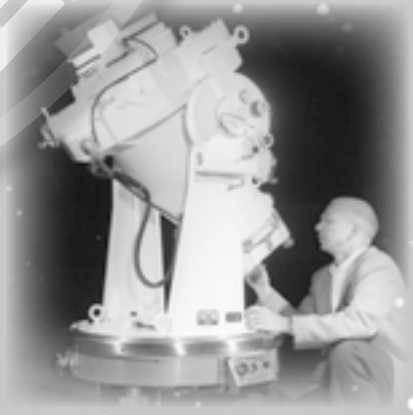
SCIENCE & THE ALLIANCE

NATO'S THIRD DIMENSION



FOREWARD

As the "third dimension" that helps to bridge the Alliance's civil and military identities, science plays a key role at NATO in bringing nations closer together not only for their defence but also for their development. As an important patron for innovative research in Western Europe, NATO has contributed to the transformation of the role and legacy of science in world affairs during the Cold War and beyond.

Since the formal establishment of the NATO Archives in 1999, the academic research community has been able to consult publicly disclosed documents related to NATO's commitment to the development, promotion and application of scientific research. The accessibility of this information has helped a new generation of scholars to shed light on the ancestry of the Alliance's scientific research agenda by placing its activities within broader historical perspectives.

The exhibition ***Science and the Alliance: NATO's Third Dimension*** and this companion volume explores the role and evolution of NATO's science programmes and initiatives using declassified and publicly disclosed documents from the NATO Archives. This booklet contains a curated sample of NATO documents that spotlights these developments, as well as including articles by the science historians who participated at the NATO Archives seminar on Science and the Alliance which took place in Brussels, Belgium on December 10, 2014.

Science and the Alliance: NATO's Third Dimension reflects the continuing aspiration of the NATO Archives to present important milestones in the history of the Organization. I hope the combined information presented in the exhibition, the booklet and the seminar offer a tantalizing glimpse into the history of the Alliance's "Third Dimension" and encourages you to further explore the subject in depth by consulting the NATO Archives in person or on-line at http://archives.nato.int .

Ineke Deserno
NATO Archivist

PREFACE

The Science for Peace and Security (SPS) Programme is an established brand for NATO that is well known amongst Allies and Partners, and has been contributing to the core goals of the Alliance for many decades. Today, three core dimensions define its identity: Science, Partnership, and Security. It brings together scientists and experts from NATO and partner countries that work together to address common security challenges through cooperation in the fields of science, technology, innovation and beyond.

Over the past five decades, the NATO SPS Programme has proved to be flexible in responding to the demands of the times. When the programme was created in the 1950s, its main aim was to build networks among Allied researchers who would work together on cutting-edge science. With the end of the Cold War and NATO's stronger focus on cooperation with partners, the SPS Programme reinvented itself as a valuable partnership tool of the Alliance, guided by the spirit of cooperative security. After a comprehensive review and reform process last year, the Programme received a more streamlined and strategic outlook and continues to be one of the Alliances' largest and most important civilian partnership tools with a stronger focus on larger-scale activities with high strategic, political and public diplomacy impact.

Today, the SPS Programme is embedded in the Emerging Security Challenges Division. But while the challenges are new, the SPS Programme has many years of experience bringing together scientists to address various scientific and security challenges, thus creating a global network of leading experts. We have engaged in a lot of projects which show that the SPS Programme is a perfect tool to enhance dialogue and cooperation with practical results.

The exhibition and seminar "Science and the Alliance: NATO's Third Dimension" will take you back to the origins of the SPS Programme and show you its evolution over the years. Taking into consideration the long history of the SPS Programme, I believe that this event is an excellent idea and I wish you an informative and enjoyable workshop.

Ambassador Sorin Ducaru
Assistant Secretary General
Emerging Security Challenges Division

PREFACE

Dear Reader,

I was born in 1957, the year that the USSR launched their Sputnik 1. It was also the year that the fundament was laid for the development of NATO S&T.

Today, 57 years later, we can only state that our ancestors have done a great job in creating the conditions for a vibrant NATO S&T.

Today's NATO S&T supports our troops deployed in military theatres all over the world and prepares them for an uncertain future, supports partnerships and helps our decision-makers to take informed decisions.

Let us continue to foster and further develop NATO S&T, in the interest of our Nations and our great Alliance.

Albert HUSNIAUX (MGen BEL AF)
NATO Chief Scientist

SCIENCE & THE ALLIANCE

**"One day in April 1949,
I read in the paper of the birth of NATO.
Here was a small and simply administered group
of nations bound together by the needs of defense.
Why not use NATO as a pilot plant to test out
the feasibility of scientific cooperation?"**

Dr. Theodore von Kármán

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ENCLOSURE

15 February 1951

MEMORANDUM FOR: The Standing Group, North Atlantic Treaty Organization

SUBJECT: Conference of Aeronautical Research Directors

1. In accordance with the memorandum from the North Atlantic Treaty Organization, DSGM-9-51, dated 9 January 1951, a conference of aeronautical research directors from the NATO countries was convened during the period 5 February through 9 February 1951, with the United States Air Force acting as executive agent.

2. The report of the delegates to this conference is transmitted herewith for your consideration. (Appendix).

3. The primary recommendation of this report is that an Advisory Group for Aeronautical Research and Development, consisting of appropriate representatives from each of the member countries, be set up immediately within the NATO framework.

4. The United States Air Force will continue to cooperate in every way possible with the Standing Group. In this connection, I suggest that NATO appoint the Air Force as executive agent for implementation of the conference's recommendations, working in close cooperation with NATO's Ad Hoc Research and Development Committee.

/S/ HOYT S. VANDENBERG
Chief of Staff,
United States Air Force

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S.G. 110

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APPENDIX

I SUMMARY OF RECOMMENDATIONS

1. In the present world situation, with the nations of the North Atlantic Community facing common problems of grave importance, there is both an urgent need and the possibility to work together in mobilizing to mutual advantage the scientific and technical skill, manpower, and facilities of all NATO nations.

2. Because of the assurance for immediate benefits from cooperation in the field of aeronautics, the conference recommends that an Advisory Group for Aeronautical Research and Development be established without delay within the present NATO framework.

3. In addition, the conference recommends that NATO consider the establishment of a Scientific Advisory Board covering the broad field of defense science, to deal with broad policy questions, and reporting to the Defense Committee.

II DISCUSSION

4. At the suggestion of the United States Air Force, the Standing Group of the Military Committee, North Atlantic Treaty Organization, called a conference of aeronautical research directors from the member nations to discuss matters of common interest in the field of aeronautical research and development. The conference, which was convened in Washington, sat from Monday, February 5, 1951, through Friday, February 9, 1951. The following countries were represented: Canada, Denmark, France, Italy, the Netherlands, the United Kingdom, and the United States.

5. All delegates agreed that, in the present world situation, faced as we are with common problems of grave importance, there is both an urgent need and the possibility to work together in mobilizing to mutual advantage the scientific and technical skill, manpower, and facilities of all NATO nations.

Therefore, the delgates greatly appreciate the step which has been taken by the Standing Group in convening this conference. (See Annex for list of Delegates.)

6. Resources, especially scientific manpower, exist in varying degrees within the NATO nations, and we believe that an effort towards mutual cooperation is required to derive the greatest benefit from the total resources that are available.

7. To achieve the objective of the common defense of the treaty nations, progress in aeronautical techniques should be accelerated as much as possible. Such acceleration is dependent on advances in those pure and applied sciences which find an application in aeronautics and will only be realized through the employment in research and development work of all highly qualified personnel available, supported by the necessary material resources. By cooperation, science, which will play in any future conflict a role even greater than it did in World War II, will be rendered more effective.

8. All delegates were of the opinion that, without affecting the principles of national policies, it is possible to accomplish much by the exchange of information and by the fullest use of qualified manpower and existing research and development facilities to mutual advantage. At the same time, it should be profitable to coordinate the planning of future facilities with a view to their common use. Much will be gained by the acceleration of research and development projects by common effort for the common good, and also by bringing together teams of leading scientists and engineers to consider and help in the solution of problems of common defense.

9. In many countries during and since World War II, the important part played by research and development in defense planning has been recognized, and close working arrangements

between science and defense have been established. Within the defense organization set up by the North Atlantic Treaty Nations, the contribution which science can make to military planning must not be overlooked.

10. The delgates were convinced that it is both urgent and practicable to bring about cooperation in the field of aeronautics for the common good and with immediate benefit to all nations concerned. To achieve this, the conference unanimously recommends that a body be set up immediately within the framework of NATO as an "Advisory Group for Aeronautical Research and Development" (AGARD).

11. This Advisory Group should be composed of one or two appropriate scientific-technical representatives engaged in aeronautical research and development work from each of the member countries. There should also be a permanent secretariat which we suggest be located in Paris. The Group would meet once or twice a year, or as required, with meetings taking place in the various member countries.

12. The Advisory Group would have the following objectives:

a. To review continuously the application of advances in aeronautical science to common defense problems.

b. To make recommendations for the solution of problems referred to it by agencies within NATO, including evaluation of research and development projects submitted by individual nations.

c. To make recommendations leading to improved cooperation among member nations in the field of aeronautical research and development.

d. To explore methods for facilitating exchange of information pertaining to aeronautical research and development.

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13. The above proposals are limited to the field of aeronautics. We are aware, however, that the fullest application of science to warfare involves the cooperation of specialists in many fields and in consequence similar advisory bodies in other spheres of research and development would be equally desirable.

14. In addition, we recommend that NATO consider the establishment of a Scientific Advisory Board covering the broad field of defense science, to deal with broad policy questions, and reporting to the Defense Committee. Because of the assurance for immediate benefits from cooperation in the field of aeronautics, we recommend that the Advisory Group for Aeronautical Research and Development be established without delay within the present framework of NATO.

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ANNEX

OFFICIAL REPRESENTATIVES

CANADA:	J. H. Parkin
	J. J. Green
	G. C. Truscott
DENMARK:	Brandt-Moller
FRANCE:	M. Roy
	Lafargue
	Gerardin
HOLLAND:	Van Der Mass
	C. Koning
ITALY:	Maj. Franco Fiorio
	Luigi Broglio
UNITED KINGDOM:	W. G. A. Perring
	E. T. Jones
UNITED STATES:	Theodore von Karman
	Hugh L. Dryden

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~~CONFIDENTIAL - NATO~~

COPY NO._____

NATO UNCLASSIFIED

S.G. 110/2

10 December 1951

Pages 1 - 5 incl.

REPORT BY

THE AD HOC COMMITTEE ON RESEARCH AND DEVELOPMENT

to the

STANDING GROUP

on

THE CONFERENCE OF AERONAUTICAL RESEARCH DIRECTORS

References: a. DSGM-9-51
b. S.G. 110

THE PROBLEM

1. The Chief of Staff, U.S. Air Force, addressed to the Standing Group a memorandum dated 15 February 1951, transmitting the Report of the Conference of Aeronautical Research Directors (reference b above), which documents

a. recommend that an Advisory Group for Aeronautical Research and Development be established without delay within the present NATO framework;

b. recommend that NATO consider the establishment of a Scientific Advisory Board covering the broad field of defense science, to deal with broad policy questions, and reporting to the Defense Committee;

c. suggest that NATO appoint the United States Air Force as Executive Agent for implementation of the Conference's recommendations.

FACTS BEARING ON THE PROBLEM

2. These documents (S.G. 110) were referred to the Standing Group Ad Hoc Committee on Research and Development for study and submission of recommendations to the Standing Group. The Ad Hoc Committee on Research and Development has carefully considered the

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Report of the Conference of Aeronautical Research and Development Directors and feels that certain of the Conference recommendations are worthwhile and should be implemented with minor modifications.

CONCLUSIONS

3. This Committee, as well as the Scientific Advisory Committee of the Western Union, has experienced difficulties in connection with the release of classified military information pursuant to the provisions of current national security policies. The Principal Staff Officers Committee of the Western European Regional Planning Group, in its report WR/MC(51)198 dated 25 July 1951 on future handling of scientific studies, recommended that "any directive by the Standing Group should take cognizance of national security policies, and no subject should be assigned on which free exchange of information is not permitted". The Ad Hoc Committee on Research and Development feels that complications imposed by current national policies preclude the effective functioning of such groups as AGARD and the proposed Scientific Advisory Board as conceived by the Conference of Aeronautical Research Directors and recommended to the Standing Group in S.G. 110 without some modification.

4. On the other hand, the Committee feels that there is a considerable potential for fruitful cooperation in research and development within the NATO Community, especially in Western Europe, in basic research and development projects on which the free exchange of information is permitted by existing national security policies. In this unencumbered area the Committee concurs with the philosophy expressed in S.G. 110 that the field of aeronautics is one where cooperation would probably be most immediately beneficial to the NATO effort. Accordingly, the Committee feels that the establishment of AGARD on a two-year experimental basis with its activities concentrated on effective utilization of

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aeronautical research and development personnel and facilities is a desirable undertaking.

5. Subsequent to the meeting of the Conference of Aeronautical Research Directors and submission of its report in S.G. 110 to the Standing Group, organizational changes in NATO have eliminated the Defense Committee and have amalgamated its functions with those of the Council. In view of this change and, further, in view of the complexity of the overall problem as outlined in paragraph 3 above, the Committee considers that the establishment of a Scientific Advisory Board as recommended in S.G. 110 is not feasible and should not be established at this time.

6. The Committee has given serious consideration to General Vandenberg's suggestion that the Standing Group appoint the United States Air Force as its Executive Agent with a view to implementing such recommendations of the Conference of Aeronautical Research Directors as may be approved. The Conference for studying the mobilization of NATO scientific potential originated with aeronautical personalities and was effectively organized and managed for the Standing Group by the U.S. Air Force. Since the Chief of Staff of the U.S. Air Force has expressed a keen interest in fostering continuing international cooperation in aeronautical research and development, it appears logical to continue this association and to accept the offer of the USAF to act as Executive Agent for the Standing Group in setting up and managing the affairs of AGARD during the two-year trial basis. It is understood that the Chief of Staff, USAF, is prepared to render such administrative and logistical support as may be required to ensure the efficient functioning of the Group.

RECOMMENDATIONS

7. The Ad Hoc Committee on Research and Development accordingly recommends that the Standing Group:

aeronautical research and development personnel and facilities is a desirable undertaking.

5. Subsequent to the meeting of the Conference of Aeronautical Research Directors and submission of its report in S.G. 110 to the Standing Group, organizational changes in NATO have eliminated the Defense Committee and have amalgamated its functions with those of the Council. In view of this change and, further, in view of the complexity of the overall problem as outlined in paragraph 3 above, the Committee considers that the establishment of a Scientific Advisory Board as recommended in S.G. 110 is not feasible and should not be established at this time.

6. The Committee has given serious consideration to General Vandenberg's suggestion that the Standing Group appoint the United States Air Force as its Executive Agent with a view to implementing such recommendations of the Conference of Aeronautical Research Directors as may be approved. The Conference for studying the mobilization of NATO scientific potential originated with aeronautical personalities and was effectively organized and managed for the Standing Group by the U.S. Air Force. Since the Chief of Staff of the U.S. Air Force has expressed a keen interest in fostering continuing international cooperation in aeronautical research and development, it appears logical to continue this association and to accept the offer of the USAF to act as Executive Agent for the Standing Group in setting up and managing the affairs of AGARD during the two-year trial basis. It is understood that the Chief of Staff, USAF, is prepared to render such administrative and logistical support as may be required to ensure the efficient functioning of the Group.

RECOMMENDATIONS

7. The Ad Hoc Committee on Research and Development accordingly recommends that the Standing Group:

a. Approve the establishment of the "Advisory Group for Aeronautical Research and Development" with the following provisos:

(1) The Group be established on a trial basis for an initial period of two years.

(2) The Group be advisory to the Standing Group and be composed of one or two civilian scientific representatives from each NATO country.

(Note: It is understood that in some countries the term "civilian" includes certain individuals having military status who are, in fact, engaged in essentially scientific activities).

(3) The objective of the Group to be the bringing together of leading aeronautical personalities of the NATO nations with a view to recommending effective ways to utilize their research and development personnel and facilities for the common benefit of the NATO Community.

(4) The Group to concentrate its activities on matters of such security classification, the free exchange of information on which is permitted by existing national security policies. Questions involving disclosure of information relating to matters on which free exchange is not authorized, will be accomplished within the Group by negotiation and in accordance with the various national laws and policies.

(5) The Chairman of the Group for the first year be a U.S. citizen. Subsequently, the Group elect its own Chairman on an annual basis. The Director of the Secretariat be a U.S. citizen.

(6) The Secretariat of the Group be held to the minimum size consistent with the work of the Group.

(7) The permanent location of the Secretariat be established in the Paris area, where the U.S. Government can offer administrative and housing facilities for the Secretariat.

(8) The U.S. Air Force be appointed Executive Agent for the Standing Group to set up and administer the affairs of AGARD.

(9) The above proposals will in no way invalidate current regional or bilateral arrangements between nations for the exchange of classified information in this particular field.

b. Not favorably consider the establishment of the Scientific Advisory Board as recommended in S.G. 110.

8. Pursuant to the provisions of DSGM-220-50 dated 6 December 1950, the Ad Hoc Committee on Research and Development recommends that this document be submitted for the information of the military representatives of the other NATO nations after its consideration by the Standing Group.

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COPY NO. 45

S.G. 110/2 (Final)

25 January 1952

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STANDING GROUP

DECISION ON S.G. 110/2

A Report by
The Ad Hoc Committee on Research and Development
on
THE CONFERENCE OF AERONAUTICAL RESEARCH DIRECTORS

Note by the Secretaries

1. On 24 January 1952, the Standing Group approved the recommendations of S.G. 110/2, with amendments to paragraph 7 a. These amendments are incorporated in the attached pages 4 and 5.

2. Holders of S.G. 110/2 are requested to replace pages 4 and 5 with the attached pages 4 and 5, and to destroy the removed pages by burning.

3. This decision now becomes a part of and shall be attached as the top sheet of S.G. 110/2.

C. H. DONNELLY
E. B. W. CARDIFF
P. L. de MONTJAMONT
Secretaries

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REGRADED

Per Authority Classif. Memo #25

By _____ Date 6 Mar 92

DOCUMENT DESTRUCTION MEMO # 1, 10 Jan 69

No longer effective

Copy in 336/SG/1 AGARD/320

[redacted]

For Declassification
See Classification Memo #25

a. Approve the establishment of the "Advisory Group for Aeronautical Research and Development" with the following provisos:

(1) The Group be established on a trial basis for an initial period of two years.

(2) The Group be advisory to the Standing Group and be composed of one or two civilian scientific representatives from each NATO country. (Note: It is understood that in some countries the term "civilian" includes certain individuals having military status who are, in fact, engaged in essentially scientific activities.

(3) The objective of the Group to be the bringing together of leading aeronautical personalities of the NATO nations with a view to recommending effective ways to utilize their research and development personnel and facilities for the common benefit of the NATO Community.

(4) The Group to concentrate its activities on matters of such security classification, the free exchange of information on which is permitted by existing national security policies. Questions involving disclosure of information relating to matters on which free exchange is not authorized, will be accomplished within the Group by negotiation and in accordance with the various national laws and policies.

(5) The Chairman of the Group, and the Director of the Secretariat, be United States citizens.

(6) The Secretariat of the Group be held to the minimum size consistent with the work of the Group.

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(7) The permanent location of the Secretariat be established in the Paris area, where the U.S. Government can offer administrative and housing facilities for the Secretariat.

(8) The U.S. Air Force be appointed Executive Agent for the Standing Group to set up and administer the affairs of AGARD.

b. Not favorably consider the establishment of the Scientific Advisory Board as recommended in S.G. 110.

8. Pursuant to the provisions of DSGM-220-50 dated 6 December 1950, the Ad Hoc Committee on Research and Development recommends that this document be submitted for the information of the military representatives of the other NATO nations after its consideration by the Standing Group.

VOID

VOID

UNCLASSIFIED COPY NO. 45

S.G. 110/3

31 March 1952

Pages 1 - 4, incl.

REPORT BY THE COMMITTEE ON RESEARCH AND DEVELOPMENT

to the

STANDING GROUP

on

FIRST MEETING OF THE ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT (AGARD)

Reference: S.G. 110/2 (FINAL)

THE PROBLEM

1. To obtain nominations from NATO Countries of their representatives to the formative meeting of the Advisory Group for Aeronautical Research and Development (AGARD) to be held in Paris on 19-20-21 May 1952.

FACTS BEARING ON THE PROBLEM

2. On 24 January 1952 the Standing Group approved S.G. 110/2 (FINAL) which established the Advisory Group for Aeronautical Research and Development.

3. The United States Air Force was appointed Executive Agent of the Standing Group to set up and administer the affairs of AGARD. The Terms of Reference provided that the Chairman of the Group for the first year be a United States citizen.

4. The USAF, acting as Executive Agent, has appointed Dr. Theodore von Karman as Chairman of AGARD for the first year.

5. The Group is to be advisory to the Standing Group and will be composed of one or two civilian scientific representatives from each NATO country.

NO LONGER EFFECTIVE

6. Information has been received from the Chairman that he proposes to call an inaugural meeting for the 19-20-21 May 1952 in Paris.

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S.G. 110/3

- 1 -

DOCUMENT DESTRUCTION MEMO. # 101, RWC 22 SEP. 58

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CONCLUSIONS

7. The Standing Group should take steps to obtain from nations the nominations of their national representatives to AGARD, and the naming of any additional observers or delegates whom the nations may wish to attend the first meeting of AGARD. Such nominations should be made by nations direct to the Chairman of AGARD.

RECOMMENDATIONS

8. It is recommended that the memorandum at Enclosure be transmitted to all Military Representatives of NATO nations.

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ENCLOSURE

DRAFT

MEMORANDUM TO MILITARY REPRESENTATIVES OF ALL NATO NATIONS

SUBJECT: First Meeting of the Advisory Group for Aeronautical Research and Development (AGARD)

Reference: S.G. 110/2 (FINAL)

1. On 24 January 1952 the Standing Group approved the recommendation of S.G. 110/2 (FINAL) for the establishment and administration of an Advisory Group for Aeronautical Research and Development (AGARD).

2. The Standing Group accepted the offer of the United States Air Force to act as Executive Agent for the Standing Group in this undertaking and agreed to the appointment of a United States citizen as Chairman for the first year.

3. The USAF has designated Dr. Theodore von Karman as Chairman of AGARD. Information has been received from Dr von Karman that he will call an inaugural meeting of AGARD in Paris on the 19-20-21 May 1952.

4. The Standing Group therefore requests that you advise your Government of the above and, if participation is desired, that your Government take steps to appoint one or two civilian scientific representatives as members of AGARD, and directly advise the Chairman as soon as possible. (Note: In some countries the term "civilian" includes certain persons having military status who are, in fact, engaged in essentially scientific activities.)

5. It is further requested that the names of any additional delegates or observers whom your Government may wish to send to the Conference be also forwarded to the Chairman.

NATO

6. The address of the Chairman of the Advisory Group for Aeronautical Research and Development is:

Advisory Group for Aeronautical
Research & Development of NATO,
2 rue de la Faisanderie,
Paris 16, France.

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S.G. 110/4

5 February 1954

Pages 1 - 13 incl.

REPORT BY THE RESEARCH AND DEVELOPMENT COMMITTEE

and

LOGISTIC AND MATERIEL PLANNERS

to the

STANDING GROUP

on

CONTINUATION OF AGARD

References: a. S.G. 110/2 (FINAL)
b. Report on Continuation of Advisory Group for Aeronautical Research and Development - Not Found
c. SGM-1543-53 - not found

THE PROBLEM

1. Continuation of AGARD and financing of AGARD Secretariat.

FACTS BEARING ON THE PROBLEM

2. On 24 January 1952 the Standing Group approved the recommendation of S.G. 110/2 (FINAL) for the establishment and administration of AGARD.

3. The Standing Group accepted the offer of the USAF to furnish logistic support for AGARD during its two-year trial period and to act as Executive for the Standing Group in this undertaking. USAF logistic support took the form of providing for a full time secretariat with a budget as indicated in Enclosure "C" for FY 1953 and FY 1954.

4. The two-year trial period established for AGARD by S.G. 110/2 (FINAL) ends 19 May 1954. Presently available funds will support the organization through 30 June 1954.

5. After a complete review of AGARD activities since its inception, the national delegates of AGARD at the Third General

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Assembly at London, 11 September 1953, unanimously recommended to the Standing Group that the continuation of AGARD be assured. (See Enclosure "B" for list of National Delegates.)

DISCUSSION

6. OBJECTIVE - The objective of AGARD was to bring together leading aeronautical personalities in the NATO nations with a view to better utilizing the research and development personnel and facilities for the common defense of the NATO community. This objective has been achieved. The majority of the leading aeronautical personalities of the NATO nations, with particular reference to the field of basic research, have now been brought together by virtue of the three full meetings of AGARD, the various symposia, panel meetings and seminars which have been arranged. This has been of great benefit in promoting the establishment of personal contacts between key individuals and institutions, both governmental and private, with resulting quick exchange of the results of independent research within the framework of national policies for the dissemination of information.

