and which determine the measures to be taken; however, this analysis can be referred to the next Session.

31. Lastly, the Sub-Commission, after having examined the aforesaid problems, which after a general discussion could be referred to groups of experts, could give its attention to another problem of land use which frequently arises in the Mediterranean basin: this is the problem of the antagonism between the plain, where farming, stock raising and forest production are apparently balanced under a market economy; and, a hinterland, mountain or steppe, generally given over to extensive forest-pasture use, usually ruinous, under a subsistence economy. In practice, it would be advisable, therefore, to find out, within limits applying more often than not to a natural region, how to ensure a periodic adjustment between: an intensive developed zone in which the forest, in the form of commercial plantations, will compete with crop and livestock production; and a sparsely populated hinterland with an extensive land-use system where the forest and pasture associated with a subsistence farming constitute both a reserve for the future and a direct guarantee for soil and water conservation.

Note: Table 1 gives soil survey status for the Mediterranean countries.

TABLEAU 1 / TABLE 1
 UTILISATION DES TERRES DANS LES PAYS MEDITERRANEENS
 LAND USE IN THE MEDITERRANEAN COUNTRIES

Pays	Superficie des terres	Surface cultivée		Terres boisées	Terres inutilisées	Terres inutili- sables
Country	Land area	Terres arables	Pasturage permanents	Forested land	Unused land	West- land
-	-	land	pasture	land	land	land
- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
		1,000 hectares				
Maroc/Morocco	39,080	7,770	9,780 d)	3,900	7,580 c)	10,050
Algerie/ Algeria	220,486	6,878	40,176 c)	3,070	...	170,362
Espagne/Spain	50,349	19,986	9,563	13,813	...	65,87
Purtugal	8,862	3,380 a)	1,484 a)	2,467	1,191	384
Total	318,777	38,014	61,003	23,240		187,733
Yougoslavie/ Yugoslavia	25,124	8,192	6,560	7,895	...	2,392
Grèce/Greece	13,156	3,515	5,178	1,958	32	2,573
Turquie/Turkey	76,749	22,543	31,284	10,418	...	13,453
Israël/Israel	2,024	364	200	62	...	1,446
Total	117,053	34,614	45,322	20,333		20,403
Liban/Lebanon	1,010	270	80	400	...	267
Syrie/Syria	18,407	4,103	6,228	449	2,881	4,727
Jordanie/ Jordan	9,656	893	740	525	400	7,098
Irak/Iraq	44,400	5,457	873 b)	1,770	12,100	24,198
Total	63,473	10,713	7,921	3,144	15,381	36,290
Egypte/Egypt	100,000	2,618	...	1	526	96,855
Libye/Libya	175,950	2,499	6,542 c)	459 *	...	166,450
Tunisie/ Tunisia	12,500	4,265	105	900 *	3,730	3,500
Total	288,450	9,382	6,647	1,360		266,755

a) comprend les jachères / includes fallow land

b) comprend 644.000 ha de terres non cultivables servant du pasturages au printemps / includes 644,000 hectares of uncultivable land used for pasture in the spring

c) dont 32,000 ha de prairies naturelles et 40,144,000 ha de pâturages sauvages/ comprises 32,000 hectares of natural grasslands and 40,144,000 of rough grazings

d) y compris 2,200,000 ha d'alfa / includes 2,200,000 hectares of alfa

e) y compris des pâturages sauvages / includes rough grazings

* Inventaire mondial des Forêts, FAO, 1953/ World Forest Inventory, FAO, 1953

Sources:FAO annuaire 1956 / Data taken from FAO yearbook 1956

UTILISATION DES TERRES ET POSSIBILITE' D'ETENDRE LA SURFACE CULTIVEE / *
 LAND UTILISATION AND POSSIBILITIES OF EXTENDING AREA UNDER CULTIVATION

