Third Annual Report of the Biological and Chemical Defence Review Committee

The Committee

E.R. Ward Neale (Chair)
Clive E. Holloway
Gabriel L. Plaa

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SUMMARY

We, the Biological and Chemical Defence Review Committee (BCDRC), since 1990 have visited annually the three Defence Research Establishments concerned with biological and chemical defence (BCD), the major BCD instructional unit at Canadian Forces Base Borden and a cross-section of Canadian Forces' units. We have received extensive annual briefings from senior National Defence Headquarters' managers, including scientific, medical, operations and intelligence officers. In addition, representatives of concerned citizens' groups have met with us for each of the past two years and in 1992 we initiated meetings with a variety of Department of National Defence (DND) contractors. Our Committee has submitted reports in November of each year and these have subsequently been made available to the public.

Although this report is based mainly on Committee activities during 1992, we also briefly review progress over the past few years and update the Barton Report's succinct account of activities at the major BCD research establishments. We continue to monitor progress on the implementation of the Barton Report recommendations and we examine the status of recommendations contained in our own two previous reports.

We have concluded that there are neither indications of duplicity within DND's biological and chemical program nor evidence to support the contention that offense-related activities are being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

We remain convinced that Canada must retain the capability to carry out a modest program of defensive research and development to permit military operations under the threat of biological and chemical weapons.

The Committee recommends that:

1. Priority of effort be given to fundamental biochemical research which could also have applications outside the defence sphere.
2. An information exchange system be instituted to ensure that applicable CRAD directed research results are readily available to civilian industry.
3. The involvement of CRAD scientists in disarmament sessions in Geneva continue and not fall victim to current fiscal restraints.
4. A program designed to train selected military personnel to conduct biological and chemical inspections and to effect environmentally safe demolitions be implemented.
5. CRAD invite, through learned societies, a number of knowledgeable outside scientists to a workshop to discuss a biological defence research strategy for Canada for the next decade.
6. DND increase its involvement in the inter-departmental activities concerning domestic coordinated reaction to terrorist use of biological and chemical weapons.
7. An invitation be extended to at least one member of the BCDRC to attend the annual DND NBC Conference.
8. A higher percentage of CFNBC School staff should have scientific backgrounds.
9. Further consideration be given to the co-location of DRES and the CFNBC School.

INTRODUCTION

Our Committee was formed in response to one of the recommendations by W.H. Barton in his comprehensive 1988 study of research, development and training activities in chemical and biological defence undertaken by the Department of National Defence (DND). Barton's report recommended the establishment of an advisory committee of senior members of the Canadian scientific community to review annually all aspects of DND's biological and chemical programs and to visit the various facilities where biological and chemical defence (BCD) work was underway.

The Chairman of the Defence Science Advisory Board (DSAB) was requested to address this recommendation and to propose an implementation plan. Following consultation with the President of the Royal Society of Canada, he submitted a proposal to the Minister of National Defence in August 1989. The Minister subsequently established the Biological and Chemical Defence Review Committee (BCDRC) in May 1990, with a mandate (see Annex C) to report to the Chief of the Defence Staff and the Deputy Minister through the Chairman DSAB. The Chemical Institute of Canada, the Canadian Federation of Biological Societies and the Society of Toxicology of Canada had been invited earlier to make nominations and we three members of the scientific community, the authors of this report, were then chosen to serve on this select committee. Replacements, as our terms end, will be chosen in the same consultative manner.

We have submitted reports in November of each year and these have subsequently been made available to the public.

COMMITTEE ACTIVITIES – 1992

To effect our mandate in this the third year of our review process, we visited, between 10 May and 05 June 1992, the below listed DND Establishments, including the associated laboratories, ranges and training facilities:

National Defence Headquarters with staff briefings from:

- Chief Research and Development (CRAD)
- Deputy Chief of the Defence Staff (Intelligence, Security and Operations)
- Surgeon General
- Headquarters Maritime Forces Pacific, HMCS ANNAPOLIS, Canadian Forces Fleet School Esquimalt, and 443 Helicopter Anti-Submarine Squadron with briefings from each on the biological and chemical training being conducted and facilities available