7. COMBUSTION PANEL - There has been a stimulation of basic scientific research in key subjects by mutual discussions; as an example, AGARD's Combustion Panel has been responsible for pooling the knowledge of NATO scientists in the fields of chemistry, physics, aerodynamics, thermodynamics, and mathematics, in an effort to achieve more rapid solutions for the many problems faced by NATO designers in operating jet engines at higher altitudes and higher maximum flight speeds, with stability of combustion over a wider operating range. The country which develops jet engines capable of flying higher, faster and over wider operating conditions than those of an enemy would have a considerable military advantage.

8. WIND TUNNEL PANEL - Through its Wind Tunnel Panel, AGARD has provided mutual education and intensive exchange of scientific information, technical data and ideas concerning design and operation

of wind tunnels and aerodynamic test equipment in the various countries. Information obtained through AGARD has paved the way to considerable savings not only in facility construction and operation cost but also in design time and technical manpower. The AGARD activities in this field have brought about a much greater degree of coordination of equipment utilization and planning essential in any effort to achieve superior aerodynamic performance of military aircraft combined with economy in the NATO defense effort.

9. FLIGHT TEST PANEL - One of the important contributions of the AGARD Flight Test Panel is the preparation of a NATO Flight Test Manual. This manual is a cooperative effort of experts from different nations utilizing the best information available from their respective nations. There is nothing similar now in existence and all concerned agree to its great importance, especially as concerns the savings in flight test effort through standardization of flight test techniques.

10. AEROMEDICAL PANEL - One of the acknowledged deficiencies in the present NATO effort is that many NATO nations receive modern high performance aircraft without the benefit of modern aeromedical methods which make possible corresponding improvements in compensating for human limitations in the operation of such aircraft. The AGARD Aeromedical Panel is making a substantial contribution toward the improvement and standardization of aeromedical indoctrination and selection of NATO flying personnel which will make possible better utilization of high performance aircraft with elimination of the waste which occurs when aircraft and pilots do not match.

11. DOCUMENTATION COMMITTEE - Interchange of aeronautical information among the NATO nations is presently handicapped by wide differences in terminology and procedures between scientists. AGARD, through its Documentation Committee, is making substantial progress towards reducing these barriers to the cross-flow of research information

12. By the preparation of [illegible] the status of the progress in certain [illegible]ying the experience of all nations, a contribution has been made toward increasing the aeronautical knowledge, raising the research and development potential and eliminating unnecessary duplication of effort among the NATO nations.

13. Continued world tensions and longer term commitments of the NATO nations underline the importance of scientific mobilization, for it is under conditions of a steady NATO build-up that a joint scientific effort will be of greatest value in improving the quality of Western aeronautical weapons.

14. Upon the inauguration of AGARD, there was some question as to whether the agency could do useful work within the limitations imposed by national security policies. During the trial period AGARD has demonstrated conclusively that there are wide areas in the field of the aeronautical sciences where effective and useful work can be done without infringing on these policies.

15. The military advantages outlined above which have arisen to date from the activities of AGARD are such as to fully justify its establishment on a permanent basis. It is considered therefore that appropriate arrangements should be made for AGARD to be continued after the end of the trial period. AGARD, being a Standing Group Agency, should inform the Standing Group of its progress and should receive from the Standing Group its general guidance. It is therefore recommended that AGARD provide the Standing Group/Military Representatives Committee with a review of its activities similar to the Report cited in reference b and present the Standing Group with a general outline of its future program. This review and program should be presented every two years.

16. Since the United States agreed to furnish logistic support for the AGARD Secretariat and its activities only during the two year trial period, a decision to continue AGARD will involve the provision of this support from some other source. AGARD was included in the

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list of NATO military agencies currently receiving international financial support in Annex 3 to Council Document C-M(53)104. It is considered therefore that the Council should be invited to agree to the international funding of AGARD and to furnish its Secretariat the necessary degree of financial support from 1 July 1954. International funding would not cover the support of national delegations and their activities, nor would it exclude any voluntary contributions from participating countries. Detailed information on the funding level for the AGARD Secretariat and an organizational outline of the staff are at Enclosure "C".

CONCLUSIONS

17. It is concluded that:

a. AGARD should be activated on a permanent basis.

b. AGARD should provide the Standing Group/Military Representatives Committee with a biennial review, together with a general outline of its future program.

c. The Council should be invited to agree to the international funding of the AGARD Secretariat as a NATO agency with effect from 1 July 1954.

d. Nations hitherto participating in the activities of AGARD should be invited to confirm their participation under the new terms of reference.

RECOMMENDATIONS

18. It is recommended that the Standing Group:

a. Approve the conclusions set forth in paragraph 17 above.

b. Forward this report to the Council for decision concerning the conclusion at paragraph 17c above, under cover of the memorandum at Enclosure "D".

c. Forward this report to SACEUR, AGARD, and the Military Representatives under cover of the memorandum at Enclosure "E".

UNCLASSIFIED

NATO UNCLASSIFIED

ENCLOSURE "A"

TERMS OF REFERENCE OF THE STANDING GROUP
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
(Revision of S.G. 110/2(FINAL))

1. The Advisory Group for Aeronautical Research and Development is hereby continued with the following revised terms of reference:

a. The Group be advisory to the Standing Group and be composed of one or two civilian scientific representatives from each NATO Country. (NOTE: It is understood that in some countries the term "civilian" includes certain individuals having military status who are, in fact, engaged in essentially scientific activities.)

b. The objectives of the Group be the bringing together of leading aeronautical personalities of the NATO nations with a view to recommending effective ways to utilize their research and development personnel and facilities for the common benefit of the NATO Community. (NOTE: It is expected in most cases that action on recommendations will result either through the work of the AGARD Secretariat or through the efforts of national delegates in their own countries. Major policy questions will be passed to the Standing Group for their consideration.)

c. The Group to concentrate its activities on matters of such security classification, the free exchange of information on which is permitted by existing national security policies.

d. The Chairman of the Group be elected on an annual basis The Director of the Secretariat will be proposed by the AGARD Executive Committee and submitted for approval to the General Assembly of the national delegates.

e. The Secretariat be established in the Paris area and be internationally supported.

f. The Secretariat be held to the minimum size consistent with the work of the Group.

g. The above provisions will in no way invalidate regional or bilateral arrangements between nations for the exchange of classified information in this particular field.

BOARD MEMBERSHIP

NATIONAL DELEGATES

14 OCT 53

Alippi, General C.
Ministero della Difesa Aeronautica
Rome, Italy

Brandt-Moeller, Lt. Col. P.N.
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Gerardin, M. l'Ingenieur General J.
Chef du Departement Technique
Direction Technique et Industrielle de l'Aeronautique
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Deputy Director General
Defence Research Board and Scientific Advisor to the
Chief of Staff
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Deputy Chief of Staff/Materiel
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Principal Director of Scientific Research
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Chairman, AGARD
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Maas, Prof. Dr. Ir. H. J. van der
Chairman of the Board of the National Aeronautical
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Parkin, Mr. J. H.
Director, Mechanical Engineering Division
National Research Council of Canada
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Peres, M. le Professeur Joseph
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Roy, Monsieur Maurice
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M.S.V. Turkish Air Force
Hava Kuvvetleri Komutanligi
ATTN: Unsal, Major Huseyin
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M.S.V. Turkish Air Force
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ATTN: Ulug, Lt. Col. Fuat
Ankara, Turkey

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ENCLOSURE "C"

SCALE OF SUPPORT FURNISHED BY USAF

1. The USAF has furnished the following general level of logisti: support during FY 53 and has budgeted for FY 54 as indicated:

		FY 1953	FY 1954
a.	Civilian personnel services	$ 49,699	$ 98,000
b.	Travel	50,000	50,000
c.	Rents, utilities and communications services	7,000	8,000
d.	Technical surveys and other contractual services	75,486	50,946
e.	Supplies, materials and equipment	2,000	3,000
f.	Taxes and assessments	88	54
		$184,273	$210,000

2. The total sum reflected above for Fiscal Year 1953 represents the actual amount of funds used for AGARD activities.

3. The Fiscal Year 1954 funding program provides for a permanent civilian secretariat of ten (10) persons of whom four (4) are professional types. Provision has been made in item a above for the pay of consultants as required*. The pay and allowances for the four (4) military members are excluded from the AGARD funding program since these costs are borne by the Department of the Air Force. Item b above includes the temporary duty travel costs of the consultants and some U. S. panel members as well as the assigned military personnel and the civilian secretariat.

4. AGARD also receives certain indirect support from this Headquarters, the Air Research and Development Command and United States Air Forces in Europe, such as the use of special mission aircraft, et cetera, the cost of which is not directly identifiable and is not included in the above funding programs.

* Approximately 600 man days of consultants at average of $40/day.

5. The personnel organization of the AGARD Secretariat is as follows:

1 - DIRECTOR	P-9	Responsible for the overall management of Secretariat affairs.
1 - ASSOCIATE DIRECTOR	GS-15	Assists the Director with overall management and coordination of panel activities.
4 - PANEL EXECUTIVES		(Wind Tunnel, Flight Test, Combustion, and Aeromedicine) 2 in the grade of Colonel and 2 in the grade of Major. They are responsible for running the day-to-day activities of their particular panels.
1 - COMMITTEE EXECUTIVE		W.A.E. (When actually employed) expert in charge of running the day-to-day activities of the Documentation Committee.
1 - DIRECTOR OF FOREIGN EXCHANGE PROGRAM	FSB-14	Organizes and manages the AGARD foreign exchange program in personnel, equipment, and information.
1 - ADMINISTRATIVE OFFICER	GS-9	Handles administrative matters within the Secretariat
1 - SECRETARY	GS-6	
4 - SECRETARIES and translators at average level of FSB-5.		

Enclosure "C"

UNCLASSIFIED COPY NO. _____

ENCLOSURE "D"

NORTH ATLANTIC MILITARY COMMITTEE

COMITE MILITAIRE DE L'ATLANTIQUE NORD

Standing Group Groupe Permanent

SGM- -54

MEMORANDUM FOR THE SECRETARY GENERAL, NORTH ATLANTIC TREATY ORGANIZATION

SUBJECT: Activation on a Permanent Basis and Financing of Advisory Group for Aeronautical Research and Development (AGARD)

1. On 1954 the Standing Group approved the recommendations of S.G. , copies of which are forwarded herewith.

2. AGARD was included in the list of NATO military agencies eligible for full international financial support in Annex B to Council document C-M(53)104. The Standing Group invites the Council to agree to the international funding of the AGARD Secretariat with effect from 1 July 1954 on a similar basis to other existing Standing Group agencies. This international funding would not cover the support of national delegates and their activities, nor would it exclude any voluntary contributions from the participating nations. Details of the staff and funding arrangements are at Enclosure "C"

3. The Standing Group assumes that the Council will delegate to the Military Budget Committee the responsibility for the detailed financial screening and procedures involved and will wish SACEUR to assist AGARD in the preparation of its budget. Standing Group has therefore requested AGARD and SACEUR to be prepared to discuss financial details at an early date with the Military Budget Committee.

FOR THE STANDING GROUP:

Copies to: Military Representatives
SGLO
SACEUR
AGARD

DIST:

UNCLASSIFIED - 13 - Enclosure "D"

UNCLASSIFIED COPY NO. ____

ENCLOSURE "E"

NORTH ATLANTIC MILITARY COMMITTEE

COMITE MILITAIRE DE L'ATLANTIQUE NORD

Standing Group Groupe Permanent

SGM- -54

MEMORANDUM FOR THE MILITARY REPRESENTATIVES
SUPREME ALLIED COMMANDER EUROPE
ADVISORY GROUP FOR AERONAUTICAL RESEARCH
AND DEVELOPMENT

SUBJECT: Continuation and International Financing of Advisory Group for Aeronautical Research and Development (AGARD)

1. On 1954 the Standing Group approved S.G. copies of which are enclosed herewith.

2. The Standing Group has invited the Council to agree to finance the AGARD Secretariat from NATO funds, with effect from 1 July 1954.

3. The Military Representatives are invited to confirm the participation of their nations in AGARD under the new terms of reference.

4. SACEUR is requested to furnish such assistance to AGARD in the finance and budgetary sphere as he now furnishes to other Standing Group agencies in the Paris area. To this end, SACEUR, together with AGARD, should be prepared for immediate discussion on the financial aspects with the designated representatives of the Council.

FOR THE STANDING GROUP:

Copy to SGLO

DIST:

ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD
NORTH ATLANTIC TREATY ORGANIZATION

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT

AGARD SECRETARIAT
Palais de Chaillot
Paris XVI^e, France

UNCLASSIFIED

ENCLOSURE

DRAFT OF STANDING GROUP MESSAGE

to

FOURTH GENERAL ASSEMBLY

of

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT (AGARD)

1. It is a great pleasure for me to be here today and to carry a message from the Standing Group to this Fourth General Assembly of AGARD. The Standing Group has watched the progress of AGARD with great interest, and with hope that this effort towards greater cooperation in a supremely important technical field would provide another solid building block in the structure of our mutual solidarity.

2. I say the Standing Group has watched "with hope" advisedly, for the Standing Group has relied in great measure on the wisdom of the AGARD national delegates and their Chairman to chart a practical and useful course through these technical seas. The progress which has been made, therefore, has been due to your own efforts.

3. This effort is based on the concept that one of the fundamental strengths of free peoples lies in their ability to achieve a rapid rate of technical progress through the interchange of new ideas.

4. The Standing Group has had occasion recently to review all of the AGARD activities. Its opinion of these activities and of the contributions which AGARD has made toward improving the mutual defense are summed up in the conclusions to the Standing Group study on this matter. Two of these conclusions which will be of interest to everyone here are as follows: (1) AGARD should be activated on a permanent basis; (2) the Council of the North Atlantic Treaty

Organization should be invited to agree to the international funding of the AGARD Secretariat as a NATO agency with effect of 1 July 1954.

5. Now that the decision to place AGARD on a permanent basis has been taken, it becomes possible to plan further ahead and undertake longer term projects rather than being restricted essentially to short term operations because of the rigid time factor originally imposed by the two year trial period.

6. In the research and development field, two years is a short time in which to achieve worthwhile results. AGARD is to be congratulated that even working within this severe time limitation and working under the inherent difficulties involved in any international undertaking, she has still achieved such substantial progress that the participating nations have been unanimous in their desire to see the organization continued.

7. The Standing Group feels that great credit is due to the Chairman of AGARD, Doctor von Karman, a great scientist and leader in the aerodynamic field, known as well abroad as in his own country, for his wise leadership and his inspiration in these first two difficult years.

8. Now that AGARD is to be financed on an international basis, the Standing Group wishes to place on record their appreciation of the contribution made by the United States Air Force in providing logistic support for the Secretariat during the initial trial period. There is no question but that the undertaking of this support by one of the Services of the participating countries, acting as executive agent for the Standing Group, has clearly accelerated the development of this cooperative effort and has provided a basic continuity during the formative period.

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9. Aside from the international funding, which will provide a measure of support to the AGARD organization, nations have indicated their willingness to make certain voluntary contributions over and above their share of the international funding. The Standing Group is happy to see this expression of interest in the AGARD work which will permit a fuller and more rapid development of the whole operation.

10. The Standing Group shares with all of the representatives assembled here a belief in the future potential of AGARD to bolster NATO defense in the air. The clear importance of this mission needs no elaboration. I wish, on behalf of the Standing Group, to extend to all delegates and to the nations they represent, deepest thanks for their efforts in the interests of AGARD, and my conviction that the Fourth General Assembly will be a very great success.

The “Three Wise Men”: Halvard Lange, Foreign Minister of Norway (left),
Gaetano Martino, Foreign Minister of Italy (centre) and Lester B. Pearson, Foreign Minister of Canada (right).

IV. SCIENTIFIC AND TECHNICAL CO-OPERATION

67. One area of special importance to the Atlantic Community is that of science and technology. During the last decade, it has become ever clearer that progress in this field can be decisive in determining the security of nations and their position in world affairs. Such progress is also vital if the Western world is to play its proper rôle in relation to economically underdeveloped areas.

68. Within the general field of science and technology, there is an especially urgent need to improve the quality and to increase the supply of scientists, engineers and technicians. Responsibility for recruitment, training and utilisation of scientific and technical personnel is primarily a national rather than an international matter. Nor is it a responsibility solely of national governments. In the member countries with federal systems, state and provincial governments play the major part, and many of the universities and institutes of higher learning in the Atlantic area are independent institutions free from detailed control by governments. At the same time, properly designed measures of international co-operation could stimulate individual member countries to adopt more positive policies and, in some cases, help guide them in the most constructive directions.

69. Certain activities in this connection are already being carried out by other organizations. Progress in this field, however, is so crucial to the future of the Atlantic Community that NATO members should ensure that every possibility of fruitful co-operation is examined. As a first concrete step, therefore, it is recommended that a conference be convened composed of one or at the most two outstanding authorities, private or governmental, from each country in order:

(a) to exchange information and views concerning the most urgent problems in the recruitment, training and utilisation of scientists, engineers and technicians, and the best means, both long-term and short-term, of solving those problems;

(b) to foster closer relations among the participants with a view to continued interchange of experience and stimulation of constructive work in member countries; and

(c) to propose specific measures for future international co-operation in this field, through NATO or other international organizations.

Extract of report of the "Three Wise Men"

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

NATO UNCLASSIFIED
and
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EXEMPLAIRE / COPY N° 377

ORIGINAL: ENGLISH
26th November, 1956

NATO ~~CONFIDENTIAL~~
DOCUMENT
C-M(56)128

RECRUITMENT AND TRAINING OF SCIENTISTS, ENGINEERS AND TECHNICIANS IN NATO COUNTRIES AND THE SOVIET UNION

Report by Robert Major, Consultant to the Committee of Three

I. INTRODUCTION

1. During the last decades it has become ever clearer that in modern society science and technology and their application provide the way to industrial growth and a higher standard of living. They are factors of rapidly growing importance for economic and military strength.

2. The rôle of science and its application for military purposes was clearly demonstrated during the last world war, and during the last decade its growing impact on all aspects of modern life has been evident. There can be no doubt that the rôle of science and technology will be even more significant in the coming years which are now so often referred to as "the atomic age" or the years of "the second industrial revolution".

3. There should thus be every reason for nations to study how science and technology can best be stimulated and how results achieved can be used in the life of the nation to increase production and improve economic, and thereby also political, as well as military strength.

4. Much has been done in this field in the Western world. However, it has now become evident that many of the steps which have been taken have been of a too short-term character. The fundamental and long-term task of building up the educational systems so that the future needs for scientists, engineers and technicians can be met, has not been taken seriously enough in all countries. The shortcomings in this field have been clearly illustrated recently through the publication of the book "Soviet Professional Manpower", a thorough study of the whole educational system of the USSR. The education of scientists and engineers in the Soviet Union has advanced rapidly since the war, and in 1955 they educated as many students in this field as all NATO countries combined. And the rate of increase is higher in the Soviet Union than in the NATO countries.

5. Whether leadership in science and technology is allowed to shift from West to East will depend upon whether the Western countries are able to meet this challenge. This has lately become clear to more and more individuals, but it has probably not yet sunk into the minds of all persons having immediate influence on developments in NATO countries.

II. THE SITUATION IN NATO COUNTRIES AND THE USSR

A. NATO Countries

6. It is difficult to give a brief and at the same time complete picture of the education of scientists, engineers and technicians in NATO countries, as conditions vary so much from country to country. However, in Table 1, a survey of the numbers of scientists and engineers educated in NATO countries in 1955 is given. This is based on information collected by the OEEC. It should be noted that the figures are not absolutely consistent as the degrees are not all exactly the same in quality.

7. In Table 1 and in this report as a whole the term scientist is used for a person trained at a University in the basic science subjects, having at least a Bachelor's or equivalent degree. The term engineer is used for a person having at least a Bachelor's or equivalent degree in applied science from a University or an Institute of Technology (f.i. Grandes Ecoles, Technische Hochschulen or equivalent institutions).

8. From Table 1 it will be seen that in NATO countries, in 1955, there were educated approximately 35,600 scientists and 39,300 engineers making a total of approximately 74,900. One striking feature is that the number educated per capita varies by as much as a factor of more than 10 from the country with the highest education per capita to the country with the lowest (i.e. from USA to Turkey).

9. Compared with 1938, the annual number of the above-mentioned degrees has been increased by from 150 to 250% in member countries. Even this increase has, however, not been enough to meet the rapidly growing demand and in most countries there is today a definite shortage in most branches. This shortage is strongest in the highly industrialised countries like the USA, Canada, England, etc., and less severe in other countries. In Germany, where conditions have been somewhat extraordinary since the war, there is also a shortage in most branches and specifically in semi-professional manpower. Italy and Greece are the only countries reporting a surplus of this type of personnel. This surplus is greater for scientists than for engineers.

10. The reasons for the shortages are partly lack of training facilities and partly lack of recruitment of new students. In the USA, the recruitment problem has been dominant. In this country where the education of scientists and engineers - thanks to the GI Bill - reached a peak in 1950, the output decreased by about 50% until 1954, but is now picking up again. In most other countries there are difficulties both with teaching facilities and the recruitment of students. One of the main reasons for the difficult recruitment situation is the lack of science teachers. Research and industry have attracted such a great proportion of this personnel that it has been impossible to fill vacancies for teachers specifically in the Secondary Schools, and this has had a serious repercussion on the recruitment of students for science and engineering.

11. It has so far been impossible to get an overall view of the output of technicians in the various countries. In this field the training follows patterns which are so different that figures might also be very misleading. Technicians seem, however, to be in short supply in all the heavy industrialised countries, and these deficits seem to follow the shortage of engineers.

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TABLE 1

EDUCATION OF SCIENTISTS AND ENGINEERS IN NATO COUNTRIES IN 1955

Figures give number of persons taking Bachelor's or approximately equivalent degree in pure science (scientists) and in applied technological sciences (engineers) in 1955.

Because of the variation in the qualities of degrees the figures must be considered as approximations only.

Country	Population in thousands	Number of Degrees			Total No. of Degrees per Mill. inhab.
		Scientists	Engineers	Total	
Belgium	8.800	282	411	693	79
Denmark(1)	4.380	58	433	491	112
France	43.000	1.614	4.158	5.772	134
Germany	47.700	1.705	3.269	4.974	104
Greece(1)	8.220	270	305	575	70
Iceland	150	?	?	?	-
Italy	47.220	2.320	2.320	4.640	98
Luxembourg	300	?	?	?	-
Netherlands(1)	10.550	434	681	1.115	106
Norway	3.370	82	428	510	151
Portugal	8.060	?	?	?	-
Turkey(1)	23.200	124	448	572	25
United Kingdom	50.950	5.096	2.986	8.082	159
NATO Europe(2)	247.390	11.849	14.985	26.834	
NATO Europe	255.900	12.000	15.200	27.200	106
Canada	15.000	753	1.505	2.258	151
USA	161.100	22.866	22.589	45.455	282
NATO North America	176.100	23.619	24.094	47.713	271
TOTAL NATO	432.000	35.619	39.294	74.913	173

(1) Figures for 1953.

(2) Excluding Iceland, Luxembourg and Portugal.

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12. As pointed out, the shortage of scientists and engineers is most severe in the most industrialised countries which, at the same time, are the countries with the highest education per capita. This shows that in countries undergoing a rapid industrialisation, long-term steps to build out the educational facilities and to stimulate recruitment have on the whole been taken too late.

B. USSR

13. A comprehensive study of the educational system in the USSR, called "Soviet Professional Manpower", written by Mr. Nicholas DeWitt, and sponsored by the National Academy of Sciences and the National Science Foundation in Washington, was published in 1955. This study provides an up-to-date account of the organization, the functioning and the size of the Russian educational system.

14. During the last 25 years it has been a firm policy of the USSR to build out the educational system of the country. During these years the enrolment in primary and secondary schools has increased from about 10 to 30 millions, and in the higher educational establishments from approximately 180,000 to nearly 1,900,000. More than 5 per cent of the gross national product are being used for the needs of education, and in 1953 approximately 40 per cent of the university or equivalent degrees were in the field of education. A great part of the students are ploughed back into teaching positions, thus making the rapid growth of the educational system possible.

15. The Russian educational system is claimed to be a system for the masses, but is, in effect, quite selective. A hard competition prevails at all levels. Of pupils entering the primary and secondary schools only 20% succeed in graduating. Of these approximately 30% get access to higher education of whom only 60% succeed in graduating.

