HISTORY OF THE ATLANTIC PROVINCES COUNCIL ON THE SCIENCES (APICS)

THE FIRST TWENTY-FIVE YEARS

1962 - 1987

BY FREDERICK J. SIMPSON

WITH APPENDIX LISTING

OFFICERS AND REWARD RECIPIENTS

BY JOAN ATKINSON

PREFACE

The Atlantic Provinces Council on the Sciences is a unique organization in Canada, devoted to the establishment and nurturing of co-operative activities among scientists in different organizations in the four Atlantic provinces. Its successes and failures serve as a source of information for the successful administration of co-operative activities by disparate groups of people.

The history was undertaken at the suggestion of Dr. Merrill Edwards, Chairman at the time of the 25th anniversary of the founding of the Atlantic Inter-university Committee on the Sciences (APICS). The name of the organization was changed in 1978 to the Atlantic Provinces Council on the Sciences to reflect the participation of research groups other than those at universities. The acronym, APICS, was retained. Over the years, each secretary employed their personal system of maintaining records, some being lost during the numerous transfers of office. During the extraction of information, the authors reorganized the accumulated files in the co-ordinator's office into a common format. The authors are indebted to the founder, Dr. W.R. Trost, and to former chairmen, Dr. J.J. MacDonald and Dr. W.A. Bridgeo, for providing information about events during the formative years. A second thank you is due those individuals who orally supplied additional information about specific events. Dr. J.F. Read, Dr. W.A. Bridgeo and Mr. S.J. Simpson reviewed the manuscript, providing additional information and correcting errors. Any remaining errors or omissions in the texts, the reporting of events and comments are the sole responsibility of F.J. Simpson. The manuscript was retyped by Linda Sturge of APICS' secretariat, edited for publication by Joan Atkinson and Linda Sturge.

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Introduction

The Atlantic Provinces Council on the Sciences is a unique Canadian organization. The Council, financially supported by institutional membership fees, has fostered a degree of co-operation in education and research between scientists in different universities and various government agencies in the four Atlantic provinces that is unparalleled elsewhere in Canada. This history was undertaken on the occasion of its 25th birthday.

During the settlement and development of the three Maritime provinces in the 19th and early 20th century, religious orders and governments established several colleges and universities in different localities reflecting religious groupings and regional needs. For example, three post-secondary institutions were established in Prince Edward Island and nine in Nova Scotia. During the depression of the thirties and the Second World War further development of the institutions ceased. Few resources were available to provide adequate facilities and staff. Science was particularly constrained. At the end of the Second World War a chemistry laboratory usually consisted of long black benches, an assortment of bottles, bunsen burners, burettes, pipettes, beakers, swing balances, an oven or two, and one or two fume hoods. Biochemistry likely shared facilities with chemistry, perhaps with the addition of a battery powered colorimeter and a Kjeldahl apparatus for determining nitrogen. The principal items in a biology laboratory were student microscopes, an autoclave and an incubator. Glassware was in short supply. During the academic year, from late September to May, the professors were fully occupied with teaching and what research was accomplished was done during the summer months. The limited time to read, think, and do research was precious.

Immediately following the Second World War, the universities throughout Canada were inundated with veterans seeking undergraduate and postgraduate education. The resources of the universities were severely strained to provide basic classroom and laboratory facilities. The increase in enrolments was dramatic. Additional staff and resources made available by the provinces and by federal government grants were never enough to meet needs, particularly space and laboratory equipment in the sciences. Indeed, equipment obtained with funds granted by the National Research Council (NRC) for research was pressed into serving teaching needs as well.

The single event that resulted in a major impetus to the development of graduate research programs in science in Canada was the launching of Sputnik by the Soviet Union in 1957. Since its establishment in 1916, NRC, through its scholarships and grants in aid of research, was the main source of financial support for research in Canadian universities. Dr. E.W.R. Steacie, President of NRC, used the launch of Sputnik as an argument to convince the federal government that a major increase in funding of science in Canada was needed. Those universities that had established graduate schools, and individuals with established research reputations were the first to benefit, mostly those in the larger universities in central Canada.

By the late fifties, enrolments in each of the post-secondary colleges and universities in the three Maritime provinces ranged from 300 to 2,300 students. Four universities had enrolments close to 1,400, a figure that at the time was considered economical for a liberal arts college. The eight universities in the Maritimes with science faculties had developed competent undergraduate programs, but research activity was in a depressed state in relation to the rest of Canada. There were few resources for graduate student support and research. At the smaller institutions, the little that existed was confined to a bachelor's or master's thesis.

The Atlantic Provinces Inter-university Council on the Sciences arose in 1962 from a desire to improve graduate research and technological capability in the three Maritime provinces, and resulted from an initiative by Dr. Walter Trost of Dalhousie University. When founded, the organization consisted of universities and research institutions in the three Maritime provinces, but later included Memorial University of Newfoundland and for a brief period the University of the West Indies (UWI).

The task of gathering together people with common interests and objectives is relatively simple in comparison with the task of maintaining the group in continuing co-operative activities directed at attaining an objective. Many efforts to do this have failed because the required principles for success were not met. In reports on Canada's activities under the International Biological Program published by NRC (1974) and the Royal Society of Canada (1975), Dr. W.H. Cook, Executive Director of NRC, noted that the initiation of interdisciplinary projects in the academic community was slow because of involved arrangements between departments and institutions. Co-operative arrangements were facilitated when funds via contracts or grants in support of a project were managed by members of the group effort under a memorandum of agreement.

Similar memoranda of agreement were used by the Atlantic Research Laboratory (ARL - formerly known as the Atlantic Regional Laboratory) to support interdisciplinary research and development activities directed at specified objectives by groups with participants from universities, commercial firms, federal and provincial government departments and agencies. Such requires a delegation of authority that often is resisted. The basic principles essential for successful management and financial support of interdisciplinary-interorganizational group efforts were defined by Dr. F.J. Simpson as:

1. that participants in the co-operative effort have common goals, a personal interest in attaining them, and mutual trust and good will towards each other;

2. that the group has good leadership combined with an ability to make decisions by mutual consent, and an organizational or operations centre that provides management services;

3. that the administrators of the organizations to which participants belong fully support the common objectives and allow members of the group access to the organization's facilities;
4. that as each active participant has a first obligation to his/her institution and demands on time, means be made available for the addition of people (students, research fellows, technicians) on a continuous or temporary basis to ensure continuity of effort;

5. that the co-operative efforts have a source or sources of central funding, that is, funds devoted to attaining the objectives of the co-operative program and that the participants have a role in deciding how the resources are spent.

Interinstitutional, interdisciplinary projects managed in such a way have the advantage that in addition to the number and types of expertise brought to bear and to the funds assigned directly to the project, the participants are able to make additional resources available from their own institutions. The total resources applied to the co-operative effort are thus greater than what each participant or the common funding agency could muster alone. The benefits accrue to all.

In evolving its organizational structure and operational procedures, APICS met most of the above criteria, but initial efforts to establish interdisciplinary-interinstitutional research programs such as that on water resources, were not successful. One stumbling block was lack of a central incorporated body for money management and administration. However, the above criteria were applied successfully by Dr. Simpson while director of ARL/NRC, in supporting the work of the Atlantic Group for Research on Industrial Materials consisting of members from various research laboratories and commercial firms in the Maritime provinces. Similarly, the principles were successfully applied by the federal Department of Energy, Mines and Resources and ARL to the funding and administration of the Atlantic Committee on Coal conducting research on the utilization of Maritime coal and comprising participants from the Nova Scotia and New Brunswick governments, power corporations, universities, government agencies and industry. The basic principles were met in supporting the work of APICS's Fundy Environmental Studies Committee and the Atlantic Fiddlehead Research Organization until financial resources provided by the Department of Fisheries and Oceans (DFO), Environment Canada and ARL augmenting those of the participants had to be withdrawn.

The beginning

Following the Second World War, there was a national conviction that enrolments and society's demands on the universities would increase with the higher birthrate and a general demand for higher education. In the late fifties, convinced that the scope for scientific research and technological development would be limited in the Maritimes without a strong graduate school and postgraduate research, Dr. Walter R. Trost, a professor of chemistry at Dalhousie, discussed enlarging the graduate studies program with Professor Bennet, Vice-president and Dean of Graduate Studies and with President A.E. Kerr of Dalhousie. Though both supported the establishment of a major doctoral program in the sciences, they cautioned that it should be done only when resources were such that it could be done well. Resources were not adequate.

In 1961, when Dr. Walter Trost became the dean of graduate studies at Dalhousie, he cast about for the means to strengthen graduate studies and research in the sciences, conceiving of a co-operative effort amongst the Maritime universities for the establishment of a strong graduate school. In 1920-21, the provincial governments of the Maritime provinces had asked the Carnegie Corporation to examine the possible union of the post-secondary educational institutions in the region. Their recommendations were rejected by the colleges and

universities but following the study and during the difficult depression years, Dalhousie and King's College received funds (grants) from the Carnegie Corporation. Dr. Trost approached the Carnegie Corporation for assistance, suggesting that Dalhousie could serve as a central graduate school.

Copies of the proposal were submitted to the deans of science at the other Maritime universities. The proposal came as an unannounced surprise. The presidents and deans of science were disturbed by the implication that they were being seen to agree to an arrangement of which they knew nothing and about which they had grave reservations. Consequently, the dean of science at Acadia University, Dr Hansen; the dean of graduate studies at Saint Mary's University, Father Bill Stewart; the dean of science at Mount Allison University, Dr. Bill Crawford; and the dean of science at St. Francis Xavier University (STFX), Dr. J.J. MacDonald, met to discuss the proposal with Dr. Trost at Dalhousie, the first of several discussions. Though the discussions were frank and occasionally heated, the memorable item was the terrible coffee brewed by Dean Trost.

The concern was that Dalhousie appeared to be making a move to become the centre for all science research in the Maritimes, to accrete unto itself the bulk of financial resources, leaving the smaller universities in a worse situation. The deans were emphatic that their science programs needed reinforcing, that it was not possible to provide competent instruction in science unless professors were given the opportunity to do original research. Indeed, they expected members of the science faculties to remain on campus during the summer and do research. Because the deans did not support the submission, the Carnegie Foundation did nothing.

However, Walter Trost's concept of a co-operative effort among the universities to reinforce research in the Atlantic region survived, a credit to his diplomacy, leadership, and the basic friendship and good will that existed among the deans. Walter Trost's ensuing informal discussions during 1961 with the deans, presidents, and heads of government research laboratories addressed three objectives: firstly, the strengthening of the sciences at all levels and initiation of graduate research at the doctoral and postdoctoral level in the Atlantic provinces; secondly, the creation of an inter-university mechanism through which the sciences in the Atlantic provinces could work co-operatively without loss of autonomy and to mutual advantage; thirdly, to determine if co-operative research activities between the federal and provincial research laboratories and the universities could be established to mutual advantage and strengthen the regional research effort inside and outside the university.

NRC and the federal government departments were almost the sole source of funds for research in the universities. With their help and despite severe constraints, the research effort in the Maritimes had gradually intensified. Research in the universities received moral and indirect support, if not direct support, through collaborative activities and joint supervision of undergraduate and graduate students by members of the newly established or

reinforced provincial and federal government research laboratories in the Maritime region. Compared to the universities, the government-supported laboratories had more analytical instruments, more resources and time for research. Dr. H.D. Smith, President of the Nova Scotia

Research Foundation and Dr. E.G. Young, Director of ARL/NRC, actively supported the strengthening of research in the region through co-operative activities.

Walter Trost met with Dr. A.H. Zimmerman, Chairman of the Defence Research Board and Dr. Jack Kash, Chairman of the Fisheries Research Board. Both agencies gave grants in aid of research in universities and supported the concept of reinforcing research in the Maritimes in those areas for which they had special responsibility. Dr. Kash was particularly enthusiastic about the aquacultural sciences. Dr. E.W.R. Steacie, President of NRC under whom Walter Trost had worked as a postdoctorate fellow, concurred that inter-university co-operation could provide the extra strength needed to bring about a surge of growth in research in the Atlantic region. The ARL was on the campus of Dalhousie and in 1962, Dr. Steacie approved a co-operative program between the ARL and Dalhousie as proposed by Dr. A.C. Neish, successor to Dr. Young as director of the laboratory. The arrangement was that staff of ARL were appointed to the faculty, presented lectures and supervised graduate students for whom the laboratory provided Dalhousie with funds for bursaries. The funds came out of the laboratory's operational budget and the students did their research at the laboratory. Such an arrangement was seen as reinforcing the graduate program of the university as well as the research program of the laboratory.

The graduate student funding arrangement continued until 1970, when a change in government policy ended the funding of students from the laboratory's operational budget. Student funding thereafter was dependent on university bursaries, NRC's University Grants and Awards Program and subsequently the grant and scholarship programs of the Natural Sciences and Engineering Research Council (NSERC).

During the winter of 1961-1962, the Inter-university Dean's Committee formulated an outline of what university co-operation in the sciences should entail. A submission to NRC was prepared and forwarded to Dr. E.W.R. Steacie through the Faculty of Graduate Studies at Dalhousie by Walter Trost on February 22, 1962. The submission was supported by Dr. E.C. Smith, Dean of Science at Acadia; Dr. W.H. Crawford, Dean of Science at Mount Allison; Dr. G. Holbrook, President of Nova Scotia Technical College (NSTC); Father Stewart, Dean of Graduate Studies at Saint Mary's; Dr. H.D. Hicks, Dean of Arts and Science at Dalhousie; and representing King's College, Dean Stewart of the Dalhousie School of Medicine; Dean McLean of the Faculty of Dentistry; and Dr. F.R. Hayes, Director of the Dalhousie Institute of Oceanography. Though STFX, the University of New Brunswick (UNB) and Memorial had expressed interest and representatives had participated in the discussions, they did not formally support the submission.

The six co-operating universities put forth a program containing seven specifics for action towards development of science and research in the Atlantic provinces. These were:

1. annual science planning seminars open to the public. There would be working committees that would report to the seminar and provide a basis for agreement on recommendations for science education at all levels and the requirements for academic and professional research in the Atlantic provinces;

2. the establishment of lecture tours within the Atlantic provinces, visits and exchanges of professors between universities in support of presenting advanced courses;

3. summer research fellowships for professors, supported by grants ranging from $400 to $1,200 to enable professors to go to other universities in the Atlantic provinces in order to develop their research interests;

4. new key research appointments in areas presently not covered in the universities. Mentioned specifically were applied mathematics, plant biochemistry, and radiation biology;

5. co-operative inter-university research projects such as those employing instruments and equipment in one university by professors and students of other universities;

6. Summer research scholarships for students to enable students to carry out work at another university during the summer months;

7. office of the co-ordinator consisting of an academic person and a secretary to be responsible for organizing the science planning seminars and for developing the exchange and liaison among the several universities.

Dr. Trost discussed the submission with Dr. J.B. Marshall, Awards Officer for the University Grants Program. In support of the concept, NRC gave Dalhousie, in Dr. Trost's name, a grant of $15,000 that enabled the organization of a co-operative program to proceed. This was a starting grant and NRC hoped that additional funds would be obtained from other sources.

Having obtained the grant, Dr. Trost convened a meeting of the Inter-university Deans' Committee. In addition to the six universities who supported the submission to NRC, STFX represented by Dr. J.J. MacDonald and St. Dunstan's at Charlottetown represented by Rev. Dr. J.C. Cheverie joined the co-operative effort. The deans adopted the name, "Atlantic Provinces Inter-university Committee on the Sciences" with the acronym, APICS. They established a Central Committee comprised of the deans of science representing each co-operating university as a policy-making body controlling the distribution of funds. Dr. Trost was appointed chairman, Dr. Erik S. Hansen of Acadia as co-ordinator, and Father W.A. Stewart of Saint Mary's as secretary-treasurer. The accounts in accordance with NRC grant were maintained at Dalhousie. Working sub-committees were organized in biology, chemistry, geology, mathematics, physics and engineering, each having one representative from each co-operating university. Three tasks were placed on the agenda: (1) the holding of an inaugural conference; (2) preparation of a submission for financial assistance to the Division of Grants, Research Corporation of New York; and (3) preparations for the first annual Science Planning Seminar.

Inaugural conference (1962)

The inaugural conference was held on May 26, 1962 in Trueman House at Mount Allison, with Dr. H. Crawford (Mount Allison) in the chair. Members of the Central Committee in attendance were President Holbrook (NSTC), Father James Murphy (Saint Mary's), Dr. W.R. Trost (Dalhousie), Dr. J.J. Macdonald (STFX), Dr. E.C. Smith (Acadia), Dr. A.C. Neish (Director of ARL), and members of the newly established sub-committees. Dr. Trost outlined the work

that had been done by the Central Committee, emphasizing that each university must itself decide the level at which it wishes to work in the sciences, that whatever is undertaken should benefit more than one institution (at least two), and that nothing should be undertaken unless the results justified the effort involved. After a period of discussion, the participants formulated the basis for co-operative activities among people in the autonomous member institutions, an operational mode that has been maintained throughout the history of APICS:

1. that all should work toward improvement of research conditions through co-operation;

2. that grants given by NRC to APICS should not interfere with grants given to individuals by NRC through its subject review committees;

3. that present funds would enable APICS to finance interchanges of personnel, but be able to help research projects only to a limited extent;

4. that participation of the non-university laboratories in the region in the co-operative effort should be sought and could be a source of visiting lecturers and of access to specialized instruments;

5. that in addition to improving the research climate, one beneficial result would be the opening of opportunities for students in the region who are now largely lost to the area.

Submission to research corporation of New York (1962-1963)

Dr. Trost invited Dr. Alfred Kelleher and Dr. S. Smith of the Research Corporation of New York to attend the inaugural conference. Dr. Kelleher was impressed with the co-operative spirit and suggested that the Research Corporation might consider an application for a grant. Following the conference, Dr. Trost met with Charles H. Schauer, Vice-president and Secretary of the Research Corporation. Dr. Trost and Dr. Erick Hansen then began the task of drawing up a submission, carrying out the time consuming task of soliciting input and data from each co-operating university and informing those who were interested in the organization, but had not yet joined. They also solicited appraisals from prominent individuals in nonparticipating institutions such as Dr. Frank MacKinnon, President, Prince of Wales College, Charlottetown; Dr. H.G. Thode, President, McMaster University; Dr. B.G. Ballard, Acting President of NRC following the death of Dr. Steacie; and Dr. A.H. Zimmerman, Chairman of the Defence Research Board, Department of National Defence.

The appraisals were mailed directly to the Research Corporation. The submission outlined the teaching and research community in the Atlantic region and presented a comprehensive review of the history, teaching resources and degrees offered by members of APICS.

In 1961-62 there were 17 degree-granting institutions in the Atlantic region having a combined enrolment of over 8,000 with 2,229 enrolled at Dalhousie, 1,525 at STFX, 1,217 at Mount Allison, 1,099 at Acadia, 567 at Saint Mary's, 350 at NSTC, 344 at St. Dunstan's, and 147

at University of Kings College. Of the above, only Dalhousie and NSTC offered the doctorate degree, and it was agreed at that time that the other universities in Nova Scotia did not have the resources nor intended to offer the doctorate degree in the immediate future. The submission argued that great gains must be made in science and research in the Atlantic provinces to catch up with others in Canada and look after the needs of the region. Progress could be greatly accelerated if certain programs could be initiated that would:

1. build and maintain competent, balanced and well-staffed graduate research programs at the doctorate and postdoctorate level in the sciences at Dalhousie and in engineering at NSTC;

2. help those universities with master's research programs to be as effective as possible;

3. strengthen the undergraduate faculties of science at the several universities in the region in order to service graduate research in the sciences;

4. create and encourage mutually beneficial exchanges between the graduate and undergraduate science faculties in the universities.

The submission outlined in some detail the proposed program and presented a budget of $43,000 of which $10,000 was allotted to summer research fellowships for professors and another $10,000 for a new key research appointment. The Research Corporation was asked for a three-year grant of $65,000 to be paid in instalments of $28,000, $22,000 and $15,000.

The Advisory Committee of the Research Corporation reviewed the submission in February, 1963. The usual submissions received were requests for grants to a single institution for a specific purpose and the Advisory Committee had some difficulty in appreciating the thrust of the request for support of an interinstitutional organization. Several questions were raised. What will this do to strengthen research at the participating universities other than Dalhousie? While the travel grants would be for support of faculty and students to work in other institutions, to use research equipment and work in a more active research environment such as that at Dalhousie, committee members expressed doubt that this would contribute to a more enlivened scientific atmosphere in all the institutions as the visits would likely be too brief to be of lasting and significant benefit. Some members believed that it would be more beneficial for faculty and students to travel farther abroad to some other Canadian or U.S. university than to contribute to perpetuating at an advanced level a parochial university system such as seems to have existed in Nova Scotia. Why do not the several institutions involved undertake to develop independently a really significant science program with a definite research orientation?

Dr. Trost sent copies of the Advisory Board's comments to the deans of science, obtained their feedback, and prepared a response which was mailed on April 18, 1963. In the lengthy and detailed response, Dr. Trost noted that of the eight institutions in APICS, six were church-affiliated colleges and more church-affiliated colleges had indicated an interest in joining. The colleges had neither the funds nor believed it was their responsibility to develop strong programs in science at the doctorate and postdoctorate level; those in the church-affiliated colleges wishing to develop the sciences could only make progress by co-operating with similar elements in like

universities and with graduate faculties in which doctorate and postdoctorate work was done. Dr. Trost stated that an immediate problem was building good honours and masters programs in the sciences in the church-affiliated colleges. The universities and colleges that were members of APICS did support and encourage staff to study at institutions in other parts of Canada, the U.S. and Europe, but this was not part of the APICS program. Such educational leaves were the responsibility of the individual universities belonging to APICS. Support for travel outside the region always seemed easier to obtain than funds for travel and study within the region. Dr. Trost agreed that the rate of growth of the Faculty of Graduate Studies at Dalhousie and at NSTC would likely accelerate because of the activities of APICS, but such would result from increased enrolment. The resources to support increased doctorate and postdoctorate research at Dalhousie and NSTC would have to come from other sources. Of course, each institution in APICS desired to develop a stronger staff and science programs. APICS would be an aid in doing this and perhaps for some, the only means of doing so.

Shortly before the Research Corporation was to consider the response and the grant to APICS, Alfred Kelleher wrote to Dr. Trost that the corporation had heard from an individual in one of the APICS institutions that there was a suspicion that Dalhousie was not laying all its cards on the table; that though he believed the leaders of science in his college were anxious to co-operate in making the organization a success, they appreciated that Dalhousie's central location and graduate programs automatically indicated that a major share of the benefits of APICS would go to Dalhousie and wondered at the extent of Dalhousie's concern for them. Mr. Kelleher suggested that Dr. Trost have President Hicks of Dalhousie write in response.

President Hicks and Dr. Trost immediately responded and enclosed a statement of expenditures that showed Dalhousie had benefited little from expenditures to date. All costs incurred by the office of the chairman of APICS and the expenses of accounting were paid by Dalhousie. But the damage had been done; the Research Corporation rejected the application for a three-year grant to APICS.

Solicitation of new members (1962)

During the summer of 1962, Dr. Trost, on behalf of the Central Committee of APICS, wrote to Dr. H.D. Smith, President of the Nova Scotia Research Foundation; Dr. J. Wright, Director of the Kentville Experimental Station; Dr. Langstroth, Director of the Naval Research Establishment; Dr. English, Director of the Bedford Institute of Oceanography (BIO); and Dr. D. Idler, Director of the Halifax Laboratory of the Fisheries Research Board of Canada, inviting each to participate in the forthcoming Science Education and Research Planning Seminar and to join with Dr. A.C. Neish of ARL/NRC in becoming associate members of APICS. This they did, and appointed members of their staff to represent them on specific sub-committees.

First science education and research planning seminar (1962)

The first Science Education and Research Planning Seminar was held in Halifax at Dalhousie on December 27 and 28, 1962. Dr. E. Gordon Young, retired director of ARL, served as organizer and was paid an honorarium of $500 to help defray administration expenses. APICS paid the travel expenses of one delegate from each co-operating university to attend. The committee extended an invitation to Dr. Colin Mackay, President of UNB, who delegated Dr. F.J. Toole and Dr. C.W. Argue as representatives. The successful seminar was reported in the media as a major event. As a consequence, in 1963, UNB at Fredericton, Saint Joseph's University at Moncton, (subsequently the Université de Moncton) and Mount Saint Vincent University (MSVU) at Halifax became members. As a result of enquiries received from Dr. Les W. Shemilt, Chairman of the Research and Productivity Council of New Brunswick, and Dr. S.A. Hilton, Director of the Canada Department of Agriculture Research Station at Fredericton, N.B., they became associate members.

Organization (1962-1972)

On expansion of the Central Committee to include associate members, an Executive Committee consisting of a chairman, secretary-treasurer, co-ordinator and three members-at-large was established. The Executive Committee and co-ordinator conducted most of the routine business and made decisions on disbursement of funds on recommendations from the Central Committee.

The Central Committee consisted of one representative - usually the dean of science or dean of the graduate school - from each member university; each representative had a vote, whereas representatives from non-university laboratories - the associate members - did not. The full Central Committee met semi-annually or as required at the call of the Executive. During 1962 and 1963, much of the work of the Central Committee was devoted to organizing and planning, with APICS paying travel expenses of university delegates to meetings. Meetings of the Central Committee were held either at Halifax or by invitation at one of the co-operating universities.

The work of the disciplinary sub-committees began in earnest in 1962 following the inaugural meeting. Each sub-committee was comprised of one representative from each member institution who was usually appointed by his/her dean or director. Other scientists also attended as the agenda demanded or because of personal interest. The sub-committees usually met twice a year, in the spring and fall, with travel expenses of the designated members paid by APICS. The sub-committees organized their individual activities, managed special programs such as the visiting lecturer program, responded to questions put to them by the Central Committee, and forwarded proposals and recommendations to the Central Committee and Executive by way of the Co-ordinating Committee.

As a means of co-ordinating the activities of the sub-committees, the Central Committee established a Co-ordinating Committee with the co-ordinator presiding and the chairmen of each sub-committee as members. Travel expenses to meetings were paid by APICS. The co-ordinator

served as the liaison officer between the sub-committees and the Central Committee and Executive. The Co-ordinating Committee met in the spring, usually in February, and at other times as business required. In addition to receiving and discussing reports of activities of the sub-committees, submissions for financial support and recommendations for referral to the Central Committee, the Co-ordinating Committee responded to specific questions put to the membership by the Central Committee. The Co-ordinating Committee was assigned the task of organizing the second Science Education and Research Planning Seminar. As the program of APICS developed, a major responsibility of the Co-ordinating Committee was the selection of students to be awarded summer scholarships.

The first meeting of the Co-ordinating Committee was held on August 7, 1963 in Elliott Hall at Acadia. It began as a get-acquainted/information-exchange meeting, but made two recommendations: 1. that the latter part of the academic year in the spring was preferable to the Christmas break for the Science Education and Research Planning Seminar and that provision be made for presentation of technical papers as well as the general seminar; 2. that a budget of $2000 be established to pay travel expenses of professors as visiting lecturers and that support for each visiting lecturer not exceed $500.

In September 1963, Dr. E. Hansen, because of increased university responsibilities in being appointed dean of science, resigned as co-ordinator. Dr. W.D. Jamieson of ARL was appointed co-ordinator and became heavily involved in working with the Central Committee and the sub-committees in preparations for the forthcoming planning seminar and in developing an operations manual. This was completed and distributed to members on November 28, 1963. The Co-ordinating Committee compiled a list of graduate students, postdoctorate fellows, research associates, temporary and continuing members of staff in member universities. The directory, used as a source document by member institutions, was updated annually until 1969 when costs became prohibitive.

When the responsibility for organizing the Fifth Science Education and Research Planning Seminar was transferred from the Co-ordinating Committee to a special ad hoc committee, the frequency of meetings of the Co-ordinating Committee declined. In addition to exchanging information and receiving sub-committee reports, the selection of students for the Summer Student Scholarship Program became the major items of business. When the task of selecting students was delegated to a committee of three elected by the sub-committee chairmen, the Co-ordinating Committee had little business to conduct and ceased to meet after 1972. Travel expenditures were thus reduced, but there was a loss in communication that led to development of misunderstandings and animosities between some members of the sub-committees and the Central Committee.