- Canadian Forces Nuclear, Biological and Chemical (CFNBC) School with briefings on its responsibilities, resources and training
- Defence and Civil Institute of Environmental Medicine (DCIEM) with briefings on the responsibilities and resources of DCIEM, the Biosciences Division and the Medical Life Support Division including current and future programs
- Defence Research Establishment Ottawa (DREO) with briefings on the Protective Sciences Division and the Chemical and Environmental Protection Sections including current and future programs
- Defence Research Establishment Suffield (DRES) with briefings on the responsibilities and resources of DRES, the Defence Technologies Division, Defence Sciences Division, the Chemical/Biological Defence Section, the Biomedical Defence Section and Project SWIFTSURE including current and future programs

The Committee also visited the Ontario Department of Health Level Four Containment Facility, the only one so rated in Canada.

Reports were presented to the Committee by representatives from eight Canadian non-governmental institutions/companies who have biological or chemical research and/or developmental (R&D) contracts with DREO or DRES.

While at DRES, the BCDRC held privileged discussions with the Joint Occupational Safety and Health Committees and representatives of the three involved Unions. Further, time was made available at DRES to allow any member or groups of members to approach us to discuss matters of concern. These three activities provided helpful insights into the program and morale at Suffield. Although the Committee was similarly available during the visits to DCIEM and DREO, no members of either Establishment came forward.

To enhance our perspective of the concerns of Canadians in Canada's biological and chemical defence activities, an afternoon meeting was held in Calgary with representatives of The Canadian Physicians for Prevention of Nuclear War and The Calgary Disarmament Coalition, a morning session in Victoria with The Vancouver Island Peace Society and an evening was spent at the University of Toronto with representatives of the Science for Peace Group.

As mandated, the BCDRC reviewed DND's 1992 Biological and Chemical Defence Research and Development Program and determined that it was indeed in accordance with current Canadian Government Policy. In addition, the latest editions of the DCIEM, DREO and DRES Annual Reports were reviewed and their current R&D contracts and publications lists scrutinized.

SOME OBSERVATIONS ON THE RESEARCH ESTABLISHMENTS VISITED

There have been changes in emphases, attitudes and direction of the three research establishments with which we have been primarily concerned during the three years of our continuing review. Some are due to the greatly diminished threat of an East/ West confrontation, others result from Canada's participation in the Gulf War, and still others from the fiscal restraints, down- sizing and rationalization that have recently affected all federal government departments. Very significant changes have resulted also from the implementation of the Barton Report recommendations.

The economic and political breakdown of the USSR and the diminishing of the major military threat in Europe coincided closely with the outbreak of the Gulf War and the very real threat that chemical and biological agents would be used. This required immediate production of most effective antidotes and detection equipment that were then in the developmental and testing stages. It also required adaptation to very different climatic conditions from those of the European theatre.

The Canadian response was excellent, as mentioned in our second report, and has won praise from many quarters. The Canadian C4 respirator and C2 canister developed at DREO were recognized as best in the field. Although DREO scientists are still working on refinements to the respirator, one NATO member has ordered the present version and several others have expressed an interest in eventual acquisition. Modifications of this respiratory equipment to meet the needs of aircrew, now known as the AC4, were developed at DREO. DCIEM assisted in bringing the AC4 into service for use during the Gulf War and also adapted commercially available water-cooled jackets for aircrew that proved especially useful for helicopter operations in the Gulf and were later modified for engine room personnel on warships. The nerve agent antidote HI-6, which had been developed at DRES, was made quickly and widely available through the purchase of 20,000 auto-injection devices and generated much favourable comment here and abroad. DRES's detection and monitoring devices were among the most sophisticated in the Gulf operations. They have been used subsequently by DRES scientists during the incineration of warheads in Iraq. These and many other accomplishments during the Gulf episode and its aftermath brought about very noticeable improvements in the morale at all BCD research establishments. Canadians, regardless of their positions on the Gulf War, wanted their armed forces to be adequately protected. So, research personnel who had long laboured under clouds of suspicion were finally acknowledged by most of their fellow citizens to be engaged in a vital enterprise.

The vast changes in the political picture over the past few years and the lessons learned in the Gulf War have generated several new research thrusts. These are designed to accommodate Canada's ever increasing role in peacekeeping and its possible role in peace restoration operations in warm climes. For example, both DREO and DCIEM are examining clothing that would integrate chemical, biological and environmental protection in a single layer. At Suffield, research on detection and identification devices, decontamination methods and both prophylaxis and therapy continues. Research has also increased and probably will continue to increase in the realm of verification technology.

