

## MEMO ROUTING SLIP

REF ID: A65645  
APPROVALS, DISAPPROVALS,  
CONCURRENCES, OR SIMILAR ACTIONS

1 NAME OR TITLE	INITIALS	CIRCULATE
ORGANIZATION AND LOCATION	DATE	COORDINATION
2 re: NSAS AB report by S.S. Cairns.		FILE
3		INFORMATION
		NECESSARY ACTION
		NOTE AND RETURN
4		SEE ME
		SIGNATURE
REMARKS		
<p>This has been "slightly edited."</p> <p>I don't think there's much more that can be done with it without changing its whole character.</p> <p>Capit M</p> <p>I'll leave this to you, and I will rely entirely on your judgment. We should have it all typed up + ready for next meeting of Bd</p> <p>JRM</p>		
FROM NAME OR TITLE	DATE	
ORGANIZATION AND LOCATION	TELEPHONE	

DD FORM 1 FEB 50 95

Replaces DA AGO Form 895, 1 Apr 48, and AFHQ Form 12, 10 Nov 47, which may be used.

16-48487-4 GPO

THE NATIONAL SECURITY AGENCY SCIENTIFIC ADVISORY BOARD  
REPORT FOR THE PERIOD  
JANUARY 1953 THROUGH JUNE 1954

I. INTRODUCTION

The National Security Agency Scientific Advisory Board (NSASAB) was created under NSA Regulation Number 11-3, dated 22 January 1953. This regulation was renewed, in slightly modified form, on 26 January 1954. The present report is submitted in conformity with paragraph 4f, Section III of that regulation. The period covered, however, is a year and a half instead of a single year, bringing the reports into phase with fiscal years.

The Board, which superseded the Special Cryptologic Advisory Group (SCAG), was established in order that the NSA might secure the advice and assistance of an organized group of consultants, qualified in fields directly related to the most important and difficult problems of the Agency. Experience with SCAG suggested the desirability of a relatively small advisory board, holding two or three formal meetings a year and performing its functions largely through the instrumentality of a varying system of panels and subpanels, composed not only of Board members but also of other outside consultants with special technical qualifications. Thus individual consultation is emphasized, supplemented by occasional discussions and reports by groups designated to study particular problems. Reports from such specialized groups are submitted to the Board for approval, and then to the Director of the NSA.

The Director of the NSA appoints the members of the Board, its Chairman, and the members of the various panels and subpanels.

In general, the Board is charged with reviewing the principal problems of the Agency, surveying the methods and the equipment employed in attacking such problems, directing attention to relevant external studies and developments, and suggesting modifications in modes of attack, in emphasis, in equipment and so on.

An Executive Group for Board Affairs (EXSAB), in the NSA is charged with various liaison functions, including presentations, arrangements for meetings and visits of individuals or groups, and monitoring the implementation of such NSASAB recommendations as are approved by the Director, NSA. This group has attacked with great skill and diligence the difficult continuing problem of briefing the members of NSASAB and its panels on the manifold

work of the Agency. Their efforts included general presentations on COMINT and COMSEC operations and on the organization of NSA; various tours of analytic machinery; discussions of teletype scramblers, special intercept equipment and urgent Russian problems in various phases of consideration.

II: MEMBERSHIP OF NSASAB .

The members of NSASAB at the time of its first meeting, 4 February 1953, were:

Professor Stewart S. Cairns, Chairman  
Head, Department of Mathematics  
University of Illinois.

Mr. H. P. Corwith  
Vice President  
Western Union Telegraph Company.

Dr. Howard T. Engstrom  
Assistant Vice President  
Engineering Research Associates  
Division of Remington Rand

Mr. John C. McPherson  
Vice President  
International Business Machines Corporation.

Professor Howard P. Robertson  
California Institute of Technology

Professor John von Neumann  
Institute for Advance Study

Professor S. S. Wilks  
Princeton University

By 23 March 1953, the Board had increased by the addition of:

Dr. L.T.E. Thompson  
Vice Chairman; Research and Development Board  
Department of Defense.

By the meeting of 11 June 1953, the Board had acquired:

Dr. Walter R.G. Baker  
Vice President and General Manager  
Electronics Division  
General Electric Company.

At the meeting of 11 September 1953, Dr. L.T.E. Thompson requested that his active Board membership be terminated, in view of the abolition of the Research and Development Board and his resignation from full-time service with the Department of Defense. His request was granted and he was replaced by:

Mr. Donald A. Quarles  
Assistant Secretary of Defense for Research and Development.