Programs in support of research and student training (1963-1978)

In 1963 APICS initiated three programs to foster co-operative research activities. The first was inter-university research grants, whose principal purpose was to provide support for co-operative efforts that reduced duplication of effort, furthered the research project and encouraged research into problems of the region. No award was given in direct support of research as this

was seen as the responsibility of the government granting agencies such as NRC and government departments. The funds available to APICS precluded such support. Support was limited to transportation, accommodation, and fringe research requirements, and only in unique circumstances were grants to be extended to students, post-doctorate fellows or technicians. APICS reserved the right to request a statement of the total support available for the project from all sources and a general statement on the intended distribution of expenditures. Recipients were required to provide the co-ordinator with a report on what was accomplished on the completion of the awarded project.

Awards were given under the following circumstances:

1. when the professor of one university had a need for the use of major equipment, a facility, or a library holding available at another institution in the region, and when transportation to and accommodation at that university to use such equipment, facility, or library holding obviated the necessity to purchase a duplicate resource;

2. the joint pursuit of a research project by members of more than one institution. The research hopefully would result in a publication with joint authorship and involve the facilities of both institutions in a unique manner;

3. the provision of the infrastructure of research by a group of scientists co-operating on a major project. Support might assume the form of transportation and accommodation to meetings and the visit of expert external assessors and other joint costs such as those for publication and technical assistance.

The first expenditures under the program were made in 1964 and amounted to $2,300, with individual claims being modest, from $200 to $500 each. By 1967, expenditures had grown to $7,150 and thereafter gradually declined as emphasis was placed on other programs, the grants being relegated to ad hoc support on merit of unique projects.

The second initiative, the visiting lecturers' program, was one of the seven specifics listed by the Deans' Committee and endorsed by the Co-ordinating Committee. It had the objectives of providing for the exchange of the special knowledge of scientists in member organizations and the fostering of communication between institutions. The program was an immediate and continuing success and involved relatively modest amounts of money. Support was limited to transportation costs and out-of-pocket expenses with the host institution providing accommodation. The program was managed by the sub-committees who were responsible for selecting the visiting lecturers, arranging the schedule and applying to the Central Committee and Executive for fiscal support. In practice, the Executive allocated an annual budget for the program and as long as the proposed schedules were within the guidelines as judged by the co-ordinator, and the total of expenditures within the allotted budget, approval was automatic. Priority was given to visiting lecturers from institutions in the Atlantic region lecturing at more than one institution (which became the standard practice). Support for transportation costs of lecturers originating outside the region was available only for travel costs incurred within the region. Initially, not more than one visitor per department per university in the Atlantic provinces per academic year was supported, but later as funds permitted more than one lecture

tour was supported. When UWI became a member of APICS, approval by the Central Committee was required for a scientist at a member organization to obtain transportation assistance to lecture at one of the campuses of UWI, because of the cost. In 1963, the total expenditure in support of the Visiting Lecture Program was $523, gradually increasing to $,1215 by 1970. Thereafter, support for visiting lecturers became a standard budget item for each sub-committee, by 1987 ranging from between $1,200 to $1,800 per committee (sub-committee).

The Central Committee was desirous of fostering lecture tours by prominent scientists from other countries. They established a committee on visiting scientists to arrange tours and obtain external funding for travel expenses and honoraria from such sources as NRC, the North Atlantic Treaty Organization, the Commonwealth University Interchange Scheme, the Royal Society (London) and the Nuffield Foundation. The committee of three, Dr. A.G. McInnes of ARL, Dr. W.B. Stallworthy of Mount Allison, and Dr. R.J. Kavanagh of UNB functioned for three years, but in the fall of 1966 recommended that it be disbanded as most of the successful lecture tours were arranged through discussions between members of the sponsoring sub-committees, the sponsoring agency and the selected touring scientist. The committee suggested procedures that would provide effective liaison between the co-ordinator, the sub-committees, the sponsoring agency and the lecturer. Unfortunately, without the stimulus of a devoted committee, the number of external visiting lecturers gradually declined and became an opportunistic activity.

Although begun in 1963 as an experimental trial with four awards totalling $3,225.00, the Summer Student Research Scholarship Program was officially adopted in 1964 following enthusiastic reports from the participants. The program was established to enable students attending a member university to do research at another member institution during the summer months, a rule that was strictly adhered to despite repeated requests to allow recipients to remain at their own institution. Not only was the program seen as a means of broadening the students background and encouraging the student to take up science as a career, but also as a means of providing support for research that was desperately needed and of fostering communication and co-operative activities between institutions.

In late September, the co-ordinator mailed announcements of the scholarship competition to deans of science, the heads of government agencies that were members of APICS and to the chairmen of sub-committees. Scientists in member organizations were invited to submit a title and brief outline of a research project that under their supervision could be pursued by a university student during the summer months. About 100 to 200 projects were submitted annually. These were compiled by the co-ordinator into a list that was distributed along with student application forms to member organizations about the middle of November. Students were invited to apply by the first of February. Applications had to include their academic record including their marks at midterm, an indication as to what projects they wished to work on, and a request for two supervising professors to provide the co-ordinator with a confidential letter of appraisal. The number of applicants ranged from 30 to 100.

Initially the selection of summer scholars was made at the annual meeting of the Co-ordinating Committee, usually held during the latter half of February, but after 1971 on a recommendation of the Executive of APICS, the sub-committee chairmen delegated the task to an elected committee of three. Recipients of the scholarships were informed by letter early in

March. Successful applicants were asked to provide the co-ordinator, on completion of their summer scholarship, with a brief statement of what they had accomplished and an assessment of the impact on their career. The reports were distributed through a newsletter to members of APICS and were positive, rarely containing critical comments.

8. The number of awards granted each year was dependent on financial resources available, ranging from 12 to 20. Between 1963 and 1970, a total of 70 students at a cost of $70,000 benefited. Of 30 recipients during the period 1964-1966, 21 continued on to graduate studies and the summer's work of 18 was published in scientific journals. Initially, the stipend was $200 a month for undergraduate students and $250 a month for graduate students plus costs of travel to and from the host institution. There were persistent requests from the sub-committees to increase both the number of awards and the stipend including suggestions that the host institution provide accommodation or that the host scientist or institution be permitted to augment the stipend. In 1971, Dr. J.J. MacDonald, then chairman of APICS, endeavoured to obtain funds to support the program from the Federal Opportunities for Youth Program, but was refused, as program support was limited to new initiatives only. However, between 1971 and 1973, the Water Resources Sub-Committee of APICS was able to employ students at Saint Mary's under the Federal Opportunities for Youth Program to prepare an inventory of water resources research in the Atlantic region. After initially demurring to suggestions about seeking augmentation of the student's stipends by host institutions, the Executive and Central Committees made enquiries about the possibility and received a favourable response from member organizations. In 1973, the monthly APICS stipend was set at $300 for undergraduates, $350 for graduate students, with $50 of the amount coming from the research grant of the host scientist or the host institution. One government laboratory raised the amount by $150 to bring the student's stipend in line with that being received by other students in the laboratory under a career-oriented summer program. In 1975, the monthly stipend for students was set at $400 for undergraduates and $425 for graduates with $75 coming from the host.

The value of bringing undergraduates into research activities early in their career was demonstrated by the success of the Summer Student Research Scholarship Program in persuading students to proceed to graduate studies and undertake a career in science. NRC and other government research laboratories established formal competitions that annually selected students to work in their laboratories during the summer months as casual employees. The number awarded dramatically increased during the seventies. In 1972, the National Science Foundation of the United States, recognizing the value of encouraging students to participate in research, established a program explicitly for support of undergraduate participation. In Canada, during 1978-1983, the federal government departments took advantage of the Youth Job Corp Program of the Canada Immigration and Employment Centre to supplement their own resources for employing students in the conduct of co-operative research and development projects with universities and industry. One of these managed by ARL involved co-operation between the Department of Energy, Mines and Resources, the Ecology Laboratory of DFO/BIO, Acadia and Dalhousie and enabled an intensification of the work done by APICS' Fundy Environmental Studies Committee. At the height of that project, 57 students worked at the four co-operating institutions on the Fundy project. Students were allowed to use data obtained for their bachelor's thesis and several successfully completed graduate studies for a Master of Science degree.

Prior to 1976-1977, the activities of APICS were supported by per capita grants from the Maritime provinces and by a grant from Memorial. The change in financial support of APICS from provincial grants to membership fees in 1976-77 resulted in fewer funds available to support the Summer Student Research Scholarships. The co-operating institutions were asked to assume a larger portion of the stipend. By 1978-79 the number of awards had declined to ten and questions were raised about the relative value of a program that was of benefit to few students. With the establishment of undergraduate summer student scholarships by NSERC in 1977-78, APICS decided to terminate the program in 1980 and devote funds to other projects.

Second science education and research planning seminar (1964)

The second Science Education and Research Planning Seminar was held at NSTC on May 20 to May 22, 1964. The program for May 20-21, designated as a polytechnical seminar, consisted of concurrent technical sessions organized by the sub-committees and was attended by about 200 scientists, a few students and interested members of the public. Fifteen technical papers on a variety of subjects were presented by members of the Biology Sub-committee while the chemists held a symposium on electrochemistry with Dr. G.J. Hills of the University of Southampton, England, as keynote speaker. The engineers held a symposium on fluid mechanics, including a discussion on problems in molecular flow and power generation by magnetohydrodynamics. The physicists held a session of contributed papers from scientists and students throughout the Atlantic provinces. Unfortunately, because of commitments of field work, the geologists were unable to participate.

The principal speaker for the science planning session on May 22 was Dr. B.G. Ballard, President of NRC. Other speakers included Dr. J.M.R. Beveridge, Dean of Graduate Studies at Queen's University and President-elect of Acadia; Dr. J.H. Cragg, President of Mount Allison; Dr. G.W. Holbrook, President of NSTC; Dr. L.W. Shemilt, Chairman of the New Brunswick Research and Productivity Council and Head of the Chemical Engineering Department of UNB; Dr. R.J. Kavanagh of the Electrical Engineering Department at UNB; Dr. W.A. Bridgeo of the Nova Scotia Research Foundation; Dr. J.J. MacDonald, Dean of Science at STFX; Dr. A.C. Neish, Director of ARL/NRC; President H.D. Hicks of Dalhousie; Dr. J.A. McCarter, Head of the Biochemistry Department and Dr. E.W. Guptill, Head of the Physics Department of Dalhousie; and Dr. H.J. Somers, Executive Director of the Association of Atlantic Universities (AAU). Premier Stanfield attended the seminar and the dinner for participants in the evening. The addresses presented at the general seminar and the activities of APICS were reported in the Chronicle Herald as major items of news. The proceedings were published.

Central committee activities (1964)

Following the seminar, Dr. D. Jamieson of the ARL resigned as co-ordinator and Dr. W.E. Jones, Department of Chemistry, Dalhousie, was appointed to the position.

In 1964, as part of its promotion of science in the region, APICS provided financial support for the commencement of a new quarterly journal entitled "Marine Sediments" with Dr. J. Stanley of the Institute of Oceanography at Dalhousie as editor.

The federal government reactivated the Scientific Secretariat of the Privy Council in 1964 and appointed Dr. Frank Forward as director at a time when NRC was expressing a concern that many university graduates in science were not being absorbed by industry, but rather were being lost to the country. A concern was also expressed that Canada was largely relying on immigrants from Europe for technically trained workers. The Economic Council of Canada in its First Annual Review (December 1964) emphasized that the economic future of Canada depended in large measure on success in creating and maintaining an adequate supply of professional, technical, managerial and other highly skilled manpower. The report stated that though Canada added one worker to her civilian labour force for every six added in the United States, Canada's universities produced only one bachelor's degree for every 20 in the United States and only one doctoral degree for every 33 in the United States. The council stated that the most critical situation was at the postgraduate level where the number of advance degrees being awarded was too small to provide sufficient qualified people to meet the needs of universities, government and industry for research and development. The Scientific Secretariat was established to serve as an advisory body to cabinet on the overall expenditure of federal funds in support of scientific research in industry, government and universities.

Dr. Trost wrote to Dr. Forward, emphasizing the urgent need to improve graduate schools in the Maritime provinces, and became involved in discussions with the secretariat on the development of a national policy. The Scientific Secretariat consulted members of the Central Committee of APICS and members of the newly formed AAU consisting of university presidents. APICS began to be seen in Ottawa as the region's spokesman for science, and was accepted by the AAU as its science arm. Unfortunately for Canada, Frank Forward died suddenly just as the work of the Privy Council was being organized, and a successor was not immediately appointed.

Establishment of rotation of executive members (1964)

In the fall of 1964, a proposal was made to the Central Committee that there be a rotation of members on the Executive Committee. The Central Committee concurred and decided that the five members should be distributed in such a manner that each of the provinces participating in APICS would be represented; that from the five, a chairman, a secretary and treasurer would be selected; that each appointed member would serve for a period of three years with one possible reappointment; and that tenure would begin and end on July 1st of the appropriate year. In order to arrange for the appropriate rotation of members, the following initial schedule was adopted:

Member	Year Appointed	Termination Date
Rev. W.A. Stewar	1962	July 1, 1965
Dr. W.R. Trost (Chairman)	1962	July 1, 1966
Dr. W.S.H. Crawford	1963	July 1, 1966
Dr. L.H. Shemilt	1963	July 1, 1967
Rev. Dr. C. Cheverie (Secretary-Treasurer)	1963	July 1, 1968

The initial schedule of rotation was subsequently modified with appointments being for two years, renewable by the Central Committee.

In accordance with the decision on rotation of executive members, Dr. Trost resigned as chairman of APICS in July, 1966. As an expression of appreciation to Dr. Trost for his leadership and energy in initiating and developing APICS, he was named Honourary Chairman. Shortly after, Dr. Trost left Dalhousie to become academic vice-president of the University of Calgary. Dr. E.C. Smith and Dr. W. Crawford also resigned as members of the Executive Committee. The Reverend Paul N. Bourque, Dr. J.J. MacDonald and Dr. Bernard S. Sheehan were appointed. Dr. L. Shemilt was elected chairman.

The first series of financial crises (1963-1971)

In 1963, NRC confirmed a previous warning that its third grant of $15,000 to APICS would be the last. Total expenditures in the founding year, 1962, were $1,862. In 1963 total expenditures were $10,222 with $2,342 being the cost of the First Science and Education Research Planning Seminar. In 1964, expenditures were $23,959 with $3,577 for the second seminar, $699 for research exchange fellowships for professors, $5,420 for research equipment and $9,868 for summer student research scholarships. This left a carryover into 1965 of $8,957.

Dr. Trost began a search for funds and found an ally in Premier Stanfield of Nova Scotia who had expressed a concern about the relatively low level of research and development in Nova Scotia. Dr. Trost met with Premier Stanfield on June 12, 1964 and presented him with a copy of the initial proposal to NRC, the annual progress reports, extracts from the report of the University Grants Committee on Higher Education in Nova Scotia for 1964, and a copy of the policies, procedures and financial statements of APICS. Nova Scotia agreed to support APICS

with a grant of $15,000 per annum for three years beginning in 1965. Premier Stanfield took a personal interest in the activities of APICS and remitted the annual grant from his office under his signature. The grant was equal to $0.02 per capita. Premier Stanfield hoped the other Maritime provinces would provide an amount on a similar basis and urged that they do so.

Dr. Les Shemilt of the New Brunswick Research and Productivity Council approached the Premier of New Brunswick and was successful in obtaining a grant of $10,000, slightly less than $0.02 per capita. The Rev. Dr. J.C. Cheverie of St. Dunstan's University and Mr. Lawson Drake of the Prince of Wales College met with Dr. George Dewar, Minister of Education for Prince Edward Island and secured his support for a grant to APICS. Subsequently, Premier Shaw of Prince Edward Island authorized a payment of $1,000, equal to $0.01 per capita. In 1966, New Brunswick increased its annual grant to $12,000 and in 1967 Prince Edward Island increased its grant to $2,000.

Despite the support from the provinces, the increased number of sub-committees placed a strain on finances that was exacerbated by receipt of the grant from Nova Scotia late in the year. Dr. Shemilt, on succeeding Dr. Trost as chairman, appealed to NRC for additional financial aid and secured a grant of $2,500 in support of the 4th Planning Seminar held in May, 1968 and a grant of $10,000 to assist in meeting the cost of activities and program. NRC made a second award of $10,000 in 1969. The money was not to be used for the scholarship program.

At the Executive meeting on April 3, 1970, at UPEI, the finances of APICS and its program came under close scrutiny. As expenditures were out of synchrony with grants, APICS was frequently in a deficit position, making commitments before money was received. Thought was given to changing the fiscal year-end from June 30 to December 31 or to March 31 to better coincide with provincial budgets and to develop one-year-ahead financing. Travel expenses were becoming large and the co-ordinator was asked to strictly apply guidelines of the lesser of economy air fare or mileage by automobile. A review of past and present activities catalyzed a discussion on the future role and programs of APICS. Suggestions raised for consideration by the sub-committees included the termination of some programs and discussions on:

1. Is it desirable or possible to shift budget emphasis so as to provide funds for policy formation and development of regional priorities?

2. Does distribution of funds among present programs reflect a balance appropriate for current conditions?

3. Should the Summer Student Research Scholarships be abandoned?

The Central Committee did not respond enthusiastically to the suggestions but did terminate the Inter-university Research Grants Program that provided travel assistance to professors to work during the summer at another institution, with the understanding that proposals of outstanding merit would receive consideration and support. Members believed most scientists could recoup such expenses from their operating grants. The 1968-69 Annual Directory of Scientists in the region containing a list of scientists, postdoctorate fellows and graduate students as well as a list of major equipment, was out of date, as usual, as soon as compilation and

publication occurred. As the cost was increasing rapidly, the Central Committee decided to discontinue annual publication and possibly publish every fifth year if outside financing could be obtained. Outside financing was not obtained.

In 1971, the Province of Nova Scotia agreed to a request from APICS for a grant equal to $0.03 per capita and increased its annual grant to $22,500, but the other two provinces did not raise their grants. Indeed, Prince Edward Island, under economic restraint, did not make a grant in 1973 and in 1974. The Central Committee, at the meeting on April 28-29, 1972, decided to limit funding travel expenses of university representatives to committee meetings to two meetings a year plus a restriction to one day's meals and accommodation. Constraints on the finances of APICS resulted in smaller grants being awarded and occasionally denial of funds in support of the work of the sub-committees. The sub-committees asked that guidelines and criteria on which to base their requests be established, including what support would be acceptable for underwriting costs of student travel to student conferences. Accordingly, the manual of procedures was revised and APICS adopted an application form for conference and seminar grants devised by Dr. Kavanagh.

Psychology sub-committee - new members - newsletter (1965)

At a meeting of the heads of the departments of psychology at Acadia on February 27, 1965, a formal submission to APICS was prepared for establishment of a sub-committee on experimental psychology. Members of the Central Committee questioned the definition of psychology as a science, but after further representations by psychologists, welcomed them as a sub-committee.

The Fisheries Research Station at St Andrews, N.B., the Experimental Farm at Charlottetown, P.E.I., and the Forest Research Laboratory in Fredericton N.B. became members of APICS. The addition of new members emphasized the need for improved communication. APICS began to distribute a newsletter in 1965. Initially the newsletter was mimeographed and issued bimonthly, but over the years it developed into a printed publication issued quarterly. The newsletter covered all aspects of Central Committee and sub-committee activities, the list of projects available for selection by students applying for summer scholarships, advertisements of vacant positions, brief biographies and outlines of research being conducted by scientists in the region, announcements of special lecture series and various items of interest such as speaker tours and honours.

Activities to raise high school standards (1965-1980)

Dr. Stallworthy, Chairman of the Biology Sub-committee, presented to the Co-ordinating Committee on April 3, 1965, a review undertaken by members of the sub-committee on the status of high school curricula and teacher qualifications for biology in the Maritimes. Dr. B. Newbold reported on a similar survey of curricula for chemistry made by the Chemistry Sub-committee. Similar studies were known to be proceeding in Saskatchewan with respect to the implementation of the "Chem Study" courses set up by the National Science Foundation of the

United States. There was general dismay that in Maritime public schools, many biology and chemistry teachers had little or no training in science. Though specialist licenses were issued to those with qualifications to teach designated subjects such as physical education, home economics and french, there were no specialist designations for those teaching science nor were those designated as specialists entitled to recognition by higher salary.

The Biology Sub-committee recommended a proposal that the departments of education establish high school specialist designations in the sciences. Dr. Trost suggested that the sub-committees broaden the scope of the study and in co-operation with the departments of education in each province, prepare recommendations for consideration by the Central Committee. The recommendations could then be submitted by APICS to the university presidents through the AAU and to governments. The study became a major project involving all sub-committees with the recommendations of the Biology Sub-committee forming the basis of submissions to the AAU and the departments of education. APICS' Central Committee appointed an Advisory Committee to establish minimum requirements of a B.Sc. for high school science teachers. Though the departments of education were sympathetic to the proposals, the school boards, who did the hiring, were reluctant to act. Specialist designations for science teachers did not occur.

The improvement of science teaching in the public school system, however, remained a continuing effort by the sub-committees of APICS. During the late sixties and the seventies, they persisted in expressing their concerns to the Central Committee and to the departments of education, and to work on the development of core curricula. Their persistence and the gradual acceptance by the departments of education of the need for change resulted in a steady improvement in the quality of science teaching and teacher qualifications. Four sub-committees (biology, chemistry, geology and physics) held discussions with the departments of education and universities regarding the further development of summer programs for training science teachers and for achieving university degrees. The efforts had limited success because of a low response from teachers. A positive step was the change in emphasis by the provinces on the basis for upgrading licenses and salaries of teachers from successful completion of courses to one based on university degrees and specialty expertise obtained.

Representations were also made during the seventies and early eighties by the sub-committees to the Central Committee and the provincial governments for the inclusion of marine science in the curriculum and to bolster post-secondary education in agriculture. The sub-committee on biology campaigned for the establishment of the Nova Scotia Agricultural College (NSAC) as a degree granting institution. The lack of instruction in marine science in the high schools was eventually corrected by the preparation of a teaching manual by Mr. Truman Layton, Science Advisor in the Nova Scotia Department of Education, working with members of the sub-committee on biology. The sub-committee on physics developed a core curriculum for physics that was adopted by the New Brunswick Department of Education. Members of the Chemistry Committee assisted in the introduction of the Chem Study Course and selection of improved texts for high schools.

The third science education and research planning seminar (1966)

In 1965, Dr. L.W. Shemilt prepared a comprehensive outline for the third seminar having the theme "Science Planning for the Seventies". Dr. W.E. Jones, co-ordinator for APICS, began the compilation of data for a study paper entitled "APICS Review and Forecast of the Cost of Research and Graduate Studies in the Natural Sciences and Engineering Universities of the Atlantic Provinces". This document, along with data gathered by the NRC Forecasting Committee from a survey of universities in Canada, the submission of the Canadian Association of Graduate Schools and that of the AAU to the Bladen Commission on Education and Research, served as resource material for the seminar.

In 1966, Dr. Jones asked to be relieved of his duties by April 1st as he would be leaving on sabbatical in May. Dr. R.W. Frei was appointed co-ordinator and he with Dr. Orest Cochkanoff, Chairman of the Seminar Committee, completed the background documents and made the detailed arrangements. At the suggestion of Dr. G. Retallack of the Defence Research Establishment (Atlantic), Dr. Frei, with the secretary, Miss F.M. Burke, gathered data on the future demand for university graduates by the Federal Research Laboratories in the Atlantic provinces. The Third Science Planning Seminar was held at the Université de Moncton on May 27, 1966. Dr. Cochkanoff presented a review of the resource data for the Atlantic region and that for Canada. The sub-committees then spent the remainder of the day preparing their critiques and responses.

The sub-committees were particularly concerned with existing heavy teaching loads, the lack of time for research, the inadequacy of physical space, equipment and funds available. The projections presented by Dr. Cochkanoff were considered to be below what was required. The vigorous discussion concluded with resolutions that the resource documents and proceedings be published in full, the proceedings be transmitted to interested bodies and APICS establish a policy of conducting a critical annual appraisal of the costs of research and of financial and manpower needs. Following the seminar, APICS compiled and published a list of major equipment (cost over $5,000) in universities and government laboratories in the Maritimes. An annual appraisal of research costs and manpower needs was beyond the capability of APICS.

Contractual arrangement with the association of Atlantic universities and employment of a co-ordinator (1967)

During 1963-64, when the universities in the Atlantic region were holding discussions that led to the formation of the AAU and adoption of a constitution, members of the Executive Committee of APICS maintained a liaison with the organizing participants. In 1964, APICS formally applied to be named as the committee on the sciences for the AAU. The Executive Committee proposed that the APICS office be incorporated into the AAU office, including provision of space for a co-ordinator and files, provision of services for disbursement and accounting of funds, and the continuity of APICS. However, APICS would retain its operational autonomy and co-operative activities with non-university research laboratories.

The AAU accepted the proposal, but it was not until September 1, 1967 that arrangements were completed. Dr. Frei was unable to continue as co-ordinator after January, 1967 and APICS was without a co-ordinator until Mr. W.L. Barteaux was appointed on September 1. In the memorandum of agreement between the AAU and APICS, Mr. Barteaux was assigned space in the office of the AAU. He was to provide as a first demand on his time, services to APICS under the direction of the chairman and Executive Committee on behalf of the Central Committee. As time permitted, he was to provide services for the AAU as prescribed by the executive director. APICS undertook to pay half of Mr. Barteaux's salary for 1967 with the AAU beginning in 1968 to pay the full salary. APICS was responsible for paying Mr. Barteaux's travel expenses, all office supplies and printing expenses incurred by APICS. As APICS was not a corporate body, the receipt of grants, dispersal of funds and the accounting function remained at the business office of Dalhousie.

The agreement between the AAU and APICS was renewed for 1972-1975 wherein the AAU continued to provide accommodation and services for the co-ordinator's office while APICS contributed per year $1,200 for salaries, $1,000 for office supplies and $500 for equipment.

Memorial University (1967-1970)

In 1967, Memorial and UWI became members of the AAU and were invited to join APICS. Memorial hesitated because of distance, travel costs, and lack of provincial government support. Though Memorial and APICS made repeated presentations to the Newfoundland government for a grant, the requests were denied as the financial position of the province was precarious. Dr. L. Harris of Memorial attended meetings of the Executive and Central Committees. The president of Memorial, Lord Taylor, and the vice-president, Dr. M.O. Morgan were delighted that members of the university began participating in some of the sub-committees though embarrassed that they were unsuccessful in obtaining provincial support for APICS. They undertook to pay all travel costs of staff to sub-committee and Central Committee meetings. In 1970, Dr. Morgan, despite financial and political difficulties, was able to arrange the university's budget so that an annual payment of $3,000 could be made to APICS. On June 19, 1970, the Executive of APICS met at Memorial in response to an invitation from Lord Taylor, President and Chancellor.

University of West Indies (1967-1976)

On becoming a member of the AAU, UWI (the Jamaica, Trinidad and Barbados campuses) was anxious to join APICS. Discussion on what form this should take occurred at the sub-committee level as well as between members of the Central Committee. During March, 1967, Dr. George Holbrook, President of NSTC and Dr. L.W. Shemilt, Chairman of APICS, visited the three campuses of UWI and were impressed by what was being done with scarce resources. Following these visits in which considerable interest in the APICS program was expressed, Dean K.S. Julien of the Faculty of Engineering attended the APICS Central Committee meeting in April. At this meeting, participation of UWI in APICS' programs was approved in principle. In October, 1967, Professor L.J. Haynes, Dean of the Faculty of Natural Science, UWI, attended a meeting of the Central Committee, and UWI officially became a member. Travel costs were a

major impediment, but the Executive of APICS agreed that subject to financial considerations, two summer scholarships for study in member institutions would be awarded annually to students of UWI.

In 1968, two students from UWI (Jamaica) carried out research in physics and biology at Dalhousie and one student from MSVU worked in chemistry at UWI at Jamaica. A constant problem in the relationship was money as UWI was not able to financially contribute to travel costs.