The morale lift brought about by favourable public recognition during the Gulf War appears to have survived a subsequent major Civil Service strike and also the staff cuts that have affected most Federal departments. Cuts to BCD units will eventually total some 25 percent. These will lead to curtailment of programs and rationalization of resources. Rationalization will see the Ottawa based Environmental Protection Section moved to DCIEM in Toronto and the DREO Chemical Defence Program relocated to Suffield.

That morale has withstood these vicissitudes seems due, at least in part, to implementation of the recommendations of the Barton report and to an enlightened management which have combined to reduce significantly public suspicion and criticism of Canada's BCD program. The thorough environmental audits recommended by Barton have been completed at DRES and DREO and the reports deposited in major libraries open to the public. The destruction at Suffield of contaminated materials was carried out successfully with extensive public exchanges and the advice of a citizens' committee. Major 1991 open house events at DREO and DRES, popular articles and pamphlets on BCD research, a widely circulated in-house newsletter at DRES, and the increasing number of interactions between DRES scientists and the public all represent an open attitude that was missing a few years ago. We believe that our Committee, itself an offshoot of a Barton recommendation, has contributed to this openness. We have met with representatives of several concerned citizens' groups, have brought their concerns to defence researchers and managers and have been quite successful in obtaining answers and publicizing them.

The aura of suspicion and secrecy that surrounds BCD research is fast disappearing to the benefit of the establishments involved and to the Canadian public.

IMPLEMENTATION OF BARTON REPORT RECOMMENDATIONS

The implementation of the recommendations contained in the Barton Report was examined in detail. The current status of each recommendation was ascertained to be:

GENERAL

1. **In the course of the annual program and budgetary process, the authorizing officer at each level be required to sign a certificate of compliance with Departmental policies.**

   Certificates of Compliance for 1992/1993 were reviewed and found to be in order.

2. **A senior Review Committee be established in association with DSAB.**

   We constitute such a Committee.

3. **"Second opinions" should be obtained from outside sources on some of the potentially controversial test programs.**

   The BCDRC considers that the most effective way to obtain credible second opinions would be to adapt the methodology developed for Project SWIFTSURE, in particular the use of outside committees. Some of these, especially those established to discuss research policy, might collaborate through the medium of workshop type conferences from which "second opinions" would most surely evolve. When selecting such external committees, stress should be placed on geographic breadth and scientific competence of designated personnel. Nominations should be made by impartial third parties such as scientific, engineering or other scholarly societies.

   To augment these initiatives local citizenry are included on each Institution's Animal Care Committee, lay persons and non-governmental specialists will be members of the Human Research Ethics Committees and on, as established, Environmental Protection Committees. Further, the emphasis of the in-house review of each proposed test, trial or research project is to be placed upon its scientific usefulness.

4. **A document be prepared annually which would set out the nature of the research and development work under way, the number of people involved, and allocated funding.**

   The 1990/91 Review was published in February 1992. The 1991/92 Review is currently under production with a target publication date of November 1992.

5. **A layman's pamphlet be published which would help improve public understanding about Biological and Chemical Defence.**

   An appropriate pamphlet was published in August 1990. A similar pamphlet, emphasizing the work at DRES, is currently in draft form.

6. **A DND directive on policies and procedures regarding the use of volunteers and animals be published.**

   DND Policy – Animal Use in R&D was issued on 15 June 1989.

   A Canadian Forces Administrative Order covering the Use of Volunteers as Subjects of Research is in the final staffing stages by the Surgeon-General. Interim guidelines were issued 11 June 1990.

DRES

1. **A procedure be established to ensure that the DRES Safety Manual is reviewed at prescribed regular intervals of not more than three years. Safety drills should also be conducted at prescribed regular intervals.**

   The procedure has been established and implemented. Safety drills are being conducted as recommended. A new safety plan is being generated to comply with the recommendations of the 1991 environmental audit.

2. **An automatic annual review and certification procedure be instituted to confirm that stocks of toxic agents are being kept to the minimum level necessary for the conduct of an efficient research and development program.**

   The annual inventory audit was completed in January 1992 and reviewed by the BCDRC in May 1992. We agreed that stocks were being properly maintained at a minimum level which in most cases is only a fraction of levels authorized.