Pays	Superficie totale	Surface improductive (% da 1 sur-face totale)	Surface cultivé chaque année	Pourcentage de la sur-face cultivée en:	Surface irriguée chaque année	Surface irrigable
Country -	Total area -	Umproductive area (% of Total area)	Area cul-tivaied yearly	Percentage of cultivated area under	Area irri-gated yearly	Area suitable for irrigation
	1,000 ha		1000 ha	<u>céréales</u> <u>jashère</u>	1,000 ha	1,000 ha
				cereals fallow		
Algérie/ Algeria	220,500	-	6,900	51	46	250 500
Chypre/ Cyprus	950	-	430	-	-	70 -
Egypte/ Egypt	100,000	97	2,600	83	<u>petit</u> <u>small</u>	2,600 3,400
Grèce/ Greece	13,150	20	3,200	59	15	300 600
Iraq/ Irak	44,400	55	2,600	50	44	1,200 5,000
Israël/ Israel	2,100	55	400	39	-	50 250
Italie/ Italy	30,100	-	15,750	-	-	2,100 -
Jordanie/ Jordan	9,650	74	900	46	35	35 -
Liban/ Lebanon	1,010	-	270	52	-	40 70
Libye/ Libya	175,950	94	400	58	39	- -
Espagne/ Spain	46,500	10	19,900	-	-	1,800 3,500
Syrie/ Syria	18,400	-	2,500	53	40	375 1,200
Tunisie/ Tunisia	12,500	18	3,300	57	39	50 -
Turquie Turkey	76,750	17	15,500	56	32	100 -
Yougoslavie/ Yugoslavia	25,600	17	8,200	75	8	60 -

* Source: Annuaire de la FAO et Arrighi de Casanova, (Statistiques d'irrigation) FAO Yearbook and Arrighi de Casanova (Irrigation Statistics)

** Surface arable à l'exclusion des pâturages
 Arable area excluding pasture

MANAGEMENT AND SILVICULTURAL TREATMENTS
OF THE MEDITERRANEAN FOREST

(Item 5 of Provisional Agenda)

NOTE OF THE SECRETARIAT

1. The Need for a Change

1. As a result of ecological and human action, the Eumediterranean forests are composed of stands of low density and slow growth. The timber produced is hard, heavy and crooked, more suitable for fuelwood than for industrial utilization. These characteristics are more aggravated by the facilities of vegetative propagation, and a heavy undergrowth often limits the production of timber in quantity and quality, even though coppices yielding relatively large amounts of fuelwood often have a productivity superior to that of high forests.

2. On the other hand, the climatic conditions favour all products such as cork, resins, tannins, and essences which are with the chemical and reproductive processes of the trees rather than with their vegetative capacity*.

3. It is one of the most serious aspects of Mediterranean forestry, that while world demand for sawn timber and pulp, which are typical products of temperate forests, has been rising - at times at rather spectacular rates - the markets for the Mediterranean forests' products have been closing one after another. It is true that new uses are beginning to render possible the utilization of wood of small dimensions, but the fact always remains that the Mediterranean forest has substantially lower productivity. This has led to wondering whether a change in silvicultural methods might not be able to reverse the present difficult situation of Mediterranean forests, mainly as regards the production of industrial timber.

4. Obviously, this need for a change is less urgently felt in the forest located in the zones of transition towards temperate and humid climates. Here, the establishment of forest similar to those growing in Central Europe does not encounter too many difficulties, and hence the transformation of

* Pavari : " Bases écologiques et techniques de la sylviculture dans les pays méditerranéens " Monti e Boschi, No. 10, 1954.

stands with a view to increasing the output of structure timber and pulp-wood appears feasible. The conversion of coppices into high forests, the artificial introduction of coniferous species, etc., are examples of this transformation already under way in many parts of the region. Any discussion on the applicability to the Mediterranean forest of silvicultural system (e.g. uniform systems versus selection systems) derived from Central European silvicultural schemes, would probably be more useful if confined at first to the transitional temperate zones.

5. As regards forest situated in the Mediterranean zones, or those climates of transition towards aridity, a more profound change in the present silvicultural methods is probably necessary. In fact, a lucid awareness of this special conditions of his environment has long since led Mediterranean man to transform the original forests into park forests or even into tree plantations yielding mainly resins, bark, etc. These latter types of forest present forms of stands quite different from those of the temperate-humid forests, where classical silviculture was born. The full utilization of this typical Mediterranean stand frequently calls for man-power and techniques borrowed from agriculture and thus a new, highly intensive silviculture is formed, fairly dependent on agricultural methods. In fact, forestry techniques in the Eumediterranean zones are enlarging their scope far beyond the old limits of classical silviculture.

6. It therefore seems that the time is ripe for discussing: firstly, to what extent, if any, the methods of silviculture are still valid for the Eumediterranean forest; secondly, the main lines of a new Mediterranean silviculture, and thirdly, how to apply these new methods to the Mediterranean stands in order to obtain from their products of high value.