Dr. Shemilt applied to the awards division of the Association of Universities and Colleges of Canada (AUCC) for assistance in meeting travel costs of students to and from Jamaica. The awards division was administering the commonwealth scholarships, the fellowships supported by the Canadian International Development Agency (CIDA) and private programs supported by industry. In 1969, the division was administering 58 individual award programs, 26 at the undergraduate level, 32 at the level of graduate, postdoctorate, or other forms of advanced study. Dr. Shemilt also applied to M.F. Strong, Director General, External Aid Office, for assistance. Though complimenting APICS on the exchange program, they did not offer financial assistance.

When Dr. J.J. MacDonald succeeded Dr. Shemilt as chairman of APICS, he followed up on Dr. Shemilt's requests for assistance in furthering student exchanges with UWI. He proposed that CIDA share equally with APICS the costs ($4,450 each) for four summer scholarships. But again, though sympathetic, CIDA did not provide funds. In 1969, two Maritime students held a summer scholarship in Jamaica while two students from Trinidad came to Canada. By late 1970, the Central Committee realized that APICS would not have funds to support one student from the West Indies in 1971. CIDA declined support as they already provided a substantial number of scholarships for West Indian students at Canadian universities and wished to apply their limited funds to projects that would have a direct impact on development in the West Indies. However, they left the door open for possible reconsideration in the future. APICS had to go it alone. In 1971, APICS funded one student of UWI to work during the summer in the Maritimes.

In January, 1972, the Executive of the AAU held a meeting at UWI. Dr. Henry Hicks, Chairman, and Dr. Donald C. Duffie, Vice-chairman, presented a review of the Atlantic universities and of possibilities that might exist for a two-way exchange. Dr. Marshall of UWI led the discussion which was followed by members of the delegation visiting those parts of the campuses related to their interests. The staff of UWI were anxious to establish exchanges and co-operative research programs but needed outside sources of funds. Dr. John Read and Mr. Barteaux represented APICS and as a consequence of Dr. Read's report to the Executive and Central Committees, APICS committed $350 to support one student from the West Indies to attend the marine biology course of the Huntsman Marine Laboratory and in addition committed funds to support two students at Atlantic universities.

In August of 1972, Dr. Seaforth, Head of Chemistry at the Trinidad campus and Dr. Meek of the Chemistry Department at Barbados met with Dr. Bridgeo, Chairman of APICS, and with those supervising students from the West Indies. These included Dr. John Read and his student Mr. Maxwell; Dr. Grossert of the Chemistry Department at Dalhousie; Dr. Mitchell, professor of astronomy at Saint Mary's and his student, Mr. Ashby; the co-ordinator, Mr. Bateaux who was

retiring to Jamaica; Mr. Caryi, the co-ordinator designate; and Mr. Doherty of the AAU. The meeting was arranged as a follow-up on recommendations arising from the visit to the Caribbean by the executive of the AAU. The desire to increase the number of student exchanges was unanimous, especially in the areas of fisheries, marine biology and geology where there were common interests.

Dr. Meek outlined the study leave policy for professors at UWI. Three months study leave were granted once every three years, but the stipend was insufficient to cover living expenses in Canada and additional support was required. In Canada some support might come from the operating grant of a Canadian host professor, but in return all UWI could offer was laboratory space and facilities for a Canadian scientist. Delegates from the Caribbean suggested that as some Atlantic university professors vacationed in the West Indies, they could be encouraged to take a few days more and present lectures. Indeed, a few professors from the Atlantic region did do that and were given a couple of hundred dollars from APICS towards travel or living costs. A consensus during the discussion was that in addition to finances, lack of communication was a problem as the staff of UWI had little knowledge of what research was underway in Atlantic universities. Despite all the good will and intentions, little could be done. Inflation had increased the cost of bringing students to the Atlantic region to over $4,000 a year. No awards were made in 1974. Subsequent events during 1974-76 that resulted in changes in structure and funding of APICS brought to an end the dialogue. UWI ceased to be a member of APICS.

Committee on television (1964-1973)

On a recommendation from the Biology Sub-committee in 1964, the co-ordinator distributed a questionnaire on the use of teaching films in the Maritimes and the need for a central system of distribution. Sixty percent of those replying believed that APICS should not have a major role, although compilation of what was available and from whom would be useful. The matter lay in abeyance for a year when the Biology Sub-committee again submitted a proposal at a meeting of the Co-ordinating Committee for development of a closed-circuit television system for instruction in the Maritimes. The two-page brief, supported by members of the Co-ordinating Committee, envisaged a system that would include specialty lectures as well as course instruction. The Executive of APICS consulted with members of the AAU who responded favourably, suggesting that APICS establish a special Committee on Television to determine the feasibility of an inter-university television network for teaching. The Executive referred the proposal to a committee of three, Professor David Arnold, Professor Robert J. Collier and Dr. Bernard S. Sheehan. Their preliminary report based on consultation with the universities about compatibility of equipment and possible development of closed-circuit systems on university campuses was presented to the Central Committee in April 1966. In response, the Central Committee empowered the three members to add to their numbers as they saw fit, to examine the feasibility of a closed-circuit television system and the co-operative distribution of videotapes and films. The committee added the Rev. M.J. Belair as secretary. Their subsequent report was accepted by the Central Committee at the meeting on April 7, 1967. They recommended that a study of university television should first focus on individual university closed systems rather than a microwave network of inter-university systems. They suggested that the AAU engage a consultant to review the actions of other provinces regarding audiovisual instruction, legal

matters and items of technical, financial and equipment compatibility required for an inter-university network. The AAU agreed to consider engaging a consultant.

Following the departure of Dr. Sheenan from the Maritimes to the University of Calgary in 1967, Mr. Charles McGuire assumed the chairmanship and in 1969 he was succeeded by Professor D. Arnold of Mount Allison. During 1968-69 the committee compiled a catalogue of all television facilities available in the Atlantic area with an outline of the use made of such facilities for education.

In 1969, Dr. I. Beattie of UNB, on behalf of the Television Committee, presented to the AAU a comprehensive report on equipment resources available in the region and urged the acquisition of compatible equipment and the establishment of a service office for television information. The concept was followed up by Professor Starcher of Memorial, who as a consultant to the AAU, submitted a report in 1970 based on a survey of the colleges and universities in the Atlantic provinces. He recommended a co-ordinating body modeled after that of the Ontario Universities Television Council. Only Dalhousie and Memorial were heavily involved in educational television while UNB, Université de Moncton, and Mount Allison were in the process of establishing programs. Professor Starcher's model included the establishment of an Atlantic Regional Council on new learning media to evaluate programs in existence, provide co-ordination, and develop compatible facilities.

The universities, however, proceeded to develop their systems independently while the Committee on Television continued to provide a communication link. In 1971, Mr. W.A. Young, Chairman, reported to APICS and the AAU that the Committee on Television was endeavouring to act as a clearing house for information on what materials were available, what was being done and suggesting solutions for problems. There were problems with copyrights and distribution of programs. The effort to develop a comprehensive catalog required funding. The co-operation of university libraries and computer centres was sought to place the catalog on an on-line retrieval system. Mr. Young worked with Mr. Bernard Trotter of Queen's University on preparation of a brief to the presidents of universities in Ontario. Closed circuit television systems were presented as being cheaper and as effective as hiring more staff where student numbers were increasing. In Toronto, the Information Retrieval Television Service (IRTV) allowed a teacher to request a program for specific classes. Ontario established Channel 19 for this purpose. Memorial developed a system of instruction by television for Newfoundland schools that subsequently was viewed as the most effective usage of educational television in Canada, delivering educational programs to remote communities. The Memorial system was developed into an audio teleconferencing system in the late 1970's which allowed a multimedia education system to encompass not only education, but the health care field, government and the private sector.

With the development of relatively inexpensive video systems, cassette tapes and portable television sets, educational television was becoming less expensive and more compatible to smaller universities and high schools. No action was taken by the AAU to develop a central and unified educational television system in the Maritimes. The task was left to the departments of education. The detailed information gathered on the activities and equipment available in the region, the information provided by the Province of New Brunswick's Audio Visual Media Study

Committee, the list of available films and videotapes prepared in 1971-1972 by the chairman, Miss Mary Cutler of UNB, was maintained in the co-ordinator's office and occasionally published as an addition to the newsletter. The committee ceased to meet and was formally dissolved in 1973.

Committee on computers (1966)

At the request of the AAU, in 1966, APICS established a special committee that subsequently became the Computer Science Sub-committee. The committee was asked to examine the feasibility of a central computer facility for the Atlantic region. The committee's report based on consultations with universities was accepted by the Central Committee of APICS and forwarded to the AAU. The committee believed, because of high costs and urgent needs, that centralized time-sharing computer facilities would best meet requirements of the universities at least cost. The committee commended UNB for its work in improving computer facilities in the Fredericton area and recommended that Dalhousie, in consultation with NSTC and Saint Mary's take the lead and install a computer facility for the Halifax area with time-share access and adequate staff. Dalhousie proceeded to do this, establishing a computer centre in its new library building that provided services to some of the universities and research laboratories in the Halifax-Dartmouth area.

Though a single central time-share facility for the Maritimes was not developed, linkages were forged such as that between STFX and UNB. The government of Newfoundland and Labrador established an independently managed centre to meet the needs of the provincial government and Memorial. At the instigation of the members of APICS, the special committee on computers became a continuing sub-committee on computer science devoted to science and teaching, while the AAU established its own working group on hardware, services and linkages between institutions.

Graduate program guidelines (1967)

Following a discussion of the Central Committee on the report of the Ontario Council on Graduate Studies in May 1967, the committee appointed Dr. Guy MacLean, Dean of Graduate Studies at Dalhousie; Dr. Roy Foran, Director of Graduate Studies at NSTC; Dr. L.W. Shemilt, Chairman of APICS; and Dr. J.J. MacDonald of STFX as an ad hoc committee to study and draft guidelines for the development of graduate programs in the Atlantic region. Dr. J.B. MacDonald, Director of the Science Secretariat Survey on Research in Universities spoke to the Central Committee on the broad purpose and objectives of government support for research and education, and policies being adopted. The ad hoc committee of four recommended that APICS ensure co-operation and co-ordination among universities in the field of graduate studies in order to develop excellence and economize resources. They requested that administrative officers responsible for graduate degree programs in science and engineering explore means of establishing a common minimal procedure for introduction of new graduate programs, e.g. a common process of internal appraisal and approval including external scrutiny by the AAU so as to improve efficiency. The report was submitted to the AAU.

Sub-committee on marine sciences (1967)

A sub-committee on marine sciences was established on September 1, 1967, but seldom met and its work was later carried on by the Biology Sub-committee.

The fourth science and education planning seminar (1968)

The fourth seminar was held on May 27-28, 1968 at UNB under the chairmanship of Dr. Gordon Retallack of the Naval Research Establishment. The subject was "Industry -University - Government: Partners in Science and Technology", with about two hundred people attending. The opening panel discussion had about an equal representation of speakers from universities, industries and governments. Each discussed the three sectors as scientific and technological components of society from the aspect of the needs of each and their interactions. This was followed by working groups that concurrently examined specific problems in more detail. The working groups then reported to the full meeting and after a vigorous discussion, Dr. L.W. Schemilt presented a summary of the main observations. Dr. W. Schneider, President of NRC, was the guest speaker at the evening dinner. He outlined programs being developed by NRC to foster closer liaison and co-operative activities between the three sectors. Dr. Schneider stated that the rapid growth of grants in aid of research and financial support for universities, currently increasing at a rate of 30% per year, could not be sustained because of pressures from competitive demands on the federal treasury. Universities were warned to anticipate in their planning a levelling off of financial support from NRC.

Water resources (1969)

In the late sixties a national concern for the environment took on special significance with respect to preservation and usage of Canada's water resources. The Department of Energy, Mines and Resources, through the National Advisory Committee for Water Resources Research (NACWRR), sponsored a Water Resources Research Colloquium at UNB on March 6-7, 1969. The colloquium was organized by APICS; over seventy participants representing university, government and industry participated in discussions on water resources, uses, protection and research in the Atlantic region. The concluding panel explored the question, "How do we develop an interdisciplinary research program on water resources"? This prompted APICS to form an interdisciplinary sub-committee on water resources with responsibilities for maintaining communication with the NACWRR. The sub-committee was charged with being conversant with water problems and priorities in the Atlantic provinces; screening operational research grants upon request; taking the initiative in planning regional and local seminars; selecting and scheduling visiting lecturers; and developing requests for financial support of projects in accordance with needs and interdisciplinary resources available.

The sub-committee met several times a year, organized a series of seminars and guest lectures, and prepared a compendium of water resource research in the Atlantic region. In 1970,

the Department of Energy, Mines and Resources asked APICS to act as the adjudicating body of requests for grants from individuals in the Atlantic region and to prepare a submission for a co-ordinated program of research on water resources for the region. The sub-committee endeavoured to prepare an acceptable submission for federal funding of an interdisciplinary regional research program on water resources, and was assisted by a grant from the NACWRR, but to no avail. There were several difficulties. The APICS proposals were developed at a time when reorganization of several federal government departments was occurring, with a shift in responsibilities for water resource research to the newly created Department of Environment. The reorganization resulted in changing policies and presented APICS with a moving target. The tight deadlines for submissions and the possibility of big money caused groups in Nova Scotia and New Brunswick universities to separately submit proposals for a federally supported water resources research institute. The two proposals had to be melded into one. An additional problem was that APICS, not being a corporate body, could not directly receive and administer funds in a secondary contractual manner. Indeed, the latter was why NRC provided its initial support to APICS via Dalhousie and later as a grant under its program of support for societies. The sub-committee terminated the effort to establish a program on water resources research and broadened its mandate to become the Natural Resources Sub-committee.

Brief on Maritime Union (1969)

During the winter of 1968-1969, the three Maritime provinces commissioned a study on the merits and implications of Maritime economic union. In the spring of 1969, Dr. Shemilt accepted a position at the Faculty of Engineering of McMaster University and resigned as chairman. The task of preparing and submitting a brief on behalf of APICS became the responsibility of the incoming chairman, Dr. J.J. MacDonald of STFX.

The brief was submitted in June 1969. APICS was portrayed as an organization that had a unifying impact and would serve well any form of economic union. Dr. MacDonald wrote that APICS had been successful in developing a high degree of co-operative research between institutions and improvements in education in the Maritime region. Although APICS had no authority other than rational argument and moral persuasion among peers, it had succeeded in developing a regional focus and through its programs reduced duplication of effort. The process had invariably suffered lapses resulting in some missed opportunities, misunderstandings and occasionally some irritations; nevertheless, APICS had accomplished much by fostering communication and co-ordination of effort through the work of its sub-committees and the support of member organizations.

Several specific co-operative activities (including access to special expensive instruments) between universities and government laboratories in the region were cited. The successful and highly regarded four science planning seminars that explored pertinent concerns of the scientific, university and industrial communities were outlined. The document described the benefits of the program of visiting lecturers between institutions within the region and special visits by outstanding scientists from external institutions that acquainted scientists and students with scientific developments occurring within and outside the region. The co-sponsorship with the Canadian Mathematical Congress of the summer school in higher mathematics had permitted a

broadening and strengthening of mathematics teaching in the region. The summer student scholarships had a demonstrated impact on students deciding to develop careers in science. Since the inception of the program in 1964, over 70 students at a cost of over $70,000 had benefitted. Of the 30 recipients during the period 1964 to 1966, 21 continued on to graduate work in science and 18 had published the results of their summer's research. In 1969, sixteen awards were made from 50 applicants who had over 200 projects from which to make a selection. The brief included the work of the special committee on television (directed at fostering co-operative use of television facilities,

video tapes and films for education) and on computers (directed at an analysis of regional needs, costs and sharing of facilities). Dr. MacDonald illustrated how APICS was being recognized as the representative body for science in the Atlantic region. For example, APICS was consulted as to available regional support and potential use of major research installations such as an aquatron at Dalhousie, for providing information for a science review of Canada, for developing a regional approach to water resources research and for assistance in expanding marine science research. NRC had called upon APICS for assistance in developing its new program of strategic grants, in promoting new developments of regional significance and in identifying current deficiencies. The comprehensive brief submitted by Dr. J.J. MacDonald was well received.

Royal Canadian Institute (1969-1973)

Dr. Michael Burt of the Department of Biology at UNB, applied for a grant in 1968 to support a summer science program for high school students at the university. The program was initiated by the Royal Canadian Institute. In 1969, APICS agreed to a grant of $1,000 which enabled students in the program to visit BIO, ARL/NRC and Dalhousie. The response from the students was enthusiastic and the grant was renewed for the following year. In 1971, the Royal Canadian Institute transferred operation of the summer school to the Youth Science Foundation (YSF) and APICS continued its support until 1973 when YSF was in a position to carry on without support from APICS, which was only a regional organization and one with financial difficulties.

New members: NSAC - NSTC - NSCAD - application from Huntsman (1969)

NSAC joined APICS in 1969, the Nova Scotia Teachers College and the Nova Scotia College of Arts and Design (NSCAD) in 1970.

Dr. John Anderson, Director of the Department of Fisheries Biological Station and Treasurer of the Huntsman Marine Laboratory, presented an outline of the laboratory to the Central Committee, suggesting membership and requesting support. The Huntsman Marine Laboratory at St. Andrews, New Brunswick, was founded in September 1969 as a consortium of universities in Eastern Canada and individuals interested in the development of marine science. The

laboratory was financed by member universities, fees and grants. The twenty-acre site adjacent to the Fisheries Biological Station at St. Andrews had undergone development with establishment of a residence and laboratories. The facility was to enable students from universities in Ontario, Manitoba, Quebec and the four Atlantic provinces to study practical aspects of marine science and to conduct research. A discussion as to possible membership in APICS followed Dr. Anderson's presentation without a decision being made on membership. However, APICS supported the Huntsman Laboratory by providing in 1971, 1972 and 1973, assistance in the form of $200 grants (up to a total maximum of $2,600) to selected undergraduate students from the Atlantic region to attend a one-month summer course at Huntsman on marine biology given by Dr. Wiles of Saint Mary's. In 1971, 25 students took the course of whom eight were from the Atlantic region. In 1974, a terminal grant of $500 was given. APICS also provided support for student conferences organized by the Chemistry and Biology Sub-committees that were held at Huntsman.

Animal care sub-committee (1970)

The Central Committee approved the establishment of an Animal Care Sub-committee in January, 1970. The sub-committee, as its first task, surveyed university teaching and research facilities in universities with respect to personnel training and animal housing. The information was the basis of a brief on procurement, care and use of laboratory animals in Atlantic Canada presented at the Fifth Planning Seminar held in 1970.

The senate hearings on science and the fifth science and education planning seminar (1970)

Senator Lamontagne, in November 1967, proposed that the Senate form a committee to hold hearings on the administration and support of science in Canada. Industry, universities, scientific societies and individuals were invited to submit briefs and attend hearings. The submissions and hearings formed the basis for three publications on administration and support of science in Canada that were published in 1972-73. APICS did not submit a brief, but provided information and assistance to the universities and the AAU in the preparation of their submissions.

Science policy and support for research and development in the Atlantic region was the theme for the Fifth Science Education and Research Planning Seminar. The "MacDonald Report" on support of universities and briefs from the sub-committees served as background documents. The seminar was held under the chairmanship of Dr. Marshall Laird of Memorial at Truro on May 19 and 20, 1970. The topic was "Science Policy - The Research Dollar: Regional Aspects of a National Problem". The keynote speaker was the Honourable C.N. Drury, Minister of Industry who was the cabinet member responsible for science and the NRC. Senator Allister Grossart, a member of Lamontagne's Senate Committee, participated. Dr. J.J. Macdonald, Chairman of APICS, obtained a grant of $1,500 from the NRC to help pay for publication of the proceedings. The proceedings were submitted to the Senate Committee by APICS in place of a brief.

Following the 5th Planning Session, Dr. Richard Tarn submitted a critique of the exercise by the four major disciplinary groups in laying the groundwork for the seminar. The four groups were asked to prepare statements of research needs stressing regional research priorities and highlighting interdisciplinary and interinstitutional approaches. In reviewing the work of the Life Sciences Group of which he was a member, he stated it was a failure. The group did not identify regional requirements in the life sciences, did not consider the characteristics of a regionally oriented plan for the life sciences, nor recognize that the future would be different from the present. Rather, the participants were concerned about their own research projects with little recognition of practical implications, regional relevance or resource management. The result was not a forward looking submission, but a list of the areas of interest of individual participants. The criticism was valid and a reflection of the tendency of university scientists to perpetuate lines of work begun during graduate studies rather than taking cognizance of the environment in which they live and developing research programs that bear on regional problems or opportunities.

One question raised at the conference was whether or not the Atlantic region received an adequate portion of research and development funds. Data was not available on the support requested by scientists and institutions in the region, the amount granted and whether it was just and fair in relation to total Canadian dispositions. The question of whether APICS should set aside money to do this was deferred until the Science Council of Canada (SCC) made a decision as to whether it would conduct a national assessment.

From the statistics available from the NRC the general disposition of federal support appeared to be as follows:

	Population %	Operating Grants Received (69-70) %	Systems Support University R&D %
Atlantic Region	9.9	8.0	7.5
Quebec	28.9	17.6	19.1
Ontario	34.8	42.4	43.4
Prairies	16.9	20.1	18.4
B.C.	9.3	11.9	11.6

Dr. J.J. MacDonald wrote to Dr. P.D. McTaggart-Cowan, Executive Director of the SCC, on February 2, 1971, reviewing the discussion between APICS and the AAU about gathering data to determine the support the Atlantic region obtained for research and development relative to other regions. Dr. McTaggart-Cowan replied that though there was no national survey of the kind APICS envisioned, there was quite a bit of data around which could be examined such as that in Special Study No. 7 by the SCC "The Role of the Federal Government in Support of Research in Canadian Universities", and the "Directory of Scientific Research and Development Establishments in Canada" prepared by the Department of Industry Trade and Commerce. The latter contained information on the type of research performed. Dr. McTaggart-Cowan enclosed copies along with a copy of a recently developed questionnaire used by the federal government

to survey research and development efforts at the federal level and a copy of the Frascati Manual developed by the OECD which gave international comparisons of research and lists of terms used.

Dr. McTaggart-Cowan expressed the opinion that although data on highly qualified manpower resources, the fields of research and development being undertaken and the extent to which funding comes from outside the Atlantic region as opposed to inside the region was worthwhile information, an analysis of the proportion of funds granted to those applying would not be a useful exercise; people play games and comparison of original requests with what is granted after review is part of the game. Nor did he believe that contrasting figures for the Atlantic provinces with national figures would be productive. The SCC's Report No. 5 on university research and the federal government clearly illustrated disparities at the university level and certainly one could assume there was substantial lack of parity at the industrial level. What does such disparity mean?

What Senator Grossart and Dr. McTaggart-Cowan tried to convey to participants at the planning seminar at Truro was that the Atlantic universities needed to take a more aggressive attitude in seeking research and development funds; as a prelude to that, they had to find out what resources in manpower existed, the extent to which they were under-used, and the relevance of on-going research to the development of the Atlantic provinces. Most critically, the universities had to investigate what the Atlantic provinces could do better than anyone else in Canada because of their people, their climate, their geography, their resources (both renewable and non-renewable) and their geographical position internationally. Dr. McTaggart-Cowan enclosed a copy of the SCC's Report No. 10, "Science and the Oceans", as an example which outlined an area where the Atlantic provinces should lead the rest of Canada. He mentioned the problem of farmland being abandoned to bush and why it was unusable or uneconomic; he also referred to the problem of pollution for which the region did have the manpower and talents to tackle, especially monitoring and taking steps to force a correction of the biggest international sewer in Canada, the St. Lawrence River. Dr. McTaggart-Cowan viewed a statistical comparison of support for Atlantic versus the rest of Canada as "being a defensive rather than an aggressive use of resources and capabilities. There are more worthwhile and different things to do in the Atlantic region than trying to ape McGill and Toronto".

Survey of research resources (1971)

The Central Committee of APICS and the AAU decided to proceed with a survey to enumerate the research resources available, the manpower, the internal and external financial support that existed in the region, and to obtain suggestions on topics for long range planning. APICS set aside $5,000 to fund the project and the AAU assigned Mr. R. Doherty to the task.

Mr. Doherty was a graduate of STFX and did post-graduate work on communications at Boston University. He was employed by the AAU as a research associate and in addition to other responsibilities was active in promoting public relations for the AAU and APICS. A steering committee comprising Dr. J.J. Macdonald, Dr. C.F.O. Langstroth, Dr. E.J. Blanchard and the co-ordinator, W.L. Barteaux, was established to develop a plan for the survey and preparation

of the report. They met in Ottawa on April 26-28 with Dr. A. Boyd of the SCC and Mr. Oscar Levine of NRC, who had offered to help devise a questionnaire. They prepared one questionnaire for universities, another for industry and government laboratories. The research survey was restricted to the life and physical sciences including agriculture, home economics and psychology, but excluded medicine and nursing. Mr. Doherty undertook to meet with the university presidents, heads of government laboratories and selected industries and solicit their assistance.

The research survey began in the fall of 1971 and by February of 1972, Mr. Doherty had held discussions with all but three universities, with 70 department heads and seven government laboratories. The federal Bonneau-Corry Commission on an examination of Canadian manpower resources and research funds was interested in the program and desired confidential access to the results. They believed the APICS survey might serve as a national model.

Though Mr. Doherty was well received during interviews, completion of the questionnaires was spotty. When the sub-committee members were asked to help, they reacted with dismay, "Not another survey"! A special effort by the co-ordinator had to be made to convince members that previous studies had not touched all bases at one time and that information from previous studies was out of date. Unfortunately, there was also some duplication as Oscar Levine, independently and without informing APICS, began a survey for NRC by means of a separate questionnaire on support of graduate students. The slow feedback from the sub-committees and universities, and concerns about confidentiality, hampered the compilation of statistics. Only 40% of the non-university laboratories responded. By April 1973, the data had been compiled and a committee consisting of Dr. Bridgeo, Mr. Doherty, Dr. W. Ford, Dr. R.J. Kavanagh and Dr. J.J. MacDonald, made revisions and recommended that copies on a confidential basis be sent to the SCC, the Ministry of State for Science and Technology and NRC, as well as to university presidents and members of the Central Committee.

One statistic cited from the report was that for each dollar received from external sources in support of research by the universities, the universities expended $0.92 in salaries, $0.16 in direct support and $0.61 in overhead, totalling $1.69. The statistics were not used as a base upon which aggressive action for support and development of regional projects could be taken. There was no follow-up along the lines recommended by Dr. McTaggart- Cowan.

It was unfortunate that the comments of Dr. McTaggart-Cowan were not widely distributed and discussed at the sub-committee level. The exercise revealed the lack of strategic thinking, the lack of thought about research applied to regional needs, and the strong parochial interests of members of the Central Committee and the sub-committees. The exercise revealed the difficulties in developing co-operation in research and graduate studies that was the initial and fundamental aim of APICS. In the polls made to obtain suggestions for long term regional planning conducted by the co-ordinator and the chairmen of the sub-committees during 1971-1972, the topic "interdisciplinary or multidisciplinary programs related to the needs of the Atlantic region" ranked at or near the bottom of a list of over 20 suggested topics; the prime nominations for action were concerns about the local adequacy of facilities for research and teaching, the supply of jobs for graduates, the quality of high school instruction and university entrance requirements. The problem then and now - with few exceptions - is the dominance of

parochial interests and emphasis on the nonce. What changes have occurred in the university community usually have been forced by outside pressures.