3. **The arrangements being implemented to improve security and access controls be expedited.**

   Completed.

4. **Pending the destruction of the excess agent stocks now stored in the Experimental Proving Ground, the adequacy of existing physical security arrangements be reviewed with a view to strengthening them.**

   Completed.

5. **The incinerator which is to be acquired for the program be considered for use in the destruction of other dangerous industrial chemicals, including PCBs.**

   The Alberta Government has essentially rendered this recommendation unimplementable as they have:

   a. restricted the future destruction of hazardous materials within Alberta to the Swan Hills Special Waste Treatment Facility; and

   b. imposed stringent restrictions on the moving of hazardous materials on provincial highways.

   The incinerator was sold and its removal from DRES was completed by 6 August 1992.

6. **The Experimental Proving Ground (EPG) operation and maintenance be given "project" status within the CRAD program.**

   Implemented. This gives positive visibility to all activities, funding and personnel involved in the EPG and ensures an annual review as a separate program component.

7. **The scope of the safety and environmental requirements governing outdoor testing at DRES be determined by the provisions of the Canadian Environmental Protection Act.**

   Although the Act at present does not include such express provisions, the Federal Minister of Environment has stated that his department will develop the requisite guidelines as and when necessary. In addition, a staff control system is in place and functioning to ensure compliance with all constraints.

8. **A full environmental audit of DRES be commissioned as soon as possible and that it be repeated at regular intervals of, say, five years.**

   Acres Consultants Ltd, having completed the audit under a Supply and Services Canada contract, submitted their final report in February 1992. An internal staff agency has been situated to initiate recommendation compliance. Reasonable progress has been effected towards early implementation. The Acres' report has been deposited with the Canada Institute for Scientific and Technical Information (CISTI), the National Library and major university libraries throughout the country. The BCDRC will review progress annually.

DREO

1. **A regular annual review procedure be instituted at DREO to confirm for the record that stocks of chemical agents are kept to the minimum necessary for the research and development program.**

   The annual inventory audit was completed in January 1992 and reviewed by the BCDRC in June 1992. We agreed that stocks were being properly maintained at a minimum level which in most cases is only a fraction of levels authorized.

2. **As part of the implementation of the Canadian Environmental Protection Act, an environmental audit of DREO be carried out at the first convenient opportunity, and at regular intervals (say five years) thereafter.**

   Having completed the audit under a Supply and Services Canada contract, Acres Consultants Ltd submitted their final report in November 1991. All the Report's recommendations have been addressed and full compliance by the realistic completion date of June 1994 is anticipated. This report is widely available as noted above (under DRES). The BCDRC will continue to monitor.

IMPLEMENTATION OF BCDRC 1990 REPORT RECOMMENDATIONS

1. **The flow of information within the Defence Research Laboratories between sections, management and staff might be improved – possibly through occasional informal meetings and discussions with senior managers.**

   There is marked improvement in the awareness levels throughout the system, particularly at DRES. Monitoring will continue.

2. **Career management procedures should be more closely attuned to the needs of small but extremely important units such as the CFNBC School.**

   An improved personnel rotation plan which caters to enhanced continuity appears to have been adopted.

3. **A higher than present percentage of the CFNBC School staff should have scientific or engineering backgrounds.**

Although a scientifically educated officer has recently been appointed to the School, we still consider that the number of instructors with adequate backgrounds is insufficient.

4. **Restricted agent training should continue to be conducted annually at DRES for selected military personnel.**

   The intended level of compliance with this recommendation has been achieved. Its continuation will be monitored.

5. **CRAD should attempt to increase the number and scope of articles on biological and chemical related research for publication in open literature.**

   This concern has been addressed in a satisfactory manner.

6. **CRAD should establish an accountability system to reflect:**

   a. all current biological and chemical research activities, both in-house and on contract, including budgets;

   b. the publications and resultant presentations directly attributable to each activity or sub-activity; and

   c. notes explaining why specific activities have not been publicized.

   An excellent first edition has been produced. The BCDRC will review the classified paragraphs during their annual visit to the applicable responsibility centre. This publication should become a most useful annual reference manual as long as substantive comments submitted by the BCDRC and other Departmental users are incorporated.