The only other change in Board membership was the addition, before the meeting of 20-21 April 1954 of:

Mr. Arthur W. Horton, Jr.  
Bell Telephone Laboratories, Inc.

Certain meetings were attended by Mr. J.Z. Millar of Western Union, in place of Mr. Corwith, and by Mr. M. Dean Post in place of Mr. Quarles.

### III. MEETINGS OF THE BOARD AS A WHOLE

Formal meetings of NSASAB were held on 5 February 1953, 11-12 June 1953, 11 September 1953, 15-16 October 1953 and 20-21 April 1954.

### IV. THE SPECIAL STUDY GROUP

The first specific major undertaking of NSASAB was an investigation which culminated in a report entitled "The Potentialities of COMINT for Strategic Warning." The proposal for this study was introduced and discussed at the meeting of 11-12 June 1953 by Radm. J.N. Wenger and Dr. L.T.E. Thompson. The Director of NSA requested that the Board conduct the proposed study, with the purpose of evaluating COMINT as an important adjunct to early warning radar in connection with the air defense problem. The composition of the Special Study Group was as follows:

1. Members of the NSASAB:

Dr. H.P. Robertson, Chairman  
Dr. Howard T. Engstrom  
Mr. John C. McPherson  
Dr. Samuel S. Wilks.

2. Consultants:

Mr. M. Dean Post, Staff Assistant,  
Assistant Secretary of Defense for Research and  
Development  
Mr. Charles S. Weaver, Staff Assistant,  
Assistant Secretary of Defense for Research and  
Development  
Dr. Richard C. Raymond, Electronics Division,  
RAND Corporation.

3. NSA Participants and Observers:

Mr. William F. Friedman, Executive Secretary, NSASAB  
Captain Irving T. McDonald, Jr., USAF  
Miss Carolyn J. Fox.

4. USAF Security Service Observer:

Colonel Gordon W. Wildes, USAF.

PL 86-36/50 USC 3605  
EO 3.3(h)(2)

This Group devoted a large part of the summer to their formidable task. The Board-member participants, accompanied by the consultants, the Executive Secretary, Colonel Wildes and Captain McDonald visited various establishments, consulting numerous persons, studying, discussing and preparing their report. The group reported in preliminary form at the NSASAB meeting of 11 September 1953 and in final form at the meeting of 15-16 October, when the Board voted its unanimous approval of the report. For present purposes, it appears sufficient to remark that the report contains many recommendations and suggestions, the importance of which can not be overestimated, which have been reviewed in NSA and, as approved by the Director, are being followed up on an active, continual basis. At the meeting of 20-21 April 1954, there was some discussion of the various recommendations and the consequent actions. There was also a discussion of a modified version to be supplied to the [redacted] at their request. It appears clear that the work of the Special Study Group will be of lasting value in the further development of the COMINT program. It has likewise proved valuable in connection with the high-level personnel problem of the Agency.

## V. THE PANELS

A second major accomplishment has been the establishment of three panels: Electronics, Mathematics, and Telecommunications. The fields of specialization, the modus operandi and the composition of the panels were subjects for deliberation throughout the period covered by this report. Each member of the Board is available for panel work, and the chairman of each panel is a Board member.

14 members of the Electronics Panel  
(H. T. Engstrom, Chairman)

7 members of the Telecommunications Panel  
(H. P. Corwith, Chairman)

12 members of the Mathematics Panel  
(S. S. Wilks, Chairman)

A number of other possible members are in a pending category. The members were appointed by the Director, in accordance with NSA Regulation 11-3, on recommendation from the Board and after the necessary clearance procedures. The chairmen were similarly appointed, after consultation with the Chairman of NSASAB. The panels were sufficiently complete to justify meetings on 20-21 May 1954, attended by all members excepting five of the mathematicians.

These two days were devoted largely to briefings and conducted tours for those unfamiliar with the work of the Agency, to technical presentations for the several panels and to individual consulting. It is expected that the work of the panels will be largely on an individual consulting basis, with occasional panel meetings. It is also expected that certain problems will be attacked by subpanels or special committees cutting across panel boundaries and possibly enlisting the aid of experts who are not panel members. One such committee has already commenced to function, as noted in the next paragraph.