The first effort at public relations (1970)

Mr. Doherty's efforts on behalf of APICS to make it better known to the public were more successful, though of fleeting duration. APICS' Executive and Central Committees applauded Mr. Doherty's efforts and activities, but provided no financial support. He prepared a colourful and simple brochure - the first - for general distribution that outlined the organization and activities of APICS. He recommended that APICS undertake a public relations effort "to create an awareness of APICS and it's sub-committees in the mind of the public, to engender an awareness of the work of APICS in the minds of government and influential organizations, to foster an impression of APICS' community-mindedness as well as it's academic interests". He was enthusiastic about the opportunity APICS had for providing a public forum for scientists to elaborate on topics of interest to the layman, to convince government of the valuable scientific brain resources that existed as technical (but not political) aids in decision making in the Atlantic region. Mr. Doherty worked closely with the public relations officers of the universities and was instrumental in having articles appear in local newspapers and on local radio about various activities of APICS. He had to expend a large effort to get such information past editors who didn't consider items on science as newsworthy and then only if the event or item was a local activity. Fortunately, this negative attitude of the media to science underwent a gradual change with the development of television programs devoted to nature and science, and growing public concerns about health and the environment. The sixties, seventies and eighties exhibited an almost total lack of concern by the media about the development of technology in Canada and its importance to Canada's economy.

Commission on rationalization of university research (1971)

In 1971, the federal government established a Commission on the Rationalization of University Research. Hearings were held in Halifax on September 16 and 17 for views on various aspects and problems in university research. Visits to individual institutions were made during October. APICS submitted the data available from the research survey and on January 4, 1972, together with the AAU, presented a brief.

The brief of the AAU to the commission emphasized that it was founded in 1964 as a voluntary association of 16 universities and colleges in the four Atlantic provinces and UWI as a means of improving communication and furthering co-operative activities. APICS, as the research arm of the AAU, was one of several associated organizations such as the Association of Atlantic University Business Officers and the Committee of Academic Vice-Presidents. By definition, the AAU was committed to the principal of rationalization through co-operation between institutions to make the best of limited resources. APICS, comprised of government and university researchers, was concerned mainly with the natural sciences and had built a base of co-operation and communication in various disciplines that could serve as a model to meet the needs of other regions. Government's support of research was spread over a number of agencies

and if the government desired a rationalization of research, then government needed to rationalize its support mechanisms. The AAU recommended that the government identify a number of Canadian or regional problems of high priority for which it would provide funding and recommended APICS as an effective consultant and manager. The message given by McTaggart-Cowan that members of the AAU and APICS should identify regional priorities and campaign for financial support had not, evidently, registered.

The APICS brief stressed that by definition APICS was committed to the principle of rationalization presuming that this term implied co-operation among institutions to make the best use of limited resources. One difficulty encountered was that institutions in the Atlantic region differed in size, history, and development; another was that distances, though shorter than between universities in other parts of Canada, presented appreciable problems in communication and the sharing of resources. True, APICS had not been dramatically successful in efforts at rationalization and in establishing a regional focus for research; still, it had established a base of co-operation and communication in various disciplines, thereby reducing duplication within the region.

The brief stated that APICS saw rationalization of research occurring through co-operative activities, close consultation and co-operation with federal and provincial governments and the granting agencies, a role for which APICS was well designed. Having low research budgets in respect to other areas, the institutions in the region would be able to mount an incrementally larger effort with an increase in funding. The brief outlined the programs of APICS directed at interinstitutional co-operation and stated that it would be a retrograde step if rationalization of research were to be taken as a means of concentrating research in just a few centres in Canada. The cutting off of funds to smaller institutions would result in the downgrading of their role in advancing the standard of education and their role in the development and advancement of the Canadian economy.

The commissions' report became part of the information base for discussions on federal-provincial agreements for support of education.

The Science Award (1972)

During the 1960's, the Chemistry Sub-committee made repeated submissions to the Central Committee for the establishment of a young scientist award. Because of continuing financial pressures, the Central Committee demurred, but in 1970 agreed to consider a proposal and asked the chemists to prepare guidelines. The guidelines submitted were modified by the Executive and Central Committees and the Young Scientist Award was established at the Executive meeting on February 25, 1972. The award was to be restricted to those no more than 35 years of age and the research for which the candidate was nominated must have been done in Atlantic Canada. The award initially consisted of an honorarium of $500 and a medal designed by Dr. J.J. MacDonald. The scientist receiving the award would be expected, at APICS' expense, to participate in a lecture tour of the Atlantic region. The adopted procedure required the co-ordinator to advertise the award through the newsletter and other appropriate media and to solicit nominations from heads of departments and research laboratories. Nominations had to be made

in writing and be supported by five scientists in the Atlantic region. The submissions included a description of the candidate's research, a curriculum vitae and a list of publications. The selection panel was to consist of five eminent scientists residing outside the Atlantic region, who were appointed for a three-year term. The secretary of the selection panel was to be either the chairman of APICS or the co-ordinator. Dr. J.J. MacDonald undertook to obtain five judges from a list of recommended people.

Eleven nominations were received in October 1972, and the selection committee met on November 1 in Ottawa with Dr. MacDonald as secretary. The five judges were Dr. J.M. Anderson, Director General, R. & D., Environment Canada (Fisheries); Dr. L. Kerwin, Recteur, Université de Montréal; Dr. D.J. LeRoy, Vice-President, Scientific, NRC; Dr. L.W. Shemilt, Dean of Engineering, McMaster University; and Dr. R.J. Uffen, Dean, Faculty of Applied Sciences, Queen's University. The judges were enthusiastic about the calibre of nominees and recommended some modifications to the guidelines for the award: (1) that the names be allowed to stand for a period of two years; (2) that the majority of the work of the selection committee be done by correspondence and that a meeting should be called only if the two top nominees following the initial balloting could not be agreed upon by correspondence; that sufficient time be allowed for the secretary to write the referees listed in the nomination for references. The recommendations, except that of allowing nominations to stand for two years, were accepted.

Dr. Michael J. Kennedy of the Department of Geology at Memorial was the first recipient, nominated for his work on the geological and structural evolution of the Canadian Appalachian region. The award was presented at a reception and dinner sponsored by Memorial on February 23, 1973, at the Battery Hotel. Memorial University set a precedent followed by each recipient's university for subsequent presentations of the award. In 1977, because of changes in income tax regulations, the title of the award was changed to Young Scientist Prize and the age restriction raised from 35 to 40. In 1979, after discussions with Dr. John Read of Mount Allison, the chairman of APICS, Fraser Inc., a pulp and paper company based mainly in New Brunswick and a subsidiary of Noranda Inc., undertook to support the Young Scientist Award. Thereafter, the award was known as the APICS/Fraser

Medal for outstanding achievement in science and engineering and consisted of $1,000 and a gold medal. The award quickly became nationally recognized as the prestigious science award for scientists working in the Atlantic region mainly because of the additional accomplishments and honours received by recipients. The award has likely done more to improve national recognition of the quality of research done in the Atlantic region than any other single effort by APICS.

Planning seminar on the Bras d'Or Lakes (1975)

In 1972, the Chemistry Sub-committee proposed that APICS sponsor an interdisciplinary planning seminar on the Bras d'Or Lakes. The conference would be a departure from the usual format of the Science Education and Research Planning Seminars, but would focus attention on a regional resource at a time when there was a national concern about water resources. The proposal had the enthusiastic support of the Water Resources Sub-committee. At the meeting of the Executive and Central Committees in February 1973, an interdisciplinary planning

committee was established to develop a detailed proposal. The members were Dr. D. Arseneau, Dr. R.H. March, Dr. J.G. Ogden, Dr. J.J. MacDonald, Dr. C. Cheverie, Mr. R.E. Drinnan, and the Co-ordinator, Mr. J.E. Caryi. Subsequently, Father Ora McManus, Executive Director of the Bras d'Or Institute of the University College of Cape Breton (UCCB), was added to the committee and preparations proceeded as a co-operative venture between the institute and APICS. Mr. Greg MacKay of the institute was appointed Conference Co-ordinator.

The successful seminar was held at UCCB on June 17 to 21, 1975. The registration fee was set at $20. The program began with an address by Roy Drinnan of the Fisheries Research Board, that outlined a proposal for coastal zone management of the Bras d'Or Lakes. This was followed by lectures, discussion sessions and poster presentations. There were 350 participants. Some of the proceedings were taped for television by ATV and there were several reports in the newspapers. The presentations were compiled by Mr. MacKay and published in 1976 as the "Proceedings of the Bras d'Or Lakes Aquaculture Conference" and sold for $10 each by UCCB to recover costs. The proceedings, a comprehensive description of the state of the technology and art of aquaculture, sold well. The conference cost $16,053.00 of which $3,420 came from registration fees, $4,000 from the Cape Breton Development Corporation, $4,000 from the Nova Scotia Department of Fisheries, $1,000 from APICS and $3,633 from UCCB.

Status of APICS IN 1972-73

Dr. MacDonald retired as chairman of APICS on July 1, 1972, but because of the resignation of Dr. Ross of the Université de Moncton, agreed to remain on the Executive for one year. Dr. Bridgeo of Saint Mary's was elected chairman. Mr. Barteaux retired as co-ordinator on September 1, 1972, and Mr. J.E. Caryi (formerly a scientific liaison officer for the army) was appointed on August 1 to succeed him. During the reception and dinner in St. John's in honour of Dr. Kennedy, the first recipient of the Young Scientist Award, Dr. Bridgeo discussed support of APICS with the Honourable Gerald Ottenheimer, Minister of Education for Newfoundland, and was advised to bring a submission forward in the late summer. Dr. Bridgeo did so on August 1, 1973, and Mr. Ottenheimer placed the request for support at the level of $0.03 per capita before Newfoundland's Treasury Board. The Treasury Board maintained its position of not supporting APICS. On July 1, 1973, Dr. Ken Leffek was appointed secretary; Dr. J. Regis Duffy, treasurer; and Dr. H.H.V. Hord, member of the Executive for the term 1973-1976. Membership in APICS totalled 32 institutions, all 14 universities and specialized colleges in the region, 17 federal and provincial government laboratories or research stations and UWI.

Warnings of a change in support for education and research (1972)

In June 1972, the Council of NRC met in Halifax. A joint delegation of APICS and the AAU comprising Dr. Beveridge, Dr. Bridgeo, Mr. Doherty, Mr. Holmes, Dr. Kavanagh, Dr. Langstroth, Dr. MacDonald, and Dr. Ross met with the Council on June 13, expressed appreciation for past support, and after presenting an outline of activities and the special needs of the Atlantic region, solicited further support for research. The delegation was warned by members of Council that

funds available for support of research were reaching a plateau, that additional increments would be unlikely.

The report of the Ontario Commission on Post-Secondary Education and that by the Carnegie Foundation in the United States revealed major changes were occurring in attitudes towards higher education. In the struggle for increased financial support, the university and scientific community realized with alarm that public support was non-existent and they were at a loss as what to do about it. University enrolments were levelling off more rapidly than predicted. The AAU, in response to pressure from the federal and provincial governments, began to develop a three-year plan, particularly in view of the forthcoming federal-provincial agreements on financing of higher education scheduled for 1974. The executive director of the AAU, Mr. Holmes, proposed that the universities develop a number of joint agreements between universities based on academic excellence and the phasing out of marginal programs in one university with corresponding increased support in another. Such would require the development of standard admission forms and the transferability of credits. The sub-committees of APICS had long urged that APICS sponsor a meeting of the registrars and department heads to resolve problems in equivalence of university credits but had been turned down by the Central Committee as a matter too complicated and beyond APICS' jurisdiction. Basically, the status quo was maintained.

Examination of the role and structure of APICS (1973)

Following the Fifth Science Education and Panning Seminar in 1970, concerns about the role of APICS, its effectiveness and direction were voiced by members of the Central Committee. In common with most businesses in the late sixties and early seventies, the scientific community and APICS, despite the formation of umbrella groups of scientific associations, did not know how to effectively go about lobbying. Nor did APICS have the financial resources to obtain the advice and assistance of effective lobbyists such as Executive Consultants Ltd.

In meeting with people while conducting the survey of research resources, R.P. Doherty raised the question of the role of APICS and incorporated some of the opinions in a report to the Central Committee entitled "Present and Future of the Atlantic Provinces Inter-university Committee on the Sciences" (April 28, 1972). He asserted that though the initial primary objective of APICS was the co-ordination of research activities in the Atlantic region, closure of the gap between discussion and active co-ordination of research had not been achieved. Though APICS had provided a means of communication between scientists in a region where contacts were limited by distances, and had through these links fostered some co-operative research and access to expensive instruments as arranged between individuals, co-operative research was a minor activity. Indeed, APICS had terminated travel support for scientists to work during the summer at institutions other than their own. Co-operation and communication in matters affecting teaching and administrative problems had become the central feature. The sub-committees were exerting most of their effort on improving public school curricula and teacher qualifications where they believed they could make a contribution. APICS had provided an organizational base and financial support for conferences and workshops that served its members and contributed to the public's and politician's awareness of science. Such a role, while valuable,

he stated, did not utilize the full potential of people and equipment resources available in the region. He spoke out strongly in favour of APICS co-ordinating scientific research in the Atlantic region.

Like most non-scientists, Doherty did not appreciate that scientists resist co-ordination of their research activities. His document was ignored. However, the members of the sub-committees were interested in the co-ordination and simplification of administrative matters that absorbed precious time and complicated their research, and in improved student quality that would facilitate teaching activities. Research scientists are interested in securing and having access to resources and equipment and in establishing liaisons that will enable them to accomplish their personal objectives. Successful leadership directed at developing co-operative research depends on how the leader can provide a benefit or show how each individual's personal aspirations will be realized.

On becoming chairman of APICS, Dr. W.A. Bridgeo, solicited comments from members of the Central Committee and chairmen of sub-committees on the structure and role of APICS. The startling revelation was that few knew what the original objectives of APICS were nor its accomplishments. Members based comments on their perception of what APICS was doing in relation to their interests and whether or not from that aspect APICS was achieving anything. Some stated the structure of APICS was a basis for inaction; the red tape of a bureaucratic structure, ambiguous and fruitless discussions with the passage of motions or recommendations that ended up on the inactive desk of the originator or passage for approval and action to higher authorities who did nothing. Some believed APICS was a white elephant, wasting people's time and money and should be dissolved. Others believed APICS was fine just as it was, listing benefits derived and emphasizing that accomplishments depended on the quality of the people involved and as volunteers, the time they were willing to devote to getting things done. Dr. K. Leffek stated that programs directed at the exchange of ideas and information at the research level and at encouraging students to take up a career in science had been working well. He suggested APICS should press ahead with efforts to co-ordinate undergraduate summer school classes and undergraduate teaching programs so as to develop a rational scheme of class equivalents for the Atlantic universities and a schedule of transferring credits.

As a follow-up of discussions in the Central Committee, Dr. Leffek solicited opinions from deans and department chairmen in Dalhousie University. The responses were evenly balanced between recommending abolishment of APICS and recommending its continuance. Dr. J. McNulty, Dean, Faculty of Graduate Studies, stated decisions and recommendations made by the sub-committees appeared to have had virtually no effect on either the policies of governments or of participating universities, that formal channels of communication and responsive action by the Central Committee and presidents of universities was required.

Certainly the faults of committees and dependence on individuals for action that afflict volunteer organizations also afflicted APICS. As it had evolved, the structure of APICS acerbated the difficulties in communication between the sub-committees and the Central and Executive Committees. APICS was composed of a Central Committee consisting of one representative (usually a dean from the universities or key administrator of a government agency) from each of the thirty-two members and with an Executive elected by the Central

Committee. The Executive and Central Committees controlled finances, determined policy, prepared briefs and initiated action on items of importance to the scientific community, reviewed and acted positively or negatively on submissions from the sub-committees. The sub-committees, organized mainly on disciplinary lines, consisted of one representative (though sometimes others would participate) from member organizations and worked under the guidance of an elected chairman and secretary who held office for two years. The sub-committees, responsible for carrying out activities of APICS, were dependent on the Executive and Central Committees for financial support, for approval of and action on submissions. Initially, communication between sub-committees occurred at the semi-annual meeting of the Co-ordinating Committee chaired by the co-ordinator. The co-ordinator also attended many meetings of the sub-committees. He was the communication link with the Central Committee. The Co-ordinating Committee ceased to meet after 1971, a change that coincided with reduced attendance by the co-ordinator at sub-committee meetings. Thereafter, communication between the governing and disciplinary committees was by exchange of documents and letters. The position of co-ordinator evolved into more of a secretarial role rather than being a focus of activity and stimulation.

At the meeting of the Central Committee in December 1972, Dr. M. Franklyn of UNB emphasized that APICS must realize its potential in the Atlantic region for developing co-operative research and therefore must set forth some major priorities to guard against a weak and unco-ordinated disposition of resources. The ensuing discussion and recognition of unrest in the sub-committees led to a motion by Dr. Erik Hansen of Acadia and Dr. Ken Leffek of Dalhousie to establish a committee to examine the organization of APICS and its role. Dr. Bridgeo, at the following Executive meeting (February 23, 1973), asked Dr. R. Kavanagh of UNB and Dr. R. Duffy of UPEI to nominate persons to undertake such a study. The following were nominated, agreed to serve and were approved at the next Executive meeting: Dr. Ken T. Leffek, Dalhousie; Dr. William D. Machin, Memorial ; Dr. Brian T. Newbold, Université de Moncton; Dr. Fred J. Simpson, ARL/NRC; Dr. E. Chalmers Smith, Acadia (member of the founding group in 1962).

The terms of reference were:

1. review the aims of APICS;
2. review the accomplishments of APICS to date;
3. review the structure of APICS as a vehicle for realizing the aims;
4. seek a reasonable cross-section of opinions from members and members organizations;
5. recommend changes or modifications in aims, structure, procedures and programs;
6. review the role of non-university institutions in APICS;
7. be aware of the present and future sources of funding and any implications of change on these funds;

8. reaffirm those parts of APICS which the committee believes have served well;

9. make a preliminary report in November 1973.

The Committee on Structure and Role of APICS met at Saint Mary's on September 7, 1973 and selected Dr. K. Leffek as chairman. Each member undertook to solicit opinions from scientists in his institution and related agencies while Mr. Caryi, the co-ordinator, was to obtain opinions from the sub-committees as to:

1. whether an organization of scientists, generally, or an organization of university scientists in the Atlantic region was desired;

2. whether the discipline sub-committees as in the present structure should be retained or changed to a general structure with ad hoc or on-going sub-committees organized with respect to problems.

The response was unanimous in desiring an organization of scientists that included members from government agencies. The majority, especially those in the universities, wanted to retain the disciplinary sub-committees, but those in government whose research was not organized along disciplinary lines favoured the establishment of special interdisciplinary projects and ad hoc committees having specific tasks whenever deemed appropriate. Dr. Leffek so reported at the Executive meeting of APICS on November 16, 1973.

The Committee on Structure and Role met several times during 1974 to review further input from the sub-committees and member organizations. At a meeting on March 1, 1974 at Memorial held prior to the presentation of the second APICS Young Scientist Award to Dr. David Strong, the committee drafted a preliminary set of six objectives. They responded to the strong demand from the sub-committees for direct access to the decision making body of APICS with a tentative structure that retained the discipline committees and incorporated two representatives from each sub-committee into the Central Committee. Dr. Simpson outlined the tentative structure to the Central Committee at the meeting in April 1973. The Central Committee recommended that because a large council would result, representation from the sub-committees should be restricted to one delegate.

Suggestions from the Central Committee and chairmen of sub-committees were reviewed by the Committee on Structure and Role on June 19. A revised draft and interim report was prepared by Dr. Leffek. The draft listed the objectives of APICS, called for retention of the sub-committees as currently organized, abolishment of the Central Committee and replacement with a Council consisting of one representative from each sub-committee, one representative from each category "A" university (those giving degrees in the natural and applied sciences), one person representing each of two colleges of category "B" (those awarding diplomas), and one person representing each group of five government research agencies comprising category "C". Fear of too large a council was the reason for compression of representation from category "B" and "C" institutions. The Executive elected by the Council would consist of a chairman, vice-chairman, treasurer, co-ordinator, and three others to give a regional and disciplinary balance similar to that of the Council. The proposal was presented to members of APICS for review and

suggestions. The keen interest in the proposal by the sub-committees and member organizations was evident from the large number of responses and suggestions for minor changes. Government agencies wanted assurance that APICS would not be seen as acting on behalf of government organizations, but all approved of the objectives and the basic thrust of the proposed structural change.

The draft of the final report of the Committee on Structure and Role as prepared by Dr. Leffek was distributed to members of the ad hoc committee and the Central Committee on November 26, 1974. The report was accepted at the meeting of the Central Committee on January 10, 1975, and the Ad Hoc Committee on Structure and Role dissolved. Further discussion and minor revisions in which the six objectives were condensed to four and minor changes in wording resulted in a document that was accepted in principle by the Executive on May 23, 1975 and adopted by the Central Committee on May 24, 1975.

The second series of financial crises - change in relationship with the AAU (1974-1976)

In 1972, the three Maritime provinces established a Maritime Post-Secondary Education Commission with Dr. W.A. Jenkins, Principal of NSAC at Truro, as Chairman. The commission was asked to examine the funding of universities and colleges in the Maritimes and the rationalization of support. The activities of APICS were funded by annual grants of $22,500 from Nova Scotia, $18,000 from New Brunswick, $2,000 from Prince Edward Island and $3,000 from Memorial. Prince Edward Island declined to make further grants after 1972 and Memorial was unable to make a grant in 1974.

The work of the Maritime Provinces Post-Secondary Education Commission concluded with the establishment of the Maritime Provinces Higher Education Commission (MPHEC) and appointment on April 1, 1974, of Sister Catherine Wallace, President of MSVU, as Chair. The commission was assigned the tasks of carrying out the functions of the former provincial agencies responsible for overseeing higher education, assisting the provinces and institutions attaining more efficient and effective use of resources, and reviewing the allocation of funds to the universities and colleges in the three Maritime provinces. The provinces stated that they would no longer make grants directly to APICS and that future submissions for support should be made to the MPHEC.

The AAU had reservations about continuance of the link of APICS with the AAU. Dr. Chalmers Smith wondered if it might not be better for the AAU to organize its own advisory committees in specific science areas as necessary rather that have a standing committee of APICS. The AAU asked Dr. Anderson, President of UNB, to chair a committee to study the relation of the AAU to APICS. At a meeting on June 20-21, 1974, the AAU passed a motion that APICS should operate as a totally independent body and a motion that as of July 1, 1975, the AAU should cease its financial support both direct and indirect of APICS. The belief was that APICS would benefit from its new relation to the AAU in that as an independent body, it would be eligible for support from other sources, capable of undertaking certain studies for the AAU

and make recommendations on matters pertaining to the work of the AAU where science was involved. Subsequently, the furniture and equipment owned by the AAU, but used by APICS, was donated to APICS and the office space was taken over by Air Canada. Termination of the arrangement with the AAU in 1975 meant loss of support for the co-ordinator's salary, secretarial assistance and office expenses. The operations of the co-ordinator's office was costing about $25,000 annually.

On June 30, 1974, Dr. Bridgeo met with Sister Catherine Wallace in Fredericton, N.B. and again on August 30 to discuss future financing of APICS and was asked to submit a proposal in time for the meeting of the commission on September 23. The submission prepared by Dr. Bridgeo contained a comprehensive outline of the structure and activities of APICS and requested $100,000 ($31,000 for the cost of operating the co-ordinators office and overhead; $30,000 for the Summer Student Scholarship Program; $18,000 for seminars, visiting and exchange lecturers and inter-university research; $9,000 for travel; $2,000 for contingencies; and $10,000 as a one-time contribution to a reserve fund). The MPHEC agreed to recommend a grant of $50,000, but Sister Catherine Wallace cautioned that neither the amount nor the timing was firm and no definite response could be expected before February 1975. The commissioners had grave reservations about funding APICS.

On January 29 and again on February 12, 1975, Dr. Bridgeo wrote to Sister Catherine Wallace explaining the urgent need for funds as time was running out for a decision on the Summer Student Scholarship Program, and that $25,000 was required to proceed. Dr. Bridgeo and Mr. Caryi canvassed other agencies for support, making submissions to Dr. L. Thur, Senior Assistant Secretary, Ministry of State for Science and Technology; Dr. R.J. Pachapelle, Director of the General Education Support Division of the Secretary of State; Mr. P. Mayboom, Director General of Science Procurement of the Department of Supply and Services; and Dr. G. Julien of the University and Grants Division of NRC. Dr. Bridgeo inquired about direct support by individual members of APICS. The federal government members thought that their participation in such an arrangement would be difficult because of regulations. The AAU, though sympathetic and supportive of APICS, decided that it ought not to provide funds as such would have the effect of vitiating a decision reached by the MPHEC, the same body primarily responsible for decisions on support of the universities. Dr. Beveridge, President of the AAU and Acadia, wrote a supporting letter on behalf of APICS to Sister Catherine Wallace.

At a meeting of APICS' Executive on March 14, 1975, the decision was made to cease paying travel expenses after July 1, 1975 for members of the Executive, Central Committee and sub-committees. At the Central Committee meeting on May 23-24, Dr. Bridgeo announced that MPHEC had granted $50,000 for the coming year, but the grant was unlikely to be repeated. NRC made a grant on June 19, 1975 of $12,000 in support of program activities provided that none be used in support of scholarships. Dr. Machin informed Dr. M.O. Morgan, President of Memorial, about the situation and as Memorial had not made its grant of $3,000 in 1974, a grant of $6,000 was made for the two years, 1974-1975. The funds from the grant of $50,000 recommended by the MPHEC trickled in as each Maritime province contributed its share of the assessment. The total amount received for 1974-75 was $70,000, but there was no assurance of continued funding.

Dr. Bridgeo initiated discussion on establishing membership fees at the Executive meeting on June 19. The suggestion was made that university fees could be based on total full-time enrolment resulting in two categories, those over 5,000 students and those under, for example: $4,000 for Dalhousie, Memorial and UNB, $2,000 for all other category "A" members and $1,000 for category "B" and "C" members. On a motion by Dr. Leffek, seconded by Dr. Kavanagh, the Central Committee decided that membership fees be initiated for the 1976-77 year to raise sufficient funds to meet the cost of the secretariat. At that meeting, Dr. E. Chalmers Smith, a founding member of APICS, announced his retirement and was applauded for his contributions and years of steady support.

When Dr. Leffek became chairman in July 1975, he was immediately faced with implementation of the new structure of APICS and a financial crisis. At a joint meeting of the outgoing and incoming Executive held on June 17 in Sydney, Nova Scotia, in conjunction with the Bras d'Or conference, the decision was made that the changeover would occur with a joint meeting of members of the Central Committee and the new Council at the fall meeting. A recommendation made was that the selection of representatives for category "B" and "C" members be based on past attendance of representatives from the institutions and that the chief executive officers of each institution appoint the representative. The joint meeting occurred on November 28-29, 1975. On a motion by Dr. Duffy, the retiring treasurer, seconded by Dr. Sears, the incoming treasurer, the Central Committee was dissolved and the new Council established. NSAC and the Nova Scotia Teachers College were classified as category "B". BIO including the Atlantic Oceanographic Laboratory and the Marine Ecology Laboratory, the Defense Research Establishment (Atlantic), the Department of Environment's Biological Station at St. Andrews and the Fisheries Laboratory at Halifax, the Agricultural Research Stations and ARL/NRC were classified as category "C".

During the fall of 1975, Dr. Leffek wrote to the university presidents and head of each member institution of the APICS announcing the above change in structure and the decision to assess fees to support the APICS secretariat. They were asked to include the fee in their budget for the 1976-77 year. The target was to raise $32,000. He also wrote to Sister Catherine Wallace stating APICS had received a grant of $12,000 from NRC which APICS hoped would be renewed and of the establishment of membership fees to support the secretariat. He stated that the sums would provide only 25% of the required budget and solicited continuing support by MPHEC for the programs of APICS. Dr. Leffek suggested that he and Sister Catherine Wallace meet at the earliest opportunity to discuss continuing

support and several questions: Does APICS offer the right sort of organization to translate the desires of government and the MPHEC for co-operation into real and effective action? If so should APICS be expanded to include the social sciences and humanities, that is, increase the number of organizations served while maintaining secretariat costs? Are the AAU and APICS two overlapping organizations which should be amalgamated or can specific and different roles be seen for each of them?