7. **An enhanced public relations program should be initiated to emphasize the many excellent achievements of the research laboratories. Perhaps the Fiftieth Anniversary of DRES could be used to initiate regular open house events, occasional visitations by citizen groups or non-governmental scientific organizations and invitations to learned societies to hold chapter meetings at DRES.**

   A noticeably improved program is in place. To reinforce this endeavour, we advocate that every plausible local special occasion be exploited, as was done during the various Fiftieth Anniversary celebrations, and that community involvement become the norm whenever possible. Although the response by the general public to Open Invitations has been most rewarding, it is our understanding that few special interest groups have availed themselves of these opportunities.

IMPLEMENTATION OF BCDRC 1991 REPORT RECOMMENDATIONS

1. **Canada continue to develop and refine verification, compliance monitoring and investigatory techniques.**

   Though Canada's Defence Policy clearly indicates the allocation of resources to both verification and treaty compliance obligations, we note that within DND an approximate 10% reduction in personnel and capital costs has occurred over the last two years.

   Clarification is required as to exactly which DND agency has primary responsibility.

   From an international view point the Department of External Affairs (DEA) is responsible and will be apprised of the BCDRC concerns.

2. **Consideration be given to the co-location of DRES and the CFNBC School.**

   Although the technical advantages to accrue from such a move are reluctantly recognized, financial constraints preclude its immediate implementation. The Committee will review this matter again.

3. **BCDRC Annual Reports should be submitted to the Ad Hoc Committee on Chemical Weapons of the Conference on Disarmament in Geneva.**

   As the formal adoption of this recommendation is the purview of DEA, DND has agreed to convey the request.

4. **The BCDRC be offered annually a vacancy on the Nuclear, Biological and Chemical Senior Officers' Course conducted by the CFNBC School.**

   Agreed. Dr CE Holloway is to be offered a course vacancy in 1992.

5. **The Canadian Forces Medical Services should hold reasonable amounts of appropriate medical supplies to treat possible future biological and chemical casualties on little or no notice.**

   The Surgeon General has initiated a medical stockpiling priority acquisition program designed to meet identified requirements.

6. **Canada continue to function internationally in the biological and chemical fields in accordance with current government policy.**

   Agreed. Full compliance is anticipated.

7. **Every reasonable measure possible should be taken to enhance the visibility of all biological and chemical defence research and development conducted in Canada.**

   The Departmental Communications' Policy currently in place should provide the necessary impetus. We are favourably impressed by the steps taken so far by the individual research establishments.

8. **A bacteriologist or microbiologist (whose speciality is infectious diseases) be appointed to the BCDRC at the earliest opportunity.**

   Approved. DSAB is taking action.

SOME IMPORTANT ISSUES

Middle East Events. Canada's response to the UN's requests for assistance in biological and chemical related activities, including the destruction of warheads, which derived from the 1991 Gulf War was outstanding. The dedication and competence of the involved scientific and military personnel were exceptional. However, the continued use of Defence Scientists in such hazardous pursuits suggests a need to train more military personnel to perform biological and chemical inspections and environmentally safe demolitions.

Concerned Citizens Groups. The BCDRC met with representatives of four such organizations at their request. These were the Calgary Branch of Canadian Physicians for Prevention of Nuclear War (who have expanded their mandate to encompass a wider range of health concerns), the Calgary Disarmament Coalition, the Vancouver Island Peace Society and the Toronto Chapter of Science for Peace. Written and oral submissions were received. The primary concerns of these citizen groups warrant comment. Based on our research and discussions with Departmental personnel, we offer the following:

a. **Concern:** There continues to be a lack of legislation in Canada pertaining to offensive biological and chemical weapons development.

   Comment: We agree, for Canada to comply with the Biological and Toxin Weapons Convention and the anticipated Chemical Weapons Convention, some legally constraining regulations and the identification of a national authority to oversee internal implementation will be essential.

b. **Concern:** The conduct of genetic engineering at DRES.

   Comment: The objective of all DRES sponsored genetic engineering is twofold. Firstly, to develop suitable methods for protection against or treatment of infections from potential biological agents and toxins. Secondly, to develop rapid and sensitive methods for the detection and identification of potential biological agents and toxins.

c. **Concern:** Allegations of possible commitment to other Nations' biological and chemical research programs were made on the basis of Canada being a signatory to certain treaties and memoranda of understanding (MOU) which were classified and hence not readily available for perusal.