7. This shift in emphasis of silviculture towards more intensive treatments yielding outputs of higher value is neither new initiated strictly to the Eumediterranean zones. Throughout the European countries there is spreading a growing realisation that the classic type of forest does not entirely satisfy the needs of an over-growing economy.* Statements such as that the classic forest is a rather slow-growing formation mainly aimed at enriching the soil, that its natural regeneration is often capricious, that its total production is relatively low and shows little variety etc., are beginning to appear in the most reliable European forestry reviews.

Similarly, the International World Poplar Congress held in Paris last year considered a resolution advocating the establishment of an international body to draw up the lines of a new, intensive, highly productive silviculture.

8. These actors indicate the beginning of a new silvicultural trend in humid temperate countries. It seems obvious that the Joint Sub-Commission on Mediterranean forestry problems, which is directly concerned with a forestry confronted with problems much graver than those of Central Europe, should establish its position on so decisive questions as the direction to be given to the future forest production policy. In order to facilitate the discussion, the secretariat has outlined below the main trends discernible in present silviculture. Those could constitute the background against which the topics Statement in para. 6 could be examined.

* Yves Claudel: "Nos besoins en bois de papeterie necessitent des techniques de production rapide". Revue forestière française, November 1957.

II. Silvicultural trends

9. European silviculture at present seems to show three main aspects, which can be summarized as follows:

a) Classical silviculture

10. As outlined in the questionnaire, the main characteristics of this trend are pure, even-aged stands, in some cases of artificial origin; clear fellings, preference for low thinning; supremacy given to questions of economics, and therefore a tendency to neglect certain types of natural forests; drawing-up of rigidly precise plans; well-defined concepts of age and rotation, definite notion of "normal forest".* In this type of silviculture, the stand is the main preoccupation of the silviculturist and trees are regarded mainly only in so far as they are the elements making up the stand. It could even be said that mathematics in the basic line of thought in this concept - order should reign in the forest - and that dendrometry is the applied science at the basis of silviculture.

11. This concept of silviculture might be classified as classical, since it can be traced to as far back as the beginning of the nineteenth century. The birth of silviculture as a science was made under the auspices of this concept, which is closely connected with the names of Hartig and Cotta. The methods established by these two foresters gained the upper hand over the last century, and it was not until the twentieth century that strong objections against these methods began to arise. The numerous disadvantages which result from their systematic employment were stressed: impoverishment and degradation of the soil, loss of production, difficulties of regeneration, invasion of insects, etc. As a result, silviculture shifted its attention towards biology and a new trend was thus declined.

b) Modern silviculture

12. Nothing can symbolise this trend better than the slogan: "Back to Nature". It was encouraged notably by the big developments taking place in the fields of phytosociology and pedology in the first decades of this century. The biological sciences now take over the place formerly occupied by mathematics. The study of ecology, phytosociology and pedology becomes the foundation of silviculture. The forest is no longer composed merely of an assembly of trees placed on the same area, but of a complex of biological associations in equilibrium, in which all factors, even those which formerly appeared unimportant, are of importance for the well-being of the whole. Therefore, the tree as an individual comes to the fore and becomes the protagonist of silviculture. In fact, as Guinier has said, "To understand the forest is to understand the tree".

13. This modern silviculture is distinguished above all by a return to the precepts of the natural forest (from which derives a certain caution with regard to exotic species), complete freedom from theoretical plans or schemes, a more intensive treatment, very short cutting cycles, careful and precise fellings, frequent and repeated cultural operations, etc.* It has been said that the modern silviculturist truly "fashions" his stands, devoting particular attention to every tree. This is made possible by the relative absence of administrative restrictions; a great deal of freedom is given to the "man on the spot".

* P. Fourchy: "Quelques aspects de la sylviculture contemporaine", Revue forestière française, May 1952.

14. This new tendency spread quickly in Europe. It encountered a favourable reception in France, where foresters, had been brought up with "Parados" celebrated phrases: "To imitate nature, to hasten its work, this is the basic maxim of silviculture". But even in the country of Cotta, the evolution in question was initiated as early as the beginning of this century, mainly by Hayr in his book "Waldbau auf Naturgesetzlicher" (Silviculture in conformity with nature). From the outset, this tendency has rapidly dominated European silviculture which has been enriched with several important development such as "jardinage", "selective improvement", "control management", etc. in which the spirit of the modern tendency has been crystallized.