Dr. Leffek was invited to the meeting of the AAU in October at Moncton and arranged to meet with Sister Catherine Wallace immediately after. Dr. Leffek outlined the proposed fee structure of APICS and asked the presidents to decide individually or collectively whether APICS should continue to receive university support. In addition to seeking funds from other

sources, APICS was asking institutions to provide fees to cover the cost of the secretariat and the MPHEC to provide funds to cover the cost of the program. Dr. Leffek presented a program through which APICS could become a suitable vehicle for translating co-operation into action:

1. a program of exchange lecturers;

2. a unified summer school program that could be enlarged to include the social sciences and humanities;

3. conferences at the level of departmental chairman to sort out the problem of transfer of credits between institutions;

4. development of co-operative graduate degree programs;

6. operation of a summer research scholarship program for undergraduates.

In the discussion that followed, Dr. Anderson of UNB expressed support for the objectives of APICS, but believed some of the programs outlined were not appropriate. He expressed concern that the role government agencies could play was being overlooked, particularly as the main reason for separating APICS from the AAU was that government funds and interactions with scientists in government laboratories would more likely occur in an independent body. Dr. Hicks of Dalhousie had included $4,000 in the budget for the following year, but suggested a full review would be necessary to make a continuing commitment. On a motion by Professor Baker, seconded by Dr. Morgan, the AAU decided that the universities should include in their budgets the proposed fee structure for 1976-77 and that administrative arrangements regarding the secretariat be worked out between AAU officers and APICS before July 1976. Dr. Beveridge personally conveyed to Dr. Leffek that the AAU's response was one of sympathy to the objectives of APICS, but less sympathetic to the five programs outlined. There was a concern that administration costs were out of proportion to the amount of money devoted to programs. Dr. Leffek asked the presidents to individually respond to his letter of August 22 and suggest ways in which the administrative structure and program of APICS might be altered to meet their wishes. Following the meeting, Dr. Leffek met with Sister Catherine Wallace and discussed funding beyond June 1976, without obtaining a commitment.

The total cost of operating the secretariat, including the co-ordinator's salary, office and travel expenses, were believed to be too large in relation to the amount spent on programs and the degree of co-ordination achieved. This was cited by the presidents of the universities and the MPHEC as a stumbling block to obtaining grants. In discussing the problem with the AAU, Dr. Leffek pointed out that administrative costs and performance were not linearly related functions, that there was a certain threshold cost below which one cannot operate and which, with a considerable amount of volunteer labour and free university services, could not be lowered below $10,000. The alternative facing the AAU was whether the universities jointly should pay for the APICS secretariat centralized in a single office or whether each university should accept having each discipline committee freeload its secretarial needs on the university for which the chairman happens to work. APICS believed the central office was superior.

As a possible means of broadening the clientele served by the central secretarial office, Dr. Leffek wrote to the Atlantic Conference of University Teachers of English, the Atlantic Provinces Political Science Association, the Atlantic Association of Historians, the Council of Atlantic Schools of Business, the Atlantic Provinces Health, Physical Education and Recreation Association, and the Atlantic Association of Sociology and Anthropology, stating that because of criticism that the cost of the APICS secretariat was too great in relation to programs, that APICS would like to extend the services to other disciplines outside science. The services would include such items as maintenance of membership roles, typing of and distribution of minutes and reports to members, supplying information about the activities of the organization and of inter-university committees in the disciplines of the sciences, social sciences, humanities etc., via the wide circulation of a newsletter, etc. Only the historians indicated an interest.

Dr. Leffek applied to NRC for a renewal of their grant, to MPHEC for a grant of $37,500 for 1976-77, and to the AAU for a grant of $10,000 for the student scholarship program. In the submission to MPHEC, he solicited support for a new professor exchange program that would allow individual professors to present part of a credit class at the undergraduate level at a university other than his or her own. As an illustration, he used the installation at Dalhousie of a slowpoke reactor and the acquisition of faculty specialists in nuclear chemistry and physics who could lecture at other universities and thereby broaden the impact of the special facility in the Atlantic region and enhance science and pre-engineering programs of the smaller universities. APICS would cover travel and accommodation expenses. The total proposed APICS budget for 1976-77 was $89,860.

When it was announced in 1975 that membership in APICS would be by payment of a fee, Dr. H. Hicks of Dalhousie and Dr. W.S.H. Crawford of Mount Allison, founding members of APICS, were the first presidents to respond with commitments. Dr. Hicks approved a grant of $4,000 for 1976. Dr. E.W.R. Neale, who had moved from being Head of the Department of Geology at Memorial to the University of British Columbia, wrote to Dr. W.D. Machin expressing his shock at the possibility of APICS being phased out. Armed with the letter, Dr. Machin approached President Morgan and Vice-president Leslie Harris of Memorial. They expressed their support for APICS and immediately contributed $4,000.

As there was no response from MPHEC about his submission of December 5, 1975 for financial support, Dr. K. Leffek met with and solicited the assistance of Professor R.J. Baker, President of UPEI and of the AAU. Subsequently, President Baker met with Sister Catherine Wallace and recommended that if the commission was not prepared to respond favourably to the APICS submission, she should get in touch with Dr. Leffek soon.

President Baker, in a letter to Dr. Leffek, said that although he appreciated what APICS was doing and had accomplished, he noted that since the formation of APICS and perhaps because of its example, other methods of communication such as the AAU, the regular meetings of the committees of academic vice-presidents, the deans, and disciplinary groups had multiplied, thus lessening the impact of APICS. He hoped that something might be salvaged and in responding to Dr. Leffek's concern about the survival of the disciplinary committees, requested an account of how frequently they met and what had resulted from their work. On March 12, 1976, APICS was informed that it would receive a grant of $25,000 from MPHEC and that it was a terminal

grant. The grant was not to be used for the student scholarship program. NRC, in expressing its support for APICS, informed Dr. Leffek in April that APICS had been awarded a grant of $5,000, but regretted that it was a once only grant as NRC funds in support of scientific societies were severely limited.

Discussions at the Executive and Council meetings on April 23-24, 1976, centred on the problems of continuing financial support and the future of APICS. As of April, only three universities had responded positively to the proposed fee structure. Dr. Leffek's opinion was that what happened after 1977 was dependent on the response from members of the AAU, that it seemed a shame to discard APICS without careful consideration. In its fifteen-year life, APICS had tackled a wide range of problems from the all embracing science education and research planning seminars to the writing of a high school curriculum in physics. As of April 1976, APICS had cash reserves of $37,645, commitments of $2,615 for Watdoc, $8,050 for the secretariat, $18,000 for student scholarships, $200 for the chemistry core curriculum program, $800 for the Young Scientist Award and $500 for the visiting lecturer program leaving a balance of $7,480. President Baker, who attended the Council meeting, assured members that the program of APICS was academically sound and generally valuable to the community of Atlantic universities. Though the financial position of the universities was poor and the future uncertain, he would recommend that members of the AAU honour the financial commitments, whereupon Dr. Leffek wrote to those universities that had not already made a commitment for 1976.

Fees trickled in during the summer of 1976 from UNB, Acadia, STFX, MSVU, UPEI, NSTC, UCCB and Saint Mary's. Dr. L.R. Comeau, President of Le College Sainte-Anne, found the $1,000 fee beyond the college's ability to pay. Dr. H.F. MacRae of NSAC contributed half the prescribed fee and stated he would attempt to find the remainder. The New Brunswick Research and Productivity Council and the Nova Scotia Research Foundation declined to maintain membership. Dr. D. Scholfield, Chief, Defense Research Establishment, Atlantic, an active member of APICS and a staunch supporter, was informed by his superiors that because of financial restraint and serious financial difficulties within the department, it was not possible to justify the $1,000 fee. The individual stations of the Department of Agriculture found the $1,000 fee too large for their respective budgets and when the suggestion was made to Dr. J.J. Cartier, Assistant Director General (Eastern Division), that one fee cover all stations, he declined because of fiscal restraint. APICS and the Department of Fisheries and Marine Service agreed to one membership fee to cover three former members: the Fisheries Headquarters in Halifax, the Fisheries Laboratory in Halifax and the Biological Station at St. Andrews, N.B. Dr. W.A. Ford, Director General of Ocean and Aquatic Sciences Atlantic at BIO and Dr. F.J. Simpson, Director of ARL/NRC, sought and obtained approval to maintain membership in APICS and pay the required fee.

In applying to the director general of the Geology Science Centre for authorization to pay the prescribed fee, Dr. Loncarevic, Director of the Atlantic Geoscience Centre (AGC) at BIO, reported that when members of the institute's management committee were asked to comment on the value of APICS membership in view of the new fee requirement, they responded that the primary benefits to AGC were the student scholarship program and communication with the universities. Students who had studied at AGC under the APICS programs had been excellent and had made worthwhile contributions through publication and co-authorship of scientific

papers at low cost to the centre. APICS was the only formal link with the universities, a link that provided an important form of communication on research and development programs with the academic community. The payment of the fee was approved.

The sub-committees were asked to review their activities with respect to budget constraints, to establish priorities and consider any other relevant matters that would assist the organization. The decision made in 1975 not to pay travel costs to meetings was reaffirmed. The Executive recommended that requests for student conferences be submitted in time for Council to consider them at the annual fall meeting; this would allow for requests to be reviewed in toto and permit some flexibility in allocating funds rather than imposing rigid guidelines. The biology executive drew up an ad hoc contingency plan to ensure that the Biology Committee would continue to meet should APICS be dissolved.

In response to a request by Dr. Leffek, Mr. Caryi, the co-ordinator, presented in September a proposal to provide part-time services for the secretariat at a cost of $18,000 including $12,000 for salary and provision of all services including financial accounting as before. He estimated the recurring expenses of the office at $2,900. The AAU did an analysis and offered to provide services on a contractual basis for $15,000 for 1977-78. Several alternate suggestions were made including allocation of various functions of the secretariat to sub-committees and member organizations.

The discussion on costs and alternate methods of operating dominated meetings of the Executive and Council at ARL during November 19 and 20, 1976. The concept of decentralizing the secretariat was not supported by sub-committee chairmen who stated they needed a central secretariat. Mr. Caryi provided a detailed description of current secretariat functions and Dr. Sears a list of alternate courses of action. On a motion by Dr. Sears, seconded by Dr. M. Edwards, Council decided to terminate the full time secretariat as of June 30, 1977. Mr. Caryi was paid a severance fee. Because the terminology of the Summer Student Research Scholarships appeared to cause difficulties in getting funds, Dr. Leffek recommended that the name, "APICS Summer Research Assistantships" be used instead. An application from Dr. Davis of the Nova Scotia Museum for membership was referred to the Biology and Geology Committees for comment, had their endorsement, but the fee structure was an obstacle. Dr. Davis, however, continued to participate in the activities of the Biology Sub-committee.

In February 1977, Dr. John F. Read, Dean of Science at Mount Allison, nominated to succeed Dr. Leffek as chairman, submitted a proposal for establishing the office of APICS at the university with a part-time co-ordinator and a secretariat budget estimated at $9,000. The treasurer of APICS was to assume full responsibility for the budget and accounts. As the sub-committees had direct representation on the Central Committee, the chairmen would be responsible for liaison with the Central Committee and the Executive. Dr. Read outlined in detail the secretariat functions and responsibilities for the various programs of APICS. The proposal was accepted at the March meetings of the Executive and Council.

Dr. Sears arranged to have funds surplus to immediate needs deposited in an account at STFX on which interest would be paid at one point below prime, a yield higher than from a bank and an arrangement that proved to be of benefit to STFX and APICS. The anticipated revenue

for 1977-78 was $33,300 of which $18,000 was budgeted for APICS Research Assistantships (Summer Student Scholarships), $6,300 for grants, seminars and awards, and $9,000 for the secretariat.

Agreements on fee structure (1978-1987)

Though the fees received from universities and government laboratories during 1976 provided funds for operations during 1977 and into 1978, assurance of continued fiscal support for APICS remained a problem. In 1977, Dr. Read prepared and submitted a brief to MPHEC requesting financial support of $46,000 a year. The submission, which outlined the activities of APICS for the past 15 years, planned and future proposed activities, and the budget under the new secretariat mode, was also the basis of his report to the AAU in November, 1977. As of April 1, 1978 the fiscal year-end of APICS would be changed from June 31 to March 31, to coincide with that of the universities, MPHEC, and government agencies. Dr. Read's presentation was well received. Following his departure, the AAU recorded in the minutes that "the majority of institutions were in support of APICS, but preferred that requests for funds be directed to the institutions rather than to MPHEC". MPHEC then declined to provide APICS with further financial support. Most members of the AAU indicated their willingness to increase fees by 25% and referred the question to an ad hoc committee (Dr. W.S.H. Crawford, Chairman; Dr. Peter Meincke; Dr. A.M. Sinclair; and Dr. John Keyston, Executive Director (ex-officio) of the AAU).

Dr. Crawford's committee reported to the AAU that the objectives of APICS were in harmony with those of the AAU and did not significantly overlap those of the learned societies; moreover, the activities of APICS had significantly increased communication and co-operative involvement in the region. The recommendation was that as co-operation would be even more important in the future, APICS should be encouraged to continue the pursuit of its objectives, that all members of the AAU each year make a commitment to support APICS on a two-year basis and that a fee schedule 25% higher than the current fees be adopted. In adopting the recommendation on October 23-24, 1978, members of the AAU expressed concerns about the independent status of APICS and the propriety of questions relating to APICS being brought to the AAU for action. In view of the current federal research and development policy and announced cutbacks, the suggestion was that APICS strengthen its role as the scientific advisory body to the AAU. The AAU proposed the following fee formula and that it be reviewed in three years time:

1. all universities except Dalhousie, Memorial and UNB would normally pay a fee equal to 0.025% of their operating income (including endowment income) for the year but one prior to the year for which the fees are due (e.g. the fee for 1978 would be based on 1976-77 income);

2. Dalhousie, Memorial and UNB would each pay a "maximum" fee based on an amount of $5,500 for the 1978-79 year. The actual fee would be calculated by expressing $5,500 as a fraction of the 1976-77 operating income and using this fraction instead of the 0.025% in (1) above (in each case it is substantially less than 0.025%);

3. if requested, exceptions could be negotiated in special cases to meet special circumstances (e.g. St. Thomas because of its small science component, Memorial because of its travel costs).

The federal government laboratories were polled by Dr. Simpson regarding the proposed 25% increase in fees. All agreed. Dr. Read held discussions with the executives of NSCAD and the Nova Scotia Teachers College who declined membership. The consensus of members of the Atlantic Institute of Education was that though there were areas where co-operation would be productive, membership in APICS was not desirable. The Université de Moncton declined membership and it appeared that the student assistantships were one of the stumbling blocks. Largely through the efforts of Dr. LeBlanc, the Université de Moncton rejoined APICS in 1979.

At the November 1978 meeting of Council, an ad hoc committee on fee structure was established to review proposals received from the AAU. The members were Dr. C.C. Bigelow of Saint Mary's, Dr. K.T. Leffek of Dalhousie, Dr. C.R. Mann of Ocean and Aquatic Sciences and Dr. J.F. Read, Chairman. The committee recommended the following fee structure which was adopted at the Council meeting on April 27-28, 1979:

1. that all universities except Dalhousie, Memorial and UNB would normally pay a fee equal to 0.025% of their operating income (including endowment income) for the year but one prior to the year for which the fees are due. The fee for 1980-81 would be based on the 1978-79 income;

2. Dalhousie, Memorial and UNB would each pay a fee based on an amount of $5,500 for the 1978-79 year. The fee for 1980-81 would be based on 1978-79 income and would be calculated by expressing $5,500 as a percentage of the 1976-77 operating income using this percentage instead of 0.025%;

3. the four government laboratories would be charged a membership fee of $1,200 each for 1980-81. This fee would be increased in subsequent years as the average percentage increase in membership fees from universities;

4. new non-university members would be charged according to (3) where their staff complement is greater than 75. Where the staff complement is 75 or less, they would be charged at a rate based on the amount of $750 for 1980-81;

5. if requested, exceptions may be negotiated by the Executive Committee and approved by Council to meet special circumstances, but in any case, the minimum membership fee for all members would be based on the amount of $750 for 1980-81.

On the transfer of the office of APICS from Mount Allison to ARL in 1981, Dr. Simpson, on succeeding Dr. John Read as chairman of APICS, sold the office equipment (except furniture) that had been accumulated over the years. The facilities of ARL/NRC, were made available, including what occasional secretarial services were required by the co-ordinator. Operational expenses were kept to a minimum by the Executive conducting business by periodic

teleconferencing and by mail. Whenever possible, university residences were used for accommodation during the spring and fall Council meetings. The savings in operational costs resulted in annual surpluses of $15,000 to $30,000, that coupled with high interest rates during 1981-84, resulted in the accumulation of $102,000 in a reserve fund. The executive director of the AAU recommended that the surplus be applied to a reduction in university fees, but after discussions with Dr. Simpson about anticipated higher operational costs on transfer of the office out of the ARL, the executive director agreed to support maintenance of the existing level of member contributions. Accordingly, membership fees between 1981 and 1986 were maintained at the level agreed to in 1980 and were not raised until 1987-88.

Re-organization, changes in program (1977-1978)

The transfer of the office of APICS to Mount Allison from the AAU occurred during the summer of 1977 with Dr. John F. Read as chairman, Phyllis J. Frick as co-ordinator and Dr. J.T Sears (STFX), as treasurer. The change in office coincided with the full impact of the new structure of APICS adopted in 1975. There had been a fear that enlarging the Central Committee to include representatives from the sub-committees would make for a large unwieldy governing body, but as it developed the deans of science met separately to conduct their business before the annual meetings of the APICS Executive and Council and not all attended the meetings of the APICS Council. Some federal government agencies delegated representation to staff who happened to be chairmen of sub-committees, depending on them and on the distribution of the minutes of the Executive and Council meetings as a means of communication. In addition to the deans and presidents of the member organizations, copies of the minutes were sent to the executive director of the AAU. Thus, the affairs of APICS gradually developed into being more dependent on the elected Executive and chairmen of the committees.

The Executive met occasionally during the year and routinely during the Friday afternoon before the semi-annual Council meetings. The chairman and co-ordinator became responsible for routine business and follow through of projects; the Executive made decisions on financial matters and reviewed items and new initiatives that would be brought before Council. The routine at the semi-annual Council meetings consisted of reports of actions taken by the Executive, discussions and follow-up on pending matters, discussion of proposals submitted for action, and reports of the activities of the committees. The structure and format worked well and a burst of activity resulted. The newsletter that during the period of financial uncertainty had not been published, was revived in January 1978.

Revision of the constitution - change of name (1978)

During 1978-1980, the Executive undertook to revise the constitution of APICS and operational mode. With the increase in fees by 25% to non-university members in 1978, restrictions to membership on the Council were eliminated (the "A", "B" and "C" categories were abolished). An invitation was sent to all members of APICS to appoint a representative. In harmony with the active role played by government scientists and research laboratories and the effort to obtain support and participation of industrial firms, the Central Committee changed the

name from "Atlantic Provinces Inter-university Committee on the Sciences" to "Atlantic Provinces Council on the Sciences", but with retention of the acronym, APICS. Council elected the Executive consisting of a chairman, vice-chairman, treasurer and three members-at-large who held office for two years, renewable, having a geographical distribution as before. The members-at-large were to be elected for variable terms so as to maintain a rotation. The final revised constitution was published in the 1979-81 Bi-annual Report.

Revised guidelines for the Young Scientist Award (APICS/Fraser Medal) were set in 1978. A revised handbook of structure and procedures was distributed in the spring of 1979. In 1979, Dr. Liengme, Registrar at STFX, who succeeded Dr. Sears as treasurer, established an operational account separate from the savings or reserve account with STFX for easier management of cash flow. Discussions included furthering the objectives of APICS by promoting communication and co-operation among scientists in the region. A proposal adopted was to establish associate memberships for those organizations who could not pay the membership fee, but whose staff would be invited to participate in areas of activity related to their interests. Associate members would not pay a fee, could not vote, but could name a representative to attend Council meetings as an observer and would receive the APICS newsletter. Also adopted was the concept of a one-year trial membership having a fee of $100.

Termination of summer student research scholarships (1980)

In 1973, APICS had cut the number of summer student research scholarships from a proposed 22 to 12 at a cost of $18,500, and in 1974, 15 were awarded plus two to the UWI at a total cost of $22,000. Twelve out of 236 student applicants were awarded scholarships in 1975 at a total cost of $18,000. In 1977, there had been 14 awards at a cost of $20,000 with the stipend set at $450 per month with APICS supplying $350 and the host institution $100. The awards were restricted to undergraduates. The program was reaffirmed for 1978. Ten awards at a total cost of $18,000 were made from 35 applications.

At the November 1977 meeting of Council, there was considerable discussion about the merit of the research assistantships (summer student research scholarships) in relation to other uses of funds. Responding to suggestions that the money for research assistantships, which represented about half the APICS budget, be used for more general purposes, the Executive appointed Dr. Merrill Edwards and Dr. LeBlanc to conduct a review. They canvassed members of APICS and the scientific community, reporting at the April 1980 meeting of Council that no respondents were happy with the program in its present form; moreover NSERC was now offering summer student assistantships. Dr. D.H. Davies and Dr. Edwards moved that funds presently used to support the APICS assistantships be put to use where the most students would benefit from dollars spent. The APICS research assistantship program for students was thereby abolished. Members recommended that APICS approach NSERC to allot additional funds for assistantships in the Atlantic region. As Dr. Kavanagh was a member of NSERC, the request was forwarded through him.

First science education seminar (1980)

At the first meetings of the Executive and Council in November 1977, under the chairmanship of Dr. John Read, an ad hoc committee to organize a science education seminar as proposed by the committees was appointed with Dr. Roscoe as chairman. Members included Dr. B.T. Hargrave (biology), Dr. Alex Whitla (chemistry), Dr. J.H. Mathews and Professor S. Smith (physics), Dr. Jim Clarke (psychology), Dr. David Hope Simpson (geology), and the co-ordinator (ex-officio) Mrs. Phyllis Frick. The theme selected was "Challenge for the 80's". The organizing committee later was enlarged by the addition of representatives from the other APICS committees, from selected high schools and departments of education. APICS paid travel costs of committee members to meetings required to effect arrangements, which proved to be more involved and costly than first envisioned. The conference was postponed to August 20-22, 1980. When Phyllis Frick was appointed as director of admissions for Mount Allison during the summer of 1979, Mrs. Sheila Stanley was appointed co-ordinator and became the key organizer, making the detailed arrangements that assured success of the conference.

Immediately preceding the conference, the Canadian Institute of Chemistry held its annual meeting and a one-day seminar on nuclear energy. The chemists then participated in the science education conference. Dr. Peter Meincke, Chairman of the AAU, presented the opening address followed by Dr. David Suzuki. Dr. P. McTaggart-Cowan was the banquet speaker and Mr. S. Lewis, a teacher and politician, the closing speaker. There were two panel discussions, one on nuclear energy led by Dr. Brian Lynch of STFX, the other on increasing science awareness led by Mr. J. Murray, Executive Producer of the CBC program "The Nature of Things". There were twenty-four workshop sessions under the themes of "modelling", "mathematics", "the language of science", and "science and industrial processes". The Ontario Science Centre sent an exhibit. Family outings were arranged that included a visit to Fort Beausejour, a walking tour of Sackville and a field trip, supervised by Dr. Don Gordon, to one of the proposed sites for tidal power in the Cumberland Basin.

The 271 people who attended were about equally divided between high school and university affiliation. Financial support was provided by the departments of education in New Brunswick ($1,000), Nova Scotia ($2,400) and Newfoundland ($2,000); NSERC ($1,505); Mount Allison University Speaker's Fund ($1,500); and Moosehead Breweries ($300). The total cost was $29,418 of which APICS contributed $9,075. Much of the latter was conference planning travel expenses. Following the conference, on October 4, 1980, the Planning Committee met at Queen Elizabeth High School in Halifax, reviewed comments on assessment sheets provided to participants, and made a series of recommendations. The principal recommendations were that similar conferences be held every two or three years and that a sub-committee on high school/university math and science education be established. Council approved the recommendations in principle at the fall meeting on November 21-22, 1980.

Representation of engineering (1962-1980)

The Engineering Sub-committee had not met for several years. Dr. O. Cochkanoff, in reporting at the fall 1977 meeting of the Central Committee on the status of the Engineering Sub-

committee, stated that there was an extensive structure in support of engineering in the Atlantic region, based primarily on professional societies or associations. There was little reason for an APICS committee. On the other hand, he did not want to see representation on APICS of engineering and of the Technical University of Nova Scotia (TUNS) disappear. There was a need for co-operation in putting forward joint proposals. Central Committee members suggested that APICS should be more involved in projects of an interdisciplinary nature involving engineering and projects emphasizing regional concerns.

The decision was to disband the Engineering Sub-committee and to appoint Dr. Roy of TUNS to the Central Committee (Council) as the engineering representative for the period 1978-1980. Though several attempts, notably those of Dr. Kavanagh of UNB, Dr. W. Carson of TUNS, and later in 1985, Dr. P. Heald, Chairman of APICS, were made to re-establish an engineering committee, each failed. Dr. Roy resigned from Council in 1980 and a replacement was not appointed. From time to time, APICS did, however, make special grants in support of student travel to workshops and conferences organized by engineers such as that of the Mount Allison Engineering Society in 1984.

Representations on closure of Fisheries Technology Branch (1978-1979)

In September 1978, the federal Department of Fisheries and Environment announced the closure on March 31, 1979, of technology branches at St. John's, Newfoundland; Halifax, Nova Scotia; Winnipeg, Manitoba; and Vancouver, British Columbia. The announced closures affected four employees at St. John's, 78 at Halifax, four at Winnipeg and 27 in Vancouver. The closure aroused a storm of protest from provincial governments and industry. Citing the nature of the interdisciplinary research and the fifty-year history of internationally recognized accomplishments of the Halifax laboratory, Dr. J. Read, on instructions from Council, wrote a strong letter of protest to the minister, Romeo LeBlanc; Judd Buchanan, Minister of Science and Technology and Public Works; Prime Minister Trudeau; Jean Crétien, Minister of Finance; Robert K. Andras, President of Treasury Board; and John Buchanan, Premier of Nova Scotia. Though acknowledgments were received, there was a period of silence during which Dr. Read mailed follow-up letters. During the period of uncertainty, several employees of the Halifax laboratory obtained employment elsewhere. Late in January 1979, the Department of Fisheries and Environment announced that the Halifax laboratory would not be closed, but there would be a reduction in applied research of primary benefit to secondary industry; in studies on packaging, storage, and utilization of marine oils; on paralytic shellfish poisoning; and on reproductive biochemistry. Twenty-three positions at Halifax were eliminated and the fisheries budget cut by $34.4 million. This was the first time that APICS had undertaken a public position on behalf of the Atlantic scientific community and began a more active role in support of science in Atlantic Canada.

Fundy environmental studies committee (1978-1985)

In October 1978, Dr. F.J. Simpson, acting on a suggestion by Dr. Ford of BIO, submitted a proposal to establish a Fundy studies group which would act within the framework of APICS.

The objective was to provide an umbrella organization and a mechanism for co-ordinating the work of those conducting environmental studies in the Bay of Fundy in relation to proposed tidal power. The nucleus was a group of scientists meeting unofficially to exchange information under the leadership of Dr. Donald Gordon. There was no intention to regulate or interfere with research activities of organizations working in the Bay of Fundy, some not members of APICS, but rather to provide a means for a co-ordinated effort. Council members were concerned that such an interdisciplinary group with members outside of the region such as scientists at Guelph, McMaster and at industrial engineering firms did not fit the APICS mode.

A compromise was reached in the terms of reference such that only representatives of APICS could vote and hold office. The inaugural meeting of the Fundy Environmental Studies Committee was held at Mount Allison on November 24, 1978. Dr. Donald Gordon was elected chairman. This was the first successful interdisciplinary committee of APICS. It conducted a broad range of field studies involving scientists and engineers from universities, government agencies and commercial firms and helped organize international colloquia. Much of the field work in the Bay of Fundy was done by students (during one summer 57 were employed through grants from the Youth Job Corp Program of the Canada Employment and Immigration Commission as managed by Mr. Don Robson of ARL), by university scientists supported by grants and by employees of engineering firms. Finances and facilities provided by the participants were augmented by the Department of Ocean and Aquatic Sciences, Environment Canada and ARL. On completion of the work by 1985, the group ceased to meet.