   Comment: The applicable treaties and MOUs were examined in detail. No evidence of such a commitment was found nor was there any indication that Canada could be coerced into R&D activities contrary to approved National policies.

d. **Concern:** If the MOUs on BCD are relatively innocuous, as maintained by our Committee, why can they not be released to the public thus alleviating suspicion.

   Comment: We are given to understand that these MOUs are classified at the request of one or more of the other signatories and cannot be made public. Our suggestion is that they be paraphrased in a way to avoid outright offence to those who demand secrecy and be published in the next annual review of the BCD program.

e. **Concern:** The construction of a "Level 4" containment facility at DRES.

   Comment: The upgrading of the existing containment facility to conform with current Health and Welfare Canada standards for "Level 3" is underway. There is neither intention nor requirement at present to build a "Level 4" facility. The Committee, after having visited the Ontario Department of Health "Level 4" Containment Facility, would like to emphasize that the disparities between the relatively small and unsophisticated DRES facility, currently under upgrade, and the superb Ontario resource preclude any possibility of confusion in the issue of what level of facility exists where.

   It should be noted that the real constraint on very sensitive research is not the facility level available but it is the risk under the existing circumstances that those involved are prepared to take. The major deterrent against undesirable research is the repetitive promulgation to all personnel that such research is contrary to national policy and will not be tolerated. This condition appears to prevail throughout CRAD.

f. **Concern:** With the Biological and Toxin Weapons Convention in place, what research and development activities does Canada consider as being prohibited?

   Comment: The major activities deemed prohibited are the large scale production of biological warfare and/or potential biological warfare agents, field trials with biological agents and any work related to the weaponization of such agents.

g. **Concern:** The nature of research and cooperative projects currently being conducted between DRES and Fort Detrick, USA.

   Comment: None. Cooperative work terminated prior to 1969. The former biological warfare facilities at Fort Detrick are now occupied by the US National Cancer Institute and the US Army Research Institute for Infectious Diseases (Tropical). Among other establishments resident in Fort Detrick are the Armed Forces Medical Intelligence Center and the US Army Medical Research Institute for Infectious Diseases. Research concerning the treatment of biological infections is being conducted at the latter Institute and Canada has expressed interest.

h. **Concern:** The disposition of the alleged large holdings of ricin, botulinum and anthrax at DRES.

   Comment: Though there never were large holdings, using proven and scientifically accepted methods the stocks of ricin were all destroyed by 31 March 1978. The anthrax and botulinum stocks were reduced to laboratory research levels before 1960.

i. **Concern:** There have been reports of inadequate housing of laboratory animals at DRES and that primates are used in experiments there.

Comment: We inspected the DRES vivarium and found it well maintained and subject to normal national inspections. The DRES Animal Care Committee appears to be functioning effectively and according to existing regulations. At the time of our visit, there were 19 old world monkeys on the premises. They were last used in the 1986 HI-6 tests. All will be sold off to other laboratories by the end of 1992. The vivarium, which is in the final stages of an upgrade, is comparable to the best we have seen at other institutions.

IMPRESSIONS OF PERSONNEL AND PROGRAMS

We would once again like to express our appreciation for the openness and cooperation given to us throughout our 1992 schedule of visits.

Within DND's biological and chemical defence research and development program, see Table 1, the quality of science, the projects underway, the resultant publications and the level of safety awareness continue to be of a high standard. The potential of commercial uses of the results of the work at DRES, particularly in the fields of public health, medical science, geriatrics and agriculture, should be made more widely known to the public.

Table 1: Chemical and Biological Defence Research and Development Program

Estimates for Fiscal Year 1992/1993

Personnel (Person Years)

	DREO	DCIEM	DRES	TOTAL
Professional	9.5	2.0	30.5	42.0
Technical	9.5	1.5	30.5	41.5
Military	2.5	3.0	1.0	6.5
Totals	21.5	6.5	62.0	90.0

Capital Cost ($000)

	DREO	DRES	CRAD/HQ	TOTAL
Contracting	1,225.0	1,957.0	1,091.0	4,273.0
Equipment	153.0	917.0	0	1,070.0
Totals	1,378.0	2,874.0	1,091.0	5,343.0

We were pleased to note that DRES, in partnership with the City of Medicine Hat and the Province of Alberta, is seeking permission to offer some of its facilities to appropriate private business projects and to joint ventures. This move will not only aid the area's economy but also will help enhance the openness that is developing at Suffield.