16. The recruitment of students does not seem to create problems. This is, no doubt, partly due to the considerable incentives for students specifically in the fields of science and engineering. All education is tuition-free, and in addition there is an elaborate system of living-allowance scholarships for the successful students. The size of scholarships depends upon the achievements of the student and also upon the field of study. Scholarships for studies within the fields of science and engineering are thus higher than in other branches, and students in these fields can expect positions with high salaries and prestige. In 1953, as much as 38% of all university or equivalent degrees were taken by scientists and engineers.

17. The education of scientists and engineers has increased considerably during the last years, and is at present as follows:

Year	Engineers	Scientists
1954	53,000	12,000
1955	60,000	approx.15,000
1956	70,000	?

18. A characteristic Soviet feature is the high percentage of women taking professional degrees. This percentage increased during the thirties, and in 1938 the proportion of women among students in all fields was 43%. This percentage has later increased and was in 1954 approximately 50%. The percentage of women is highest in the fields of education and health. In 1938

the percentage of women studying engineering was 28%, and in 1940 approximately 20% of all engineers were women.

19. Great emphasis is given to the education of techniciens. A complete picture of the situation in this field cannot be given, but it can be mentioned that in 1953 approximately 70,000 semi-professional engineers completed a 4-years' education from the so-called "technicums". Judging from the enrolment in the "technicums", this figure should increase considerably in the following years.

20. While the information on the quantitative trends in Soviet education is considered to be fairly accurate, it is more difficult to give any precise judgment of the quality of the graduates. However, the quality of the training has been improved considerably during the years, and, judging from the information available, there should not be any reason to believe that their training is inferior to that of most NATO countries.

21. In the figures given personnel from the USSR only has been included. Recent reports show that also in the Russian satellite countries like Poland and Czechoslovakia the technological education is under rapid development, and a great number of engineers are being educated every year.

C. Comparison between NATO countries and the USSR

22. In Table 2 approximate figures have been given for the total number of persons who took a Bachelor or equivalent degree in science or technology in NATO countries and the USSR in 1955. When studying the figures it must be kept in mind that they do not necessarily give a completely true picture, partly because the degrees compared will not all be of exactly the same value and partly because the number of students taking post-graduate studies in the various countries has not been taken into account. Nevertheless the figures are considered to give a reasonably good basis for comparison.

TABLE 2

	Population (Mill.)	Scientists	Engineers	Total
NATO Europe	255.9	12.000 (47)	15.200 (59)	27.200 (106)
NATO North America	176.1	23.600 (134)	24.100 (137)	47.700 (271)
TOTAL NATO	432	35.600 (82)	39.300 (91)	74.900 (173)
USSR	200	15.000 (75)	60.000 (300)	75.000 (375)

The figures in brackets are numbers of degrees per million inhabitants.

23. As will be seen the total number of scientists and engineers was in 1955 approximately the same in the USSR as in all NATO countries together. This means that the number educated

per capita is more than twice as high in the USSR as in NATO countries and more than three times as high as in NATO Europe.

This is even more serious when it is taken into account that the increase in degrees in the Soviet Union in the coming years is expected to be considerably higher than in the NATO countries.

24. It will further be noticed that whereas in NATO countries the number of engineers educated was only slightly higher than the number of scientists, the number of engineers in the USSR was four times as high as the number of scientists. In this connection it is of interest to notice that in Moscow there has been established a Central Translating Service, employing approximately 1,300 people, translating and distributing scientific publications from the Western countries. This highly organized service keeps the Soviet scientists quickly and well informed about new discoveries in the West, which can be exploited in their own country.

25. Information is not available to allow a comparison of the total numbers of scientists and engineers available in the NATO countries. In Table 3, however, some figures have been given for the USA and the USSR.

TABLE 3

		USA	USSR
1956	Total number of		
	Scientists	250.000	180.000
	Engineers	650.000	535.000
Between 1956 and 1960			
	Estimated to graduate		
	Scientists	85.000	125.000
	Engineers	143.000	420.000
1960	Estimated total number of		
	Scientists	320.000	260.000
	Engineers	750.000	805.000

Source of estimates:

For USA: Dr. Hower Meyerhoff, Director, Scientific Manpower Commission.

For USSR: Mr. Nicholas DeWitt, Russian Research Centre, Harvard University.

As will be seen the USA still has a greater number both of scientists and engineers than the USSR, but with the expected strong increase in graduates in the USSR the total number of scientists

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and engineers can be expected to compare fairly equally in 1960.

III. POSSIBLE MEASURES TO BE TAKEN BY NATO

26. The information given above should leave no doubt as to whether the strengthening of recruitment and training of scientists, engineers and technicians in member countries should be a NATO interest. Strength in this field constitutes one of the fundamental factors for economic growth, and thereby also political influence of member countries, and will play an increasing rôle for achieving military security. Therefore, to be discussed here, is what NATO as such can do in this field.

27. When considering possible NATO action it must be borne in mind that the recruitment and training of the personnel in question is mostly a national responsibility, and improvements must, on the whole, be made at national levels. Even within individual countries responsibility in this field is considerably decentralised. In countries having a federal system, the individual states or provinces play an important part, and in many countries universities or institutions of higher learning are independent institutions free of detailed government control.

28. It should also be taken into consideration that the situation in this field both with regard to needs and education of personnel is very different in member countries, and it would be impossible to suggest a common course which would be applicable for all members.

29. Keeping the above-mentioned factors in mind it seems that NATO or other international action in this field mainly should aim at stimulating activities in member countries.

30. NATO action should also be co-ordinated with the work already started by the OEEC. The OEEC has compiled information on shortages and surpluses of highly qualified scientists and engineers in member and associate countries in 1953 (published in 1955) and undertakes at present a similar study based on information for 1955. A symposium to study these questions was held in Vienna in October 1956. So far the need for action in this field, however, has not been considered at any OEEC Ministerial Meeting.

As the OEEC has collected information also from its associate member countries all NATO countries are included in the investigations which have been made.

31. The need for scientific and technological personnel would in the OEEC be evaluated mainly from its bearing on the economy of the Western countries. As the interests of NATO will in addition include the political and military aspects of the question, it is not considered that an evaluation of the situation in this field in both organizations would represent any unwanted duplication.

32. Taking all the above-mentioned factors into account it is recommended that NATO:

(a) make an annual appraisal of the situation with regard to the recruitment and training of scientists and engineers in member countries. This could probably be based mainly on data collected by the OEEC;

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(b) give recommendations to member countries for steps to be taken in this field which would serve the common course of the Alliance;

(c) at certain intervals arrange meetings of one or two recognised authorities from each member country to

(i) exchange information and experiences in the field and thereby stimulate activities,

(ii) discuss and suggest possible NATO action to be taken.

33. Of special short-termed matters which might help member countries to make better use of the personnel available and which call for an immediate study can be mentioned:

(a) the establishment of a Western joint service for translation and distribution of Soviet scientific publications;

(b) the proper use of scientific and technological personnel during their military service.

It should, however, be recognised that it is the fundamental and more long-termed questions regarding recruitment and training which really call for a study. Without such studies and following action in the individual countries we shall not be able to meet the challenge from the East.

Palais de Chaillot,
Paris, XVIe.

ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD
NORTH ATLANTIC TREATY ORGANIZATION

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NATO UNCLASSIFIED
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PALAIS DE CHAILLOT
PARIS-XVI
Tél. : KLEber 50-20

ORIGINAL: ENGLISH

NATO UNCLASSIFIED
RDC/57/409

To: Secretaries of Delegations

From: Executive Secretary

PROVISION OF SCIENTIFIC AND TECHNICAL PERSONNEL

The Secretary General has received the attached letter from the Executive Secretary of the NATO Parliamentarians Conference together with the Report by the Committee on the Provision of Scientific and Technical Personnel of the NATO Countries, the Chairman of which was Senator Henry M. Jackson, and the Resolution adopted on this matter by the Parliamentarians Conference.

(Signed) COLERIDGE

18th November, 1957

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 1957/Gen/Eng/55

NATO PARLIAMENTARIANS' CONFERENCE

(Conference of Members of Parliament from the NATO Countries)

THIRD ANNUAL CONFERENCE

NATO Headquarters
Palais de Chaillot, Paris XVI
11th-16th November 1957

SPEECH BY SENATOR HENRY M. JACKSON

CHAIRMAN OF THE COMMITTEE
ON THE
PROVISION OF SCIENTIFIC AND TECHNICAL PERSONNEL
IN THE NATO COUNTRIES

/1957 Con./Doc.8B/

SPEECH BY SENATOR HENRY M. JACKSON (U.S.A.)
Chairman of the Committee on the Provision of Scientific and Technical Personnel in the NATO Countries

NATO IN THE SCIENTIFIC AGE

The North Atlantic Treaty Organization is now eight years old. When NATO was born, the fortunes of our community were at ebbtide. The wounds of military strife had not yet healed. Post-war economic recovery was just beginning. Our community faced collapse from within. And from without, totalitarian systems confronted us with massive danger.

Then we closed ranks in NATO. We proved that, in the affairs of nations, the whole is greater than the sum of its parts.

To-day, seven years later, the miracle of our community's economic and social recovery is here for all to see. Side by side with this, our military defences have become formidable.

But a community of nations cannot stand in one place. It goes forward, or it inevitably goes backward. Each new year brings new problems and new challenges - requiring new solutions. Programmes adequate for yesterday become inadequate for to-day and tomorrow.

The symbol of the newest challenge to NATO is of course the Sputniks.

Let us state plain facts plainly: The Sputniks represent a monumental scientific and technical achievement. Although they have no direct military significance in themselves, they are an ominous symbol of the Soviet Union's growing scientific and military might. They are a sober reminder that, in certain areas of missile development, the Soviets now lead our own community.

Before Sputnik, too many imagined that the job of maintaining Atlantic community leadership could be done on a part-time basis. Too many imagined that the scientific and industrial supremacy of our community could never seriously be threatened.

We can no longer entertain such illusions. It should now be clear that we are in an all-out competition. This contest will not be decided by what we have done in the past; it will be decided by what we do in the future.

Acknowledging these elementary truths is one thing; a needless sense of defeatism is a completely different thing. If - and this is a vital if - if we exploit our true advantages, the years ahead can bring peace and unparalleled prosperity to the one- third billion people those of us assembled here to-day represent.

What is this "if" ? It is simply this: Our community will be first in military strength, and first in economic prosperity, only if it is first in science.

Our twentieth century world is now passing through a scientific revolution. Useful atomic power, automation, and the thousand and one other practical applications of these discoveries of the last century have brought our world, and our Atlantic community, to the threshold of an age of new abundance. At the same time, this scientific revolution has transformed the nature of warfare. Our community must now be able to defend itself against nuclear bombs carried by ballistic missiles.

A century ago, both military strength and economic wealth depended primarily on raw manpower and raw materials. Big armies and abundant natural resources represented an unbeatable combination.

But to-day this is not so. The discovery of a single scientific genius can contribute more to man's prosperity than the discovery of some vast new body of iron ore. And likewise, the discovery of one genius can upset the military balance of power.

To-day, the balance of economic and military power depends on the balance of scientific brain power.

Herein lies our community's peril - and its great opportunity.

SCIENCE & THE ALLIANCE

On 4 October 1957, the Soviet Union successfully launched Sputnik 1, the first artificial Earth satellite.
In the shadow of this spectacular Soviet technological achievement, the North Atlantic Council met at the level of Heads of Government
for the first time in December 1957, where the establishment of a NATO Science Committee
and the position of a Science Adviser to the Secretary General was formally announced.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

EXEMPLAIRE / COPY N° 179

ORIGINAL: ENGLISH
11th February, 1958

~~NATO CONFIDENTIAL~~
DOCUMENT AC/137-D/1

DN(58)10

NATO UNCLASSIFIED

SCIENCE COMMITTEE

DECISIONS REACHED AT THE MINISTERIAL MEETING IN DECEMBER 1957 AND TERMS OF REFERENCE FOR THE COMMITTEE APPROVED BY THE COUNCIL

Note by the Executive Secretary

Ministerial Communiqué

1. The communiqué issued by the Ministerial Session of the North Atlantic Council in December 1957 referred to scientific and technical co-operation in the following terms:

"Scientific and Technical Co-operation:

-25.- We recognise that in most of our countries more should be done to increase the supply of trained men in many branches of science and technology. The full development of our science and technology is essential to the culture, to the economy and to the political and military strength of the Atlantic Community.

-26.- We realise that progress will depend on vigorous action within individual states and in particular on the devoted contribution of teachers and scientists. We must increase the provision for the training of young people in scientific and technical subjects and must also ensure that the free pursuit of fundamental research continues to flourish. Each of our governments will therefore re-appraise the support being given to scientific and technical education and to fundamental research.

-27.- We seek to increase the effectiveness of national efforts through the pooling of scientific facilities and information and the sharing of tasks. We must build on the established tradition of the universality of true science. Our governments will support the international organizations doing work in this field.

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-28.- We have decided to establish forthwith a Science Committee on which all of the NATO countries will be represented by men highly qualified to speak authoritatively on scientific policy. In addition, a scientist of outstanding qualifications will be appointed as Science Adviser to the Secretary General of NATO.

-29.- The Science Committee will be responsible in particular for making specific recommendations to the Council for action on a proposal by the French Government for a Western Foundation for Scientific Research and on the many other valuable proposals which have been put forward by the NATO Task Force on Scientific and Technical Cooperation and by the NATO Parliamentarians Conference."

Terms of reference:

2. At its meeting of 29th January 1958 (1), the North Atlantic Council:

"(1) approved provisional terms of reference of the Science Committee," (Annex)

"(2) agreed that appropriate qualified military representation should be provided as deemed necessary by the Committee, it being understood that military representatives would, as a general rule, attend meetings as observers."

"(3) invited those delegations who had not already nominated their representatives on the Science Committee to supply names to the Secretary General as soon as possible."

(Signed) COLERIDGE

Palais de Chaillot,
Paris, XVIe.

(1) C-R(58)6

~~NATO CONFIDENTIAL~~
ANNEX to
AC/137-D/1

SCIENCE COMMITTEE

PROVISIONAL TERMS OF REFERENCE

Bearing in mind that NATO has an important role in the promotion of effective action - wherever possible through existing organizations - to increase the supply and improve the quality of scientific manpower and to ensure the optimum utilisation of this critical resource and of scientific facilities in all fields, including that of defence research, through co-operative measures where appropriate, as well as to increase the exchange of information on scientific research, we have agreed to establish a Science Committee. We have also agreed to approve provisionally the following terms of reference for the Science Committee, it being recognised that the Committee should be free to suggest to the Council amendments to these terms of reference, should they deem fit.

2. The Committee will:

(a) advise the Council on problems of science and technology of concern to the NATO Alliance.

(b) propose to the Council recommendations concerning:

(i) steps which member countries might take to strengthen the scientific and technical resources available to NATO;

(ii) direct action by NATO itself designed to initiate or improve co-operative activities between member countries;

(iii) support which NATO might give to other organizations whose efforts are of particular concern to the members of the Alliance;

(c) set up such ad hoc working groups or other bodies as may be required to formulate proposals for action in relation to specific scientific and technical problems;

(d) review periodically the operation of any co-operative scientific and technical institutions set up under NATO auspices;

(e) review at suitable intervals the scientific and technical progress of member countries insofar as it bears on problems of general concern to NATO, and in particular with respect to:

~~NATO CONFIDENTIAL~~
ANNEX to
AC/137-D/1

(i) measures agreed to by Council;

(ii) action under NATO auspices to improve scientific co-operation and exchange;

(iii) action in connection with programmes of other agencies which are of particular concern to NATO;

(f) maintain liaison with other agencies fostering international scientific and technical co-operation.

3. NATO countries will be represented on the Science Committee by men highly qualified to speak authoritatively on scientific policy. Appropriately qualified NATO military representation will be provided as necessary. The Committee shall meet not less than twice a year and more frequently at the discretion of the Secretary General.

4. The Committee will, as decided at the December Ministerial Meeting, be responsible in particular for making specific recommendations to the Council for action on the proposals referred to in paragraph 29 of the communiqué of the Meeting.

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OTAN — NATO

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PRESS RELEASE (58)2

For immediate release
February [illegible], 1958

THE APPOINTMENT OF THE NATO SCIENTIFIC ADVISER

Following the decision taken by the Heads of Governments in December, 1957, Professor Norman F. RAMSEY, Professor of Physics at Harvard University and a member of the US Department of Defense Advisory Panel on Atomic Energy, has been appointed Scientific Adviser to the Secretary General of the North Atlantic Treaty Organisation.

Professor Ramsey, who is 42 years old, studied at Columbia University in New York City and at Cambridge University in England. During the Second World War, Professor Ramsey led the group which developed magnetron radar transmitters at the Massachusetts Institute of Technology, and later returned to Columbia University to conduct research on the heavy hydrogen nucleus. He helped to establish the famous Brookhaven Laboratory for nuclear research and served as the first Chairman of its Physics Department.

In 1947, he became Professor of physics at Harvard University where he developed a new method of studying beams of atoms and molecules. At present, he is studying the forces between polarized protons by the scattering of high energy, and the structure of heavier atomic nuclei and molecules.

Professor Ramsey is a fellow of the American Academy of Arts and Sciences, and the American National Academy, and a member of the governing Council of the American Physical Society. He is the author of three books and of numerous scientific articles in the Physical Review and other scientific journals. In 1954, he was appointed a Guggenheim fellow at Oxford University.

19.1.58

DR. NORMAN FOSTER RAMSEY, JR.

Dr. Ramsey is currently a Professor in the Physics Department, Harvard University. He was born in Washington, D.C. on August 27, 1915. He received his A.B. at Columbia, 1935; his B.A. in 1937 and an M.A. in 1941 from Cambridge University, England; Ph.D from Columbia, 1940. He received an honorary M.A. from Harvard in 1947 and a Doctor of Science from Cambridge University, England, in 1954. Dr. Ramsey was a Kellett Fellow at Columbia, 1935-37; a Tyndall Fellow, 1938-39; a Carnegie Fellow at the Carnegie Institute of Washington, 1939-40. He was Associate Professor of Physics at the University of Illinois, 1940-42, Assistant Professor at Columbia University, 1942-46. Dr. Ramsey served as Research Associate at the Massachusetts Institute of Technology Radiation Laboratory, 1940-43, served as consultant to the National Defense Research Committee, 1940-45 and as expert consultant to the United States Secretary of War, 1942-45. He was Group Leader and Associate Division Head, Los Alamos Laboratory of the Atomic Energy Project, 1943-45. Dr. Ramsey was Associate Professor at Columbia University, 1945-47 and Head of the Physics Department of the Brookhaven National Laboratory of the Atomic Energy Commission, 1946-47. He was Associate Professor of Physics at Harvard, 1947-50 and became Professor during 1950. During this period he served as Director of the Harvard nuclear laboratory, 1948-50 and from 1952 to the present.

Dr. Ramsey has been a member of the Air Force's Scientific Advisory Committee from 1947 to the present and a member of the Department of Defense panel on atomic energy. Dr. Ramsey was also a Guggenheim Fellow at Oxford University, 1954-55.

He is trustee, Associated Universities, Inc., Brookhaven National Laboratory, and has received the Presidential Order of Merit for radar development work in 1947.

Dr. Ramsey is a member of the following professional societies: American Academy of Sciences, the American Physical Society, the New York Academy of Sciences, the National Academy of Sciences, Sigma Xi and Phi Beta Kappa.

He is the author of 'Nuclear Moments and Statistics', 1953, and 'Nuclear Two-Body Problems', 1953. He also has contributed numerous articles to the 'Physical Review' and other scientific journals on nuclear physics, molecular beam experiments, radar, nuclear magnetic moments, radio frequency spectroscopy, neutron scattering, diamagnetism, molecular structure, etc.

Dr. Ramsey is married and has four children.

SCIENCE & THE ALLIANCE

OTAN — NATO

DIVISION DE L'INFORMATION — INFORMATION DIVISION

PALAIS DE CHAILLOT PARIS XVI — TÉLÉPHONE : KLÉBER 60-20

Press Release (58)6

Not to be released
before 12 noon
Sunday 23rd March, 1958

THE ATLANTIC ALLIANCE SCIENCE COMMITTEE

It will be recalled that at their meeting in December, 1957, the Heads of the Governments of the countries of the Atlantic Alliance recognised that in most of their countries more should be done to increase the supply of trained men in all branches of science and technology, and that a fuller development of science and technology was essential. In order to give effect to these aims, the Heads of Governments decided to create a Science Committee.

This Committee, the composition of which has now been completed, will hold its first meeting, under the chairmanship of Dr. Ramsey, Science Adviser to the Secretary General, at the Palais de Chaillot on March 26th, 27th, 28th and 29th, 1958. Its principal tasks will be to make recommendations to the North Atlantic Council on all problems of science and technology of concern to the Alliance, and on the steps which member countries might take to increase the supply of scientists and strengthen and co-ordinate the scientific and technical resources of NATO. It will meet periodically to review progress realised in carrying out its recommendations.

The following is the list of the names of the members of the Committee:

BELGIUM — M. PAUL BOURGEOIS, Doctor of Physics and Mathematics, and Professor at Brussels Université Libre; Director of the Royal Belgian Observatory.

CANADA — Dr. EDGARD WILLIAM RICHARD STACIE, Doctor of Philosophy, Science and Law; President of the National Research Council at Ottawa.

DENMARK — Professor POUL BRANDT RIEHBERG, Doctor of Philosophy and Medicine, Professor of Animal Physiology; Member of the Council of the Danish Commission for Atomic Energy, and of the Danish Defence Research Council.

FRANCE	M. ANDRE LOUIS DANJON, Agrégé of Physics; Director of the Paris Observatory, Professor of Astronomy at the Faculty of Science of Paris; Member of the National Defence Committee of Scientific Action.
FEDERAL REPUBLIC OF GERMANY	Professor AUGUST RUCKTER, Graduate of Munich Technical University; Professor of Town Planning; former Director of Munich Technical University; former Bavarian Minister of Education and Cultural Affairs (1954-1957).
GREECE	Dr. CAESAR ALEXOPOULOS, Professor of Physics at Athens University; Member of the Greek Atomic Energy Commission.
ITALY	Professor FRANCESCO GIORDANI, Professor of General and Inorganic Chemistry at Naples University; former Chairman of the National Committee of Nuclear Research in Italy, Chairman of the National Council of Research, Member of the commission of experts on EURATOM.
NETHER-LANDS	Professor G.J. SIZOO, Doctor of Science at Leiden University, Professor of Physics and Director of the Physical Laboratory at the Free University of Amsterdam; Chairman of the National Defence Research Council and of the SHAPE Air Defence Technical Centre at The Hague; Member of the Central National Council for Applied Scientific Research.
NORWAY	Professor SVEIN ROSSELAND, Professor of Astro-Physics at Oslo University; Member of the Executive Committee of the Royal Norwegian Council of Technical and Scientific Research.
PORTUGAL	Professor RUI FERRO MAYER, former Vice-Rector of Lisbon Technical University; Professor at the Higher Institute of Agronomy; former Chairman of the Permanent Scientific Commission of the Institute of Advanced Studies, former Vice-Chairman of the National Education Board.
TURKEY	Dr. CAVIT ERGINSOY, Doctor of Physics at London University; Vice-Chairman of the Consultative Commission for Atomic Energy

in Turkey; Member of the Institute for Nuclear Research at the Technical University of Central Anatolia; Chief Engineer in charge of nuclear research at Etibank.

UNITED KINGDOM — Sir SOLLY ZUCKERMAN, Professor of Anatomy; Deputy Chairman of the Advisory Council on Scientific Policy; Chairman of the Natural Resources (Technical) Committee; Member of the Agricultural Research Council.

UNITED STATES — Dr. I.I. RABI, Doctor of Philosophy and Science, Professor of Physics at Columbia University, Nobel Laureate in Physics; former Chairman of the General Advisory Committee of the United States Atomic Energy Commission.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

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EXEMPLAIRE N°
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ORIGINAL: ENGLISH
3rd April, 1958

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DOCUMENT
C-M(58)52

REPORT ON THE FIRST MEETING
OF THE NATO SCIENCE COMMITTEE

Note by the Chairman of the Science Committee

The first meeting of the NATO Science Committee took place in Paris from Wednesday 26th to Friday 28th March. Each of the fourteen appointed members of the Committee attended. All members seemed to agree that the meetings were remarkably successful and that a surprising degree of agreement was achieved on most major problems. Although the agenda was a long one, consisting of over twenty different items, the discussions were completed in three days. A complete record of the meeting is being prepared but the chief results are discussed below:

1. Terms of Reference:

   (a) The Terms of Reference set out by the Council(1) were discussed by the Committee and agreed to be excellent and to be sufficiently broad that the Committee saw no reason at the present time to recommend any changes.

2. Co-ordination of national actions in the field of scientific and technical manpower

   (a) It was agreed that NATO could and should influence the member nations to undertake more effective action in the field of scientific and technical manpower but that unnecessary duplication of the activities of OEEC and other international agencies should be avoided. The Science Adviser and his staff were asked to seek the inclusion of suitable information in the OEEC annual review, to study the results of the review as they affected NATO interest, and to recommend NATO intervention in those cases where it was felt that stronger means of pressure than those available to OEEC should be brought to bear on governments.