Efforts to obtain industrial members (1978-1983)

During the period 1978-81, Dr. Read and the co-ordinator met with officers of many regional and national firms to discuss membership in APICS. Mr. Oland of Moosehead Breweries Limited agreed to assist in the science education conference. The Fraser Company Inc. responded by agreeing to underwrite the young scientist award. This established the APICS/Fraser Medal in science in 1978. The award consisted of a medal and $1,000, a sum that was increased to $3,000 in 1985.

The effort to enlarge membership among the federal and provincial research agencies and industry continued during 1981-83. An ad hoc committee on industrial membership was appointed with Dr. David J.W. Piper (Chairman) and Mr. Don Robson as members. Industrial firms in the Atlantic region, though appreciating the work of APICS, did not view membership as being of value to them. At a meeting of industrial representatives at ARL on March 24, 1983, Mr. Smith of Hermes Electronics and Dr. J. Brooke, Industrial Consultant, said that the Marine Applications Council, to which most belonged, served their purposes in a similar manner as would APICS. The ad hoc committee on industrial membership was disbanded.

Media relations (1978-1983)

In the spring of 1979, APICS established an ad hoc committee on reporting to the media with Dr. D.H. Davies (Chairman), Dr. J.G. Ogden and Dr. F.J. Simpson as members. The committee

reported at the fall meeting that it was in favour of APICS trying to obtain support for a science writer and preparing a list of scientists to be made available as resource people for journalists. As the committee was formed on the recommendation of the Natural Resources Committee, members of that committee were asked if they were prepared to have their names on such a list. Twenty were approached and eleven agreed. Several chemists at Mount Allison and Acadia also volunteered. The committee suggested that APICS undertake to prepare and distribute such a list and provide support for the science focus working group. The latter, a group of writers, scientists, public relation officers of universities and government agencies, had been organized by Dr. Simpson with the objective of increasing the reporting of science conducted in the region. The APICS committee on reporting to the media was dissolved in the spring of 1981.

Through efforts of members of the science focus working group, especially Mr. C.E. Murray, Public Relations Officer for BIO, the Halifax Herald appointed Mr. W. (Bill) March in the summer of 1981 as editor of a science and technology page to appear each Monday. The initial page was devoted to the work of APICS, the change of officers and office from Sackville, N.B. to Halifax, N.S. Several committee chairmen met with Mr. March at ARL on November 27, 1980 and provided information about their research and lists of scientists who could be approached for information. Mr. March's enthusiasm and emphasis on local people and their contributions to science in the region made the weekly science and technology page a popular and successful feature. Unfortunately in 1984, the Halifax Herald reassigned Mr. March to other tasks. The science and technology page gradually diminished from a full to a part page, then was abandoned as a feature without public protest. Science reporting in the newspaper was reduced to sporadic articles as before. The experience emphasized that reporting of science in the media and public awareness of developments in science and technology is dependent on sustained interest by those responsible for media content, the editors and reporters. The careful and sustained nurturing of that interest by scientists requires much time and effort that few are willing to undertake.

In 1980, Mr. Jim Lotz, a freelance writer and member of the science focus working group, arranged with the Atlantic Provinces Economic Council (APEC), who were marking their 25th anniversary, to prepare in magazine format a tabloid that would present a comprehensive display of research, developmental and technological capability in the Atlantic region. Dr. J.D. McNiven, Executive Vice-president of APEC, appointed Mr. Lotz as editor; Mr. John O'Day as responsible for advertising; Saga Communications for layout, printing and distribution; and the science focus group responsible for input from members of APICS, the universities and research organizations. The cost was $75,000 with financial support secured by advertisements from industry, the universities, provincial and federal government agencies. The tabloid was underwritten by APEC. The tabloid contained an article on APICS, articles on the work of the Nova Scotia Research Foundation, the New Brunswick Research and Productivity Council, articles on industrial technological successes, such as Hermes' sonars and the Halifax Metal Works' shipboard refrigeration technology, on research and industrial support programs of NRC and provincial governments, on co-operative projects with industry being conducted by BIO, ARL and several universities, and on capabilities of commercial consulting and service firms. The tabloid was distributed in eight newspapers covering the Atlantic region and copies were mailed to businesses and high schools. This major and comprehensive effort to bring to the

public an overall view of the contribution of science and technology to the region's economic welfare has not been repeated.

After the creation by Mr. W. March of the weekly science page in the Halifax Herald and publication of the tabloid, the science focus working group disbanded. Members of APICS, however, continued to work at improving science coverage in other local newspapers. On March 14, 1983, UNB sponsored a luncheon for representatives of the media. Ms. Estelle Dorais, Public Relations Officer for NRC, and Dr. Simpson were guest speakers. Among presentations and discussions related to improving public awareness of science, the role of APICS in co-ordinating research and science education in the Atlantic region was presented. Dr. Simpson was interviewed on the local radio and spoke to graduate students on trends in the supply of scientists and employment opportunities.

Co-operative activities in support of Atlantic science (1979-1982)

Jim Stanley, Executive Director of the Maritime Resource Management Centre, had expressed an interest in co-operating with APICS in matters of mutual concern. Dr. Read took advantage of this interest by inviting him to attend and address the fall meeting of Council in 1979. Dr. Read also invited Dr. Tom Ingraham, Director of Programs, NSERC, to speak to members on the policies and programs of the granting council, especially that on the NSERC summer student assistantships. The ensuing discussion brought out concerns of university members about inadequate regional representation on grant committees and the problems encountered by smaller universities in conducting research. Subsequently, NSERC appointed scientists from Atlantic Canada to its grant award committees.

The above concerns, the squeeze on budgets resulting from a lack of growth in federal support for science, problems of emphasis and interaction between sectors, led to an exchange of views in a conference on February 15, 1980, jointly sponsored by APICS and the AAU. Presentations were made by Dr. J.D. McNiven, Executive Vice-president, Atlantic Provinces Economic Council; Mr. E. Fanjoy, Secretary of the Council of Maritime Premiers (CMP); Dr. D.G. McKay, Centre for Energy Studies, TUNS; Dr. R. Peters, Director of Ocean Engineering, Memorial; Dr. P.J. Wangersky, Director of the Institute of Oceanography, Dalhousie; Dr. R. Duffy, Diagnostic Chemicals Ltd., Charlottetown; and Dr. G.A. Baskerville, Department of Forest Resources, UNB. At the luncheon, Dr. L. Kerwin, Vice-president of NSERC, outlined the research support programs being introduced under the five-year plan. The discussion served to intensify concerns about the lack of understanding of the difficulties facing the smaller Atlantic universities in maintaining research programs.

In an effort to create a broader appreciation of the difficulties, APICS established an ad hoc committee consisting of Dr. J. Ivan Dowling, Dean of Science at UPEI (Chairman); Dr. K.J. Leffek, Dean of the Graduate School at Dalhousie; Dr. J. Keyston of the AAU; Professor G.B.J. Ward of UNB; and Dr. J. Read of Mount Allison, to review and prepare a report on research difficulties at small universities. On soliciting input from the science community, Dr. Dowling

received an excellent response and was able to prepare a comprehensive report. The report was submitted to the AAU, NSERC, MPHEC and CMP.

At the request of SCC, APICS and the AAU organized a special seminar on October 31, 1980, at Dalhousie to discuss implications of the SCC's Report No. 31, "University Research in Jeopardy: The Threat of Declining Enrolment". Panel members were Mr. Emery Fanjoy, Secretary, CMP; Dr. R.J. Kavanagh, Dean of Graduate Studies, UNB; Dr. Don LeRoy, Science Advisor, SCC; Mr. John Fisher, President, Fraser Inc.; Dr. J.D. McNiven, Executive Vice-president, Atlantic Provinces Economic Council; and Dr. Matthew W. Spence, Director, Atlantic Research Centre for Mental Retardation. Dr. R.J. Pottie of NRC was the luncheon speaker. Sixty representatives from universities, provincial governments, industry and government laboratories attended. The proceedings were recorded on tape, transcribed by APICS and submitted to SCC and NSERC. A summary of the points raised by the panel speakers was distributed to members of APICS and attendees.

The growing concern about support for science and the status of technical innovation in the Atlantic region led to the preparation of a discussion document by Mr. E. Fanjoy, Secretary of CMP, and to the establishment by the premiers in the fall of 1980 of a committee on research and development. APICS was invited to submit a brief with a tentative deadline of January 15, 1981. The task of preparing the brief was assigned to Dr. F.J. Simpson. He submitted a draft to Council members early in January for comments and submitted the final version to CMP at the end of the month. The reception was positive with Mr. Fanjoy stating that much of the report of CMP's committee on research and development would be based on the APICS submission. The report of the committee on research and development was published in the spring of 1982 and contained 13 recommendations.

CMP invited APICS to comment on the report of its committee on research and development. Dr. Simpson prepared and submitted in June, 1982, a twelve-page document reflecting the views of Council, urging the adoption of its 13 recommendations by the provinces and offering the services and support of APICS in carrying them out.

Activities of Council (1981-1984)

On assuming the chairmanship in July, 1981, Dr. Simpson met with each of the university presidents and directors of member organizations during the summer and fall and discussed activities and finances of APICS. During the winter, he also met with those who had been members before establishment of the fee structure, seeking renewal of their participation either as members, or under the trial and associate membership mechanism, but was not successful despite inclusion of various sectors such as agriculture and forestry in special APICS-sponsored activities. Those participating in the discussions stressed the importance of the role of APICS in promotion of co-operation, avoidance of duplication and the nurturing of science. Comments included the need for more awareness of what science education and research possibilities existed in the Atlantic region, the need for improved communication and interaction with industry, the possible role of APICS as a co-ordinator of interdisciplinary projects involving

engineering, and the creation of a greater public awareness of science. The weekly science page in the Halifax Herald was cited as a major contribution to local public awareness.

Dr. Simpson established, as a regular event, invitations to officials of provincial and federal agencies to address members during the Friday evening sessions of the spring and fall meetings of Council. The objectives were to establish an awareness of APICS in the various federal and provincial administrative offices and to inform members of APICS about government policies and activities related to technological development. Dr. Keyston, Executive Director of the AAU and Mr. Emery Fanjoy, Secretary of CMP, became regular attendees and contributed to the discussions.

At the Council meeting on November 27, 1981, Dr. Margaret Fulton, President of MSVU, gave the welcoming address and Dr. Gordon MacNabb, President of NSERC, outlined policies and programs of the research granting agency, particularly the success of the undergraduate summer research awards that he hoped would be increased from 1,000 in 1981 to 1,500 students in 1982. He expressed disappointment that the Atlantic region was under-represented in submissions to the strategic grants program directed at support for targeted interdisciplinary research and in the program of project research applicable in industry. Certainly there were areas of research in the region worthy of support, but what was lacking was the development of sound submissions. Mr. Fanjoy reviewed the current status of the report by CMP's committee on technological development.

At the April 1982 meeting of Council at the Université de Moncton, Mr. Cecil W. Freemont, Director of Planning, Department of Commerce and Development, Government of New Brunswick, spoke on how his government had come to recognize the importance of technological innovation for long term economic gain and on actions planned in response to CMP's report on "Technological Innovation, An Industrial Imperative". Dr. Ronald MacDonald, Academic Vice-president of Acadia, welcomed Council members to the fall meeting; Mr. John Terry, Chairman of MPHEC described how the commission operated, its role as an intermediary between government, universities and colleges and its effort to collect and compile data and information on specific topics. At the April 1983 Council meeting at Memorial, Mr. Douglas Inkster, Director of Energy Policy for the province of Newfoundland, reviewed the current crisis in oil supply and inflation, the need for Canada to move to world prices and the status of energy projects in Atlantic Canada. At the November meeting, the newly appointed federal economic development co-ordinator for Nova Scotia, Dr. Douglas Love, reviewed the background that led to the decentralization of the office of the Ministry of State for Economic and Regional Development and the local office's responsibility for co-ordinating federal-provincial development programs with an emphasis on those related to ports and the ocean. The guest speaker at the Council meeting in April 1984 was Mr. Hugh Plant, Director of the Ocean Industry Development Office at Halifax. He explained the role and responsibilities of his office in support of all aspects of ocean development, on and offshore.

The invited speaker program attained its objectives of informing members of APICS about regional developments and of making government agencies cognizant of APICS as a representative body for science in the Atlantic region.

In 1982, Council adopted specific funding guidelines for its annual budget. The name of the Math, Science and Education Committee was changed to the Math, Science and Engineering Education Committee and the terms of reference were amended. In 1985, the name of the Mathematics Committee was changed to Mathematics and Statistics.

Atlantic Fiddlehead Research Organization (1981-1985)

At the Council meeting on November 27-28, 1981, Dr. Simpson outlined research activities of some member universities and government agencies on development of fiddle heads as a crop. The resources at their disposal were being augmented by contracts from ARL. The group desired the support of APICS and recognition as a committee. Following a discussion on the merits of establishing a committee, Council supported association of the group with APICS and instructed the Executive to make arrangements. Terms of reference were prepared and the Natural Resources Committee accepted the Atlantic Fiddlehead Research Organization (AFRO) as a unit of its committee. The chairman of AFRO was R.K. Prange of NSAC. The group made significant progress in their research, but contractual support from ARL ceased in 1985 because of budget cuts. The group did not meet after 1985.

Teaching award (1978-1985)

At the Central Committee meeting (Council) on April 14-15, 1978, Dr. Simpson and Dr. Leffek raised the question of establishing a teaching award that would single out those in the Atlantic region who had made major contributions to instruction in science and who were appraised as being excellent teachers. Council members expressed an aversion to judging teaching and emphasized difficulties of selection. Despite the negative response, Council defeated a motion to postpone indefinitely consideration of such an award and agreed that the proposal be submitted to the committees for comments. Dr. Simpson attended meetings of several committees and though encountering opposition, obtained useful comments on selection criteria. At the council meeting in November, Dr. Simpson tabled a detailed proposal. Dr. Leffek and Dr. Ferguson successfully moved that the teaching award be approved in principle. An ad hoc committee (Dr. Bigelow [chairman], Dr. Zinck and Dr. Simpson) was charged with establishing criteria and method of selection.

The resulting document was presented at the Council meeting of April 27-28, 1979. The question of whether there should be a teaching award was debated again with several members voicing opposition. Dr. Liengme expressed his opposition to the concept of an award for something that one is paid to do and feared that difficulties in choosing a recipient might lead to inter-university bickering. Dr. Heald emphasized the impossibility of assessing what are and what are not good teaching characteristics. Council, he thought, was presenting itself with a difficult task and noted the absence of criteria apart from subjective evaluation. Dr. Kavanagh's reservations, though expressing his belief that good teaching should be recognized, were with the mechanisms of selection, that within an institution there are problems in making comparative subjective evaluations. When nominations come from different institutions, the scale of

difficulty is increased and he did not know how one could arrive at a reasonable scientific judgment on teaching quality.

Dr. Simpson responded that the same arguments had been encountered during consideration of almost any award for excellence. The problems of judgment and assessment were never easy and he appreciated the difficulties after having been involved in such assessments. Nevertheless, the Carski Teaching Award of the American Society of Bacteriologists had been operating successfully for 15 years. If members of APICS and professors cannot develop something to evaluate and appreciate excellence in teaching, then we have serious questions to ask about our activities. Dr. Bigelow noted that arguments made against the teaching award could be made against having a reward for research, but what is important is that the profession take teaching seriously. As he had also been involved with a teaching award in another province, he recognized the difficulties, but people did not find it demeaning to nominate a recipient. Dr. Leith expressed his support for the award and noted that the work assessed would be done over a longer period of time than work for the Young Scientist Medal. Whoever would be chosen would be chosen by a great weight of reputation as a teacher. This would add to an already established distinction for the person who received the award. The process of identifying individuals is often conservative, one that reinforces traditional methods of teaching, whereas the more significant developments in teaching methodology were made by individuals who set out to become educators rather than teachers. Dr. Grundke stated that as teaching goals are not as well defined as research goals, determination of success or failure of teaching is subjective and more difficult. It is easier to make an award for poor teaching. If the concept of a teaching award was just a public relations exercise, there were other more effective means. Dr. Grundke moved that the motion made by Dr. Bigelow and seconded by Dr. Dowling to adopt the report of the committee on the teaching award be accepted. The motion carried with the proviso that a sponsor be found.

Dr. Simpson was charged with the task of finding a sponsor, an exercise he found discouraging as the larger regional as well as national industries which were approached, declined. National Sea Products, after reviewing the request, decided to establish scholarships for children of employees rather than support an APICS award. It was not until 1983 that Dr. Simpson's chat with Mr. Roy Cottier, Senior Vice-president of Corporate Relations, Northern Telecom, Limited, produced a response. Subsequent discussions with Mr. John Strimas, Vice-president of Public Relations, correspondence and meetings with Ms. Theresa Arts, Director, Corporate Contributions, were followed by a memorandum of agreement establishing the APICS/Northern Telecom Science Teaching Award. In the agreement, the method of nomination, adjudication and criteria for selection were defined.

The award honours the individual teacher at the secondary and post-secondary level considered to have made the most significant contribution during his/her career in the teaching of sciences, engineering and technology. The intent was to recognize mature individuals who not only had become known as having a comprehensive knowledge of their subject, but of possessing the ability to communicate, impart information on scientific principles and the unknown in such a manner as to inspire or encourage students to higher and subsequent achievement. Contributions to education were to include such items as course design, curriculum development, innovative teaching aids and methods, including research. The

recipient, a resident of the Atlantic region, must have taught at least five years in the Atlantic provinces. The award consisted of a silver medal and a cash payment of $5,000. Northern Telecom assumed all costs associated with the award. APICS was responsible for administration, managing the adjudication, selection, and presentation process. Subsequently, Northern Telecom established similar awards across Canada.

The award was announced in June by Northern Telecom and advertised in the fall of 1984 in the APICS newsletter. Announcements were distributed to universities, high schools and research establishments in the Atlantic region. The response was overwhelming and it was with some difficulty that the selection committee, first by individual assessments then as a group, made the final selection. The first award was granted to Mr. Martin Schwartz, a teacher and head of the science department at the Cape Breton Education Centre, New Waterford, Nova Scotia. Mr. Schwartz had co-authored studies on coal and tidal energy, conducted many local student science fairs including establishing and organizing the Cape Breton Regional Science Fair, and had developed a physics science course that had been integrated into the science curriculum of Nova Scotia. Mr. Schwartz was presented with the award by David Vice, Vice-president of Northern Telecom, at a reception and dinner at Dalhousie sponsored by Northern Telecom. During the following year, conforming to the request that the recipient visit various parts of the Atlantic region and speak on education, Mr. Schwartz was the guest speaker at conferences of the Association of Science Teachers at Halifax, at the P.E.I. Teachers' Federation's Professional Development Days, and at the Newfoundland Department of Education In-service Sessions at St. John's, in addition to seminars at several Atlantic universities. Subsequent presentations of the award and the subsequent lecture tour followed this format.

Briefs and actions in support of science education (1982-1984)

Nova Scotia, in the fall of 1982, established a Royal Commission on Post-Secondary Education in Nova Scotia and solicited a submission from APICS. A draft was prepared by Dr. Simpson and following a review by members of Council, was submitted in April, 1983. The submission included an analysis of trends in the supply and demand for scientists through to the end of the century.

On behalf of the Math, Science, and Engineering Education Committee, Dr. Fred Dobson prepared a brief on educational policies for the Atlantic provinces. The brief underwent a number of revisions as members of the committee and members of Council made suggestions that resulted in a comprehensive document. The document made specific suggestions for improvements in science education at all levels of instruction. The final draft was submitted in 1984 to the Nova Scotia Royal Commission on Post-Secondary Education, to the provincial departments of education, the Standing Committee in New Brunswick on Science Education, the SCC and presidents of universities.

The two briefs were well received. Complimentary letters were received from the chairman of the Royal Commission, from the ministers of education, university presidents and from Dr. Stuart Smith, President of SCC.

Dr. Charles McFadden of the Nova Scotia Institute of Education, in co-operation with science teachers in Nova Scotia, was preparing a science text for use in the junior high schools that would illustrate basic principles by using Canadian examples and pay due attention to Canadian achievements. Financial support was provided by the Nova Scotia Institute of Education, but on its dissolution in 1982, the co-operative project was in limbo.

APICS' Council strongly supported the project. Dr. Robert Hawkes, Chairman of the Math, Science and Engineering Education Committee, and Dr. Simpson made representations on behalf of Dr. McFadden for continued funding to the federal and provincial governments. CMP arranged to have TUNS act as the corporate body responsible for the project. Grants were obtained that enabled work on the texts to be completed. The texts were published in English and French versions as the Science Plus Series, volumes 1, 2 and 3 for grades 6, 7 and 8. They became popular, were used throughout the Maritimes and adopted as the basic science texts in Nova Scotia junior high schools.

Bill C10 (1982)

The federal government tabled legislation in 1982 concerning requirements for establishment of degree granting institutions. The wording of Bill C10 would in effect have enabled any three individuals, on payment of a fee of $200, to establish themselves as a university and issue degrees. On behalf of APICS, Dr. Simpson wrote to each cabinet minister objecting on the grounds that such would result in bogus degrees being made readily available without regard to qualifications or standards. There was a groundswell of opposition to the Bill from universities across Canada. The Bill was accordingly modified to meet the objections of the university community.

Efforts to broaden membership in apics (1982-1983)

One result of discussions on the activities and finances of APICS held by Dr. Simpson with members of UNB was a decision to catalyze interest of industrial firms by sponsoring a conference on forest resources and utilization. The symposium, "Fuel or Fibre - Hardwood Utilization and Marketing Opportunities" was held in March 1982, at UNB. Organized by Professor Dickson and the staff of the university's Department of Forestry with support from the Natural Resources Committee, the successful symposium attracted much attention. The proceedings were edited by Dr. J.C. Lees and published. Though the symposium was praised as a major contribution, members of the forestry industry did not view APICS as an organization suitable for their needs.

Several participants at the symposium, however, suggested that APICS might be an appropriate body to co-ordinate research activities of those in universities, agriculture, forestry and provincial agencies involved in insect control. Accordingly, Dr. Simpson convened a meeting at ARL of 14 entomologists from the four provinces to consider the possibility. The majority did not want to be involved in another committee, affirming that existing committees were adequate, but recommended that APICS could have a useful role in encouraging students to

take an interest in entomological research by supporting attendance at annual meetings of the Acadian Entomological Society and participating in workshops on insect control measures. APICS provided a grant of $1,500 in support of student travel, but of the 60 people who attended the Acadian Entomological Society annual meeting in Fredericton on April 18-20, 1982, only four students took advantage of an APICS grant. APICS again provided $1,500 in support of students to attend a workshop on insect control held by the Acadian Entomological Society on April 18-20, 1983, at Fredericton. Nine students took advantage of the support and attended. A grant was not made in 1984.

Psychology Committee (1983)

The Psychology Committee did not meet during 1982. In submitting her resignation as chairman, Dr. Rosemary Sampson conferred with Dr. Simpson about the need for a new thrust. Dr. Richard Brown and Dr. John C. Fentress of Dalhousie were consulted and were successful in bringing together a representative group of psychologists to re-establish an active committee. Dr. Brown acted as chairman and secretary for the initial meeting which established topics for future meetings. The seventh Student Psychology Conference was held at Dalhousie in May 1984. At that conference, the psychologists requested support in counteracting slanderous propaganda by anti-vivisectionists. In this effort they were joined by the Animal Care Committee.

Second science education conference (1983)

Following the first Science and Education Conference held at Sackville, New Brunswick, on August 20-22, 1980, members of the organizing committee conducted a review of the exercise and recommended that APICS organize a conference of a similar nature in two or three years. Accordingly, Council appointed a steering committee comprising Dr. Merrill Edwards (Chairman), Mary Wright (P.E.I.), Don Downer (Newfoundland), Brian Hurley (N.S.), R. Toussaint, (N.B.), and Sheila Stanley (Co-ordinator).

In the summer of 1981, Dr. Simpson appointed Dr. Archie McCulloch of ARL as conference manager to co-ordinate a series of working sub-committees responsible for detailed arrangements. Local arrangements were made by staff of UPEI and P.E.I. high schools under the chairmanship of Dr. Ivan Dowling who secured the assistance of the local tourist office and newspaper reporters. Mr. Michael Read of UPEI provided university services and managed accommodation and meal arrangements. The conference was held on August 16-18, 1983. The theme was "Preparing for Tomorrow - A Stitch in Time" with the objective of displaying several facets of science and classroom instructional techniques. Attendees were invited to bring their families and participate in scheduled family events.

As at the first conference, the Atlantic section of the Chemical Institute of Canada held its annual meeting immediately prior to the conference and attendees participated in the sessions. Following the opening keynote address by Dr. Hubert N. Alyea, Dept. of Chemistry, Princeton University, a reception was held in the area of exhibits and posters. These included the travelling

science circus of the Ontario Science Centre, a working model of the tidal power electrical generating system to be installed at Annapolis, displays by science associations and several commercial, federal and provincial government agency exhibits.

The morning and afternoon sessions of the second day commenced with a plenary session having a keynote speaker and were followed by discussion groups organized by Dr. Tik Liem and Dr. Bob Hawkes. The keynote speakers were Dr. Henry A. Bent, Dept. of Chemistry, North Carolina State University and Dr. Gordon L. Baskerville, Dean of Forestry, UNB. The banquet speaker was Dr. J. Tuzo Wilson, Director General, Ontario Science Centre. On the morning of the concluding day, Dr. John van der Meer organized a symposium entitled "Science and Technology - The Leading Edge" with Dr. Larkin Kerwin,

President of NRC; Mr. G.F. Sekely, Director of Information Systems, Canadian Pacific; Dr. Glen E. Palmer, Department of Chemistry, UPEI; and Dr. M. Wein, Division of Electrical Engineering, NRC, as speakers. That afternoon, the public was invited to an open house to see demonstrations of chemical and physical phenomena by Dr. Alyea, Mr. George Vanderkurr of the Ontario Science Centre and Dr. Tik Liem. During twenty-minute intermissions between each speaker, the public was invited to view exhibits, posters and talk to scientists.

The success of the conference held on August 16-18, 1983 was due largely to outstanding support by staff of UPEI and the guest speakers who with the participants had great fun. Mr. Jim Stevenson prepared the evaluation report. As the conference was held during a recession and a period of severe restraint, a major effort was made to make the conference self-supporting by means of commercial exhibits ($150 each), registration fees ($45) and grants. There were 19 exhibitors. Donations were received from the A.C. Neish Memorial Trust ($850), N.B. Department of Education ($2,000), P.E.I. Department of Education ($1,000), N.B. Teachers' Association Science Council ($100), NABU Manufacturing Corporation of Ottawa ($100), Fischer Scientific ($75), Sciences Research Association ($150), Olands Breweries ($200), and Andres Wines. The total cost was $27,828.23 of which APICS contributed $2,356.99.

Review and evaluation of APICS (1984)

On assuming the chairmanship of APICS in the summer of 1984, Dr. Peter Heald, Dean of Science at Memorial, prepared a review and evaluation of the activities of APICS noting that education dominated the thrust of committees though two, the Bay of Fundy Environmental Studies Committee and the Natural Resources Committee, were primarily concerned with applications of science. Two areas that he stated required strengthening were those directed at improving the public's awareness of science and co-operative research on regional problems. At the fall meeting in 1984, Council discussed a need to broaden the base of membership including closer ties with industry and intensification of promotional efforts improving public understanding of the implications of science and technology. Mr. Emery Fanjoy noted that advanced technology was forcing changes in society, yet the Atlantic provinces were not organized to deal with conflicts that arose. Though there were 70 organizations involved in research and development in the Atlantic region, the efforts did not appear to be cohesive. CMP did not have any "hard" information on the impact of technology on society in the region.

Out of the discussion came three decisions. One was to seek support, in co-operation with CMP, for a symposium on the social impact of science and technology in Atlantic Canada. Fundraising encountered difficulties. Abitibi Price donated $1,500 and DFO offered a similar amount, but as further donations were not immediately forthcoming, the conference was postponed to after 1987.

The second decision was to intensify efforts in achieving an improved public awareness of science. Some success was achieved by the preparation and distribution of short news releases about specific events and accomplishments by members of APICS. These were picked up and published by local newspapers in the Atlantic region. A new format on glossy paper was given to APICS NEWS and it was retitled ATLANTIC SCIENCE.