SOME CONCERNS

- The reduction in personnel through attrition to meet new staffing levels could cause a disparate impact in some talent groupings at individual Establishments. Due regard is required to ensure that safety continues to be a paramount consideration.
- Although statements describing all existing contracts with outside agencies are open to our review, the continuation of an annual briefing of the BCDRC by a cross-section of selected contractors is deemed to be necessary in order to provide us with complete confidence in the total program.
- The measures taken over the past two years to enhance public awareness and trust in Canada's biological and chemical defence program have been very successful. However, doubts and suspicions do still arise. These can only be allayed if the openness and consultation that characterized Project SWIFTSURE are applied to all potentially controversial programs.
- Although communication between scientists and support staff and the internal information flow seem to have improved markedly over the past two years, continuing effort will be required to maintain the easy rapport, sense of purpose and identification among all employees that characterizes good research laboratories.
- The Gulf War, the political upheaval underway in Eastern Europe, Canada's increasing involvement in peacekeeping and peace restoration operations in lesser developed areas of the world all suggest that a discreet research and development program aimed at maintaining state-of-art detection, protection and verification devices should continue.
- Due to their accessibility and relatively low cost, chemical and biological weapons are no longer the sole purview of nation states. Thus, the potential problem of terrorists using, or threatening to use, chemical or biological weapons in Canada occasions a notable degree of anxiety.
- The planned co-location of elements of DREO with DCIEM and DRES appears to be both logical and financially sound. It also means that all future experimentation involving agents will be restricted to DRES premises. However, suitable attention to the morale aspects of this restructuring is demanded if a significant dysfunction is to be avoided.

CONCLUSIONS

- The BCDRC found neither indications of duplicity within DND's biological and chemical program nor evidence to support the contention that offense-related activities were being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

- We remain convinced that Canada must retain a modest capability to effect defensive research and development to permit military operations under the threat of biological and chemical weapons. We believe that the priority of effort should be accorded to the following projects, which in addition to their obvious military relevance also contribute to treaty monitoring, medical support, pollution control and the handling of toxic wastes:

  a. verification technology;

  b. prophylaxis and therapy for biological agents;

  c. development of less physiologically burdening individual protective clothing with wider geographical pertinence;

  d. refinement of procedures to foresee and assess hazards posed by both established and hypothetical chemical and biological agents; and

  e. improved decontaminants.

- To comply with the intent of the Biological and Toxin Weapons Convention, Canada should consider enacting supporting legislation to meet or exceed that enacted by some of the other signatories.

RECOMMENDATIONS

1. Priority of effort be given to fundamental biochemical research which could also have applications outside the defence sphere.
2. An information exchange system be instituted to ensure that applicable CRAD directed research results are readily available to civilian industry.
3. The involvement of CRAD scientists in disarmament sessions in Geneva continue and not fall victim to current fiscal restraints.
4. A program designed to train selected military personnel to conduct biological and chemical inspections and to effect environmentally safe demolitions be implemented.
5. CRAD invite, through learned societies, a number of knowledgeable outside scientists to a workshop to discuss a biological defence research strategy for Canada for the next decade.
6. DND increase its involvement in the inter-departmental activities concerning domestic coordinated reaction to terrorist use of biological and chemical weapons.
7. An invitation be extended to at least one member of the BCDRC to attend the annual DND NBC Conference.
8. A higher percentage of CFNBC School staff should have scientific backgrounds.
9. Further consideration be given to the co-location of DRES and the CFNBC School.

ANNEX A
BIOGRAPHIES OF COMMITTEE MEMBERS

Dr. E.R. Ward Neale, OC (Chairman)
A graduate in geology from McGill and Yale Universities and a Fellow of the Royal Society of Canada, he has been employed as a scientist and research manager by government and as an academic at several universities. He retired as Vice President (Academic) from Memorial University in 1987. He has chaired committees that have reviewed university faculties, government agencies and international scientific programs.

Dr. Clive E. Holloway
A graduate in chemistry from the Bristol College of Advanced Technology and the University of Western Ontario; he is currently Director of Natural Science at York University, and is actively involved on the executive committees of the Chemical Institute of Canada and the Association of the Chemical Profession of Ontario.