## VI. THE COMMITTEE ON GENERAL PURPOSE FLEXIBLE ANALYTIC EQUIPMENT

This committee was established at the suggestion and under the chairmanship of John C. McPherson. The membership is drawn from the Electronics and Mathematics Panels.\* A first meeting was held at the Agency 4-7 May 1954.

\*(Mr. McPherson, Dr. von Neumann, Mr. Howard, Prof. Forrester, Mr. Desch, Mr. Dunwell, Dr. Shannon, and Mr. Horton.)

#### VII. THE DEPUTY DIRECTOR FOR RESEARCH AND DEVELOPMENT

The search for a Deputy Director (R/D) dates back to August of 1952. It was fraught with the difficulties (1) initially of obtaining a suitable super-grade for the position (2) of locating an individual who combined the necessary high qualifications, prestige and experience with availability and willingness to serve. From the very first Board meeting, 5 February 1953, until an appointment was finally made in April 1954, the Board devoted a great deal of time to assisting in the search. Long lists of variously qualified prospects were drawn up and apportioned into categories in accordance with estimates of their availability and their suitability. From time to time a few of these prospects were arranged preferentially and submitted to the Director, NSA, as suggestions for the next few approaches. In February 1954, the possibility of A.B. Clark (a vice president of the Bell Telephone Laboratories) came into the picture. He was obviously qualified and was fortunately found to be available and willing. His appointment was announced to the Board members by letter prior to the meeting of 20-21 April 1954, at which time Mr. Clark was introduced to NSASAB and participated in its deliberations.

#### VIII. THE PERSONNEL PROBLEM

Various discussions of NSA problems have led to personnel considerations. These have included such matters as the distribution of effort between relatively long-range research and problems related to current production. The urgency of the latter may at times tend to divert some attention from the former. Another source of difficulty, which has been substantially ameliorated, was the lack of super-grades and the shortage of high-level positions to which scientists in the Agency might aspire, without necessarily being promoted from scientific work into primarily administrative duties. At the meetings in the fall of 1953, the Board discussed the high-level personnel problem. On 16 October, it adopted a Resolution on Personnel, which, along with the report of the Special Study Group, was of assistance to the Director in obtaining significant improvements. There are, of course, continuing problems, including the establishment of a well-developed career program for scientists at the NSA and the problem of recruiting outstanding new talent despite the security restrictions which inevitably interfere with "selling" the Agency to a desirable prospect. Various suggestions have involved the possibility of utilizing the prestige of Board members in recruiting. The members of NSASAB have expressed a willingness that this be done, if it can contribute to the effort. The possibility of more extended use of Educational Testing Services (Princeton, N.J.) was suggested in connection with procedures for the selection, placement and evaluation of personnel. It appears that S.S. Wilks may be useful if it is decided to pursue this possibility and, in general, if opinions are wanted regarding the merits of various personnel consulting organizations.

## IX. TRAFFIC ANALYSIS

The desirability and practicability of increased exploitation of traffic analysis was discussed at various times. The discussions included the question of increasing the amount of T/A at outlying points, with the result that more product and less actual traffic would be sent to the NSA. This possibility raises serious personnel considerations, including the need to establish career futures for personnel in "medium levels" of T/A work. Dr. Wilks is helping in connection with statistical aspects of the T/A methods problem. He plans to pursue this study in liaison with related British efforts.

## X. CONSULTING ACTIVITIES

The Board has been informed, through formal presentations and individual consultations, of a large number of NSA activities and problems. At various times, on the occasion of meetings and also between meetings, members of the Board have, on request and at their own initiative, visited the Agency and performed consulting services. It appears impracticable, in this report, to detail these instances or to evaluate the resulting contributions.

## XI. GENERAL

The preponderance of recommendations made by the Board are contained in the Special Study Group's report on the "Potentialities of COMINT for Strategic Warning." Since the actions taken on the recommendations are being followed up on a continual basis, and since most of the members of the Group are still available, an opportunity is afforded for continued study of this whole problem.

During the Board meetings various problem areas have been suggested in addition to those acted upon by the Board. Some of these will come under closer examination by the Board in the coming year.

## XII. THE CHANGE IN CHAIRMANSHIP

Dr. S. S. Cairns served as first Chairman of NSASAB and continued in that capacity until the meeting for 21 May 1954. He had asked to be relieved of the office in view of an impending sabbatical year in Europe. On 21 May, John C. McPherson was introduced as new Chairman of the Board.

*Stewart S. Cairns*

STEWART S. CAIRNS

Chairman

NSA Scientific Advisory Board