The third decision was to set aside $30,000 of the accumulated reserve as a New Initiatives Fund to encourage committees to move into new activities, particularly those which could have technological or social impact. The first and a successful one was that undertaken by the Mathematics and Statistics Committee where, at a workshop held at Dalhousie on April 25-26, 1986, industry and government agencies were invited to submit problems for study and solution. Eighteen problems were submitted that ranged from forestry modelling to optimum design of ships curves. The organizer, Dr. J. Clements, co-ordinated the follow-up with colleagues after the conclusion of the workshop. The effort led to solutions for most problems submitted and illustrated the application of mathematical science to practical problems.

At the meeting of Council on April 25-26, 1986, Dr. P. Heald, Chairman of APICS, invited Mr. Fraser Nicholson of the Maritime Education Foundation as a guest speaker. The ministers of education for the three Maritime provinces established the foundation with the objectives of enhancing the already existing spirit of co-operation within the region, and enable the private sector and departments of education to pool their resources in the production of educational materials in the region. Twenty projects had been undertaken. Some of these were the holding of an Energy Education Symposium; production of Units I and II science kits in both official languages; publication of a Maritime Energy Field Guide; publication of a booklet entitled "The Past and Focus", which outlined the region's historical resources; and development of a series of audiovisual films providing information for students on potential careers in the Maritime provinces.

New handbook and forms. Permanent APICS office (1985)

In 1985, the Handbook for Committee Members and the forms for submitting requests for financial support were revised to include a forecast of proposed activities a year in advance in order to facilitate financial planning by the Executive. Through the generosity of Memorial, a permanent office for APICS was established with fewer changes in personnel than previously experienced. The office and the co-ordinator, Mr. Tim Murphy, who was shortly succeeded by Ms. Joan Atkinson, then remained at Memorial when Dr. Merrill Edwards of UNB assumed the chairmanship in 1986.

Huntsman Marine Laboratory and St. Thomas University (1986)

In 1986, the Huntsman Marine Laboratory, members of which had participated in the Bay of Fundy Environmental Studies Committee, applied for and was granted "observer status", as an associate member and continued to participate in committee activities of APICS. St. Thomas University rejoined APICS after an absence of five years.

Representations in support of increased

Science funding (1986-1987)

Beginning in 1984, a series of reductions in the budget of NRC and NSERC caused a growing concern among scientists about the future of Canada's scientific and technological capability. In the fall of 1986, a severe reduction in budgets was announced that aroused strong protest from the Canadian scientific community in which members of APICS participated. Dr. Edwards invited Dr. A.W. May, President of NSERC, to attend the Council meeting on April 24, 1987. The news was not good. The Summer Undergraduate Student Research Program that provided 2,000 awards in 1986 was to be reduced by 25% for 1987 and likely to disappear in 1988. As two hundred awards were held in Atlantic Canada in 1986, demise of the program would mean a loss of $600,000 in student summer employment in the region. The major impact on stimulating research and improving students attitudes toward research as a career would be lost and lead to deficiencies in highly qualified people at a time when retirements at universities were beginning to increase. Also slated as a casualty was the University Research Fellowship Program.

Dr. Edwards, on behalf of members of APICS, wrote to the prime minister, the minister of state for science and technology and several other members of the government and opposition, including provincial politicians, about the impact that the reductions in support for research and technological development would have on the supply of highly qualified manpower with a resulting decline in innovation in Canadian industry and competitiveness. All who were sent a copy of Dr. Edwards' brief, acknowledged receipt; the federal government, however, held to its course, and deductions, with the exception of undergraduate student awards for 1987 and 1988, were made.

COMMENT

The Atlantic Provinces Council on the Sciences arose from a desire to strengthen university graduate education, improve research and technological capability in the region, to promote co-operative interinstitutional research at a time when research and technological development were at a depressed state in relation to the rest of Canada. APICS became the voice of science for the Atlantic provinces and its advice was sought on several matters. The science education and research planning seminars helped create a political awareness of the need for increased financial support that was endorsed by the then premier of the province of Nova Scotia, the Honourable

Mr. Stanfield. Summer student research scholarships increased the number of students considering science as a career. The establishment of the Young Scientist Award, later known as the APICS/Fraser Medal, for scientific achievement resulted in a national awareness of the high calibre of science being done in the Atlantic region and assisted in improving the region's representation in science adjudication committees and in funds granted to support research. But there is much more to do to fulfil the original objectives of APICS. The administrative criteria for successful interdisciplinary, interinstitutional research are now known, yet there is little action in such co-operative activities within APICS. There are regional problems to solve. The Fundy Environmental Studies Committee and the problem solving workshop of the Mathematics and Statistics Committee are examples of what can be done. Dr. McTaggart-Cowan's challenge, made in 1970, has remained largely unanswered.

Though the initial objectives of APICS were strengthening university graduate student research and research activity in the region, the working theme in the discipline committees quickly became improvement of science teaching in the public school system. Members of the committees worked assiduously to improve standards for science teachers and to develop improved science curricula. That they were successful was due to the co-operative attitude of those in the departments of education who implemented many of the recommendations. The efforts of the committees culminated in the successful science education conferences and establishment of the APICS/Northern Telecom Science Teaching Award.

Gradually the emphasis in the discipline committees moved away from the status of science in the public school system to improvement of university undergraduate and graduate education throughout the Atlantic region. This included the holding of annual student conferences with awards for presentation of the best papers and efforts to improve university finances through activities directed at increasing awareness of the importance of science and technological capability to the region's economy. Such was a natural development because members of the smaller universities, with relatively larger representation on the committees, were experiencing inadequate resources for teaching and insufficient time for research. They needed the benefits from interaction with those at the larger universities and public support. The work of the committees gradually evolved into a routine of organizing undergraduate and graduate student research conferences, managing the visiting lecture program and holding discussions on current instructional and administrative problems.

Making the case for sciences and research is difficult, as benefits may not be readily apparent and the effort requires presentation of complex subjects in simple terms. Though public awareness of the benefits resulting from science is more extensive than during 1962, Canada is facing a growing lack of interest in science as a career among its young people. The deficiency in technologically trained workers is increasing. The percentage of total enrolment in the sciences steadily declined in the community colleges from 34% in 1984 to 26% in 1989 and in the universities from 24% in 1984 to 21% in 1989. As science was developing in the Atlantic provinces during the fifties to the seventies, students were encouraged and expected to be active participants in the development. Hopefully, as an appreciation of the utility and benefits of science become more pervasive, active participation of students will again occur.

In the two decades following the second World War, Canada met its deficiencies of technically trained people by importation, largely from Europe. Today international competition is intensifying and many opportunities for technically trained people exist in other nations. Canada is no longer as attractive. In Canada, resources for exploratory research and support for science students declined during the late seventies and eighties. The NRC that sparked much of the innovation and growth of science in Canada is no longer the driving force that it once was. The resources of NSERC are inadequate to support the basic and technological research activity that Canada needs. Federal and provincial deficits are placing strains on the financing of education. There is no less a challenge for APICS today than there was in 1962. Indeed, the need for co-operative activities toward efficient use of resources and raising of standards in education and research has never been greater.

F. J. Simpson

HISTORY OF THE TWELVE

SUB-COMMITTEES 1962-1975, COMMITTEES 1975-1987

by FREDERICK J. SIMPSON

Animal Care

The growth of the public school system, the universities and medical schools during the 1960's was accompanied by an increased demand for animals for teaching and research and an increasing concern amongst the public about the treatment of animals. NRC established a Committee on the Care of Experimental Animals in Canada to examine the problems of animal care facilities, supply of animals, use and treatment of animals for teaching and research. Their report of June 1966, recommended the establishment of regional, central animal facilities which could be used as a resource for conditioning random pound-procured dogs and cats and for the breeding of special strains of laboratory animals as required by research investigators. In addition, the centres could train people in animal care at the technical and professional level.

The regionalization of such a service for Alberta was slowly being established at the University of Alberta in Edmonton, and for central Ontario at Queen's University in Kingston. In the Maritimes, informal discussions between representatives of the universities about supply problems began in 1968. NSAC established a committee to consider the possible design for animal care rooms to serve the needs of the college. Dr. G.V.M. Mowbray, Henry MacConnell and L.J. Eaton met on June 18, 1969, and recommended that facilities be constructed at the college for the proper care of live laboratory animals such as rabbits, cats, dogs, mice, rats, amphibians, insects, and birds to provide live animals for first year technician and degree biology and biochemistry laboratories and for research. They proposed construction criteria and designed a possible floor plan. Copies of the report were submitted to staff of the college, to the provincial veterinarian, the director of the Livestock Services Branch, and to Dr. Grant Hilliard, Director of the Animal Care Centre at Dalhousie.

The response from Dr. Hilliard was immediate and positive because he was struggling to meet the growing needs of Dalhousie. He met with members of NSAC on September 22, 1969 to explore the possibility of establishing a complex at Truro to be used jointly by Dalhousie and NSAC, and the use of residences for accommodation of technicians undergoing training and temporary accommodation for professional staff. Dr. Hilliard believed that the location at Truro, central to many Maritime universities, would be ideal for a regional facility.

Dr. Hilliard presented the results of the discussions to Dr. Hicks, President of Dalhousie, who suggested that Dr. Hilliard meet with the Dr. Somers, President of the AAU and Dr. J.J. MacDonald, Chairman of APICS, to obtain information on teaching and laboratory animal requirements, animal supply, use and care at other Atlantic universities. Dr. J.J. MacDonald suggested that a meeting of all interested parties be held. Letters of invitation (50) were mailed to all concerned with animal care in the universities, provincial and federal agencies in the Atlantic region. On January 9, 1970, the special meeting was held at Truro; twenty people attended.

Dr. H.C. Rowsell, Executive Director of the Canadian Council on Animal Care (CCAC), established in January 1968, described the activities of the Council and its effort to gather information on needs and priorities for laboratory animals across Canada. The discussion following his address indicated that several Atlantic institutions had made significant advances in their animal care facilities with larger facilities being set up away from the main campus because of cost and disease isolation factors. However, many facilities at Atlantic schools were not adequate to allow proper training of animal care personnel. The concern about financing dampened a ground-swell of support for a regional centre, but all were unanimous about the need for better communication between the scientist, school teacher and animal welfare groups, about the possibility of too restrictive legislation, and about the need for improved interinstitutional co-operation that could be undertaken with modest sums. On a motion from Dr. R.A. McAllister and Dr. G.F. Bennett of Memorial, the representatives concurred that application be made to the APICS' Executive to form a sub-committee on animal care. Dr. W.G. Hilliard was appointed chairman, Mr. L.J. Eaton as secretary, Dr. J.C. Cheverie and Dr. R.A. McAllister as members of an ad hoc committee who drafted the following terms of reference:

1. to collect and distribute detailed information concerning requirements for procurement, care and use of animals in teaching and research in the Atlantic region including animals, personnel and physical plant;

2. to investigate the feasibility of a central or Atlantic regional animal centre which could assist in supplying quality and quantities of animals not now readily available in the region;

3. to assess the need for an Atlantic region training centre to train personnel in the care and handling of animals used in research and teaching;

4. to provide a central group to serve as a clearing house for technical information to members of APICS and to serve as an instrument to facilitate good public relations between laboratory animal users and the general public;

5. to determine present and future needs for animal care technicians and technologists in the Atlantic universities and institutions;

6. to consider the use of available species not presently used in teaching and research.

APICS' Executive and Central Committees, at the May 1970 meeting, were unanimous in accepting the application for establishment of an Animal Care Sub-committee. The steering committee immediately moved ahead with arrangements to participate in APICS' Fifth Planning Seminar to be held at NSAC. At the seminar, the sub-committee met on May 19, 1970. Following the election of officers, the meeting reviewed provisions in Bill 194 of the Province of Ontario, "An Act Respecting the Care and Provision of Animals for Research", with Dr. D.G. Sinclair of Queen's University as guest speaker. Members agreed that animal care committees of institutions in the Atlantic regions should adopt the provisions as operational guidelines. Dr. R. Greenwood, Director, Animal Care Services at Queen's University, outlined the Ontario experience of a regional service unit, facility requirements and operational costs. Dr. McAllister

described the facilities available at Memorial. Those present at the meeting concluded that highest priority in the Atlantic region should be the establishment of co-operation between the institutions and that a recommendation be forwarded to the federal government for support of a system of "Co-ordinated Laboratory Animal Care", which would cover all aspects of laboratory animal procurement, care and usage in the Atlantic region. A form was devised to solicit information and make known each members' inventory of surplus animals.

The sub-committee met on September 25, 1970, at Mount Allison to discuss the report of the APICS 5th Planning Seminar and formulate plans for action. Dr. McAllister expressed a concern about the protests of animal welfare groups, especially the severe criticism by the SPCA on the treatment of animals in high schools and science fairs. The discussion resulted in a recommendation that Dr. McAllister and Dr. C.E. Johnston send out letters to teacher associations and unions in the four Atlantic provinces offering the services of members of the APICS sub-committee as a source of information on the use and care of live laboratory animals at the pre-university level and offering to provide animals and equipment (subject to supply) to the schools for animal care instruction. Information was distributed about the offer to members of the Canadian Federation of Biological Societies and the Canadian Medical Association. Members offered to counsel, advise, or supervise pre-university students conducting extracurricular science projects and using live animals in science fairs, and to provide input on the use of live animals in the brochure, "Guidelines of the Youth Science Foundation". Dr. J.P.W. Gilman, the newly appointed Executive Director of the CCAC, described the survey of animal care facilities that was being undertaken and secured the support of the sub-committee in gathering data. Dr. McAllister agreed to serve as a central repository for information on the planning and renovation of facilities. The sub-committee unanimously agreed that training of technical animal care personnel was an urgent matter and proposed that APICS make available travel grants of $300-$500 to support the travel and living costs of technicians to obtain training at "centres of excellence".

The request for travel support for technicians was denied by the Central Committee and only the Newfoundland Teachers' Federation replied to the offer of assistance on care and use of laboratory animals. Teachers in the Maritimes were apparently indifferent to the problem. Consequently, Dr. McAllister conducted a tour of New Brunswick schools and Dr. Hilliard of schools in the Dartmouth-Halifax area, lecturing and counselling on care and use of animals in the classroom.

The sub-committee then turned its attention to organizing a seminar on "Animals in Education" and enlisting the financial support of the CCAC and the Canadian Association for Laboratory Animal Science (CALAS). Both organizations immediately pledged support by paying the transportation costs of invited speakers. APICS gave a grant of $500. Additional support was obtained from exhibitors. The seminar was held in the Sir Charles Tupper Medical Building at Dalhousie on October 13-14, 1972. In addition to the 78 participants, 20 students attended. The seminar met its objectives of establishing an awareness of the need for improvement in the care and use of animals in teaching and research and an awareness of the expertise available in the region. This resulted in numerous requests from university staff for more specific training. In response, the Animal Care Centre at Dalhousie presented five semi-formal lectures of one hour each on animal care aimed at researchers, technicians and graduate

students. Because of the favourable response, it was decided that such a course should be given twice each year to persons using animals at Dalhousie and at other centres.

In 1973, Dr. C.E. Johnston endeavoured to establish a task force on preparation of a guide for educational pre-university use of animals. The response for contributions to the guide was poor and in its place the newly published "Blue Book" of the CCAC was recommended. An effort to organize a summer course on the use of animals for teaching also lacked support from public school teachers. In 1973-74, some key supporters of the sub-committee, Dr. Hilliard, Dr. McAllister, Dr. Balbeck and Dr. Sweeney left the Atlantic region for positions elsewhere and meetings of the sub-committee were poorly attended. Under the chairmanship of Dr. John Love, a variety of projects dealing with laboratory animals was discussed including those resulting from use of animals in primary and secondary schools, colleges and universities. Dr. Love made a valiant attempt to hold workshops to upgrade the expertise of laboratory animal technicians in institutions where the range of animals was small and experience was lacking. The lack of interest by junior and senior staff members of institutions using animals and a sense of frustration led Dr. Love to recommend that the committee be disbanded, despite his concern that animal care problems in the region were increasing, that restrictive legislation was being prepared by one province, and that the public increasingly was becoming active in animal rights movements. A recommendation for dissolution of the committee was accepted by APICS' Executive and Council in the spring of 1977.

Dr. J. Read, newly elected chairman of APICS, shared Dr. Love's concerns about the apparent indifference on animal care within institutions and the publication of scurrilous pamphlets and inflammatory articles in the mass media. Dr. Read canvassed members of the universities to determine what institutions had animal care committees and who were using animals for research. On May 19, 1979, Dr. H.C. Rowsell, Executive Director of the CCAC, sponsored a meeting at Dalhousie of directors and technicians involved with animals. Representatives from most institutions in the region attended. The program was chaired by Dr. Love and included lectures by four speakers on care and ethics in research with animals followed by a discussion workshop. The discussion included complaints from students about procedures they must carry out in biology and physiology classes and complaints from scientists about facilities and availability of animals. The decision was to establish a liaison person to stimulate communication between institutions and the CCAC. Dr. C.E. Johnston agreed to serve; APICS agreed to support travel costs.

In February 1980, in response to a request from the Biology Committee, Dr. Johnston canvassed universities in the Atlantic region about the possibility of re-instituting the Animal Care Committee and submitted a positive report to APICS' Council in April. Meanwhile, Dr. Johnston organized a successful workshop on animal diseases that was held on November 15, 1980 at Dalhousie. The proceedings were published and distributed by APICS. At that meeting Dr. D.Crowe (UNB), Dr. Johnston (UPEI), Dr. Threlfall (Memorial), and Dr. M. Komourdjian (UCCB) were appointed as a steering committee to prepare terms of reference and investigate the re-establishment of the Animal Care Committee. Their recommendation was accepted and terms of reference were approved at the Council meeting in April, 1981. The terms of reference were:

1. the committee will consist of persons interested and involved in maintaining and improving the quality of animal care in universities and research institutions in the Atlantic provinces;

2. the committee shall develop the exchange of information regarding animal use in teaching and research in the Atlantic provinces;

3. the committee shall co-ordinate and develop programs in response to the needs of university and institutional animal care committees, and inform organizations interested in animal care about these programs;

4. there shall be an executive committee consisting of four members, preferably one from each Atlantic province, elected at an annual meeting for two-year terms. A chairman, vice-chairman and secretary-treasurer shall be chosen from the executive committee and will be responsible for the fulfilment of the terms of reference;

5. at annual meetings, only two representatives from each APICS member institution shall be eligible to vote.

The Animal Care Committee held a second workshop at UNB on November 21, 1981. The subject was animal nutrition, including that of marine animals, poultry, ruminants and laboratory animals. The proceedings were recorded on tape, transcribed by the co-ordinator, Gillian Dalziel, published and distributed by APICS. At this meeting, Dr. D. Crowe of UNB was elected chairman and proceeded to organize a workshop on "Animal Experimentation, Ethics and Alternatives", that was held at Dalhousie on November 20, 1982. Twenty-eight scientists and technicians attended, including one high school teacher, a biologist and a psychologist. Again the proceedings were recorded and published. On November 19, 1983, the fourth Animal Care Workshop, supported by a grant of $1,600 from APICS, was held at Dalhousie and took the form of audiovisual presentations and hands-on experience in the design and mechanics of audiovisual techniques as a means of instruction on animal care.

Because of the interdisciplinary nature of the committee, Dr. Crowe invited each department in each university that utilized animals to send a representative to the next meeting of the committee at NSAC in May 1984. At that meeting, the Animal Care Committee followed up on its decision to prepare a directory of animal scientists in the Atlantic region, a project that was completed in the winter of 1984-85, printed and distributed in the spring of 1985. In addition to identifying those working in the area, the hope was that the directory would facilitate an exchange of information and the co-operative provision of experimental animals. Subsequent reports indicated that the directory had facilitated access to experimental animals and resulted in fiscal savings. The workshop on audiovisual material in 1983 resulted in a decision to compile a "Directory of Audiovisual Materials Related to Animal Use" under the editorship of Dr. W. Threlfall. The CCAC complimented the Animal Care Committee on its initiative and wished to give the directory national distribution. The University of New South Wales, Australia, obtained a copy and requested permission to distribute the directory in Australia. Five hundred copies were printed by APICS and distributed during 1986 and APICS agreed to fund the preparation and printing of a second edition.

On Saturday, November 9, 1985, the Animal Care Committee held a workshop on the "Use of Wild Vertebrates in the Field and in the Laboratory" at Acadia. There were 40 participants. At the fall meeting in 1986 at Mount Allison, the workshop was on the "Use of Anaesthetic and Antibiotic Drugs with Laboratory Animals". The 1987 fall workshop was held at the Atlantic Veterinary College, UPEI. The theme was "Some Current Issues in Laboratory Animal Care and Medicine" with topics ranging from "Fish as Laboratory Animals" to "Role of the Canadian Association for Laboratory Animal Science".

Over the years, the work of APICS has been hindered by the cynical attitude towards science of some teachers and members of universities. Such has hindered the work of the committees, especially that on animal care. Animal care began as a vigorous committee that endeavoured to correct deficiencies in the care and use of animals in education. Though it suffered a "mid-life" crisis, the committee was re-established and continued to address many concerns in the treatment and use of animals for experimental research and teaching. Not only has the Animal Care Committee served the Atlantic region well, but some of its initiatives have received compliments from Canada and elsewhere. The committee, in 1987, found itself confronted with similar problems as in 1970 - a lack of adequate training courses and facilities for animal handlers and increasing pressures from anti-vivisectionist and animal-rights groups.

Biology

The first meeting of APICS' Biology Sub-committee was held on May 27, 1962, with Dr. Stallworthy (Mount Allison, Chairman), Dr. Bleakney (Acadia), Dr. Chaisson (STFX), Mr. Waller (NSTC), Dr. Neish (ARL/NRC) and Mr. Greenridge present. Several topics were discussed including the teaching role, science seminars, visiting and exchange professorships, summer guest researchers and speakers, summer research fellowships, equipment needs and summer student research scholarships. Their report to the inaugural general meeting of APICS stated that the bulk of the effort of university biologists was spent on two activities: imparting facts to arts, pre-medical, other pre-professional students; and training young biologists, whereas little time was available for research. The report emphasized that to carry out a graduate research program, a department needed adequate staff to meet teaching requirements, staff time and equipment for research; each was deficient.

The sub-committee began work by endeavouring to establish a base of information about education in biology in the Maritimes at the high school and university level. Reverend J. Charles Cheverie (P.E.I.), Dr. A.R.A. Taylor (N.B.) and Dr. A. Rojo (N.S.), undertook to conduct an initial survey. J.E. Philips served as secretary to the Biology Committee.

A follow-up meeting of representatives from each member of APICS was held at Mount Allison on February 15, 1964. The survey report revealed:

1. there were no recent studies or reports on biological training in schools in the Maritimes;

2. a few high schools were recognized for their excellence in biological teaching by granting students from those schools with senior matriculation level biology, advanced standing in first year university biology. In Prince Edward Island approximately 85% of high school students took biology at the senior matriculation level, in Nova Scotia about one third, but few in New Brunswick, as biology was not generally taught at this level;

3. the quality of biological curricula, laboratory training, and facilities were highly variable.

The delegates expressed strong personal opinions about the last item, but agreed that a review and recommendations for improving the status of biology education in the Maritimes needed to be prepared and submitted to the ministers of education in each Maritime province. At that meeting, the members reviewed abstracts of papers submitted for presentation at the Polytechnical Seminar to be held in conjunction with the first Science Planning Seminar at Halifax. Fifteen of the 17 submitted were selected.

The next meeting was held on May 22, 1964, at NSTC in association with the Science Planning Seminar. The committee approved the organization of a joint university student-professor field trip under the general supervision of Dr. Chalmers Smith of Acadia and the establishment of an inventory of university staff, equipment and research interests as co-ordinated by Dr. Stallworthy. Criteria for the survey of the status of education in biology in the Maritimes were established. The representatives agreed that to ensure continuity and wider regional representation, the Executive should consist of a chairman, a vice-chairman who would succeed as chairman, and a secretary. The three officers elected were Dr. W.B. Stallworthy, Dr. A.R.A. Taylor and Rev. J.C. Cheverie.

Three working committees were established to conduct the survey on the quality of education in the schools in each province (Prince Edward Island - L. Drake and Rev. Cheverie, New Brunswick - Ian MacQuarrie and L.E. Aadlers, Nova Scotia - L.A. Dionne and O.T. Page). In addition, Page and Dionne were to propose qualifications for the science specialists grade for teachers, while Ian MacQuarrie, Sister Mary Lun and A. Rojo were to review the Grade XII biology course in Nova Scotia. A.R.A. Taylor served as the representative on the Curriculum Committee of the New Brunswick Department of Education and L. Drake as the representative on that of Prince Edward Island. The other sub-committees of APICS were urged to undertake similar studies on the state of science education in the high schools. Dr. B. Newbold of the Chemistry Sub-committee initiated a similar study for the chemists and assisted with the introduction in New Brunswick of the Chem Study Course prepared by the U.S. National Science Foundation.

Dr. Stallworthy presented the preliminary findings to the chairmen of the other sub-committees at the meeting of the Co-ordinating Committee on April 3, 1965. Dr. Newbold reported on a survey of curricula for chemistry. Similar studies were known to be progressing in Saskatchewan with respect to introduction of the Chem Study curriculum. There was general dismay that in the public schools, many teachers of biology and chemistry had no training in science. Except for mathematics where several universities offered summer courses at various levels, some advanced, there was little available for teachers to upgrade their qualifications.

Though freshmen courses in physics, chemistry and biology abounded during the summer months, few universities offered courses at the second and third year levels and then only occasionally. The Department of Education in Nova Scotia offered professional teaching programs during the summer months, but these were not recognized for university or professional credit. In general, the majority of education students were not interested in science per se, following the curricula laid down to obtain a Bachelor of Arts degree. The level at which a teacher was licensed was related to the number of courses successfully taken. Though specialist licenses were issued to those with additional qualifications to teach physical education, french, or home economics, there were no specialist licenses for those teaching science, nor were those designated as specialists entitled to recognition by higher salary. The salary for a combined Bachelor of Science-Bachelor of Education degree requiring five years of university study was $4,100 per annum, less than could be obtained in industry with a Bachelor of Science degree requiring three or four years of study. There was a lack of incentive.

The Biology Sub-committee recommended that APICS propose that departments of education establish high school specialist designations in the sciences. Dr. Trost, Chairman of APICS, suggested that the scope of the study be broadened and done in co-operation with the departments of education in each province and that the sub-committees prepare recommendations for consideration by the Central Committee, who would submit these to the university presidents through the AAU.

The findings and recommendations of the Biology Sub-committee were submitted to the provincial departments of education, the curriculum committees, and the high schools. Though the departments of education were sympathetic about the designation of specialists in science with higher remuneration, the school boards who did the hiring were reluctant to act.

Despite foot dragging by the school boards, the sub-committees obtained the co-operation of the departments of education with regard to improving curricula. Reports of the working groups on biology were presented at meetings of the sub-committee on April 21 and October 16, 1965, at Mount Allison. Progress included the introduction of new texts in the schools and a preliminary report on desired qualifications for high school biology teachers and science specialists. The committee recommended that the latter be a topic for discussion by the Central Committee and that other sub-committees of APICS be invited to present their suggestions. In response, the Central Committee of APICS established a Central Advisory Committee with respect to establishment of minimum requirements of a B.Sc. for high school science teachers and designation as science specialists, recommendations that were transmitted to the departments of education.

In Nova Scotia, a few pilot schools were selected by the Department of Education to test a new biology studies program introduced through the combined efforts of the Department of Education, Dr. MacQuarrie, Sister Mary Lua and Dr. McInerney of the Biology Sub-committee. The comprehensive exam set at Boulder, Colorado was used to test students and the results compared favourably with those in the United States. The major concerns were:

1. deficiencies in laboratory equipment and basic items such as refrigerators and pressure cookers;

2. the need for teacher training and upgrading of qualifications;

3. resolution of scheduling problems that would permit a minimum of two single periods of instruction and one double period for laboratory work.