15. As already stated, this evolution has been encouraged by the ever-increasing development of the biological sciences. These developments are still in progress, and it is to be expected that, together with them, silvicultural evolution will also continue. In fact a third type of silviculture seems to be emerging, whose development may be decisive in particular for the future of the Mediterranean forestry.

c) The new silviculture

16. This newest of silviculture is, to a by no means small extent, a result of increased needs for forest products, and of the development of vegetative selection. In fact, on poor soils natural evolution often leads to stand yielding a very low output. In addition, the original natural forests are either disappearing almost everywhere, as a result of human action, or else their products are no longer required. In many cases, therefore, the return to a natural "climax" by natural means, is hardly desirable.

17. The progress made in vegetative selection and tree hybridization has given fresh hope for a better utilization of soils covered by trees. The utilization of selected clones and hybrids in modern poplar cultivation, accompanied by very intensive treatment of the stands, has permitted yields never attained by the classic forest - in fact, ten or twelve times yields of the latter. Similarly, the introduction of selected types of willow, although still in its first, experimental stages, would seem to promise unexpected, almost fantastic yields per unit.

18. Obviously, these selected clones or hybrids are expensive and can only be utilized with the maximum benefit on very well prepared soils and through intensive tending. It seems as if silviculture now aims at suiting the environment to the trees; and this would, indeed, be the final stage in an evolution which has passed roughly through the following stages: neglect of the environment, subjection to the environment, adaptation of the environment. There is, in fact, a growing realization that modern silviculture cannot consist of a simple return to nature, and that it should not refrain from establishing stands which are entirely different from the natural ones, nor reject any means of increasing yields: fertilizers, irrigation, working of soil*.

* H. Franz: "Naturgemasse oder standortsgemasse Waldwirtschaft" - Allegemeine Forstzeitung, Hochschule fur Bodenkulture, Wien XVIII, N.68, November 1957.

19. A new, intensive type of silviculture is therefore envisaged, in which the ecotype, the clone or the hybrid is the protagonist - the stand thus being composed of repetitions of "the same tree" - and in which there is almost constant human intervention. With this basis, the characteristics of the new silviculture become inevitably: even-aged stands of artificial origin, mainly through plantation, clear fellings to reap the products; intensive working of the soil, use of fertilizers, pruning, etc.

20. As an illustration of this new trend, we can quote the action taken by some paper factories, for instance the Spruce Falls Company at Kapuskasing, Ontario. This firm, whose annual output is 300.000 tons of paper for the "New York Times", has begun an important reforestation project aimed at covering its requirements in wood. This project is to be carried out in natural forest of Picca mariana, owned by the Society, whose yield no longer satisfy the needs of the factory. Even more striking is the example of Japan. Although natural forests cover 61.8% of the land area, this country has stated in its now 5-years forestry plan that forest productivity will be raised through the increase of artificial reforestation, with stress on the intensification of forest management systems and the development of the forest tree breeding projects.

21. To a certain extent, it is obvious that the studies carried out by Mr. Patterson and Week on the correlation between natural environment and potential productivity of the forest cannot but favour this new evolution. The findings of these two distinguished scientists, taken in conjunction with the fact, recently established by research, that productivity is practically independent of the methods of thinnings,* enables us to begin to discover the production ceiling of natural silviculture. Patterson, for instance, considers that the productivity of natural forests under the very favourable natural conditions of equatorial stations with high rainfall, does not surpass the figure of 17 m³/ha inclusive of non-utilisable wood, roots, etc. In those circumstances, it seems clear that supplementary energy must be afforded to the complex climate-soil, if higher outputs are to be expected. Agriculture has done no other than this in order to attain its high yields.

22. It might now be asked what has become of the former preoccupations about the disease potential and, the impoverishment of the soil in pure stands. As regards the former, we could not do better than to quote the following paragraph by the well-known English pathologist, Mr. T. R. Peace. **

The author has no desire to deny that, in general, the disease potential of pure stand is higher than that of a mixed one containing the same species. Though it may be desirable to remember that the most devastating tree disease so far encountered, Chestnut Blight, (*Endothia parasitica*) destroyed chestnut in America mainly in mixed stands. It can be said that almost all, agricultural crops are more liable to diseases than their wild counterparts, nevertheless, the yield of usable material is invariably higher under managed cultivation. It is often suggested that this is due to the use of modern chemical disease-control methods, most of

* R.Scherber, "Deutung und Aussage der Durchforstungsvorsuche: II Die Buchon-Durchforstungsvorsuche" - Allgemeine Forstzeitschrift, Marsstrasse 225 Munchen, No 33-34, 21 August 1957.