Dr. Gabriel L. Plaa
A graduate in toxicology from the University of California in San Francisco, he is a Professor in the Department of Pharmacology in the Faculty of Medicine and the Director of the Interuniversity Centre for Research in Toxicology at the University of Montreal. Among his many appointments and affiliations, he is a member of the Society of Toxicology of Canada and the American Board of Toxicology.

ANNEX B
REFERENCES FOR PREVIOUS REPORTS

Research Development and Training in Chemical and Biological Defence within the Department of National Defence and the Canadian Forces: A Review by William H. Barton, Minister of Supply and Services Canada, 1989, p.54. [Available in Canada through the Canadian Government Publishing Centre, Supply and Services Canada, Ottawa, Ontario K1A 0S9. Catalogue No. D2-79/1989E, ISBN 0-660-13103-X.]

First Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, 1991, p.7. It is also included in the second annual *Review of the Chemical and Biological Defence Program January 1990 – April 1991,* Minister of National Defence, Ottawa, February 1992, p.28. [Both available through the National Defence Headquarters Library Services, National Defence Headquarters, MGen GR Pearkes Building, Ottawa, Ontario K1A 0K2.]

Second Annual Report of the Biological and Chemical Defence Review Committee, is included in the third annual *Review of the Chemical and Biological Defence Program April 1991-March 1992,* Minister of National Defence, Ottawa. [Will be available through the National Defence Headquarters Library Services, National Defence Headquarters, MGen GR Pearkes Building, Ottawa, Ontario K1A 0K2.]

ANNEX C
TERMS OF REFERENCE BIOLOGICAL AND CHEMICAL DEFENCE REVIEW COMMITTEE

(Revised Sept 92)

BACKGROUND

1. The policy of the government of Canada is to press for a global, comprehensive and verifiable treaty to ban all chemical and biological weapons. While the threat from such weapons remains, however, Canada has an obligation to ensure that members of the Canadian Forces (CF) have adequate training and equipment to protect themselves against exposure to chemical and biological agents.

2. On the other hand, the Canadian public has a right to be assured that Canada's policy of maintaining only a defensive capability in this field is fully respected at all times, and that any research, development and training activities undertaken by this country are professionally conducted and pose no threat to public safety or the environment.

AIM

3. The aim of the Biological and Chemical Defence Review Committee (BCDRC) is to review annually the research, development and training programmes in biological and chemical defence undertaken by the Department of National Defence (DND) to ensure that all activities within those programmes are, in fact, defensive in nature and are conducted in a professional manner with no threat to public safety or the environment.

EXECUTION

4. BCDRC will annually:

   a. visit the major activity centres;

      (1) the Defence Research Establishment Ottawa (DREO),

      (2) the Defence Research Establishment Suffield (DRES), and

      (3) the Canadian Forces Nuclear, Biological and Chemical School (CFNBCS);

   b. visit at least two other DND establishments where biological and chemical training is conducted;

   c. review the annual DND R&D Programme as developed by the Chief of Research and Development (CRAD) and approved by the Defence Management Committee (DMC);

   d. review the implementation of the recommendations made in the Barton Report of 31 December 1988; and

   e. submit a report of their findings to the Chairman, Defence Science Advisory Board (DSAB).

5. The Chairman DSAB will present the Report to the Chief of the Defence Staff and the Deputy Minister of National Defence.

6. DND is to respond to the Report to the BCDRC Chairperson with a copy to the Chairman DSAB within 90 days of the presentation of the Report to DND.

COORDINATION

7. Assignment of responsibilities:

   a. OPI: Chairman DSAB;

   b. committee (to consist of a chairperson and two senior representatives of the Canadian scientific, juridical and industrial communities): to be appointed for a term of two/three years by DND on the recommendation of the Chairman DSAB; and

   c. conduct of tasking: all elements of DND and the CF are to assist the committee as required by the chairperson.

8. Support:

   a. DSAB will assign an executive officer to the committee;

   b. the committee executive officer will attend to all liaison, travel, accommodation, coordination, administrative support matters and will prepare and publish, as directed by the chairperson, the committee's annual report;

   c. technical support is to be available from whatever sources the chairperson requires; and

   d. access to all relevant information and personnel is to be given to the committee.