(1) Annex to REC/58/43

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(b) It was agreed to recommend "that the Council again draw the attention of governments to the urgent need of larger appropriations for the teaching of science, for the training of research workers and technicians and for extending research establishments, particularly in the field of pure science; and that these governments should keep Council informed of the measures taken and the plans for further action drawn up with a view to scientific expansion in the countries of the North Atlantic Alliance".

3. Scholarship and International Awards Programme

(a) It was the view of the Committee that the primary burden for scholarship programmes must and should fall upon the individual nations. However, in the field of international exchange scholarships at the post-graduate level, it was agreed that some scholarships financed by NATO would be of real value and should be provided. A Working Party was appointed to make explicit recommendations on a scholarship programme for action at the next meeting of the Committee.

4. Summer study institutes

(a) All members of the Committee expressed the view that post-graduate international summer study institutes have been of great value and should be extended. It was agreed that the partial support of such institutes both directly and through scholarships was a particularly fruitful field of NATO activity which would yield a large return for a small investment. The Scholarship Working Party was asked to make explicit recommendations for a summer study institute programme.

5. Western Science Foundation

(a) The French Government's proposal for the establishment of a Western Science Foundation for international financing of research projects as well as scholarships was discussed at length. Although the purposes of such a foundation were considered desirable, some doubts were expressed as to the financing of such a potentially large undertaking. A Working Party, chaired by the French Delegate, was asked to prepare more details so that the problem could be effectively reconsidered at the next meeting.

6. Defence scientific research

(a) The position of the Science Committee with regard to defence scientific research was discussed at length. It was agreed that the Committee both

could and should consider problems in defence research as well as those in non-defence research.

(b) The best means for the Committee to operate in this field were discussed and the following resolution was agreed:

"That the Science Committee delegate to the Chairman responsibility for deciding which issues in the field of defence science research be considered by the Committee; that the Chairman should handle these issues on behalf of the Committee in consultation with the appropriate national members of the Committee; and that, in concert with the national delegations, the Chairman should decide which institutions, inside and outside NATO, be approached."

(c) It was agreed that conferences and ad hoc study groups on classified problems were desirable and should be arranged by the Science Adviser.

(d) A Working Party was appointed to prepare recommendations for effective means for the declassification of scientific papers which were unnecessarily classified.

(e) Since the remaining items on the agenda were for discussion and not yet for action, the Chairman, in accordance with the resolution in (b) above, reported his own present views on all of the remaining defence items on the agenda and invited the Committee members and others to do likewise. A number of helpful suggestions were made. The topics discussed included weapons systems evaluations, bilateral and limited multilateral research agreements in support of NATO, NATO research centres, the problems of secrecy, and problems arising from the interrelation between research and production.

(Signed) N.J. RAMSEY

Palais de Chaillot,
Paris, XVIe.

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ORIGINAL: ENGLISH
28th November, 1958

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WORKING PAPER
AC/137(DR)WP/1

DEFENCE RESEARCH DIRECTORS

SUBJECTS OF MILITARY IMPORTANCE WHICH HAVE A LARGE ELEMENT OF SCIENTIFIC RESEARCH

The following is a list of military subjects which have at one time or other been proposed to the office of the Science Adviser at NATO as being worthy of study. The importance of the items varies in at least two respects, namely in their relative military importance and in the relative amount of research that might be required to solve them. Because of this dual character it is not possible to place the items in order of overall importance and the following list does not attempt to do so. The order is roughly in terms of sequence of related subjects.

2. The majority of these proposals have either come from SHAPE and been discussed with SACEUR or from SACLANT. The fact that they occur in this list must not be taken as an assumption that they are necessarily best dealt with by the office of the Science Adviser in NATO. It may be that they would be better handled by the Production and Logistics Division in NATO, by national agencies, or by quite other means.

(a) Missile development.

(b) Defence against missiles.

(c) Communications; NATO-wide.

(d) Battleground surveillance.

(e) Technical improvements possible to give mobility of the strike force, including land mobility.

(f) Prevention of surprise attacks.

(g) Anti-Submarine warfare.

(h) Evaluations of new weapons systems, etc.

(i) Defence of Europe in the case of a war with a nuclear stalemate.

(j) Control of national borders.

(k) Defence against local and larger limited aggressions.

(l) Guerrilla warfare.

(m) Methods of detection and surveillance for partial disarmament.

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ORIGINAL: ENGLISH
26th November, 1958

DN(81)10

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WORKING PAPER
AC/137(DR)WP/3

DEFENCE RESEARCH DIRECTORS

PRESENT NATO ORGANIZATIONS FOR DEALING WITH PROBLEMS IN RESEARCH AND DEVELOPMENT

The following notes have been written as an unofficial guide on the present methods used in dealing with research and development studies within NATO. Since a number of changes are being discussed at the present time, these notes must be taken as provisional and should not be quoted as authoritative. Further, these notes supplement two lists of existing NATO bodies, (civilian and military) which deal with the equipment of forces, and whose activities and interests impinge upon the field of research and development. These lists are set out in Working Papers AC/142-WP/2 and AC/142-WP/3 respectively. Copies of these will be made available for the information of delegates and should be consulted in conjunction with the present notes.

2. The NATO Science Committee held its first meeting from 26th to 28th March, 1958, its second from 9th to 11th July, 1958, and is holding its third from 5th to 8th January, 1959. It consists of one senior scientist from each NATO nation with a Chairman, Dr. Norman F. Ramsey, who is also the Science Adviser to the Secretary General of NATO. This Committee reports directly to the NATO Council and is therefore at the highest level, namely the same level as the Military and Armaments Committees.

3. The Science Committee is responsible for advising over the whole field of scientific research but it has delegated to the Science Adviser questions of detailed research in the defence field. This was necessary partly because of security and partly because many of the members had no detailed knowledge of defence matters. On the other hand, since there is no complete dividing line between civil and defence science, the Science Committee still concerns itself with the general health and vitality of any research undertaken for defence matters. For instance, it will be informed of the general but not detailed conclusions of the present meeting.

4. The Office of the Science Adviser to NATO consists of five scientists of whom two are already in post and the remaining three are nominated though they are not as yet finally approved.

5. As explained in AC/142-WP/2, the Standing Group has the Advisory Group for Aeronautical Research and Development (AGARD)

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to assist it. AGARD is housed in the Palais de Chaillot and is therefore well placed to give direct assistance when requested both to NATO and to SHAPE. Briefly it is an advisory body with a small staff who call together outside experts in fields connected with aeronautics.

5. Below the Standing Group SACEUR has a Scientific Adviser with a small office of three scientists experienced in defence matters. This organization allows consultants to be called in as required. Moreover there is a continual flow of visitors to SHAPE, many of whom are distinguished scientists and SACEUR is therefore often able to get first hand advice from them. SACEUR has also the SHAPE Air Defence Technical Centre (SADTC) to advise him on air defence matters. Briefly it is established at the Hague and consists of 210 people of whom 57 are scientists. It is able to carry out limited development and research and is increasingly undertaking the evaluation of communication systems, air defence weapons, etc.

7. Below SHAPE there are very few NATO-paid scientists, though there are two at Air Centre. However, some commands such as Allied Forces Mediterranean, Northern Army Group, etc., have national scientists attached to them, a number of whom study from time to time problems concerned with NATO. Moreover such major commands as SACLANT are able to draw upon the knowledge of national scientists in the country where their HQ is established. In this way there is a fairly wide range of scientific advice and analysis even though it is not formally inter-related.

6. In a rather different but a very significant sphere there are numbers of scientific and technical personnel in or attached to the Production and Logistics Division in NATO. The role of this division and of the Armaments Committee is explained briefly in AC/142-WP/3.

9. So far it has been provisionally agreed that all questions of pre-production for any weapon that is to be designated by NATO are of concern to the Armaments Committee. Unfortunately the term pre-production is one which is used in a variety of senses. It would seem primarily to have been used for those elements of development which are sufficiently well advanced not to need fundamental research or really novel ideas in order to implement them. So far the organization of this field of pre-production is still in an experimental stage but national experts have already been asked for advice in a number of cases, and there is no reason to suppose this practice will not continue. The best means for obtaining decisions from such national experts is difficult to discover and will probably only be decided with experience. Examples of such work on pre-production are the recommendations on data handling, on the Hawk missile, the intermediate range ballistic missile, the naval reconnaissance aircraft etc.

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AC/137(DR)WP/3

10. One further proposal has been made within NATO, namely a Naval Steering Group. This proposal is based on the principle that there is an advantage in having all the navies of NATO discussing the research, development and production of those weapons which they may need.

Palais de Chaillot,
Paris, XVIe.

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CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

EXEMPLAIRE / COPY N°

ORIGINAL: ENGLISH
7th January, 1959

NATO UNCLASSIFIED
DOCUMENT
C-M(59)9

DECLASSIFICATION OF SCIENTIFIC INFORMATION

Note by the Chairman of the Science Committee

At its meeting between 5th and 8th January, 1959, the Science Committee approved a resolution on the declassification of scientific information, and requested that it be submitted to the Council for approval and forwarding to governments. This resolution is accordingly attached for the consideration of the Council.

(Signed) N.F. RAMSEY

Palais de Chaillot,
Paris, XVIe.

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NATO UNCLASSIFIED
ANNEX to
C-M(59)9

DECLASSIFICATION OF SCIENTIFIC INFORMATION

The NATO Science Committee:

recognising that it was charged by the North Atlantic Council with a responsibility to increase 'the effectiveness of national efforts through the pooling of scientific facilities and information',

realising that scientific research can attain its full effectiveness only in an atmosphere where there is an unfettered exchange of scientific information, and

desiring to ensure that military classification procedures do not unnecessarily obstruct scientific advance,

requests the North Atlantic Council to urge member governments to review their practice in the classification of scientific information in order to ensure:

(1) that scientific information that has no direct defence significance remains free for distribution in traditional scientific channels;

(2) that only scientific information the divulgence of which may affect the defence of NATO member countries becomes classified;

(3) that, since the process of classification is effected by security regulations which are applied by the originator of a report, an equally effective procedure be used to declassify scientific information that has lost its original defence significance;

(4) that the improper interpretation of the 'need to know' criterion is not allowed to stultify the exchange of classified information between member countries, and

(5) that, within the area of classified information, an efficient information service is available to ensure that those authorised to receive scientific information are aware of and have access to the information.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

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EXEMPLAIRE / COPY N° 419

ORIGINAL: ENGLISH
14th April, 1959

NATO RESTRICTED
DOCUMENT
C-M(59)39

SACLANT ANTI-SUBMARINE WARFARE RESEARCH CENTRE

Note by the Deputy Secretary General

At its meeting on 1st October 1958, the Council, after hearing a statement by SACLANT on the proposed SACLANT Anti-Submarine Warfare Technical Centre, agreed to resume discussion of this matter on receipt of the observations by the Standing Group on the meeting at La Spezia on 29th September (1). On 10th February 1959, revised plans drawn up by SACLANT were circulated. These dealt with the initial organization and establishment of the Centre, renamed the SACLANT Anti-Submarine Warfare Research Centre (2).

2. After further examination of comments from Ministries of Defence, SACLANT has decided to revise his plans still further. The finally revised terms of reference for the Centre are attached.

3. The Standing Group has fully supported the establishment of the SACLANT Anti-Submarine Warfare Research Centre with these terms of reference.

4. The Standing Group points out that if and when common funding of the Centre by NATO is agreed, the terms of reference would be subject to review. If, in the meantime, it is found necessary to revise the terms of reference, the Standing Group anticipates that the Ministries of Defence of the participating nations would be given an opportunity to propose modifications.

5. SACLANT has now issued invitations to the Ministries of Defence of the participating nations (Canada, Denmark, France, Italy, the Netherlands, Norway, Germany, the United Kingdom and the United States) to send scientific and naval representatives to attend the opening ceremony of the Centre at La Spezia on 2nd May 1959, and also the preliminary initial meeting of the Scientific Council at La Spezia from 28th April to 1st May. The NATO Science Adviser is included in both these invitations.

6. I intend to put this document on the agenda of the Council's meeting on Wednesday, 22nd April, 1959. The Council is invited to note the terms of reference for the SACLANT Anti-Submarine Warfare Research Centre as attached.

(Signed) A. CASARDI

Palais de Chaillot,
Paris, XVIe.

(1) C-R(58)49, paragraph 17
(2) RDC/59/41

NATO RESTRICTED

NATO RESTRICTED
ANNEX to
C-M(59)39

TERMS OF REFERENCE FOR THE SACLANT ANTI-SUBMARINE WARFARE RESEARCH CENTRE

1. Mission of Centre. The mission of the Centre will be to provide technical advice and assistance to SACLANT and to other NATO Commanders and participating nations in the field of anti-submarine warfare, and to be in all respects responsive through SACLANT to the requirements of naval forces in this field. To this end, the Centre will perform the following functions:

(a) Operational research and analysis.

(b) Research and limited development, but not manufacture, including such activities as monitorship and analysis of oceanographic measurements in the Eastern Atlantic and European waters.

(c) Advisory and consultant work.

(d) Exploratory research considered necessary by the technical staff of the Centre to achieve the NATO objectives delineated by SACLANT with the aid and the advice of the Scientific Council.

(e) Such other related tasks as may be necessary.

2. Scientific Council. The SACLANT ASW Research Centre Scientific Council will be composed of scientists appointed by the Ministers of Defence of the participating nations; it will also be composed of the Science Adviser to the Secretary General of NATO, the Scientific Director of the Centre, and the SACLANT Deputy for the Centre. The Council shall choose its own Chairman from among the membership. The Chairman will call the Council into session periodically at the request of SACLANT, or on request from an individual member, for the purpose of:

(a) recommending to SACLANT programmes for the Centre, in which there will be incorporated the requirements and views of SACLANT, and the requirements and views of other NATO and national commands in the ASW field as transmitted through SACLANT. Related national and multi-national research programmes will be taken into account. In recommending the programmes for the Centre, the Council will ensure that national needs consistent with NATO requirements in the ASW field are given due consideration, and will also ensure that the recommended programmes will not unnecessarily overlap national projects.

(b) examining and reporting to SACLANT on the progress made by the Centre.

(c) commenting from a technical standpoint on the requirements of SACLANT, and on the requirements of other interested NATO military commanders transmitted through SACLANT.

(d) advising SACLANT as to co-ordination of the national interests with the common NATO interests. SACLANT will rely heavily upon the advice and the assistance of the Scientific Council. The Scientific Council will have direct access to SACLANT on all matters pertaining to the Centre. Likewise, SACLANT will have direct access to the Scientific Council.

3. Scientific Director. The scientific work of the Centre will be conducted under a Scientific Director appointed by the contractor and acceptable to SACLANT, the Government of the United States and the Italian Government. The Scientific Director will be a US scientist during the period of mutual weapons development programme funding. He will be assisted by scientists, engineers and technicians from the participating nations, and will be responsible for:

(a) selecting and organizing the scientific staff.

(b) planning and conducting the scientific work at the Centre within the general areas prescribed by SACLANT.

(c) representing the Centre in scientific matters.

(d) commenting to SACLANT on the practical implications of the recommendations of the Scientific Council.

(e) in joint co-operation with the SACLANT Deputy for the Centre

(1) formulating administrative policy for the Centre on matters which might reasonably involve problems of concern to SACLANT, subject to overall guidance from SACLANT;

(2) approving reports and studies promulgated in the name of the Centre;

(3) obtaining SACLANT's approval of the scientific programme;

(4) reporting directly to SACLANT any disagreements with the SACLANT Deputy which cannot be resolved locally. The Scientific Director will be a member, ex-officio, of the Scientific Council and will have direct access to SACLANT.

4. SACLANT Deputy. SACLANT will maintain full-time at the Centre a Naval Officer as SACLANT Deputy with such military and civilian assistants from participating nations as may be required. The SACLANT Deputy will be responsible for:

(a) providing liaison and transmitting tasks from SACLANT to the Centre;

(b) furnishing advice and assistance as necessary regarding anti-submarine warfare;

(c) providing the Scientific Director with authoritative interpretations of SACLANT's tasks and views;

(d) in joint co-operation with the Scientific Director, assuring that the Centre is at all times responsive to SACLANT's needs, and to any task submitted to the Centre by SACLANT originating from participating nations and national Commands, and from other interested NATO Military Commands and agencies;

(e) representing SACLANT in behalf of the Centre in all dealings with the Italian Navy, other NATO Military Commands and Military Agencies. As to such dealings, this includes:

(1) receiving and transmitting correspondence, radio messages and classified documents and reports from such Commands;

(2) operation of the NATO Sub-Registry to be furnished to the Centre by SACLANT;

(f) serving as an ex-officio member of the Scientific Council.

5. Funding. Initial funding of the Centre by the United States under the Mutual Weapons Defence Programme will extend through 30th June 1961.

The activation ceremony of SACLANTCEN on 2 May, 1959.


SACLANTCEN

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ORIGINAL: ENGLISH
22nd April, 1959

~~NATO CONFIDENTIAL~~
~~WORKING PAPER~~
~~AC/137-WP/2~~

SCIENCE COMMITTEE

DEFENCE SCIENCE

Note by the Deputy Science Adviser

At the first meeting of the Science Committee it was decided that problems in defence science to a considerable degree should be delegated to the Science Adviser and his office. The following note outlines a number of these and some of the steps taken or proposed.

2. The Heads of Government communiqué for December 1957 stated that the full development of our science and technology was essential not only to the political but also the military strength of the Atlantic community. In fact, the Task Force Report which had been considered by the Heads of Government in making its communiqué had already included several methods by which this might be done. The most relevant of these for our purposes are:

(a) areas of defence research and development where international co-operation might prove beneficial to NATO interests should be reviewed by the Science Committee;

(b) countries should examine regulations governing security classification, and all possible should be done to improve the exchange of information;

(c) countries should individually and collectively, through NATO, seek to maintain a balanced deployment of scientific and technical manpower both between and within the civil and defence sectors, taking into account the present and subsequent defence policies.

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(1) This Working Paper is to be taken under item X of the agenda (AC/137-A/4) of the Science Committee for the meeting of 22nd, 23rd and 24th April, 1959.

 ~~NATO CONFIDENTIAL~~

3. It is fair to state that at least some progress has been made on these points, either through national or international action. In particular it is now clearer as to what is and is not practical.

4. As to the first method, the Science Adviser called a meeting of the Defence Research Directors in the NATO countries on the 1st and 2nd December, 1958, where the main fields for possible co-operation were discussed. The following are a selected list of subjects chosen from that meeting (the figures in brackets refer to the Agenda numbers for the present Science Committee meeting and call attention to items relevant to the subject. NATO organizations already concerned are also given in brackets):

(1) Underwater detection (Item VIII, La Spezia)
(2) Oceanography (Item II)
(3) Upper atmosphere research (Item V)
(4) Communications for the Services (SADTC and OSCAD)
(5) Chemistry of solid propellants (AGARD)
(6) Tactical mobility for the Army
(7) Solid State Physics
(8) Anti-ballistic missile defence (SADTC)
(9) Service uses for electronic computers
(10) Materials research and testing, etc. (Item VI(d) of the previous Science meeting. AGARD)
(11) Defence against low level air attack.

5. Before the Science Committee discusses what should be done on the above and similar tasks, it may wish to consider those NATO organizations which are concerned either directly or indirectly with defence research to see how many of these tasks could be undertaken by them in their present or an expanded form.

6. There is no doubt in the view of the Science Adviser's Office that the present organizations within NATO which are working on scientific problems should and deserve to be encouraged by the Science Committee, and wherever possible should be used for any new tasks that arise. (It is considered axiomatic that, wherever reasonable, present organizations should be strengthened rather than new ones created.) But there are a number of problems for whose solution present organizations may not be suitable.

7. Action on a number of problems of this latter character has already been started by the Science Adviser on an ad hoc basis. In many cases such action has implied no more than obtaining flexible agreement between scientists of different countries already working in the same subject, and it has been found impossible to lay down fixed principles by which such work can be promoted; it is necessary to deal case by case.

However, the methods which the Science Adviser has used and might use in future include those already followed for oceanography by calling together groups of experts; the setting up of special study groups for periods of 2 - 6 weeks; personal contact with the research workers, etc., of the various nations to call their attention to problems of NATO interest and to encourage them to co-operate, such as has been done on journeys to NATO countries; and the transfer of appropriate problems such as the study of solid propellants to existing research organisations such as AGARD.

8. An obvious gap is the lack of research for the NATO Armies. The Air Forces and now the Navies of NATO have their international research organizations capable of dealing with common problems, but not the Armies, in spite of the fact that the problems of the Armies remain perhaps the hardest to solve of any. The Franco-German research group at St. Louis might be considered as a possible nucleus for such an establishment if it were decided upon. Other gaps are, for example, co-operative work in the uses of electronic computors, physics of the solid state (perhaps in part because of commercial interests), and anti-ballistic missile defence (where security has hampered SADTC).

9. As to the second method, the Science Committee itself took an active interest in it at its first two meetings, discussing whether an automatic method for declassifying papers and documents could be adopted (Item Ia of the present meeting). The Committee were, however, unable to reach agreement, although there has lately been a marked improvement in releasing papers through the action of the nations themselves. The Science Adviser has attempted to shorten security delays by seeking the maximum exchange of research information under the present security criteria. Nations are often unable to ask for documents for which there is a "need-to-know" because they are unaware of the existence of such papers. The Science Adviser's suggestions for alleviating this problem have been given in his proposals for a documentation centre (Item VII). In essence, they are that a small number of scientists should be appointed with the specific task of increasing the flow of documents on a "need-to-know" basis. This would alleviate but not solve the main problem of security.

10. As to the third method, so far the military statement of NATO's defence policy has not been easy to translate into research requirements by which a redeployment of effort could be justified. The question of military requirements has lately been taken by the Standing Group, the Military Committee and the Joint Working Group on Co-operation in the Field of Armaments. The problem of a balanced deployment of scientists between the civil and defence sectors, including perhaps the needs of the economic struggle against Russia, has not yet been framed in manageable terms. The answer will in any case depend upon what degree of co-operation with the rest of the free world is envisaged in the cold war against the Communistic bloc.

11. Progress in the field of co-operation has thus been slow, but it has occurred. The words of the Canadian Representative at the Defence Research Directors meeting referred to above might with advantage be recalled: "If we let ourselves become joined in co-operative ventures that are ill-conceived, ill-prepared, unpromising or merely idealistic we shall surely impair the basic will to co-operate. Co-operation is a delicate plant that needs very careful attention from the sowing of the seed to the day of blossoming and it shrivels up at the first touch of a frost. If we in Canada presume to tender advice on the form of co-operation, maybe it is because we have had to become experienced in taking measures to combat the cold!" While agreeing with this, the Science Adviser's Office believes that the worst of winter is now over and spring on its way, even if we should remain mindful of April frosts.

12. The Science Committee is asked to take note of:

(a) the need for more progress in dealing with security classification;

(b) the expectation that it will be possible soon to consider the deployment of scientific manpower in terms of NATO's defence policies;

and (c) the need to take further steps with regard to areas of research and development where international co-operation might prove beneficial.

(Signed) H.A. SARGEAUNT

Palais de Chaillot,
Paris, XVIe.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

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EXEMPLAIRE N°
COPY

ORIGINAL: ENGLISH
30th April, 1959

NATO UNCLASSIFIED
DOCUMENT
C-M(59)44

CO-OPERATIVE OCEANOGRAPHIC RESEARCH

Note by the Science Adviser

At the meeting of the Science Committee on the 22nd and 23rd April, 1959, it was agreed to appoint a sub-committee for oceanographic research, under the chairmanship of the Science Adviser, and with terms of reference as set out in paragraph V, 6(d) (i), (ii), (iii) and (iv) of document AC/137-D/37.

2. The Committee was of the unanimous opinion that NATO should take a special interest in sponsoring co-operation in oceanographic research in the North Atlantic, the Mediterranean and adjacent seas, and the prime object of appointing the sub-committee for oceanographic research is to prepare specific recommendations in this field. Background information is available in document AC/137-D/37, an appropriately reworded version of which is attached herewith, at Annex, for the information of the Council.

3. It is intended to convene the sub-committee as soon as possible, and the Science Adviser will be writing to national delegations asking that members for the sub-committee be nominated. From 31st August to 12th September, 1959, there is to be an international meeting of oceanographers in New York, at which most if not all potential members of the proposed sub-committee will undoubtedly be present. The Woods Hole Oceanographic Institution in New York has offered to make available its building for the NATO sub-committee during this period if so desired. It is proposed to benefit from this offer to convene the first meeting of the sub-committee on this occasion, which would greatly reduce the cost to nations and to NATO.