** "Approach and Perspective in Forest Pathology - Forestry, Vol.XXX, No 1, 1957.

which are not applicable in forestry outside the nursery. But surely it is unnecessary to resign ourselves to the belief that we cannot elaborate methods of control lying between the so inapplicable chemical methods on the one hand, and a slavish faith in the mixed "natural" forest on the other. In any case, there is little evidence in Great Britain that pure planting has, as yet, led to any major disasters. Nor, in the author's opinion, are any such disasters immediately imminent.

23. As to the impoverishment of the soil, we may turn to Duchaufour, the well-known French pedologist:*

"The forester therefore disposes of two methods of action for exerting a favourable influence on soil evolution : a natural, long-term method by the maintenance of biologically balanced stand which itself ensures the conservation of its fertility: this is the method employed by traditional silviculture, and though extremely slow, it is usually sure: An artificial method, more immediately effective, through the combined use of working of the soil and of fertilizers or ameliorators: this method is more rapid, but also more violent, and therefore, more dangerous; it should be put into practice only with the necessary scientific guarantees, hence after a complete study of environment.

24. It must be admitted that silviculture as intended under the present heading could more accurately be defined as tree farming. As pointed out by Mr. Peace, however, this does not imply that the new forestry techniques must be exactly the same as those used in agriculture. It means that forestry, like agriculture, should be improved through the use of techniques based on the knowledge accumulated of artificial tree crops, until a new stage is reached in which the trees grown and crops produced are superior to those resulting from natural stands. In most countries, admittedly, forestry is largely based on the use of existing, more or less natural, forests, just as agriculture in some very backwards places, is based on the use of existing, more or less natural herbage. But if wood is to continue to occupy an important place in the markets it would probably be advisable to keep in mind the idea of improvement beyond the fixed natural level.

25. It might be deduced from the above that foresters were now beginning to face up to two different tasks: one directly concerned with the natural forest and the other more with wood cropping. As regards the former, it would be up to the foresters to ensure the best management of a natural reserve, from which the maximum benefit should be drawn while it is still standing. As regards the latter, a new method - tree farming - seems to be open to the forester for producing wood of the quantity, quality and price required by an ever-expanding economy. In this connection, a great many new techniques would still have to be elaborated.

III. Special Mediterranean silviculture

26. It cannot be denied that present-day forest management is to a large extent concerned with economizing the detritus of the forest. This is accomplished mainly by various methods of outing, which all aim at allowing

* "L'action des divers types d'humus sur les processus d'entraînement dans le sol forestier"- Revue forestière française, Décembre 1957.

the annual leaf falls, branches, barks, fruits and detritus from cutting, to remain in the forest. It is the decomposition of this residue which supplies the soil with those essential elements which render possible a typical silviculture aimed at obtaining a sustained yield.

27. In Mediterranean forestry, on the other hand, seeds, branches, bark, etc., which contain the greater proportion of the mineral nutrients, are in most cases removed from the forest. In fact, it is the production of fruits, fodder, juices, etc., which makes higher demands on the soil, that gives to Mediterranean forestry its distinctive character.

28. This fundamental feature has necessitated treatments very different from those used in pure forestry, and the situation has long been understood both by Mediterranean foresters and by Mediterranean forest owners. The former, at the Third Session of the Joint Sub-Commission on Mediterranean Forestry Problems, drew the attention of member governments to the impoverishment of Mediterranean forest soils resulting from the removal of foliage and fruits. As for the latter, their awareness on the special Mediterranean conditions is clearly shown in the present intensive treatments carried out in most "encinares" and "montados" in the Iberian peninsula, in the best chestnut stands in Italy and in those of Valonia oak in Turkey. It may here be appropriate to recall that the survival of the chestnut as an important element in Mediterranean forestry is due, to a large extent, to a different treatment of the chestnut stands, entailed by the change from methods based on pure silviculture to an intensive forestry based on tree farming.

29. It seems, therefore, that an increase in the specialized production of Mediterranean forests is mainly dependent on the improvement of pure tree farming methods. Genetical selection and breeding, of types, for instance, has frequently been pointed out as one of the most promising techniques to be adopted. Vieira Natividade*, has indicated the importance of selecting clones and of intensifying research into vegetative reproduction as regards the cork tree. A better knowledge of the techniques of pruning and of the working of the soil in conjunction with fertilization and disease control is also urgent, in order to increase the production of fruits in the "encinares". The case would not appear to be very different for the production of resins.

30. But further progress in the direction already undertaken of improving tree farming in order to increase the production of so-called accessory products is not the main challenge to be met by Mediterranean forestry. To obtain sawn timber and pulp of the required quality and above all in the required quantity, is an urgent need of Mediterranean forestry. In meeting this challenge, the experience already gained by Mediterranean forester in tree cultivation could be very valuable. In fact, it seems fair to support that tree cultivation constitutes the surest way open to Mediterranean forestry if timber production is to occupy an important place in Mediterranean economy. The work already undertaken in Italy for the simultaneous production of better timber and better fruits in the same chestnut stands, by means of tree cultivation, would seem to show clearly the direction to be followed by Mediterranean forestry in the future.

* "La Suberaie Méditerranéenne - Situation et perspectives d'avenir, Lisbon, 1956.

** M.M. Bolaños, "Comentarios sobre los encinares españoles" Instituto Forestal de Investigaciones, Madrid.

IV. The future of the autochthonous Mediterranean forest

31. If, in fact, the Mediterranean environment seems to advise tree cultivation as the most valuable means of increasing, and improving, timber production, there still remains the problem of what policy to follow as regards the present natural Mediterranean stands. In general terms, this policy will depend on the physical, economic and social roles which the forests in question are still playing. Obviously, their economic role is seriously endangered. There only remains their protective role and, to a smaller extent, closely dependent on local conditions, the social role. The drawing up of the policy to be followed will therefore be largely dependent on the answer to the following question: Is the role played by this forests sufficient to justify keeping them under their present management?

32. If it is thought that the answer is affirmative, then it is essential that Mediterranean forestry research should evolve methods of evaluating in terms as concrete as possible the physical and social advantages of these forests, so that they can be asserted against those of other competitive uses of the land. This would be of particular interest since it has a very close bearing on the solutions to be given to the present problems of the Mediterranean mountain. All the possible solutions range between schemes which look upon the mountain as a large forestry reserve, with a light complementary industry, and a subsistence agriculture and grazing for a small population charged with maintaining the mountain area without damaging it and reviving it without separating it from the national community, and schemes aimed at retaining the present population of the land by every means possible. In all cases, the role to be played by the forest will depend closely on the results of the type of research advocated above.

33. If, on the contrary it is thought that the answer is negative, then the only other alternative is to render the forests economic without forfeiting the social and physical benefits they may still afford. An increase in the output of these forests could, in fact, be achieved by purely silvicultural methods, such as the introduction of conifers, the transformation of coppices into high forests, etc. Unfortunately, the applicability of these methods seems to be e confined, as has already been pointed out, to the more humid zones. In these circumstances, it may be wondered whether the adapting of tree plantations to the simultaneous attainment of three aims, physical, economic and social, should not be the central idea of every Mediterranean forestry policy. It is probable that in the Mediterranean region, these tree plantations will alone be capable of supplying these ample quantities of wood, homogeneous and easily accessible that, no matter what its technological characteristics, will always constitute, as has been so lucidly explained by Professor Pavari, the essential basis of a strong forest industry.

34. But the conversion of unproductive hard-wood stands into the desired forest types can be more expensive than the establishment of plantations.* On the other hand, in the Mediterranean region, the assurance of a steady wood

* "Stand conversion costs varied from \$43.57 to \$80.92 per acre, depending on the hardwood control method employed. Such costs, are considered far in excess of those feasible for plantation establishment. These costs should be borne in mind by foresters acquiring land for planting with pulpwood or sawtimber production as the objective. Recently abandoned fields where brush has not yet completely occupied the site can be planted at a more reasonable cost and with present fewer forest management problems". - West Virginia University Agricultural Experimental Station, Bulletin 408, October 1957.

production by means of tree plantations can be seriously hampered by the hunger for agricultural land resulting from the pressure of population. This unfortunate dilemma shows clearly the importance of the problems confronting the autochthonous Mediterranean forest.

CONCLUSIONS

35. The Sub-Commission could therefore discuss, on the basis of the national Reports and the Note of the Secretariat, the tendencies of Mediterranean silviculture and the direction which it is desirable to give to it in the future. The conclusions of this discussion would be of fundamental importance for the Mediterranean Development Project which is now being carried out.

The Sub-Commission could also make any recommendations necessary for promoting the type of silviculture judged to be the most likely to give the best results. These recommendations could apply to the establishment of pilot forests, the setting up of national forest advisory services and the strengthening of research programmes, in order to help the spread of the new techniques advocated.