4. The Council is invited:

(a) to endorse the principle of NATO support for co-operative oceanographic research;

(b) to note the proposals of the Science Committee to appoint a sub-committee for oceanographic research.

(Signed) N.F. RAMSEY

Palais de Chaillot,
Paris, XVIe.

NATO UNCLASSIFIED

NATO UNCLASSIFIED
ANNEX to
C-M(59)44

CO-OPERATIVE OCEANOGRAPHIC RESEARCH

Note by the Science Committee

I. Introduction

An ad hoc meeting of experts on Oceanography was held at the request of the NATO Science Adviser on 25th - 26th February, 1959. The participants in the meeting were:

Dr. Norman F. Ramsey (Science Adviser, Chairman)
Dr. C. Jorgensen (Science Adviser's Office)
Professor Dr. A. Rucker (German Representative to the NATO Science Committee)
Professor Haken Mosby, Geofysisk Institutt, University of Bergen
Dr. George E.R. Deacon, F.R.S., National Institute of Oceanography, Wormley, Surrey.
Dr. Bostwick H. Ketchum, Woods Hole Oceanographic Institution, Mass.
Dr. Anton F. Bruun, Zoologisk Museum, University of Copenhagen.

and three part-time participants:

Ing. Gen. André Gougenheim) Laboratoire d'Océanographie
Dr. H. Lacombe) Physique du Muséum National
Dr. P. Tchernia) d'Histoire Naturelle, Paris.

II. NATO Assistance to Oceanographic Research

2. It was agreed by the Science Committee, after consideration of the Ad Hoc Group's report (AC/137-D/37), that there are many important and scientifically interesting oceanographic problems in urgent need of further study in the North Atlantic, Mediterranean and adjacent areas.

3. It was further agreed that co-operation within NATO for these studies was particularly appropriate for the following reasons:

(a) For many oceanographic problems the co-operative use of a more elaborate research facility by several nations would make smaller individual efforts more fruitful.

(b) Oceanographic studies by individual nations are more effective if they are co-ordinated with those of other nations in the same area.

(c) Greater understanding of the oceanography of the NATO area is important to the scientific, economic and military strength of the NATO nations. Fishing, meteorology, submarine operation, ocean transportation, effects of radioactive fallout and waste, anti-submarine warfare, etc., are all dependent upon oceanography.

(d) The North Atlantic is so central to NATO that it is the identifying feature in the name of the organization. Nevertheless, the largest oceanographic research vessel at present studying the North Atlantic belongs to Russia.

III. Problems in Oceanographic Research

4. The scientific problems of oceanographic research include the following:

(a) Interchange between sea and atmosphere.

(b) Response of sea surface to winds and pressure changes,

(i) Waves,
(ii) Storm surges,
(iii) Changes of mean sea level.

(c) Circulation and structure of the ocean,

(i) Origin and variation of deep and surface currents,
(ii) Secular, seasonal and day-to-day changes of physical and chemical properties of the sea,
(iii) Thermal layers, propagation of sound.

(d) Tides and other oscillations in the open ocean.

(e) Productivity of the ocean,

(i) Survey of general productivity of the plants in the ocean,
(ii) Study of the factors which determine productivity,
(iii) Transfer of organic matter through trophic levels leading to food for man.

(f) Distribution of marine organisms,

(i) Life histories of oceanic plants and animals,

(ii) Study of the factors which govern the distribution of marine organisms,

(iii) Dynamics and interdependence of oceanic populations.

(g) Chemistry of the sea, including radioactivity,

(i) Nutrient cycles of phosphates, nitrates, silicates and relations between them,

(ii) Storage of carbon dioxide in the sea and exchanges of carbon dioxide between sea and air,

(iii) Distribution and importance of trace elements,

(iv) Transport and accumulation of radioactive materials by water and marine organisms,

(v) Geochemical processes.

(h) Study of sea bottom and sediments.

Geography, geology and morphology

(i) Calibration and application of new methods of measurement.

Standardisation of results.

IV. Possible Co-operative Activities

5. Oceanographic research activities which might be appropriate for co-operation within NATO include:

(a) Construction and operation of a co-operative deep sea oceanographic research vessel.

(b) Co-operative development of oceanographic research instruments and techniques.

(c) Development and application of moored recording buoys for studying physical, chemical and biological changes; of similar oceanographic recording equipment for use on weather, naval and merchant ships; and of landbased oceanographic recording equipment at key shore points such as the Straits of Gibraltar.

(d) Co-operative utilisation of an oceanographic research submarine.

(e) Encouragement of co-operative use of one nation's oceanographic research facilities by oceanographic scientists of another nation.

(f) Supplement existing arrangements for co-ordination of national oceanographic research activities, particularly of the areas and problems of greatest interest to NATO.

V. Recommendations

6. Agreement was reached on the following recommendations:

(a) NATO should take a special interest in sponsoring and particularly supporting co-operation in oceanographic research in the North Atlantic, Mediterranean and adjacent seas.

(b) The North Atlantic Council should be asked to agree to the principle of such oceanographic research support.

(c) The Science Committee should forthwith appoint a Sub-committee for Oceanographic Research, under the chairmanship of the Science Adviser, to prepare specific recommendations for co-operation in oceanographic research.

(d) The terms of reference for the Sub-committee for Oceanographic Research should include:

(i) To recommend to the NATO Science Committee appropriate actions in the field of oceanographic research.

(ii) To prepare specific plans for co-operative oceanographic activities.

(iii) To initiate oceanographic research co-operation by direct action of the Sub-committee when this can appropriately and effectively be accomplished without reference to the Science Committee or NATO Council, though the Sub-committee will keep the Science Committee informed, at all times.

(iv) To serve as a forum for the establishment of informal co-operative actions between oceanographers of different member countries as a supplement to existing arrangements, particularly for the areas and problems of greatest interest to NATO.

SCIENCE & THE ALLIANCE

Dr. Ramsey chairs the first meeting of the Science Committee

ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD
NORTH ATLANTIC TREATY ORGANIZATION

PALAIS DE CHAILLOT
PARIS-XVI
Tél. : KLEber 50-20

Pc. 1.8.02,
2.1-04

12th June, 1959

Dear Monsieur Spaak,

Now that the time of my departure is at hand I have wanted to write you a note to express my sincere thanks for all the help which you have given to me and the NATO Science Committee. I must confess that I am very pleased with the results which have so far been achieved. In fact, they far exceed my highest expectations on my arrival here a year and a quarter ago.

I was particularly pleased at the excellent support which the Science Committee projects received at the last meeting of the Council. I believe that with the approval of these projects, coupled with the previously approved and already highly successful fellowship and advanced study institute programmes, the NATO activities in the field of scientific and technical co-operation are well under way. I hope that you and the Council will support my excellent successor as well as you have myself.

Although I am naturally very eager to return to my own research laboratory and my students there, I must confess that I am leaving NATO with many regrets. I have greatly enjoyed my year here and I believe that the field of scientific and technical co-operation will prove to be one of NATO's most effective activities.

Sincerely yours,

Norman Ramsey

Norman F. Ramsey

Monsieur Paul-Henri Spaak,
Secretary General of NATO.
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ENCLOSURE

Statement to NAC Regarding NATO Funding of the SACLANT Anti-submarine Warfare Research Center at La Spezia, Italy

The SACLANT Anti-Submarine Warfare Research Centre was established in 1959 by Italy and the United States to assist SACLANT in carrying out his anti-submarine warfare mission, through the setting up of a research program to improve defense against submarines.

On March 23, 1959, the United States entered into a contract with SIRIMAR, an Italian corporation, for the operation of the Centre.

The terms of reference of the Centre were submitted to the North Atlantic Council by NATO Document CM(59)39, dated April 14, 1959, and duly noted by the Council in C-R(59)17 (Restricted), dated April 24, 1959. The terms of reference provide for general planning and supervision of the Centre's work by SACLANT, acting with the advice and assistance of a Scientific Council composed of representatives of the nations concerned.

Although the Centre from its inception has been funded by the United States under its Mutual Weapons Development Program it was envisaged that other participating countries would take part in the work of the Centre by making available scientists, technical information, etc. This participation was agreed in a Multilateral Memorandum of Understanding, signed June 9, 1960 among the Governments of Canada, Denmark, France, The Federal Republic of Germany, Italy, The Netherlands, Norway, the United Kingdom and the United States of America.

The Centre's research activities are now well under way. It is presently staffed with scientists from the nine partidpating countries concerned. The NATO Assistant Secretary General for Scientific Affairs is a member of the Centre's Scientific Council, and the NATO Science Committee has reviewed the general scope of the Centre's activities through the latter's reports and a visit of the Committee to the Centre in September, 1960. SACLANT has stated that he considers the Centre of invaluable aid in the field of anti-submarine defense of the NATO area, and that its role will become increasingly important in the face of the growing Soviet submarine threat.

As noted by the Council in C-R(59)17, the intention of the United States had been to finance the Centre until June 30, 1961. The Multilateral Memorandum of Understanding recognized this date and provided in Article IX thereof that the participating nations would before that date review the mission, functions, financing and other aspects of the Centre with a view to multi-lateral financial participation in the support of the Centre. The United States recognizing the importance of the Centre to the NATO alliance has since that date been providing interim financial support pending completion of these multilateral arrangements.

The United States now believes that NATO financing of the Centre should commence as of July 1, 1962. In order to proceed promptly to make arrangements to this effect, the United States therefore proposes that the Council :

(1) agree on the desirability of continuing the operations of the Centre, and reaffirm its importance to the North Atlantic Treaty Organization and its member countries, and particularly to the accomplishment of SACLANT's anti-submarine warfare mission.

(2) agree in principle to the desirability of NATO funding of the Centre for the period beginning July 1, 1962, and

(3) establish a NATO ad hoc Working Group to proceed to examine in detail questions arising from the transfer to NATO financing, and to prepare, for approval by the Council, the arrangements governing the future financing, role and operations of the Centre.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

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EXEMPLAIRE / COPY N° 268

ORIGINAL: ENGLISH
2nd October, 1961

~~NATO RESTRICTED~~
DOCUMENT
AC/137-D/113 Bnd(61)10

SCIENCE COMMITTEE

INVENTORY OF SCIENTIFIC RESOURCES

Note by the Secretary

Attached at Annex for the information of the Science Committee are statements requested by the Division for Scientific Affairs on the background, accomplishments and objectives of organizations concerned with research in NATO.

(Signed) J. LECONTE

OTAN/NATO,
Paris, XVIe.

~~NATO RESTRICTED~~

CONTENTS

ANNEX I to
AC/137-D/113

THE SHAPE AIR DEFENCE TECHNICAL CENTRE

Statement by the Director of SADTC

Mission

The mission of the SHAPE Air Defence Technical Centre as described in its Charter, approved by the North Atlantic Council, is "to provide the Supreme Headquarters Allied Powers Europe with scientific and technical advice and assistance in the field of air defence ... as air defence cannot be considered completely in isolation from other military problems of Allied Command Europe, the term air defence will be interpreted in a broad rather than a narrow sense."

2. By agreed evolution the Centre's programme of work now contains problems concerned with air operations, by aircraft or by missiles, generally in Allied Command Europe; with all air defence operations no matter by which service controlled; and with communications, data transmission, and command and control throughout ACE.

Organization

3. The Centre was established in The Hague at the beginning of 1955 upon the initiative of the United States Air Force. The Centre was entirely financed by the United States, through contract with the Netherlands National Defence Research Organization (RVO-TNO). On 1st July, 1960, the North Atlantic Council assumed responsibility for the financing of the Centre through the medium of the Military Budget Committee of NATO, the RVO-TNO remaining as the contractor in the Netherlands responsible for the general administration of the Centre.

4. The establishment is directly responsive to the requirements of SHAPE and, through SHAPE, of the nations of the alliance. The annual work programme is reviewed by a Committee of National Representatives, who report to the NATO Council and SACEUR on the scientific programme and effectiveness of the Centre.

5. The authorised strength of the Centre includes 80 scientists, of whom 10 from the United States and 2 from Canada are on loan with their expenses borne by these countries. The scientists, recruited internationally, are supported by approximately 80 technicians, all from the Netherlands. Administrative and ancillary staff bring the total strength to nearly 300 persons. The present annual budget is just under 9,000,000 Dutch Guilders.

Activities and Objectives

6. The work of the establishment encompasses systems evaluation, operational research, systems research and engineering laboratory work (detectors, data handling, communications), and field experiments. In its laboratory work, the Centre is not competing with or duplicating the vast national resources deployed in the scientific fields of interest to the Centre. There are, however, many cases in which the military requirements are genuinely international and do not appear in any national programme; and there are many cases in which to achieve compatibility of national weapons or communications systems, laboratory work on an international scale or field experimentation is essential. A typical example of SADTC work is the ACE Early Warning System supported by a Tropospheric and Ionospheric integrated communications network. The scientific reports, which are largely classified, are disseminated throughout the various NATO nations.

7. The work of the Centre at present divides conveniently into three main groups. A brief outline of their activities and objectives is contained in the following paragraphs.

(a) Communications Group

The group was responsible for the implementation and testing of the first part, called "Hot Line", of the extensive "ACE High" troposcatter system. It is now concerned with feasibility investigations and trials of new techniques and possibilities, in particular for emergency communications. Space communication is studied relative to SHAPE operational requirements. Work concerning communication with warships at sea consists of planning studies and tests concerning the special problems of flank communications with naval strike forces supporting the Allied Command Europe in the North Atlantic and Mediterranean areas. Much work has been and is being devoted to the study of the capability, reliability, and vulnerability of SHAPE communications. These studies and experiments involve integration and co-ordination of national facilities into one network to meet the needs of specific systems such as Early Warning, Command and Control, Bomb Alarm and Alert.

(b) Systems Research Group

This group is concerned primarily with detection systems, modern data-handling methods and weapon-control systems. An important function is to serve as a consulting systems engineering facility for SHAPE. In

the radar field studies and evaluations have been carried out for the SHAPE early warning and long-term surveillance systems. Research in electronic counter-countermeasure techniques forms major and continuing activity, aimed at the optimization of radar parameters and recommending suitable retrofits to prolong the useful life of some existing equipments. Electronic warfare techniques are under continuous surveillance. Passive methods in the radar and infra-red spectra are studied. The work on data-handling methods is centered around the application of modern digital techniques to problems of automatic detection, tracking, organization and transmission of information and its display. The compatibility of systems is a major interest. This group has project responsibility for the implementation of a SHAPE Early Warning Data Transmission System. The optimization of weapon control systems against various electronic countermeasure threats is the subject of continuous study.

(c) Systems Evaluation Group

The Systems Evaluation Group is concerned with the application of operational research methods to many facets of SHAPE's problems. This work includes the study of overall systems by war-gaming and related techniques, as well as more detailed studies of various weapon systems and components. Specific projects have been concerned with evaluation of the air and missile threat to Allied Command Europe, analysis of the decision-making network, study of the command and control structure for both defensive and offensive forces, analysis of active and passive defence requirements, study of the survival capability of the offensive forces of Allied Command Europe, and many others. The group assists in planning and observes and analyses some of the SHAPE exercises. The Systems Evaluation Group is also responsible for maintaining and operating a modern computing facility, necessary for many of its own tasks, but which is used by all the groups for problems demanding these resources.

(Signed) E.C. WILLIAMS

THE SACLANT ASW RESEARCH CENTER

Statement by the Scientific Director of the Centre

The SACLANT ASW Research Center at La Spezia, Italy, was established in May, 1959 in order to provide scientific support in the European area for the ASW mission of SACLANT. Nine NATO nations (Canada, Denmark, France, Germany, Italy, The Netherlands, Norway, United Kingdom, and the United States) are currently represented on the scientific staff of the Center. The scientists now on the staff are engaged in applied research in oceanography, sound propagation, submarine detection, and related problems.

2. The mission of the Center is to provide technical advice and consultant services to SACLANT and other NATO commanders, and to carry out a programme of operational analysis, applied research and limited development in areas of importance to anti-submarine warfare.

3. The Center occupies a laboratory building furnished rent-free by the Italian Government. This building, located in an Italian naval reservation on the Gulf of La Spezia, provides space for offices, technical library, shops, electronic and oceanographic laboratories, and a high speed digital computer installation. Other activities associated with the sea, both military and commercial, line the Gulf in both directions from the Center.

4. The Center's principal technical facility is the research ship ARAGONESE, a converted 2,000 ton merchant freighter, with accommodations for about ten scientists, and equipped for oceanographic, electronic and acoustic work at sea. The ARAGONESE is supplemented by a 65 foot workboat, an AVRS on loan from the United States Navy. Conveniently close to La Spezia are testing areas of various depths up to 1,400 fathoms, and the rest of the Mediterranean is within easy cruising radius. The Atlantic approaches to Western Europe and the United Kingdom are also within reach of the Center's research vessel. The comparatively mild climate permits sea tests based at the Center to be carried out all the year around.

5. The current level of monetary support, through Mutual Weapon Development Program channels from the United States Department of Defense is about $1,630,000 annually. A modest growth of about 35% in staff and program is projected to mid-1963, by which time the plans call for a change-over to multilateral financing by the participating nations.

6. The scientific and business operations of the Center are conducted through a non-profit Italian Corporation called SIRIMAR (Societh Internazionale Ricerche Marine). SIRIMAR is

wholly owned by the DOD contractor, The Pennsylvania State University, and its Board of Directors contains several university officials, headed by Dr. Eric A. Walker, President of the University.

7. The entire civilian staff of the Center, including scientists and supporting personnel, are employees of SIRIMAR. Dr. John M. Ide, the Scientific Director, heads the Scientific staff of 26 professional scientists from the nine participating nations. Mr. Walter S. Gabel, the Managing Director, heads the supporting non-technical personnel who are engaged in the business management and the general administration of the Center.

8. The military staff of the Center is headed by the SACLANT Deputy, Captain J. O. Phillips, USN. He is assisted by three United States Naval Officers, and by three naval officers from participating nations (on a rotating basis) for liaison and operational assistance.

9. SACLANT provides major policy and approval of technical programs for the Center. SACLANT is advised at intervals by a Scientific Council, consisting of one member named by each participating country, together with representatives from the Center and the NATO Science Office. By this means, a group of distinguished scientists from many nations is brought into an advisory relationship with the Center. The members of the Scientific Advisory Council act individually as interested friends of the Center in each of the countries represented. This is important to the program and beneficial to many of the Center's operations, such as staff recruitment and liaison with national ASW research establishments.

10. Exchange of technical information on ASW is provided for by agreements signed by the participating nations. The Center is thus building up a collection of classified documents for the use of the scientific staff. The Center also has an unclassified, technical library covering pertinent fields. The research on oceanography is, in general, unclassified, but most of the Center's program is classified because of its application to ASW.

11. The Center's scientific program is carried out by a staff organized in three major groups, devoted respectively to oceanography, applied research, and operations research and analysis.

12. Oceanography fits naturally into the program because of the Center's favorable location on the sea, and the suitability of the ARGONESE for work in this field. The importance to ASW of a better understanding of water currents, sea temperatures, and submarine geophysics in this key area can readily be appreciated.

13. Applied and operational research at the Center is conducted on both acoustic and non-acoustic projects, with major emphasis on matters related to the detection and location of submarines.

(Signed) JOHN.M. IDE

TRAINING CENTER FOR EXPERIMENTAL AERODYNAMICS

The Training Center for Experimental Aerodynamics was founded in 1956 and is incorporated as an international scientific association with the following aims:

(a) To give scientists and engineers from the NATO countries a specialized training in the techniques and practice of a modern aerodynamics laboratory.

(b) To contribute to the dissemination of knowledge in the field of fluid mechanics and, more particularly, of experimental and applied aerodynamics.

(c) To encourage the practice of research work in the field of experimental aerodynamics and fluid mechanics.

Facilities

2. Since the date of the Center's foundation there has been a considerable growth in the number and variety of wind tunnels and similar facilities, as can be seen from the attached table. Apart from the large subsonic tunnel, which is simple to operate, the experimental facilities of the Center are of relatively small size and all are free from undue complication. As such, they are suitable for student operation after a brief period of instruction, and appropriate to an institution engaged in educational and fundamental research. Apart from the large subsonic tunnel and, to some extent, the subsonic cascade tunnel, the facilities are not suitable for routine development testing.

3. With the completion of the hypersonic facilities (expected in the course of 1962), the Center will have a substantial collection of wind tunnels whose range of operation will extend up to a Mach number of 8. All these facilities are well provided with appropriate instrumentation and there is, in addition, a central electronics laboratory equipped with a number of specialized items for use in aerodynamics research.

4. In addition to the equipment already in operation or in the course of installation at the Center, it is planned to build some new facilities comprising high-temperature, low-density devices of modest size for the study of the physics of gas flows.

Course in Fluid Dynamics

5. Since its inception the Center has given a 9-months course in fluid dynamics with emphasis on experimental techniques.

Admission to this course is limited to graduate engineers, physicists and mathematicians from NATO countries, the minimum requirement being an M.S. degree for graduates from a United States university, degree with honours from the United Kingdom, a diploma "avec mention" from a University, Grade Ecole or Technische Hochschule in continental Europe.

6. Of the 9 months which constitute the academic year, each student spends about 6 months on organized course work, and 3 months on an individual research project. The course work comprises both compulsory and optional subjects, giving a student the opportunity to gain some knowledge over a wide range of topics while allowing him to work more intensely in one or two of them. The course work is mainly experimental, but not exclusively so. As part of his individual project, which is normally closely related to one of the optional courses taken, each student is required to give an oral account of his work as well as writing a thesis.

7. A brief examination is held at the end of the academic year and a diploma is given to those students who have completed the course work and reached a satisfactory standard in this examination, and who also write a satisfactory project thesis. In the 5 academic years 1956-1961, 91 students were enrolled for the 9-months course, and of these 85 qualified for the diploma. A grade of distinction was instituted in the year 1958-9, and of the 59 students gaining a diploma in the three years 1958-61, 18 were given this grade.

Other Activities

8. In addition to the 9-months course, the Centre has organized special courses in electronics and expects in the future to have similar short courses in other subjects.

9. A small but increasing volume of research, at post-doctoral level, is being undertaken at the Centre and, as the new facilities become established, it is planned still further to increase this volume. At the moment this work is being undertaken exclusively by members of the Centre's permanent staff, but it is hoped that in future years young members of the teaching staff of NATO universities will look to the Centre as the place to spend a sabbatical year doing research using its resources.

TRAINING CENTER FOR EXPERIMENTAL AERODYNAMICS

EXPERIMENTAL FACILITIES

	Principal Characteristics	Application
LOW SPEED (all continuous operation)		
Composite wind tunnel L-1	open jet: 10 ft. dia., 200 ft./sec. closed jet: 6.6 ft. dia., 300 ft./sec. vertical jet: 10 ft. dia., 100 ft./sec.	student tests, research and development student tests, research and development demonstration, research and development
Wind tunnel L-2	closed jet: 12 ins. dia., max. air speed: 200 ft./sec.	student tests and demonstration
Wind tunnel L-3	open jet: 6 ins. dia., max. air speed: 26 ft./sec.	instrument calibration and demonstration
Wind tunnel L-4	closed jet: 8 ins. dia., max. air speed: 400 ft./sec.	instrument calibration
TRANSONIC		
Continuous wind tunnel S-1	16 ins. x 16 ins. slotted Mach No. 0.5 - 1.2	student tests
SUPERSONIC		
Continuous wind tunnel S-1	16 ins. x 16 ins., Mach No. 2.2, pressure: 0.05 to 0.3 ATA	student tests, research

	Principal Characteristics	Application
Continuous wind tunnel S-2	0.6 ins. x 0.6 ins., Mach No. 1.5 - 2.2	student tests
Blow-down wind tunnel S-3	2.4 ins. x 2 ins., Mach No. 2.75, pressure: 5 ATA	student tests
HYPERSONIC Blow-down wind tunnel H-1	5 ins. x 5 ins., Mach No. 4 - 8. pressure: .40 ATA temperature: 1,400°R ejector suction	student tests, research
Blow-down wind tunnel H-2	1.6 ins. dia., Mach No. 5.8, pressure: 40 ATA temperature: 900°R	student tests
TURBOMACHINERY Low speed cascade tunnel C-1	8 ins. x 20 ins., max. air speed: 130 ft./sec.	student tests, research, possibly development
Low speed rotor test stand R-1	rotor tip: 28 ins. dia., hub: 22 ins. dia., max. tip speed: 400 ft./sec. at 3,600 rpm	student tests, research
Variable density high speed compressor test stand R-2	rotor tip: 16 ins. dia., hub: 12 ins. dia., max. tip speed: 1,000 ft./sec. at 17,500 rpm	student tests, research

	Principal Characteristics	Application
SHOCK TUBE	14 ft., 4 ins. dia. low pressure: 1 mmHg high pressure: 10 ATA.	student tests
WATER TABLE	hydraulic analogy to supersonic flows	student tests and demonstration
WATER COMPRESSOR R-3	three-stage pump, rotor tip: 11.4 ins. dia. hub: 8.3 ins. dia. max. tip speed: 400 rpm	demonstration

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT

Condensed from a booklet called "AGARD, Its Mission - Its Achievement"(1)

1. The creation of an Advisory Group for Aeronautical Research and Development (AGARD) was recommended in January, 1951, at a conference of NATO research directors called together by Dr. Theodore von Karman in his capacity as Chairman of the USAF Scientific Advisory Board.

2. AGARD is an official agency of the Standing Group of NATO, and acts in an advisory capacity to the Standing Group. Its purpose is to bring together the leading aeronautical personalities of the NATO nations in order to recommend effective ways to use their research and development personnel and facilities for the common benefit of the NATO Community.

3. Each NATO nation represented in AGARD has appointed from one to three senior scientists as National Delegates, and the assembly of these National Delegates meet once or twice a year. Between meetings authority is delegated to an Executive Committee consisting of the AGARD Chairman, four National Delegates, and ex officio: the Director of AGARD, the Assistant Secretary-General for Scientific Affairs, NATO, and the Scientific Adviser to SACEUR.

4. The Advisory Group has the following objectives:

(a) To review continuously the application of advances in aeronautical science to common defence problems.

(b) To make recommendations for the solution of problems referred to it by agencies within NATO, including evaluation of research and development projects submitted by individual nations.

(c) To make recommendations leading to improved co-operation among member nations in the field of aeronautical research and development.

(d) To explore methods for facilitating exchange of information pertaining to aeronautical research and development.

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(1) Note: More detailed information may be obtained from "AGARD General Information 1961"

5. The principal technical activity of AGARD is conducted by Panels in selected research and development areas of particular importance to NATO. The Panels are composed of selected NATO experts who meet approximately twice each year to plan and co-ordinate their continuing work.

6. The Panels employ four principal methods for carrying out their mission, namely: co-operation and exchange of information through Panel members; use of the AGARD International Exchange and Consultants Programme; publication of surveys and research papers under the AGARD-ograph programme; and sponsorship of technical meetings, symposia and colloquia.

7. The AGARD Panels are:

Aero Space Medical Panel
Avionics Panel and Ionospheric Committee
Combustion and Propulsion Panel
Documentation Committee
Flight Mechanics Panel
Fluid Dynamics Panel
Structures and Materials Panel

8. It was felt from the beginning that the greatest potential for influencing NATO advancement in aeronautics was to select important objectives and to strive toward real progress in these rather than to cover the whole vast field of aeronautical research and development. Whenever formal Panels did not seem justified, ad hoc committees or special consultants have been utilized.

9. In addition to this Panel activity, the International Exchange and Consultant Programme organizes the exchange of personnel between the various countries to enable them to acquire valuable experience which could not otherwise be obtained.

MAIN ACHIEVEMENTS OF AGARD PANELS

Aero Space Medical Panel

10. The Panel deals with the principal limiting factor which confronts the development of modern aviation: the human element.

11. A significant achievement of the Panel is its showing the authorities in aero medicine of several NATO countries how the science of aero space medicine contributes to progress in aviation.

12. An anthropometric survey of Turkey, Greece and Italy has been completed in April, 1961, and will result in improved personnel equipment design and human engineering advancement. This project was initiated by the Aero Space Medical Panel and supported by the United States Air Force and the Division for Scientific Affairs, NATO.

13. This Panel has given assistance and advice on text books and Aero Space Medical publications for the Research and Development libraries in NATO countries such as Turkey, Greece and Portugal.

- Assistance has been provided in making plans for adequate facilities for aero medical centres in smaller countries.
- Lecture series have been provided to Turkey, Greece and Portugal on special subjects relating to the flight surgeon, of special interest to each country.
- Arrangements have been made to provide for training of Medical Department Officers in the United States and other countries.
- Advice and assistance have also been furnished for the operation of low pressure chambers. Studies have been made related to physical limitations of personnel in low pressure chambers.
- Information and advice have been provided from time to time from the experts of the panel on the medical problems related to high pressure suits.

Avionics Panel

14. The Avionics Panel was created in 1957 for the purpose of promoting international co-operation within the NATO Community in Avionics research and development which has applications to aeronautics. To fulfill the purpose for which it was created, the Panel:

(i) surveys and promotes advances in avionics research relating to common defence;

(ii) recommends the solution of problems referred to it by agencies within NATO;

(iii) evaluates research and development projects submitted by individual nations;

(iv) recommends methods leading to improved science co-operation among member nations;

(v) explores methods for facilitating the exchange of research and development information;

(vi) promotes and assists in the establishment of joint NATO facilities for scientific research, testing and training.

15. The Panel has been active in sponsoring theoretical studies, research projects, and co-operative research. AGARDographs are to be completed in 1961 dealing with subjects on "Applications of Statistical Communications Theory" and "Satellite Injection"; the latter, covering the interrelated problems of placing a satellite in orbit. Co-operative research investigations are in progress on oblique incidence measurements, cosmic ray measurements, study of solar activities and satellite tracking. Technical assistance and advice has been given in establishing astronomical observatories in Greece and Turkey.

16. An activity of great importance to NATO has been the assistance given to NATO agencies and NATO countries in the selection of sites for missile training and testing facilities. Technical studies have been made giving advice in site selection, planning, management and design of facilities.

Combustion and Propulsion Panel

17. The Panel was established in recognition of the growing importance of combustion research in the development of advanced air-breathing aircraft engines and rockets. Its activity was then expanded into the broader propulsion area.

18. The first Colloquium sponsored by this Panel was devoted to both combustion and propulsion topics, with marked success. The problems of transport phenomena, ignition, altitude behaviour, and scaling of aero-engines were discussed at the Second Colloquium. A third Colloquium has covered propulsion problems involving noise, shock tubes, magnetic effects, instability, and mixing. The fourth Colloquium was devoted to the subject of "High Mach Number Air Breathing Engines" where the timely topic, "The Future of Air Breathing Engine" was the theme of a round table discussion. The programme is being arranged for the 5th Colloquium which will be held in March or April 1962 at a site in Germany to be selected.

19. The Panel organized a comprehensive meeting on "Chemistry of Propellants" and more recently a classified discussion on "Solid Propellants" at the request of the Assistant Secretary-General for Scientific Affairs, NATO.

20. A meeting in Pasadena, California, explored current thinking in the United States on "Advanced Propulsion Techniques" to stimulate interest and co-operation among the NATO nations in this field.

Documentation Committee

21. The primary purpose of the Committee is to provide service and advice in documentation for the AGARD technical Panels, to advise on the publication problems of AGARD and, through the individual members of the Committee, to stimulate national agencies for aeronautical information.

22. The Documentation Committee has been concerned with the following main activities:

- Standardization of the form of technical reports produced within the NATO countries.
- Preparation of the AGARD Aeronautical Multilingual Dictionary of aeronautical terms in eight languages, namely: Dutch, English, French, German, Italian, Russian, Spanish, and Turkish, providing in each language a definition of each term. The Dictionary has been completed and published. A supplement is in process of preparation including a Greek section.

Flight Mechanics Panel

23. The Flight Mechanics Panel has the main function of providing exchange of information on flight test techniques and instrumentation between the NATO nations. In this regard, a major contribution has been the preparation of the NATO Flight Test Manual. The Panel was at an early stage concerned with the important problems of operation of Light Weight Military Aircraft from unprepared fields.

24. The rôle of STOL/VTOL aircraft was explored at the August 1956 Brussels meeting. This subject is of interest to SHAPE, and the Panel has discussed further studies in this field. The rôle of STOL/VTOL aircraft was further brought out in papers given by representatives of the aviation industry and military services of the various NATO countries at the 14th meeting of the Panel held in Athens in May 1959.

25. The Panel has also sponsored meetings to bring together prominent researchers in the helicopter field. These groups of helicopter experts have prepared summaries outlining the many problems which they considered important and which could be solved by inter-NATO exchange of information and co-operative

research and development effort. This subject was further pursued at the 14th meeting under the theme of "Human Engineering Aspects of Flight in Unconventional Aircraft".

26. The Panel, along with the Fluid Mechanics Panel, sponsored a "Specialists Meeting on Stability and Control". This meeting was held in Brussels in April 1961 at the Training Centre for Experimental Aerodynamics.

Fluid Dynamics Panel

27. Formed in September 1952 as the Wind Tunnel and Model Testing Panel, this committee first addressed itself to the problem of exchanging among the NATO countries information concerning the latest techniques and experiences of member countries in the investigation of aerodynamic problems.

28. To take some account of the necessarily changing function of the Panel, its name was changed in 1960 to "Fluid Dynamics Panel". Its objectives are broadly as follows:

(a) To assist the interchange of aerodynamic information including that pertaining to experimental techniques of model experiments.

(b) Where desired, to lend assistance in suggesting and co-ordinating research work in the field of fluid mechanics.

Structures and Materials Panel

29. The Panel maintains a critical review of (i) the scientific frontiers of new structural materials, (ii) the application of modern mathematical analysis to complex aeronautical structure, and (iii) the methods of aeroelastic analysis of the dynamic response of the structures.

30. A material handbook has been developed which provides design data and characteristics of the materials which are available in the NATO nations. The first volume deals with Aluminium Alloys; the second volume with Steels; the third will be devoted to Magnesium, Nickel and Titanium.

31. The Panel is preparing a Manual on Aeroelasticity which will exhibit in its chapters the talents of 40 recognized experts in this field. A co-ordinated programme among ten NATO nations has been completed on Runway Roughness, and a profile criterion for the construction and maintenance of Runways has been defined. The Panel is now initiating a study of non-destructive testing methods for bonded aircraft components.

32. The Panel's structural and aeroelastic component is now undertaking the development of a "Manual on Aircraft Loads", the development of a co-operative NATO programme which embraces all production phases of structural materials having refractory materials as a base.

33. The Panel arranged a Symposium on the sciences dealing with materials which took place in May 1961 at NATO Headquarters. The need for such a meeting was brought to the attention of AGARD by the NATO Division for Scientific Affairs. The purpose of the symposium was to present summary review papers outlining the frontiers of present knowledge in this field.

International Consultants and Exchange Programme

34. The International Exchange Programme, established in 1953, is one of AGARD's means of increasing the NATO nations' potential in research and development. It deals with the arrangement of exchanges of technical personnel, lectures, special conferences, and in addition provides general co-ordination of the consultant activities.

Operational Research

35. At the request of many NATO countries, and in conjunction with the Scientific Adviser, SACEUR, advice in Operational Research techniques has been provided by AGARD consultants during the last few years.

36. In addition, a NATO Conference on Operational Research was convened in April 1957, under joint AGARD-SHAPE sponsorship with a view to creating within NATO an increased interest in Operational Research and, to demonstrating to practising technicians and scientists the application to specific problems of some of the latest techniques and methods of Operational Research.

37. As a joint project, the Mutual Weapons Development Programme and AGARD sponsored a NATO Summer Course on Operational Research. This course took place at the Training Centre in Experimental Aerodynamics, Rhode-Saint-Genèse, near Brussels, in August 1959.

38. AGARD has to prepare a report to the Standing Group, of the requirements, as seen by AGARD, for education in, prosecution of and co-ordination of OR in NATO. This study will deal with OR in all NATO countries, commands and agencies, and will be made with the co-operation of the NATO and national authorities, by an AGARD Survey Team.

VTOL/STOL Aircraft

39. Having recognised the importance of vertical take-off and landing, and short take-off and landing (VTOL/STOL) aircraft, AGARD, with the approval of the Standing Group, organized a Symposium in this field of aeronautical technology. This symposium took place at the NATO Headquarters, Paris, on 28th, 29th and 30th June, 1960 and was attended by leading experts from Government organizations and Industry.

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ANNEX V to
AC/137-D/713

OFFICE OF THE SCIENTIFIC ADVISER TO SACEUR

Note by the Acting Scientific Adviser to SACEUR

Historical Background

In January 1954 General Gruenther intimated his need for a Scientific Adviser to assist him and the SHAPE staff. In view of the over-riding importance of atomic matters he further specified that, at least in the first instance, the Scientific Adviser should be an American. He further intimated the possible need for further scientific staff, but that this consideration should wait until after the initial appointment.

2. General Gruenther's proposal was quickly accepted and Dr. H. P. Robertson was appointed to fill the post. He assumed office in May 1954.

3. The needs of the office were reviewed after six months and it was decided that the staff should be strengthened by the inclusion of two assistant scientific advisers, one English and one French, together with a military assistant.

4. The principle adopted in establishing and staffing the office was then, and has since remained, that the number of scientists should remain small, but that individuals would be able to draw upon the knowledge and experience in their respective countries to which end they should be of adequately high standing and familiar with the defence science activities in their own countries. In October 1958 the establishment was further increased by one assistant scientific adviser to be provided from Germany. Dr. J. Jonnisson was appointed to this post.

5. Following Dr. Robertson the post of scientific adviser has been filled successively by Dr. K. S. M. Davidson in 1956, and Dr. K. C. Black in 1957. The post has been vacant since October 1960.

Terms of Reference

6. The terms of reference for OSCAD have been variously stated since the office was established, but have always been wide enough to cover such assistance as scientific advisers might reasonably be expected to provide to a military headquarters. The terms of reference are presently stated as follows:

The SCIENTIFIC ADVISER is the adviser to SACEUR, his deputies and the SHAPE staff on scientific research and development in weapons and weapon systems in relation to strategic concepts involved in the conduct of war. His specific responsibilities include:

(a) Studying and evaluating general world-wide scientific research and development in weapons and weapon systems and advising as to its implications and relationship to SHAPE plans, problems and tactical concepts.

(b) Making recommendations as to integration of such weapons and weapon systems as may be appropriate into future plans.

(c) Furnishing as required, membership or consultant services to various committees of the North Atlantic Council on matters of scientific importance or implication.

(d) Determining scientific sources of information in connection with specific questions raised by the staff, subordinate commands, or by individual NATO nations; performing liaison between military and scientific agencies.

7. One regular activity undertaken by OSCAD and not specifically covered in the above terms of reference is to hold at regular intervals the SHAPE OR/SA conference. These conferences have been held with a view to advancing operations research among the NATO countries, and have been organized sometimes by OSCAD alone and sometimes by OSCAD and AGARD in co-operation.

8. Funds are available to OSCAD to employ as consultants for limited periods experts who can undertake specific tasks required by SHAPE. Consultants have been so engaged on two occasions.

(Signed) P. JOHNSON

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

REGISTRY
S.A.

EXEMPLAIRE 448
COPY

ORIGINAL: ENGLISH
29th March, 1963

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DOCUMENT
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DEFENCE RESEARCH DIRECTORS

PROVISION OF SCIENTIFIC ADVICE TO THE NATO MILITARY AUTHORITIES

Note by the Secretary

The summary record(1) of the Defence Research Directors' meeting of 21st and 22nd March, 1963 will be circulated shortly. Meanwhile, the conclusions reached by the Defence Research Directors on the provision of scientific advice to the NATO military authorities(2) are circulated herewith for your convenience.

(Signed) J. LECONTE

OTAN/NATO,
Paris, XVIe

(1) (AC/137(DR)R/5
(AC/74(DR)R/5

(2) Agenda (AC/137(DR)A/5, Item V
(AC/74(DR)A/5

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AC/74(DR)D/3

RECOMMENDATIONS OF THE DEFENCE RESEARCH DIRECTORS REACHED IN RESTRICTED SESSION

After a frank and free discussion during which each Director expressed his point of view, the following conclusions and recommendations were agreed:

(1) No ideal solution was possible to the problem of advising the NATO military authorities about scientific matters.

(2) The Defence Research Directors should be constituted as a permanent and independent Committee of NATO.

(3) The scope of activity of the new Committee would be:

(a) to consider long-term prospects and short-term studies of all scientific matters, as they might affect or do affect military matters. This could be considered to include operational defence research applied to particular problems;

(b) to provide scientific and technical advice to the Military on the formulation of operational requirements;

(c) to advise on the inter-relationships of the various existing NATO bodies and procedural channels through which scientific advice now flows to NATO military authorities.

(4) The new Committee should have sufficient authority to take the lead within NATO in all scientific matters having a defence aspect, and which are considered to be of importance or interest to the Alliance; it should not be inhibited in its actions and should be free to take the initiative wherever its advice was felt to be of value, including assisting the military authorities in formulating important questions, as well as answering those that are asked.

(5) The Science Committee should continue to carry out its present functions but some of its activities would be pursued in the closest relation to the activities of the proposed new Committee of the Defence Research Directors.

(6) It was recognised that some of the activities at present preoccupying the Science Committee might fall under the purview and control of the new Committee (i.e. Defence aspects of operational research).

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(7) The new Committee should be served by a small but adequate staff. No big increase was called for in the secretariat set up to serve the needs of the new Committee. The United Kingdom proposals in this respect were felt to express the general feeling of the Defence Research Directors.

(8) Regarding the Chairmanship of the new Committee, the opinion of the Defence Research Directors was divided between the following two proposals:

(a) that the Chairman should be elected by the new Committee from amongst its members, and

(b) that a Chairman should be appointed from the NATO International Staff.

(9) The following detailed propositions were made:

(i) that a small drafting Committee be set up under the aegis of the Assistant Secretary General for Scientific Affairs, composed of Representatives of France, Italy, the United Kingdom and the United States, and should be required to submit a report within three months; these four representatives would be free to consult the Standing Group;

(ii) that this report should bring together the common ground already existing in the papers and proposals submitted by various countries, and should define the objective of the new Committee of Defence Research Directors, outlining the background which had led to the evolution of the present arrangements and situation, and examining the existing problems of NATO in the scientific field. It should also put forward various alternative solutions to various administrative issues concerned, stating and discussing the advantages and disadvantages of each, and should make definite proposals concerning the recommended course of future action;

(iii) that the report should be circulated to the Defence Research Directors and once their approval of an alternative solution had been obtained in writing, should be submitted to the Secretary General, who should take what action he saw fit to meet the problem. It is understood that those preparing the report will consult with other NATO groups, such as the Standing Group, as necessary, to ensure that the report is comprehensive and complete.

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ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD
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Enclosure

ORIGINAL: ENGLISH
5th May, 1964

NATO CONFIDENTIAL
PO/64/183

To: Permanent Representatives

From: Deputy Secretary General

COMMITTEE OF DEFENCE RESEARCH DIRECTORS - TERMS OF REFERENCE

References: C-M(64)5
C-R(64)20

In the light of the decisions taken at its meeting on the 22nd April(1) on the provision of Scientific Advice to the NATO Military Authorities, the Terms of Reference for the Committee of Defence Research Directors will be those recommended by the Defence Research Directors(2), with the amendment suggested by the Science Committee(3), and Paragraph 3 - dealing with the Chairmanship brought into line with the decision recorded by the Council(4).

2. These Terms of Reference are attached: amendments to the Appendix to Annex I to C-M(64)5 are underlined.

(Signed) G. COLONNA

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(1) C-R(64)20, Item VIII
(2) Appendix to Annex I to C-M(64)5
(3) Annex II to C-M(64)5, paragraph 10
(4) C-R(64)20, paragraph 51

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PO/64/183

TERMS OF REFERENCE FOR THE COMMITTEE OF DEFENCE RESEARCH DIRECTORS

The Committee will:

(a) advise the North Atlantic Council and the Military Committee, or when appropriate, any other NATO body, on problems of science and technology bearing directly on the military policies of the Alliance;

(b) advise, when requested, the North Atlantic Council or other relevant NATO Authorities on the appointment of senior defence scientists within the Organization;

(c) propose to the North Atlantic Council or NATO Military Authorities actions which, in their view, will improve the organization and quality of the scientific and technical support provided at all levels within the NATO military organization;

(d) set up such ad hoc working groups or other bodies as may be required to study specific scientific and technical problems of interest to the NATO Council and its Committees;

(e) at suitable intervals, review on behalf of the NATO Military Committee, the possible military consequences of advances in the field of science and technology;

(f) establish close working relations with other appropriate NATO bodies;

(g) refer to the Science Committee from time to time problems of general or specific scientific interest bearing on the work of the Committee of Defence Research Directors and on which the Science Committee is deemed to be specially qualified;

(h) report annually to the North Atlantic Council.

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2. Defence Research Directors forming the Committee will be the men who, in their own countries are responsible at the highest level for the application of science and technology to military problems. Appropriate representation from the NATO International Staff and military staffs will be provided.

3. The Committee will meet under the Chairmanship of the Assistant Secretary General for Scientific Affairs.

4. The Committee of Defence Research Directors will appoint a Standing Sub-Committee, meeting as required to discharge the tasks set by the main Committee and consisting of the Defence Research Directors or their representatives, with appropriate NATO representation. The work of the Committee will be supported by a strong executive staff.

ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD
NORTH ATLANTIC TREATY ORGANIZATION

PLACE DU MARÉCHAL
DE LATTRE DE TASSIGNY
PORTE DAUPHINE
PARIS XVI
KLEber 30-20

LE SECRÉTAIRE GÉNÉRAL
SECRETARY GENERAL

Po-64.292

23rd June, 1964

Dear Dr. McLucas,

I understand that you would like to have in a letter from me a succinct outline of your responsibility as Assistant Secretary General for Scientific Affairs.

In this function you will be responsible to the Secretary General of NATO :-

(1) for administration of the Office of the Assistant Secretary General for Scientific Affairs, including the proper operations of the Science Committee and the Committee of Defence Research Directors and related sub-committees;

(2) for providing advice and support to the Secretary General on matters of military research and development;

(3) for maintaining liaison between the Committee of Defence Research Directors and the Science Committee on the one hand and the NATO military authorities on the other. This specifically includes liaison and co-ordination with the Standing Group.

At the same time you will, of course, be the Chairman of the NATO Science Committee and the Chairman of the NATO Committee of Defence Research Directors.

Yours sincerely,

Dirk U. Stikker.

Dr. John L. McLucas,
Deputy Director,
(Tactical Warfare Programs),
Office of the Director of Defense
Research and Engineering,
Department of Defense,
Washington 25, D.C.

E/6 - F/6

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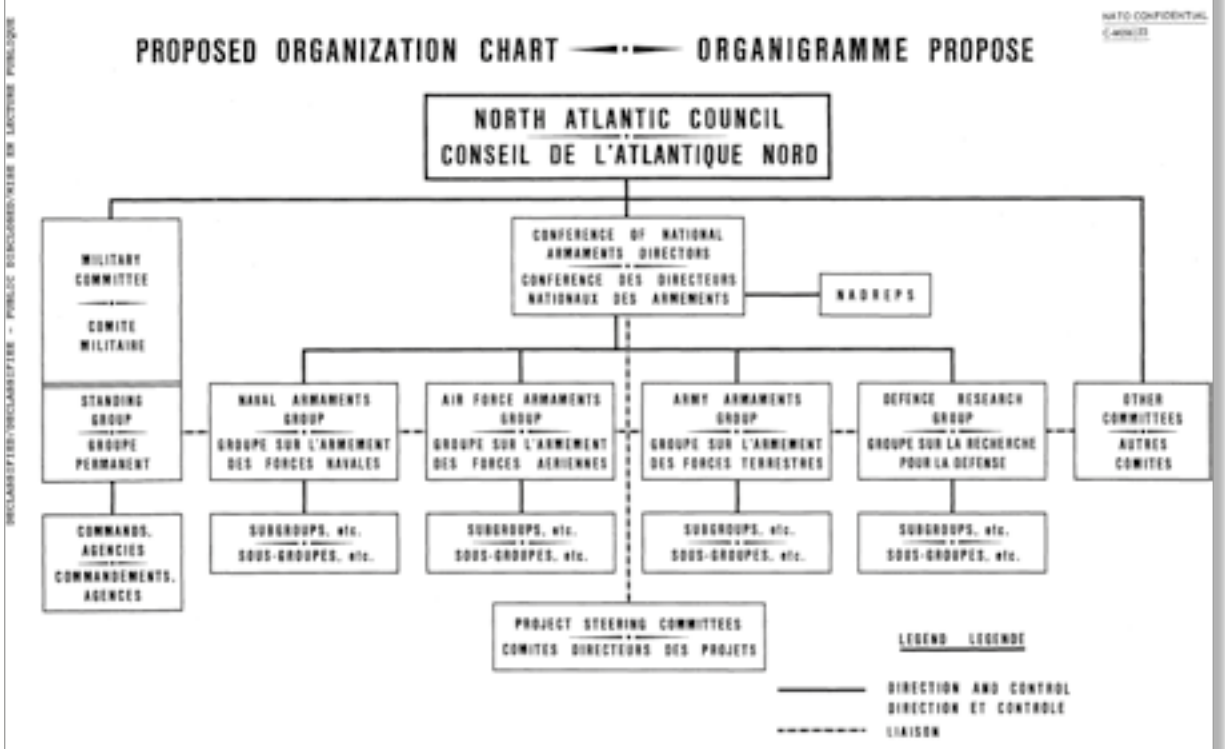
PRESS RELEASE (64)13 — Paris, 9th October, 1964

DEFENCE RESEARCH DIRECTORS COMMITTEE MEETING

The Secretary General of NATO, Mr. Manlio Brosio, addressed the opening session of the newly created Defence Research Directors Committee, which has just ended its first two-day meeting under the Chairmanship of Dr. J.L. McLucas, the Assistant Secretary General for Scientific Affairs of NATO, who will be responsible for implementing the decisions of the Committee. In welcoming members to NATO Headquarters, Mr. Brosio said that the new Committee had an important role to play in ensuring that the Alliance had available to it the latest scientific concepts in the development of its co-operative defensive systems.

The Defence Research Directors Committee, which was formally established by the North Atlantic Council in the spring of this year, brings together the scientists of each member country who are in charge of defence research and development. The main function of this new Committee is to advise the Alliance on the applications of science in strengthening its defences, especially those aspects which call for international scientific co-operation. The Committee will also be concerned with ensuring that the Alliance's Military Authorities have ready access to the best scientific advice in formulating long term policies.

This first meeting of the Committee was largely concerned with a discussion of its future activities, and its relationships with other NATO Committees, especially the Armaments Committee and the Science Committee. The Committee also discussed several areas for possible co-operative research, and agreed to explore these further. Appropriate working groups were established and the Committee will be invited to undertake specific recommendations at later meetings.


PROPOSED ORGANIZATION CHART — ORGANIGRAMME PROPOSE
NORTH ATLANTIC COUNCIL
CONSEIL DE L'ATLANTIQUE NORD
MILITARY COMMITTEE
COMITE MILITAIRE
CONFERENCE OF NATIONAL ARMAMENTS DIRECTORS
CONFERENCE DES DIRECTEURS NATIONAUX DES ARMEMENTS
NADREPS
STANDING GROUP
GROUPE PERMANENT
NAVAL ARMAMENTS GROUP
GROUPE SUR L'ARMEMENT DES FORCES NAVALES
AIR FORCE ARMAMENTS GROUP
GROUPE SUR L'ARMEMENT DES FORCES AERIENNES
ARMY ARMAMENTS GROUP
GROUPE SUR L'ARMEMENT DES FORCES TERRESTRES
DEFENCE RESEARCH GROUP
GROUPE SUR LA RECHERCHE POUR LA DEFENSE
OTHER COMMITTEES
AUTRES COMITES
COMMANDS, AGENCIES
COMMANDEMENTS, AGENCES
SUBGROUPS, etc.
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PROJECT STEERING COMMITTEES
COMITES DIRECTEURS DES PROJETS
LEGEND LEGENDE
DIRECTION AND CONTROL
DIRECTION ET CONTROLE
LIAISON

(d) Organizational changes

25. The above procedures for future co-operation require a number of organizational changes for their implementation (see chart at Annex VII). It is recommended that these changes should be as follows:

(i) The three existing Service Advisory Groups, renamed Armaments Groups, will become the main bodies responsible for promoting co-operation in developing and producing equipment, and in the relevant logistic aspects thereof, handling both operational requirements and the initiation of co-operative projects. The representation on these Groups should be capable of speaking with authority on operational concepts and national programmes. The Groups will remain, as now, directly responsible to the North Atlantic Council, as represented by the Conference described in sub-paragraph (iii) below. The proposed composition and Terms of Reference of these Groups are set out in Annexes III to V.

(ii) The three Service Armaments Groups will be augmented by the new Defence Research Group, which will be responsible for promoting co-operation in research and technology which might lead, in the long term, to future equipment, as mentioned in paragraph 24 above. This Group will undertake such research studies on its own initiative. It will also, at the request of the Service Armaments Groups, undertake studies in fields where requirements cannot be met for technological reasons. It will further take over existing work in certain specialised fields of defence research. The proposed composition and Terms of Reference of this new Group are set out at Annex VI.

(iii) A NATO Conference of National Armaments Directors will be established which, in principle, will meet twice a year. This will have a special status as a body acting under the authority of the Council in respect of defence equipment and connected problems. It will be composed of senior governmental representatives responsible for defence equipment. With respect to the Armaments Groups and the Defence Research Group, the Conference will be informed of their progress and discuss problems which cannot be resolved by them. It will also consider the more important political, economic and technical aspects of the provision of equipment for NATO forces and may issue broad directives thereon. The proposed composition and Terms of Reference of this Conference are set out at Annex I.

(iv) To provide a point of contact with its National Armaments Director, each country will designate a member of its permanent delegation to NATO as the representative of its National Armaments Director. These NADREPS will meet as required, at the call of and under the chairmanship of the Assistant Secretary General for Production, Logistics and Infrastructure, to prepare the business of the Conference and to undertake such tasks as the Conference may direct. The proposed composition and tasks of these NADREPS are set out at Annex II.

(v) The Armaments Committee and the Committee of Defence Research Directors in their present form will disappear, their higher functions being absorbed in the new Conference, their responsibility for promoting co-operative projects being taken over by the four Groups and their more routine tasks being undertaken by the NADREPS.

(vi) The existing Ad Hoc Mixed Working Groups, Groups of Experts and other bodies under the Armaments Committee will be re-allocated to the Service Armaments Groups on the basis of the Service having the major interest in each case. The Armaments Groups will decide within six months whether to keep them in being in their present form, or a modified one, or to dissolve them. They will take similar action in respect of all NBMRs already promulgated. Long-term activities of any of the bodies under the Armaments Committee having no definite operational interest or being concerned only with technology will be transferred to the new Defence Research Group for decision. Certain bodies, undertaking general activities of a logistic or administrative nature, will be placed under the direct responsibility of the Conference (see Annex I).

(vii) The existing NPLOs, including NAMSO, will remain Council bodies, with progress reports being made available to the Conference. The existing Steering and Co-ordinating Committees, responsible for the development and production of equipment, will report progress at intervals to the Conference.

(viii) Close liaison between the bodies described above and the NATO Military Authorities is essential for maximum co-operation. The NATO Military Authorities will therefore be appropriately represented in these bodies in order to give advice. This representation will be provided at the discretion of the Military Committee/Standing Group with such support from Commands and Agencies as deemed necessary.

(ix) Some changes will be required in the structure of the International Staff, to match this new organization, so that it will be able to give effective assistance to countries in their co-operative efforts. As well as providing services, the International Staff will supply the necessary co-ordination between the various bodies by occupying the Vice-Chairmanship of them on a permanent basis. For this purpose it is envisaged that there will be a Director of Armaments who will be concerned with the Service Armaments Groups and a Director of Research who will similarly be concerned with the Defence Research Group. The Director of Research, together with staff now concerned with Applied Research, will be placed under the Assistant Secretary General for Production, Logistics and Infrastructure, whose Division will thus support all of this co-operative activity.

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ANNEX VI to
C-M(66)33(Revised)

PROPOSED COMPOSITION AND TERMS OF REFERENCE
OF THE DEFENCE RESEARCH GROUP

I. The Defence Research Group shall be composed as follows:

Chairman: National Representative (by election every two years)

Vice-Chairman: Director of Research

Members: Senior national representatives capable of speaking with authority on the application of science and technology to military problems and resulting national research programmes.

II. The meetings of the Defence Research Group shall also be attended by:

(a) Representatives of the NATO Military Authorities, as appropriate;

(b) the Director of Armaments;

(c) a representative of the Division of Scientific Affairs.

III. The Defence Research Group shall have the following Terms of Reference:

1. Exchange information on new research and technology which might lead to future equipment.

2. Review the possible military consequences of advances in the fields of science and technology.

3. Identify suitable areas or individual proposals for bilateral or multilateral co-operation in defence research, resulting from 1 and 2 above, and set up such subordinate bodies as may be required for the implementation of appropriate co-operative research studies and programmes.

4. Undertake studies, at the request of any of the three Service Armaments Groups, in fields where requirements cannot be met until a breakthrough or a serious advance in technology has been achieved.

5. Co-operate fully and maintain close liaison with the three Service Armaments Groups, with a view to avoiding duplication of effort. To this end, these four Groups shall, when practical, either jointly or at the direction of the Conference, designate one of them to act for such activities in their domain as are of interest to more than one of them.

6. Continue, as necessary, the studies undertaken by the Committee of Defence Research Directors on the long-term aspects of specialised fields.

7. Examine matters of defence research policy which may be of interest or common concern to NATO countries.

8. Refer to the Science Committee any problems of general or specific interest bearing on the work of the Defence Research Group and on which the Science Committee is deemed to be specially qualified.

9. Report periodically to the Conference of National Armaments Directors on progress and submit to it those problems for which a solution is required.

10. Review the long-term activities undertaken to date by bodies under the Armaments Committee having no operational interest or being concerned only with technology which will be transferred by the Service Armaments Groups and decide whether these activities shall be continued and if so in what form. These shall include in particular the long-term aspects of identification of aircraft, NBMR 36 (AC/218 Group).


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TWENTIETH ANNIVERSARY OF THE NORTH ATLANTIC TREATY

ADDRESS BY THE PRESIDENT OF THE UNITED STATES
AT THE COMMEMORATIVE SESSION OF THE
NORTH ATLANTIC COUNCIL - 10TH APRIL, 1969

Your Excellencies, Distinguished Guests, Ladies and Gentlemen:

As we gather here today, we celebrate a momentous anniversary.

We celebrate one of the great successes of the postwar world.

Twenty years ago, a few dedicated men gathered here in Washington to cement an Atlantic partnership between the older nations of Europe and their offspring here in the New World - and in this room, the North Atlantic Treaty was signed. Some of the men who gathered then are here again today - and if they would stand, I think we all, with hindsight, would like to salute their foresight.

At this anniversary, we especially honour the memory of one of NATO's great champions: the General who commanded the armies that liberated Europe; the first Supreme Commander of the forces of NATO; the American President who did so much to keep NATO strong and to give life to its principles - Dwight David Eisenhower.

His life demonstrated that there is a moral force in the world which can move men and nations. There is a spiritual force, lodged in the very roots of man's being.

As for NATO, it is precisely because it has always been more than a military alliance that its strength has been greater than the strength of arms. This alliance represents a moral force which, if we marshal it, will ennoble our efforts.

Dwight Eisenhower was a great humanist, and also a great realist. If he were with us today, he would have recognised that together, as men of the Old World and of the New World, we must find ways of living in the real world.

Third, I strongly urge that we create a committee on the challenges of modern society, responsible to the Deputy Ministers, to explore ways in which the experience and resources of the Western nations could most effectively be marshalled toward improving the quality of life of our peoples.

That new goal is provided for in Article II of our treaty, but it has never been the centre of our concerns. Let me put my proposal in the context of our times:

On my recent trip to Europe, I met with world leaders and private citizens alike. I was struck by the fact that our discussions were not limited to military or political matters. More often than not, our talks turned to those matters deeply relevant to our societies: the legitimate unrest of young people, the frustration of the gap between generations, the need for a new sense of idealism and purpose in coping with an automating world.

These were not subjects apart from the concerns of NATO; indeed, they went to the very heart of the real world we live in. We are not allies because we are bound by treaty; we bind ourselves by treaty because we are allied in meeting common concerns.

For 20 years, our nations have provided for the military defence of Western Europe. For 20 years, we have held political consultations.

Now the alliance of the West needs a third dimension.

It needs not only a strong military dimension to provide for the common defence; not only a more profound political dimension, to shape a strategy of peace; but it also needs a social dimension, to deal with our concern for the quality of life in this final third of the Twentieth Century.

This concern is manifested many ways: culturally and technologically, through the humanities and the sciences.

The Western nations share common ideals, and a common heritage. We are all advanced societies, sharing the benefits and the gathering torments of a rapidly advancing industrial technology. The industrial nations share no challenge more urgent than that of bringing 20th-Century man and his environment to terms with one another - of making the world fit for man, and helping man learn how to remain in harmony with his rapidly changing world.

We in the United States have much to learn from the experiences of our Atlantic allies in their handling of internal matters: the care of infant children in West Germany; the "new towns" policy of Great Britain; the development of depressed areas programmes in Italy; the great skill of the Dutch in dealing with high-density areas; the effectiveness of urban planning by local governments in Norway; and the experience of the French in metropolitan planning.

Having forged a working partnership, we all have a unique opportunity to pool our skills, or intellects and our inventiveness in finding new ways to use technology to enhance our environments, rather than destroy them.

The work of this Committee would not be competitive with any being carried on by other international agencies. Neither would it be our purpose to limit this co-operation and the benefits that flow from it to our own countries. Quite the opposite! Our purpose would be to share both ideas and benefits, recognising that these problems have no national or regional boundaries. This could become the most positive dimension of the Alliance, opening creative new channels to all the rest of the world.

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

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FILES N°

ORIGINAL: ENGLISH/FRENCH
17th November, 1969

NATO UNCLASSIFIED
DOCUMENT
AC/274-D/1

COMMITTEE ON THE CHALLENGES OF MODERN SOCIETY

ORGANIZATION OF THE COMMITTEE

Note by the Assistant Secretary General for Scientific Affairs

Attached is the text organizing the Committee established by the reinforced Council on 6th November, 1969(1), (Organization, Terms of Reference, Choice of Subjects and Methods of Work).

2. At Annex, and for your information is a large extract of the cover note to document C-M(69)43, submitted to the Council, signed by the Chairman of the Preparatory Committee.

(Signed) Gunnar RANDERS

OTAN/NATO,
Brussels, 39.

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(1) C-M(69)43,
C-R(69)49, Item II - to be circulated.

NATO UNCLASSIFIED

COMMITTEE ON THE CHALLENGES OF MODERN SOCIETY

I. Preamble

In accordance with Article 2 of the North Atlantic Treaty, the parties to which agreed that they would contribute towards the further development of peaceful and friendly international relations by promoting conditions of stability and well-being, and in pursuance of the declaration in paragraph 14 of the Washington Communiqué of 11th April, 1969, the Council agree to set up a Committee on the Challenges of Modern Society.

II. Organization

(1) The Committee shall be a regular Committee of the Council, meeting as required. It shall be under the chairmanship of the Secretary General or his representative.

(2) The Committee shall be open-ended, and individual governments shall decide the nature of their representation.

(3) The Committee shall be assisted by the competent divisions of the Secretariat, as required.

III. Terms of Reference

(1) The Committee shall examine how to improve, in every practical way, the exchange of views and experience among the Allied countries in the task of creating a better environment for their societies. It shall consider specific problems of the human environment with the deliberate objective of stimulating action by member governments.

(2) In examining environmental problems the Committee must have regard to the aims of the Alliance. The Committee shall not undertake executive action, nor engage in research itself.

(3) The Committee shall collect information on and make assessments of selected activities of common interest, planned or pursued by member governments in their countries or in the international field.

(4) The Committee shall make suggestions or recommendations to the Council with the intention:

(a) to improve the existing arrangements for the exchange of information on work being done nationally on environmental problems;

(b) to draw attention to the need for governmental action on recommendations made by other international organizations on methods of dealing with particular environmental problems;

(c) to propose governmental action, where appropriate, when national or international bodies have done work on particular problems without making recommendations for action;

(d) to indicate in cases where studies on particular problems have not been adequately carried out or co-ordinated how important gaps might best be filled by member governments, either individually or collectively, or in international organizations, or by an appropriate Committee of NATO.

(5) With regard to activities pursued in international organizations the Committee shall examine the necessity or advisability of co-ordination between the participating NATO members.

(6) In performing these functions, the Committee shall take care to avoid undesirable duplication of work being done in other international organizations.

(7) The Committee shall make recommendations to the Council:

(a) on co-operation between member states and non-member states;

(b) on the use to be made outside the Alliance of the Committee's findings;

(c) on any publicity on its activities.

IV. Choice of Subjects for Examination by CCMS

(1) The Committee shall propose to the Council the subjects to be studied.

(2) The subjects shall normally be of common interest to member countries.

(3) They shall be subject to which NATO group of countries can take a useful contribution.

V. Methods of Work

(1) The Committee shall normally proceed by inviting members to propose subjects and to indicate studies they would be willing to pilot, either by themselves or in association with other members.

(2) Members who have indicated their willingness to pilot a study shall then first submit a brief synopsis setting out the reasons for undertaking the study.

(3) When the CCMS has decided, in the light of the criteria above, that the problem is suitable and requires examination, and when the Council has approved the subject for study, the piloting member or members shall, in due course, circulate their pilot study and proposals for preliminary consideration in capitals and subsequent discussion and action as appropriate in the Committee. It is understood that papers of the Committee shall, in order to facilitate its work, whenever possible be unclassified.

(4) The CCMS shall transmit its findings to the Council and shall review the action taken on the suggestions or recommendations of the Council after a suitable interval of time.

(5) An annual report of the Committee's activities and of action taken shall be forwarded to the Council in Ministerial Session at its Spring meeting.

NATO UNCLASSIFIED
ANNEX to
AC/274-D/1

Extract from the cover note to document C-M(69)43

"....

4. As far as subjects are concerned, the Committee considered that the various lists in Annexes I-VII of the Secretary General's report(1) on his exploratory missions represented a useful basis for future selection. In addition, a number of countries indicated their willingness to act as pilots or co-pilots as regards certain subjects:

- oceanography (in particular pollution of oceans): Belgium offered to act as pilot, Iceland and Portugal as pilots or co-pilots;
- air pollution: the United States offered to act as pilot, and Turkey as co-pilot;
- road safety: the United States offered to act as pilot;
- disaster relief: the United States offered to act as pilot and Italy as co-pilot;
- individual and group motivation: the United Kingdom reiterated its offer to act as pilot;
- social security (the main emphasis being on the relation of economic development and social policy allocations, as well as the effects of environmental and technological changes on social security systems): Greece offered to act as pilot.

5. A number of countries also indicated a strong interest in some subjects without necessarily being ready to act as pilot or co-pilot:

- Canada called attention to the following problems: water and noise pollution; dissemination of scientific, technological and industrial information; siting of major airports and the environmental problem near airports; forestry conservation and environmental problems of the North;
- Belgium expressed interest in the study of problems of education in a technological society;
- Italy expressed a strong interest in the study of problems of urbanisation.

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(1) PO/69/338 dated 8th July, 1969

NATO UNCLASSIFIED

6. It was generally felt that in the field of oceanographic problems (sea pollution) the Science Committee with its extensive programmes could be of particularly great use in co-ordinating and supporting the work. For socio-economic questions it was suggested that the Committee of Economic Advisers could make a contribution.

7. It was generally agreed that the idea of countries piloting particular studies was very promising. All member countries need not be involved in each project - this would create difficulty because of shortage of personnel, but the success of the idea would depend to a large extent upon the willingness of other members to support a pilot nation.

8. There were views for and against the alternatives of starting in an experimental way with a very few subjects or working simultaneously, in pilot groups, on a larger number, only one or two of which would be completed in a relatively short time.

9. Before considering the subjects which might be studied by the CCMS, the Preparatory Committee exchanged views on the philosophy behind the initiative taken in NATO in this field. Certain ideas expressed met with widespread interest and sympathy - and the Committee agreed that I should transmit these ideas to the Council:

> The first, and continuing, challenge of modern society is to safeguard freedom, while improving the quality of life for mankind, in the rapidly changing circumstances brought about by advances in science and technology. Owing to these advances, men of necessity live in a new environment, at once more threatening and more promising than anything known before. From this fact further challenge arises. The most pressing challenge is to protect individuals and society from the unheeded effects of technological change, which too commonly are found to detract from or to cancel the benefits originally sought. A further challenge is to shape the new environment of man so as to bring to reality what until now have been only the dreams of mankind: dreams not only of freedom and of peace, but also of justice, of equality, and of release from the ageless struggle to maintain the elementary conditions of life.
>
> It is the experience of modern society that these goals are not separate, but are in every way and at every point connected. The stability and well-being of nations rest fundamentally on the success with which they face these challenges. That success, in turn, will depend in large measure on the degree to which nations sharing

these common goals come together in concerted or joint efforts to attain them. The circumstances among the North Atlantic Nations which led to such efforts in the field of security and political consultation now urge a further effort. The Alliance must prepare to consult, to exchange information, and, where appropriate, to establish common undertakings to improve the social and technological environment of modern society.

To enhance the understanding in member countries of the paramount importance of these problems and of the usefulness of NATO as a forum for collaboration in this field, the public should be kept duly informed of the activities of the Alliance in this respect.

The problems of the modern environment being universal it shall be the constant concern of the North Atlantic Nations to extend co-operation and exchange in this area with non-member nations.

In sum, the challenges of modern society are to minimize the harmful effects that arise from imperfect use of technological developments, to achieve a more effective use of technology and more humane forms of complex systems with a view to enhancing the welfare and freedom of individuals and strengthening the bases of world peace.

(Signed) Gunnar RANDERS

N A T O — O T A N

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EN/I
1st April 1971

NATO AND ENVIRONMENTAL PROBLEMS

THE COMMITTEE ON THE CHALLENGES OF MODERN SOCIETY

I. BACKGROUND

President Nixon's Initiative

The threat to human life brought about by man's inventions, with their power to consume resources and change the environment, is a planetary one. The United Nations, in particular its Economic and Social Council, regional bodies such as the OECD, the EEC, the Council of Europe, the East European Council for Mutual Economic Assistance and the Organization of American States, as well as national governments are all acutely concerned with the problems involved in the rapid deterioration of man's environment. In this field, NATO is the most recent newcomer.

In the course of the Ministerial meeting held in Washington on 10th April, 1969, to commemorate the signing there of the North Atlantic Treaty twenty years previously, President Nixon recommended that NATO acquire a "third dimension" to deal with "our concern for the quality of life in this final third of the Twentieth Century". "The Western nations", the President said, "are sharing the benefits and the gathering torments of a rapidly advancing industrial technology". He urged the Alliance to gear itself to help make "the world fit for man".

NATO's Response

The Secretary General of NATO, at the request of the North Atlantic Council, thereupon undertook a mission of enquiry to ascertain the views of all member countries with regard to action which the Alliance might take to implement President Nixon's proposal.

On 6th November, 1969, the North Atlantic Council agreed to set up a Committee on the Challenges of Modern Society (CCMS). The mandate of the Committee, in the words of a Press Communiqué, is:

> "How to improve, in every practical way, the exchange of views and experience among the Allied countries in the task of creating a better environment for their society. It will consider specific problems of the human environment with the deliberate objective of stimulating action by member governments."

The CCMS is a regular committee of the North Atlantic Council, chaired by the Secretary General of NATO or his representative. Neither the CCMS nor the Council, as the Communiqué referred to above also explained, will take executive action, nor will they duplicate the activity of other international bodies.

What have Environmental Questions to do with NATO?

What reasons have impelled member governments to entrust this new task to NATO? In some quarters fears were expressed that it might in practice dilute NATO's dual role of peace-keeping and peace-making (defence and détente). Others think that alternative existing organizations would be more appropriate for this purpose. Still others harbour the suspicion that NATO is seeking popular favour by cashing in on this new vogue of concern for the environment.

Article 2 of the North Atlantic Treaty, which broadly commits the member countries to "promote conditions of stability and well-being" among their peoples, clearly envisages activity

of this nature. Through more than twenty years, NATO has developed into a highly versatile instrument of inter-governmental co-operation. Procedures such as the internationally financed infrastructure programme, or the Defence Review of national defence plans, may well contain useful lessons for collaboration to solve environmental problems. Furthermore, the massive and complex system of technology transfer carried on by NATO would seem to endow the Organization with unique qualifications to assist the solution of issues connected with man's environment - issues in which technology is an important factor.

The record of the Alliance proves that NATO is able to engage the attention of its member governments at a high level. The case has been well stated by Mr. Daniel P. Moynihan, then President Nixon's Adviser on Urban and Social Affairs and the United States Representative to the CCMS, when he said:

> "We come to NATO in quest of some response to these challenges not least because the unique and singular function of this Organization, which is without precedent in history. Mankind has never produced an equivalent of the NATO experience. It is that not only it has for 20 years involved itself with the science of technological transfer, exchange and co-operation, and with the art of political consultation and agreement-reaching, but also, and fundamentally, it has done so at the very highest levels of government. NATO matters are taken seriously in each of our countries. And this is a matter I should like to stress. We bring this initiative to NATO, this issue of the environment, because we regard it as fundamentally serious."

How the CCMS works

Two concepts are basic to the work of the CCMS. The first idea is that of the pilot country. One country, possibly in association with others, will offer to sponsor a project. The second idea is that NATO's efforts in this field will not be aimed at research, but at the formulation of government policy and legislation to deal with environmental issues.

Sponsoring countries may invite representatives of States outside the Atlantic Alliance to participate in their work; e.g. representatives of the Japanese and Swedish automotive

industries have assisted in the Road Safety Project piloted by the United States of America. The problems of environment are, of course, general ones and capable of solution only on a global scale.

II. STATUS OF PILOT PROJECTS
(1st April, 1971)

AIR POLLUTION

Pilot: United States of America
Co-pilots: Federal Republic of Germany and Turkey

At the plenary meeting of the CCMS in April, the United States will be reporting on the Low Pollution Power System Development Conference (the "clean car" conference) held at Eindhoven in February 1971, as well as on other aspects of this project, including work in progress in Ankara, Frankfurt-am-Main and St. Louis. On the clean engine, the United States is working toward bilateral or multilateral agreements with its Allies calling for the development of low pollution engines.

OPEN COASTAL WATER POLLUTION

Pilot: Belgium
Co-pilots: Canada, France, Portugal
Associated countries: United Kingdom and United States

Belgium, the pilot country, having sponsored the NATO Colloquium on pollution of the seas by oil spills in November, 1970, which led to the adoption by the North Atlantic Council in Ministerial Session last December of a resolution on Oil Spills, is engaged with the co-pilot countries on the follow-up work. They are also continuing work on the mathematical model of the North Sea and are looking into the problem of ocean dumping.

INLAND WATER POLLUTION

Pilot: Canada
Co-pilots: Belgium, France, United States

An organizational meeting took place in Brussels in March 1971. The Canadian study will focus on the St. John River Basin flowing between New Brunswick and Maine. Canada has stated that the goal will be to "identify and recommend through CCMS the elements, mechanisms and instruments for effective inland water quality management, especially in an inter-jurisdictional setting".

ROAD SAFETY

Pilot: United States

The Experimental Safety Vehicle is the most interesting part of this project. Bilateral agreements have been signed between the United States and the Federal Republic of Germany and between the United States and Japan; further bilateral agreements may follow, it is thought, in the near future. Responsibility for other aspects of the project have been assumed as follows : Accident Investigation (Netherlands); Vehicle Inspection (Federal Republic of Germany); Emergency Medical Response (Italy); Alcohol and Highway Safety (Canada); Road Hazards (France); Pedestrian Safety (Belgium).

DISASTER ASSISTANCE

Pilot: United States
Co-pilots: Italy and, for Earthquake Hazard Reduction, Turkey

The United States will present two documents to the April plenary meeting of CCMS, one on the establishment of National Disaster Procedures in NATO, the other a report with recommendations following the conference held in Venice last October on Flood Mitigation.

A conference on Earthquake Hazard Reduction will take place in San Francisco in May 1971.

ENVIRONMENT IN THE STRATEGY OF REGIONAL DEVELOPMENT

Pilot: France
Co-pilot: United Kingdom

Preparations for the pilot study have continued and a first meeting has been scheduled to take place in Paris in late April.

The study will examine the inter-connexion between environmental problems in the framework of regional developments.

WORK SATISFACTION IN A TECHNOLOGICAL ERA

Pilot: United Kingdom

In December the Director of the Study met a number of professional colleagues in the United States and Canada. He has also completed a tour of several European countries. A progress report will be made to the CCMS plenary meeting in April.

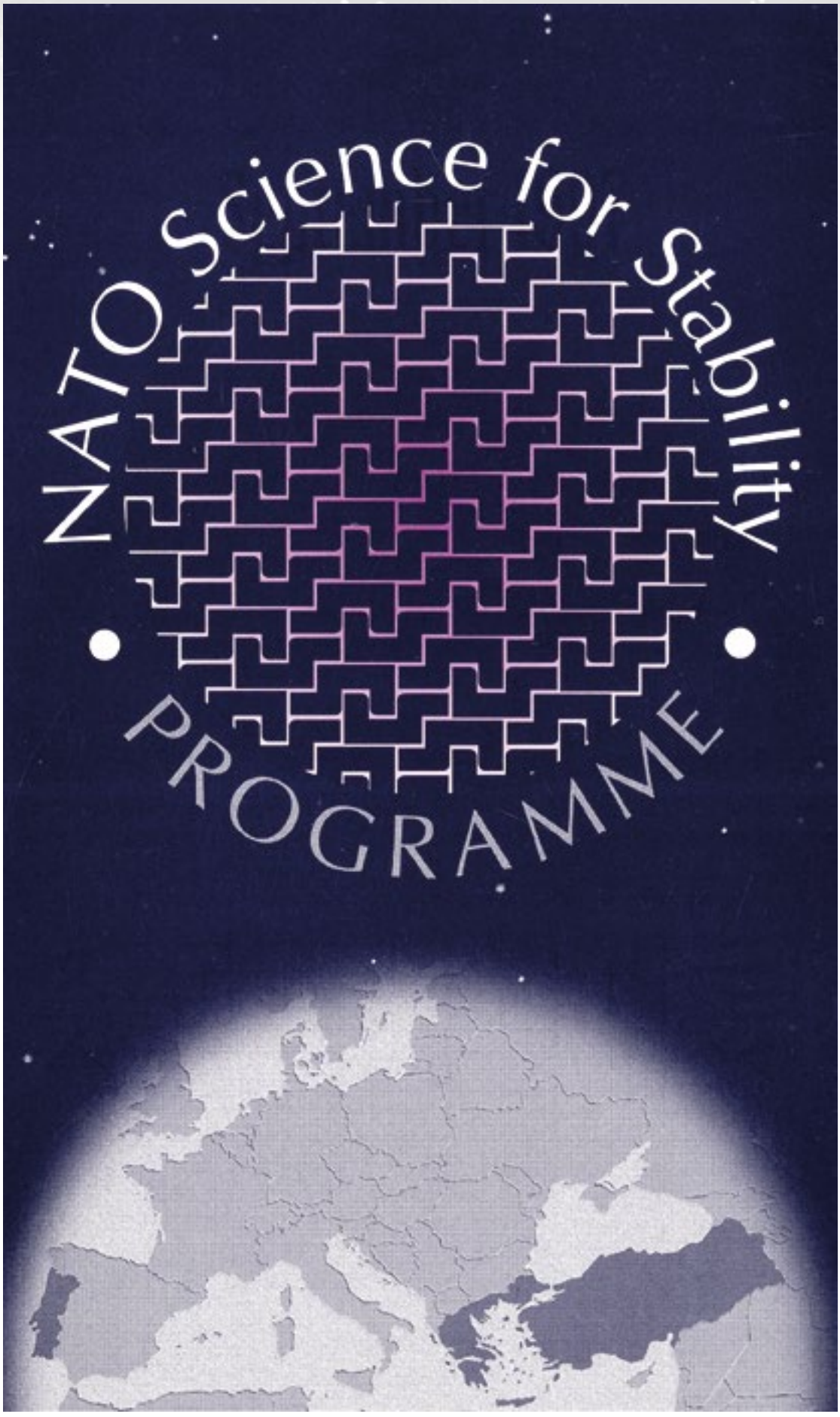
INDIANAPOLIS CONFERENCE ON CITIES

A conference of U.S. Mayors and Local Authorities will be held at Indianapolis from 25th-28th May, 1971. Representatives of other international organizations and very senior officials and mayors from Europe and Canada will take part. The theme of the conference is "Innovation in the Cities" and the discussion will include new approaches to problems such as Environment, Recreation, Housing, Transportation, Public Health and Safety, Local Government Organization, Planning and Development, Fiscal Resources.

ENVIRONMENTAL FELLOWSHIPS

The North Atlantic Council approved last December the creation of CCMS Environmental Fellowships to a total of $25,000 for the first year. The United States, as sponsor of this proposal, will present to the April plenary meeting of CCMS a document outlining proposed rules and procedures for such a fellowship programme.


ALTERNATIVE
AUTOMOTIVE
POWER
SYSTEMS
PROGRAM
AAPS PROGRAM


NATO Science for Stability
PROGRAMME

CONSEIL DE L'ATLANTIQUE NORD
NORTH ATLANTIC COUNCIL

N A T O U N C L A S S I F I E D

ORIGINAL: ENGLISH/FRENCH
9th April, 1979

DOCUMENT
C-M(79)19

STATEMENT TO THE COUNCIL BY THE SCIENCE COMMITTEE:
AN ASSESSMENT FOR FUTURE PROGRAMME DEVELOPMENT

Note by the Secretary General

The Science Committe has examined the results of its Twentieth Anniversary Conference, reassessed its basic principles and agreed on its future programme development.

2. The Science Committee has expressed its concern over two main issues: first, that the West may not be maintaining its scientific and technological leadership; secondly, that the scientific and technological disparities within the Alliance are growing.

3. The Science Committee addresses the Council with the attached statement and recommendations in order to initiate further actions in that respect.

4. The Council is invited to:

(a) note the statement by the Science Committee;

(b) endorse the exploratory efforts of the Science Committee on issues in which science and technology may play important rôles, which are outlined under "Science for the Future";

(c) consider the special programme dedicated to reduce the scientific and technological disparities within the Alliance, which is outlined under "Science for Stability", and to support its further elaboration by the Science Committee.

(Signed) Joseph M.A.H. LUNS

NATO,
1110 Brussels.

N A T O U N C L A S S I F I E D

STATEMENT TO THE COUNCIL

BY THE SCIENCE COMMITTEE

AN ASSESSMENT FOR FUTURE PROGRAMME DEVELOPMENT

1. The Terms of Reference of the NATO Science Committee charge it, in particular, to

"advise the Council on problems of science and technology of concern to the NATO Alliance;

"propose to the Council recommendations concerning:

(i) steps which member countries might take to strengthen the scientific and technical resources available to NATO;

(ii) direct action by NATO itself designed to initiate or improve co-operative activities between member countries;"

In response to this charge of vital important to the continuing and future strength of the Alliance, the Science Committee addresses the Council with the following observations and recommendations.

THE INTERACTIONS BETWEEN THE COUNCIL AND THE SCIENCE COMMITTEE

2. At the 20th Anniversary Commemoration Conference of the Science Programme in April 1978, Representatives of the Council, the Science Committee and other intellectual leaders of member countries participated in a provocative exchange of views on the challenges to scientists and governmental policy-makers in their mutual concern with complex societal problems. Particular attention was focussed on the long-term contribution of science and technology to the strength of the Alliance.

3. The Science Committee profited greatly from this close interaction with the Council and has examined the results of that meeting to reassess its basic principles and to develop recommendations for future programmes. The Committee is gratified by the continuing support of the Council for the Science Programme: this has been concretely expressed in the recent decision to maintain 1979 science activities at a slightly increased level, in real terms, in order to redress the serious erosion of the past several years.

BASIC PRINCIPLES AND CONCERNS

4. The concepts and objectives so ably prescribed twenty years ago by Foreign Ministers Lange, Martino and Pearson remain the keystone of the NATO science programme - the "special importance . . . of science and technology . . . is so crucial to the future of the Atlantic Community that NATO members should ensure that every possibility of fruitful co-operation is examined".

5. The Secretary General underscored the vital need for international co-operation in science and technology in an increasingly interdependent world in his concluding statement at the Commemoration Conference. He stressed our need to give priority attention to concerns of a global nature such as the protection of the environment, the management of natural resources, the welfare of our peoples. We reaffirm this highly significent conclusion.

6. We do, however, underscore two grave dangers in the current interplay between science and government, and address the Council with recommendations for corrective action.

A. First, there are signs that the West may not be maintaining its scientific and technological leadership which is fundamental to the broad concept of our mutual security. A strong, dynamic science and technology enterprise is crucial to the democratic strength and welfare of the Alliance and its member nations. Leadership based on this strong effort is, moreover, of primary importance for securing our long-term interests in the East/West balance. The vigorous scientific and technological capability required to sustain our innovative economic and social systems also enables us to carry on a competitive yet mutually beneficial dialogue with the emerging nations of the Third World. A number of indicators suggest that both national and co-operative international efforts to maintain the strength of this enterprise are lessening in effectiveness. These views and our related recommendations are further outlined below under "Science for the Future".

B. Secondly, we are deeply concerned over the growing scientific and technological disparities within the Alliance, and in particular by the current situation and pressing priority needs of Greece, Portugal and Turkey. These nations should be beneficiaries of a concerted emergency programme that would also have long-term economic and technological benefits. Our proposals for a special effort to deal with this crisis respond to the challenges expressed in the Ministerial Session of the Council of 8th December, 1978, and are outlined below under "Science for Stability".

SCIENCE FOR THE FUTURE

7. In dealing with the West's scientific and technological leadership we wish to restate goals, warnings, aspirations and convictions within the economic and social environment of 1979, our twenty-first year.

8. In the first instance we wish to bring to the attention of the Council our serious concern over the long-term implications of the deteriorating support of basic science in national and international programmes of interest to the Alliance. The anti-technology movement in many circles is having negative effects on attitudes and support in behalf of basic science. Accelerated by the economic slowdown, this erosion is a deleterious process that may take some time to become visible to politicians, and even longer for its consequences to be felt by the public. Corrective action to restore our scientific momentum may subsequently take much, much longer, thus making the situation extremely serious. The Committee must continue to be the harbinger in the international arena for proclaiming and promoting the importance of new knowledge and assessing the health of fundamental research. We invite increased political attention and encouragement, both at the national and the international level to this investment in knowledge in support of our mutual security. It is recommended that the Council bring these concerns to the attention of national authorities.

9. In the second instance we intend to meet the many other challenges of the Commemoration Conference in the delineation of coming Science Committee programmes. We have already stated our convictions on the importance of accumulating knowledge today for the unknown problems of tomorrow, and have rejected the concept of immediately visible relevance as a criterion for necessary work(1). There are, however, a number of societal issues of "intermediate-term relevance" before this political and scientific community that deserve research, analysis and dialogue. It is here that we intend to employ Science Committee Conferences and other ad hoc efforts to provide facts, interpretation and commentary for further use at political levels. We invite the Council's endorsement of these exploratory efforts to contribute to the resolution of societal issues in which science and technology play increasingly important roles.

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SCIENCE FOR STABILITY

10. The serious economic difficulties of some member countries were recognized by the 8th December, 1978, Ministerial Session of the Council. In an expression of solidarity and in light of Article 2 of the North Atlantic Treaty, Ministers agreed on the urgent necessity of increased financial assistance and economic co-operation by the more favourably situated member nations, through both bilateral and multilateral channels. Disparities between the economic and social situation of the highly-developed and less-developed member countries of the Alliance (the latter being particularly Greece, Portugal and Turkey) had also been brought into the discussions at the Science Committee's 20th Anniversary Commemoration Conference.

11. These several alarms, plus the Committee's own observations, have stimulated consideration of prompt action which might be taken, within our area of competence, to meet this Alliance-wide concern. A robust scientific and technological infrastructure in these countries is an essential element of the environment for their continued growth and stability. Yet there are significant differences in needs among them, and due account must be given to such differences in designing co-operative efforts.

12. The Science Committee is uniquely placed to provide multilateral expertise for strengthening this infrastructure. It would draw on the considerable intellectual resources of the Alliance that have been associated with its current programme.

13. We recommend consideration be given to a special programme dedicated to this purpose; one of substance, clear thrust and finite duration. The general lines of this proposed programme are outlined at Annex. Indicative projects and activities, as well as an order of magnitude of resource requirements, are presented as examples to illustrate the nature of this proposed programme.

N A T O U N C L A S S I F I E D

ANNEX to
C-M(79)19

SCIENCE FOR STABILITY

RECOMMENDED PROGRAMME OF THE NATO SCIENCE COMMITTEE TO ASSIST THE SCIENTIFICALLY AND TECHNOLOGICALLY LESS-DEVELOPED COUNTRIES OF THE ALLIANCE

1. The Science Committee has become deeply concerned over the growing scientific and technological disparities within the Alliance, and particularly the current situations and pressing needs of Greece, Portugal and Turkey. It believes that these countries should be the beneficiaries of a concerted emergency programme of finite duration (but gradually phased out) that will help them strengthen the technological infrastructure needed for their growth and stability. This recommended programme of the NATO Science Committee is a response to the challenges expressed in the Ministerial Session of the Council of 8th December, 1978.

THE PROGRAMME PERSPECTIVE - CO-OPERATIVE ACTION

2. One of the greatest impediments to the economic and social development of the scientifically less-developed countries of the Alliance has been their inadequate scientific and technological training and research system, which is not structured to relate to and develop technologies appropriate to their needs. This has led to difficulty in adjusting to the realities of problem-oriented research efforts, especially at advanced levels of the educational systems.

3. Provision of increased support through the on-going Science Committee programmes, which are directed primarily toward the encouragement of individual and institutional research excellence, will not help change this situation in any large measure. What is required is carefully co-ordinated multilateral assistance to help countries develop and improve their own problem identification and solving abilities, for which the Science Committee is uniquely placed to draw on the intellectual manpower resources of the scientifically stronger members of the Alliance.

4. It is clearly understood that the needs and priorities of the countries are different. With this in mind, the Science Committee proposes that it support demonstration projects and activities aimed at providing initial assistance in dealing with urgent problems through

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ANNEX to C-M(79)19 -2-

a fixed term programme. The Committee believes that programme areas where co-operative ventures are likely to be most effective are (i) the development and use of skilled manpower and (ii) research, development and adaptation to individual national situations.

(i) Development and Use of Skilled Manpower

5. The problem here is not so much a shortage of skilled manpower as its effective and appropriate use. Full and effective use of manpower also requires the forging of links between universities, technical institutes and industry; to do this mutual confidence has first to be built between them. To support these efforts, a concerted programme in designated fields of science and technology should be established for the improvement of institutions of higher education. Activities could involve, for example, institution-to-institution agreements involving the two-way movement of graduate students, and the provision of faculty assistance from the advanced countries to help in the development of priority training and research areas including the establishment of graduate degrees programmes.

(ii) Research, Development and Adaptation

6. The Science Committee proposes to establish an intensified programme of co-operative applied research involving comprehensive interactions between scientists and institutions in the scientifically developing and advanced countries of the Alliance. The transfer of technologies and managerial styles is not effective in the absence of domestic ability to understand, use, adapt and improve them under local conditions. The Science Committee proposes to support projects that will stimulate the development of organizational frameworks that will encourage industries to undertake or be receptive to Research and Development. Concerted efforts will be directed towards establishing more effective links between university research institutes and the priority needs of industry.

PROJECT SELECTION

7. Selection criteria would require that:

(a) projects be clearly identifiable during implementation as benefiting from NATO-wide co-operation and assistance, and should benefit from multilateral contributions in the form of personnel and material resources, and strengthen scientific and technological infrastructures through more effective use of the existing university and institutional research community.

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-2-

(b) With respect to research-oriented projects, particular consideration should be given to strengthening research management capabilities, and promoting closer links between university and industrial communities.

ILLUSTRATIVE PROGRAMME

8. Consultations during early 1979 with the scientific and technological authorities of Greece, Portugal and Turkey, guided by their Representatives to the NATO Science Committee, have provided a provisional basis for formulating a concerted programme of fixed duration based on the foregoing criteria and objectives. The following illustrative programme is outlined in broad, descriptive terms, covering some problem areas to illustrate the nature of proposed activities, and particularly the mutually-supportive aspects of Alliance-wide co-operation in dealing with the scientific and technological component within these problem areas. This descriptive overall programme is followed by a few country-project statements to give examples of possible activities directed towards strengthening scientific and technological infrastructures for economic and social development. A comprehensive, co-operative programme is being prepared along these lines, as well as in other problem areas, for early consideration by the Science Committee.

(i) Descriptive Common Programme

9. All NATO countries would benefit from developing advanced managerial training in appropriate fields of technology: the Science Committee proposes to support co-operative efforts for training of teaching staff and technical/managerial personnel, as well as establishing new graduate degree programmes in Applied Sciences with the assistance of the advanced countries of the Alliance.

10. Within already identified areas of common research interest, all three countries plan a collaborative programme on water resources evaluation and management, each giving different emphasis to problems of power development, industrial waste water treatment, irrigation, urban water supply and aquaculture. Research on energy systems is also given priority attention by two of the countries, with specific interests ranging from interactive planning models to assess demand and the ways in which it can be met by different energy systems, to new processing methodologies for low-grade coals (lignites) and the development of

economic solar energy technologies appropriate to these countries. Solar projects of interest to most NATO countries would probably involve heating and cooling, electricity production, and desalination. There is also priority interest in management of ocean and coastal resources, which requires assistance in strengthening R&D capabilities for exploiting and protecting the marine environment - with attention being given to aquaculture, the training of personnel for oceanographic surveys, and the monitoring and control of pollution. Technological improvements in food production, food preservation and control of food additives and toxins are all aspects of nutrition and agricultural problems raised by two countries.

(ii) Indicative National Projects

11. Greece

- Ocean Science as a Basis for the Development and Management of Marine and Coastal Resources

In order to strengthen research and training capabilities in broad fields of oceanography including fisheries and aquaculture, the Hellenic Institute of Oceanography and Fisheries Research (IOAKAE) and the University of Athens have proposed collaborative activities with other NATO countries. A five-year programme would include establishing and equipping a small sea-shore marine station, improving the utilization of oceanographic research vessels and intensifying the training of applied scientists and engineers in the management of ocean resources.

- Water Resources R&D Programme

The evaluation and management of water resources for power production, irrigation, water supply and aquaculture is severely hampered by the lack of an experimental watershed. The Technical University of Athens (NTUA) and the Public Power Corporation propose a five-year collaborative research and training programme in co-operation with other NATO countries in forecasting, control and river basin management.

- Training and Research in Computer Sciences

A modern computer installation covering university and other institutional needs is urgently required to provide training for skilled personnel for data handling and applied research. The University of Athens and associated Ministries have proposed a five-year collaborative programme with other NATO countries in areas such as operations research, computer science, weather prediction, ocean modelling, seismic studies, medical statistics and mass diagnostics.

12. Portugal

- Strengthening Management for Economic Development and Public Administration

In order to improve the linkages between research and development institutions and private and public administrative bodies, the new Portuguese National Institute of Administration has proposed an international collaborative programme to strengthen its teaching staff and help establish innovative training activities. This 3-4 year programme will involve the use of foreign specialists for the elaboration of teaching programmes and materials.

- Management of Coastal Resources

Increasing pressures for economic and industrial development in coastal and offshore regions make a comprehensive investigation of the Portuguese Coastal Zone a matter of high priority. This six-year multi-disciplinary programme will involve several Portuguese institutes in collaboration with institutions in many NATO countries. It will consider, inter alia, protection of coastal plains and uplands, utilization of wetlands, mineral production, recreation, commercial development, commercial fishing and disaster protection, aimed at legislative action and acquiring the knowledge and expertise needed for continuing management.

- Aquaculture

Demands for dietary protein and the uncertainties of commercial fish catches has stimulated Portuguese interest in both fresh and salt-water aquaculture. Collaboration over a five-year period with fisheries agencies in Britain, France, Italy and Canada will focus on research on techniques for intensive fish cultivation and banks of reproducers and eggs, species selection and tests and controls. As the results of such a programme could have major industrial impacts, analysis of economic feasibility is also envisioned.

13. Turkey

- Management of R&D Resources for Economic and Social Development

In order to improve the applications of R&D resources, including skilled manpower and research capabilities, to industrial and social development goals, the Turkish Research Council (TUBITAK), several universities, the Ministry of Industry and the State Planning Organization

would collaborate in a four-year international co-operative programme, drawing on the experience of the advanced nations of the Alliance. Innovative institutional mechanisms would be established to link more effectively R&D institutes of universities and the Research Council to industrial needs, including the encouragement of local industrial research efforts directed towards development of appropriate technologies.

- R&D on Food Production and Preservation

The objective of this collaborative programme involving the Turkish Research Council (TUBITAK), several universities and the Ministries of Agriculture and Industry, is the development of new food products by novel techniques based on international co-operative efforts. This five-year programme would focus on innovative processing and preservation technologies (e.g. freeze-drying), with particular attention to quality improvements, the effects of food additives, the contributions of single-cell proteins, fruit juices and citrus concentrates, local cereal products, as well as meat, milk and fish products.

- Water Resources Management

In order to meet critical public, agricultural and industrial water resource needs, the Turkish Research Council (TUBITAK), several universities, the Navy and Under Secretary for Environment, have proposed collaborative approaches drawing on the experience of the advanced countries of the Alliance to improve the utilization of R&D capabilities to deal with a number of pressing water management problems. This five-year programme would be directed towards improved river basin management, including innovative methods for treating industrial waste water, and the better use of coastal resources.

MANAGEMENT AND FINANCE

14. The Science Committee believes that this multilateral effort, guided by both donors and recipients working together, would provide long-term benefits to all member states. The Assistant Secretary General (Scientific and Environmental Affairs) would be responsible for the administration of the programme, advised by a Programme Group selected with the approval of the Science Committee.

15. The Committee recommends that the programme be administered through a special fund, to which all NATO countries will be asked to contribute. It is envisaged that the multilateral programme would require funds in the order of $20 million from a special NATO-sponsored programme over the total time period. Recipient countries would be responsible for meeting major expenses within their boundaries with their own currencies. The programme will provide for financial and expert assistance to member states for a five-year period with allowance for appropriate "phase-in" and "phase-out" periods in such a way that all projects are terminated within eight years from the initial start of the programme.

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