Further progress on improving high school curricula was reported at the sub-committee meetings on April 23, 1966 and May 27, 1967. The BSCS course was being introduced into grade X in Nova Scotia where suitable teachers were available and the special biology text in mimeograph form prepared by Dr. MacQuarrie and Sister Mary Lua was being introduced into grade XII. In Prince Edward Island, the BSCS program was being tested in a few schools with favourable results. While biology was taught at grades seven to nine in New Brunswick, the only high school biology course given was that introduced in 1951 as a senior matriculation course to be taught only in those schools that had adequate facilities. The newly devised New Brunswick curriculum called for three programs to be introduced at grade X, a simplified course for non-academics, a regular course for academic and technical students, and an enriched course where facilities were available. The program for grade XII included a regular academic course and where facilities permitted, an enriched course. In 1966, biology exams were written as a matriculation subject at 109 centres in New Brunswick.

Dr. Taylor's comprehensive report on the qualifications of teachers in New Brunswick revealed that of those teaching biology, 27% had no training in biology, 17% had some training, but not at the university level, and 43% had taken one or two university courses in biology. Thus about 60% of the teachers had what was classed as inadequate training as biology teachers. The most common degree in the high schools was the B.Ed. (43%); a few teachers had a masters degree in education, arts or science, but none had a Ph.D. The larger centres with the higher salaries had teachers with the highest qualifications, whereas teachers in many rural areas had low qualifications.

The surveys on teacher qualifications in the other provinces revealed a similar situation: biology courses were being taught by teachers who had few, if any, university courses in biology. There was a general lack of training in the sciences. The reports from the three provinces were combined and submitted to the departments of education and the presidents of the universities along with recommendations that:

1. the Maritime institutions of higher learning provide co-operative instruction in biology during the summer session, not only at the freshman level but in all other years for high school teachers;

2. the mechanics of establishing the courses and credits might best be managed by a committee under the AAU (Dr. O.P. Kamra of Dalhousie was subsequently appointed as chairman of a co-ordinating committee);

3. the Bachelors Degree in Science contains some professions pedagogical courses in conjunction with the introduction of science courses to the bachelor of education degree.

4. the departments of education establish standards for "specialist teachers in science";

5. publicity be continued on the need for qualified high school science teachers.

The provinces responded to the presentations by making some changes. In 1966-67, the P.E.I. Department of Education instituted bonus payments to teachers having specialist qualifications. MSVU established an annual course on the BSCS biology program in 1964 and by 1967, 40 high schools in Nova Scotia were using the program. Professor Fensom at Mount Allison established a series of workshops with participation by teachers and university professors as a means of upgrading biology teaching in New Brunswick through teacher involvement. The sub-committee was thus successful in bringing about a major improvement in the teaching of biology in the public schools, in catalyzing a recognition of the importance of science in the high school curriculum and of having adequately qualified people as teachers.

The Biology Sub-Committee was also active in pursuing faculty concerns. It viewed the financial support by APICS for visiting lecturers as an excellent means of broadening the teaching effort in Maritime universities and made full use of the program. Opportunities for research at the smaller universities were limited and the sub-committee recorded its support for a program that would enhance inter-university research projects. Major concerns at the smaller universities were lack of equipment, costs incurred in travelling to the larger centres and the availability of graduate students. The ability to attract graduate students suffered from the lack of funds for bursaries, the availability of jobs and the higher financial rewards in fields other than biology that lured away promising students. The committee gave its support to the establishment of a co-operative field station at Crystal Cliffs near Antigonish, N.S., by STFX. All of the universities opted in, but the stumbling block of $90,000 required for building renovations was not overcome.

The discussion document prepared for the Science Planning Seminar held at Moncton on May 27, 1966, on costs and projected budgetary needs of the sciences in the Atlantic region, was criticized and drew the following statements from the biologists:

1. that the estimates presented for technician salaries ($5,000 per annum) and cost of graduate student support ($2,000-$3,000) were too low in view of current experience and external pressures;

2. that the projected 1976 cost estimates for the Atlantic region were too high (the region, with 10% of the population and 8% of the total numbers of staff and students, had estimated costs of 13% of the total for the national estimate);

3. that a comparison of the actual amounts received by biology departments for research and graduate training were significantly less than the amounts estimated and that the number of technicians required was grossly underestimated;

4. that the report failed to present the full cost of education and research in biology because agriculture, forestry and other branches of biology were not included;

5. that Dalhousie and UNB had reached the limits of their facilities and staff for graduate studies in biology and required an infusion of staff and capital expansion;

6. that the smaller universities in the region were capable of carrying out graduate research in certain branches of biology, such as terrestrial and aquatic resources. In this connection the sub-committee campaigned for an extension of the Department of Agriculture's research grants to universities in the Atlantic region;

7. that departments with no graduate program still have a role to play in providing well-trained students for other graduate programs;

8. that it would be wise to avoid inbreeding in the Atlantic scientific community;

9. that Canada should not permit its graduate programs to develop in an unbalanced fashion in which non-Canadian students outnumber Canadian students. Such would be indicative of a failure of our educational systems and the need for corrective measures;

10. that an important inducement for students to enter graduate training is participation in research projects during the summer months. There is a need for scholarships to support the obtainment of such experience and the knowledge of whether or not a career in science is desired. The stipends for APICS summer student scholars was considered low in relation to other opportunities.

The sub-committee held a panel discussion on the teaching of elementary biology in the universities at its October meeting in 1967. The main speaker was Professor D.S. Fensom of Mount Allison and included presentations by Dr. Page of UNB, and Dr. L. Cameron of Dalhousie. This served to catalyze continuing discussions and exchange of information on teaching and laboratory methods at subsequent meetings.

In 1968, the sub-committee on marine sciences recommended that it be disbanded and that the responsibility for continued interest in marine science be sustained by the Biology Sub-committee. The Biology Sub-committee responded favourably and the Central Committee complied. Members of the Biology Sub-committee participated in discussions at a panel review of marine science sponsored by the SCC on August 7, 1969, at NSTC. Subsequently, the sub-committee supported the request by Dr. Wiles of Saint Mary's for financial assistance to students applying to take a summer course on marine biology at the newly established Huntsman Marine Laboratory at St. Andrews, N.B. APICS provided an annual grant for this purpose until 1974.

In 1969, members of the sub-committee organized the first undergraduate conference in biology. The initial conferences were informal and conducted without financial assistance from APICS. The students received some support from biology clubs and their university. Dr. D.S. Fensom championed the need for travel assistance for students attending the conferences, but it was not until 1973 that a grant in support of the student conference was made. The student conferences, arrangements for visiting lecturers, the summer student scholarship program and the APICS research survey dominated discussions at the semi-annual meetings between 1970 and 1974.

On June 14-15, 1969, the sub-committee met at Memorial and among other items, devoted attention to the proposed re-structuring of APICS and biology curriculum development in the Atlantic universities. The latter was the topic of a symposium based on a comprehensive review of university biology curricula.

In 1970, the Biology Sub-committee had reviewed biological science in the Maritimes in support of agriculture, especially in relation to the status of NSAC at Truro. There was strong support for developing the college into a degree granting institution with university status. Graduates of the two-year diploma course had to go to central of western Canada if they wanted to pursue a university degree. A working group consisting of the director of ARL/NRC, representatives from MacDonald College, the Ontario Agricultural College and NSAC met at NSAC in May 1971. The proceedings were distributed to concerned people. One recommendation was that the principals of NSAC and MacDonald College inaugurate a committee to scrutinize and report on developments in agriculture education pertaining to the Maritimes and make recommendations. Such a committee was evidently established, but their report was not released and the question remained in abeyance, though it resurfaced occasionally at meetings of the Biology Sub-committee, and was especially championed by Dr. A. Taylor of ARL.

During the seventies, MacDonald College, affiliated with McGill University, was undergoing structural changes that made automatic acceptance of diploma graduates from Truro to degree courses at MacDonald College less assured. The Biology Sub-committee, in 1976, therefore again made presentations to the Nova Scotia Minister of Agriculture and Marketing that action be taken to establish NSAC as a degree granting university. The presentation was favourably received by the Minister who replied that such a proposal made by NSAC was under consideration by MPHEC. In 1982, NSAC at Truro did become a degree granting institution.

The status and support for biological research in the Atlantic provinces and the exchange of information on developments at the universities were continuing topics of discussion at meetings of the committee held in conjunction with the annual Atlantic undergraduate student conferences. The closure of the Halifax Technology Laboratory by DFO in 1978 heightened that concern. The proposal by Dr. F.J. Simpson for the establishment of an APICS teaching award resulted in lengthy discussion and general opposition. Instead, a two-tier Young Scientist Award was proposed, one to go to the larger

universities and one to the smaller universities. Eventually, the Biology Committee went on record as agreeing to the concept of a teaching award, but expressed great concern over the means by which the award would be implemented. In response to the discontinuance of the summer student scholarships, the Biology Committee recommended that four summer student scholarships in biology be awarded in 1981, with the selection made by the Biology Committee from applicants with first class honours, that the awards be held at an institution other than their own, and that the host institution or supervisor guarantee the salary. There was no action on the proposal.

The annual Atlantic universities biology conferences held each spring, usually in March on a weekend, had gradually grown in stature and became the main focus of activity by the Biology Committee. In addition to providing students with experience in presentation of scientific papers

and stimulation of working relationships between students in different universities, the conferences were directed at heightening an interest in biology as a career. The conferences were organized by the students and were rotated among the universities in response to invitations from sponsoring universities. Financial support was provided by services from the host institution, registrations fees that usually included the cost of meals, banquet and a concluding student dance ($40). The grant from APICS steadily increased from an initial $500 in 1973 to $1,500 in 1984 and $2,500 in 1987. A special grant of $5,000 was made in 1983 for the conference held at Memorial. The funds from APICS were used to help defray travel costs by students or occasionally to help defray travel costs by invited speakers. The meetings consisted of papers presented by undergraduate students, a special lecture or seminar by invited speakers, a closing banquet and dance. Occasionally the host institution would arrange a field trip. The business meeting of the committee was held in conjunction with the conference. In 1977, a best student paper award of $75 (increased to $100 in 1983) was made and subsequently following the example of the geologists, a plaque was prepared for inscribing the names and institution of the successful students to be held for one year at the university of the winning student. The award and plaque became a motivating factor in raising the standard of presentation. Over 200 students attended the conference at STFX on March 8-9, 1974. By 1976, the one-day conference had been expanded to two days with one or two invited speakers on a selected topic. In 1985, poster sessions were introduced in order to accommodate the increasing number of student submissions and at that meeting a cash award was provided by NSAC for the best poster. The committee continued to utilize the visiting lecture program of APICS fully through a grant that ranged from $1,000 to $1,200 a year.

In October 1984, ten years after the first study of university biology curricula, the committee held a one-day workshop at Acadia on first-year university biology instruction. The topics were: "What's being done now? What objectives do we have for our program? How do we meet the objectives? The discussion was a sharing of ideas, but no conclusions were made. The annual discussions became known as the annual teaching workshop. In 1985, Dr. B. Newsome completed an "Inventory of Biological Research in Atlantic Canada" from submissions made in 1984. The fifty-page document was distributed with the objective of stimulating more collaborative research. An analysis of the data and discussions between members of the committee drew the conclusions that support for biological research came from a diversity of sources, that funds were becoming more difficult to obtain, and moreover, because of general budget cuts, that some research funds were being used to fill gaps in higher education activities. The smaller universities were feeling the pinch more than the larger institutions, including the ability to obtain funds for travel to committee meetings. The committee held a workshop on honours biology programs at Atlantic universities on November 14, 1987, at UPEI that served as a forum for discussion on the merits and disadvantages of each program, the impact of various interactive factors including those of other departments and funding. Dr. B. Rao undertook to prepare the proceedings for publication.

The concern of biologists and their active promotion of improved teaching standards in the public schools continued throughout the first 25 years of the committee's existence. The committee had a major impact on improving biology curricula and teacher qualifications in high schools in the Atlantic region. During latter years, the attention of members began to shift towards examination of university curricula in view of the advances in interdisciplinary

biological activities and changing standards in Atlantic universities. Diminishing support for research became a reality, one that intensified the need for inter-university co-operative activities.

Chemistry

The Chemistry Sub-committee was established at the inaugural meeting of APICS in 1962. Initially, the members responded to questions concerning operational, procedural and policy questions from the Executive and Central Committees and were involved in preparations for the Polytechnical Seminar held as part of the second Science Education and Research Planning Seminar at NSTC in May 1964. The sub-committee also provided lists of nominees for possible appointment to advisory committees of the Defense Research Board. In co-operation with the Biology Sub-committee, the sub-committee undertook a review of the teaching of chemistry in the public schools. Members assisted in the introduction of the Chem Study Course into the schools in New Brunswick.

Because the same people often were involved in the activities of the sub-committee and the Atlantic section of the Chemical Institute of Canada (CIC), the two groups frequently combined their efforts. Jointly, the two groups sponsored and organized annual visiting lecture tours. Under the APICS Visiting Lecture Program, speakers (usually two or three) from Atlantic universities were initially selected by nomination and ballot, but later were chosen by one member of the committee serving as speaker tour co-ordinator. The initial grant for the lecture tours was approximately $500 per annum with support restricted to travel costs and the host institution responsible for local costs. APICS gradually increased the grant, attaining $1,900 per annum by 1984.

The CIC and the Chemistry Sub-committee collaborated in organizing and sharing costs of bringing speakers to symposia and organizing student conferences. A prize of $50, later increased to $100, was awarded to the student presenting the best paper. The sub-committee's business meetings were held in the spring, usually at the time of the student conferences, and again in the fall. The successful student conferences were initially held every second year until 1985, when following the successful ninth student conference at Saint Mary's, Mount Allison hosted the tenth Student Conference on Computers in Chemistry. At that conference there were 93 participants and prizes were awarded to students placing first, second and third in the competition for the best paper presented. APICS provided a grant of $1,500 for the 1985 conference. The student conferences thereafter became an annual spring event with the 1986 conference on natural products and related drugs being held at Université de Moncton. Two of the sessions were conducted in English, the other in French. The 1987 conference, the twelfth, on Chemistry and Biotechnology, was held at Acadia.

In preparation for the Third Science Education and Planning Seminar, "Science Planning for the Seventies", held at Université de Moncton on May 27, 1966, the sub-committee gathered information on current overhead costs, impediments to and support for research in chemistry in the Atlantic region and prepared a brief for presentation. There was overwhelming agreement among the chemists that institutions in the region were in an underprivileged position for conducting research because of the heavy teaching load, the lack of funds to purchase or secure

access to equipment and inability to obtain operational funds. The low representation from the region on the award committees of NRC was a contentious issue, and the recommendation was made that NRC could assist with increased grants to Atlantic universities by president's or dean's grants as a catalyst for research in small universities. Implementation of the Bladen Commission recommendations on financing research was strongly supported. The members believed there was ample evidence that Atlantic universities had and could attract good scientists, but retention required more favourable conditions for research and maintenance of expertise. NRC responded to the brief by increasing the president's grants to Atlantic universities; subsequently, Dr. Z. Valenta of UNB was appointed to the Chemistry Awards Committee.

In addition to exchanging information of particular interest to the research and teaching activities of the individual members of the sub-committee, the members were active in discussing and presenting to the Central Committee their conclusion about curricula modifications, the exchange of information about instructional films, the criteria for selection and stipend of students for summer scholarships. In 1969, at the instigation of Dr. K.H. Adams of Mount Allison, the sub-committee undertook a review of courses offered in summer schools with the objective of providing some co-ordination between universities, avoiding unnecessary duplication and examining the possibility of rotation and pooling of funds to permit chemists within the region to move to another institution to present selected courses. The survey led to the realization that if co-ordination of summer school courses was to be effective, the transferability of credits between Atlantic universities was essential. The sub-committee presented the results of the study to the Central Committee and recommended that the Central Committee organize a meeting of representatives from science departments of Atlantic universities for the negotiation of a schedule for transfer credits of winter and summer courses. The Central Committee declined to act. This resulted in a strong sense of frustration and anger among members of the sub-committee as recommendations and proposals made by the Chemistry Sub-committee had to be forwarded to the Central Committee for action, but often no action was taken and no response made.

The Chemistry Sub-committee first raised the question of establishing an APICS research award in 1964, initially for a chemist in the Atlantic region under the age of 35. The financial situation of APICS did not permit this though the merit of establishing an award was not questioned. The chemists were persistent and a request for funds to establish an award was forwarded annually to the Central Committee. It was not until 1970, following the Fifth Planning Seminar held in Truro, N.S., that the Executive and Central Committees decided to proceed. The sub-committee was asked to propose criteria and selection procedures. Consequently, they submitted a list of criteria and procedures for a Young Scientist Award which formed the basis of the award program. The initial award was granted in 1972.

Previous to the Fifth Planning Seminar, the sub-committee established a working committee to develop long range plans in the Atlantic region for chemistry. The procedure adopted was to circulate a list of topics and ask for feedback on priorities. Only six replies were received and these listed entrance requirements, transfer of credits, summer school rationalization, the employment crisis in science, promotion of research programs of specific interest to the Atlantic region, and the NRC policy on funding research. The information formed the basis for the submission to the Fifth Planning Seminar.

During the late seventies, the chemists expressed concern about the lower quality of students entering the sciences, a topic that was discussed at each meeting. There was a consensus that the main deficiency in students entering university chemistry courses was their inability to express themselves in written work and their problems with simple arithmetic and mathematics. The problem was communicated to the Mathematics Sub-committee and the High School Liaison Committee of the CIC for advice and suggestions on what could be done. The problem continued to plague the universities, some of whom, against their will, but in defense, established remedial courses for what they saw as a lowering in standards of education in the public schools.

The concern of the chemists was shared by the members of the Physics, Computer Science, and Mathematics Committees. At the meeting in 1975 at Memorial, discussion of a proposal to establish a joint effort by means of a Science Education Sub-committee occupied most of the time. The Computer Science Sub-committee raised two questions:

1. could the various disciplines all be represented on the Science Education Committee without making the proposed sub-committee unwieldy?

2. would the proposed Science Education Sub-committee possibly transgress on areas normally dealt with by the existing discipline sub-committees?

The latter question was pertinent as the Chemistry, Biology, Physics and Mathematics Sub-committees were involved in co-operative curricula development work with provincial representatives on core programs for adoption by high schools. Following the discussion, Dr. B. Liengme recommended that a joint meeting of the chairmen of the four committees be held prior to the next meeting of the Central Committee with Dr. A.G. Fallis as chairman. With the support of the chemists, Dr. Liengme proposed that a Science Education Sub-committee must represent all disciplines and all provinces. This could be arranged by having representatives from the various discipline sub-committees chosen for geographic representation. The representation should include teachers and high level government personnel, and where possible, a representative of the provincial curriculum committees. The discussions that arose out of this meeting eventually led to the holding by APICS of the First, Second and Third Science Education Seminars and the establishment of the Math, Science and Engineering Education Committee with the recommended composition.

In 1976, Richard Turle and Brian Lynch proposed that the sub-committee sponsor further development of the computer program "Kemstor", devised at STFX, that would provide each university with an accurate list of chemicals in inventory and could be used to assist in regional chemicals exchange system. The concept arose from a need to maintain supplies for undergraduate programs and the difficulty small universities experienced in obtaining small amounts of relatively rare compounds for research. The proposal died from lack of support, but A.R. Robinson did undertake to serve as a clearing house for programs developed by members for microcomputers as applied to chemistry teaching and laboratory technique. Over the years several PET compatible teaching programs were distributed such as titration-mole drill; logarithms and pH; symbols and valencies, nomenclature; stoichiometry, density, molecular weight; temperature; etc.

The joint core-curriculum committee of the Chemistry Sub-Committee and the Atlantic section of the CIC recommended that the Atlantic universities establish a master's degree in science education. Such would encourage high school chemistry teachers to update their background in chemistry and science in general and allow a high school chemistry teacher to improve qualifications by taking graduate or post-graduate courses. The brief pointed out that the lack of courses available in the region, the lack of an achievement goal for teachers, and the high cost of studies outside the region was resulting in stagnation and inadequate preparation of high school students for an increasingly science based economy. The proposal sketched an outline of what the requirements for the degree should be and suggested that the degree could be obtained through a combination of summer session, regular session and extension courses. The recommendation was not acted upon by the universities.

The Chemistry Sub-committee had a perennial concern with laboratory safety, particularly aspects which touched upon student exercises. There was an exchange of information on problems encountered by chemistry departments with regard to enforcement of safety rules, the security of laboratories and disposal of hazardous chemicals. The problem of liability insurance was frequently discussed at meetings. The sub-committee chairmen kept in close touch with negotiations about insurance that proceeded during 1980-82 between the CIC and insurance companies. Those members of universities with union contracts were advised to include a clause in their contract that would transfer individual liability of the employee to the employer. Saint Mary's was the first to do so. Since its inception, the Chemistry Committee conducted a periodic update of a list of chemists in the universities and government laboratories. In 1982, the list underwent a comprehensive update, including chemists in industry; the resultant Directory of Atlantic Chemists was published by APICS. Copies to those other than members, heads of departments and libraries, were made available at $4 a copy. The warm reception the directory received indicated that it met a need and it was updated in 1984. In 1986, the committee again undertook to update the directory and in addition compile information on chemistry classes including class outlines, textbooks, laboratory experiments and equipment utilized. The objective was to provide a base for establishing inter-university standards and assisting institutions in equipment sharing.

Dr. Michael Webb of Sir Wilfred Grenfell College, Corner Brook, Newfoundland, began a crusade in 1983 for support of a Canadian Journal of Chemical Education. Support was difficult to obtain as support for an earlier journal published by the CIC had failed. However, the chemists at Acadia initiated publication of a mimeographed description of experiments suitable for university as well as high school laboratories. Called Acadian Letters, it was supported by APICS by placement of an advertisement, amounting to an annual grant of $200.

The International Group on Fast Reactions in Solution held its first meeting outside of Europe in 1987 on July 12-15. The Chemistry Committee and Mount Allison were hosts and APICS provided a grant of $750 which was used to support travel costs of the keynote speaker, Dr. E.M. Eyring of Utah. Sixty scientists attended the conference. Mount Allison also hosted the First Maritime Inorganic Discussion Weekend on September 25-26, 1987, an informal gathering of inorganic chemists that included presentations of current research and discussion of problems.

During its first 25 years, the Chemistry Committee was successful in raising the standards of instruction in chemistry in the Atlantic region's public school system. By promoting the exchange of information between chemists in the Atlantic universities, the organization of lecture tours and special conferences the committee advanced the conduct of research in the region. The chemists initiated the call for the Young Scientist Award and were instrumental in establishing the science education seminars. It is difficult to place a value on the student conferences, but there is no doubt that the participating students would give their resounding approval.

Computer Science

Computer facilities were established in Canadian universities largely as a result of special supporting grants made by NRC in the late 1950's and early 1960's. Usage increased rapidly. Responding to a request from the AAU, APICS in 1966 established a special committee to examine the most economical way of providing computer services, especially the feasibility of central computer facilities for the Atlantic region. The initial report of the special committee, based on consultations with the universities during 1966-67, recommended that, because of the high cost and urgent need, centralized time-sharing computer facilities would best meet immediate requirements. The committee commended UNB for its work in improving computer facilities in the Fredericton area; it also recommended that Dalhousie, in consultation with NSTC and Saint Mary's, with assistance provided by NRC, take the lead and install a computer facility for the Halifax area with time-share access and adequate staff. The IBM 360 or Control Data 3300 configurations were recommended. Dalhousie acquired an IBM 360/50.

The presidents of the Atlantic universities became concerned about the burgeoning demands for computer services and costs. They looked to APICS for continuing advice on management of such services. APICS established a continuing sub-committee on computers consisting of a nucleus of members from the previously established special committee and representatives from member organizations of APICS. The sub-committee met frequently, about every two or three months, exchanging information about installation of new equipment at member organizations and possible structure of a regional computer centre for Nova Scotia. Two structures were discussed: an independent centre with a board of users and a centre operated within Dalhousie, but offering service to all users. Newfoundland opted for an independent centre to provide services to the university, Newfoundland and Labrador Power Commission, Newfoundland Medical Care Commission and the provincial government. Newfoundland and Labrador Computer Services Limited was established under the Provincial Companies Act with a board of directors consisting of appointed representatives from each of the four users. The board is responsible for staffing, equipping and managing Computer Services Ltd.

In Nova Scotia, the universities independently provided their staffs with what services they could. Three concurrent events added to the concern of the AAU and the Nova Scotia University Grants Committee about the lack of progress in formulation of a comprehensive plan for providing computer services in the Maritime provinces: a request from Dalhousie for funds to upgrade the IBM 360/50 to an IBM 360/65 before the reduction in the IBM educational discount was discontinued, requests from other universities in the Maritimes to upgrade their computer

facilities and an announcement from NRC that it was going to withdraw from providing grants for underwriting the installation and operational costs of computer centres in universities.

A.L. Murphy of the Nova Scotia University Grants Committee wrote to Dr. J.J. MacDonald, then chairman of APICS, on November 13, 1969, expressing what appeared to be a lack of co-operation among the universities with regard to co-ordinating facilities and making use of the one large instrument at Dalhousie. He urged that the APICS sub-committee bring in strong recommendations leading to settlement of the problem. If such required the services of an independent computer expert, funds might be obtained from NRC. Though he preferred that the universities solve the problem at their own level, otherwise, he would recommend that the provincial government act on the matter.

Dr. MacDonald immediately informed the presidents of the universities and on November 29, met with and presented a brief, "Analysis of the Present Problem of Computer Facilities at one University", to the sub-committee on computers. At that meeting the sub-committee concluded that an increasing number of scientists in the Maritimes needed greater access to computer facilities than could be financially justified in the light of existing requirements of any one institution and that the need for co-ordination of computer facilities in the universities should be assessed by a committee representing each of the universities. Such a committee was established. In 1970, the first operational link made was between the IBM 1130 at NSTC and the Dalhousie IBM 360. Later in that year, the IBM 1130 at STFX and the IBM 1130 at Mount Allison were linked to the IBM 360 at UNB. NSAC used interactive terminal services with Maritime Computers in Halifax.

The sub-committee on computers continued to meet and exchange information about equipment problems and training students in the usage of computers, the availability of training films and video tapes. Dr. W. Wasson of UNB recommended a series of tapes obtained from Kennedy and Solomon at the University of Kentucky entitled "Ten Statement Fortran". Members of the sub-committee contributed $100 each towards the $1,200 required to purchase the tapes which were then circulated among members. The co-ordinator for APICS, Mr. W. Barteaux, drew the attention of the committee to the summer scholarship and visiting lecture programs of APICS; and though occasional use of the visiting lectureship program was made, students applying for summer scholarships were generally unsuccessful. By 1972, BIO needed access to more computer capacity than it possessed, and after considerable discussion opted to support Dalhousie in acquiring a CDC 6400 computer to replace the IBM 360. This was installed at Dalhousie in late 1971 and by May 1972 was operating on a two-shift basis.

Approximately 1,200 students received formal programming training in 1971-72 at Dalhousie; selected high school students were being given training on Saturdays at Dalhousie and other universities in the region. High schools were beginning to take an active role in instruction and the industry was becoming active in promoting the sale of units to high schools. The difficulties encountered by inexperienced users at high schools and school boards in dealing with manufacturers became apparent; members of the sub-committee agreed to offer their services as consultants and to make available copies of general terms and conditions for satisfactory computer service contracts. Only a few high schools took advantage of the offer.

The sub-committee examined the merits of a proposed national computer linkage system (CANUET) and a proposed co-operative library interest group (CLING) for the deposit and exchange of computer programs. The two proposals originated in Ontario, but costs were beyond the resources of most universities in the Atlantic region. The possibility of an interactive centre in the Maritimes for CANUET was left to whatever host would be willing to give the greatest support. The sub-committee concluded that what support was available should go towards developing a regional network first, then linking with CANUET.

In 1973, members of the sub-committee decided that they should deal with science and related teaching matters and a separate committee, reporting directly to the AAU, should be established to consider hardware and computer services outside the field of science. This recommendation was considered by the Executive Committee of APICS and passed on to the AAU. The latter decided to have an ad hoc joint APICS-AAU committee examine the question and appointed Dr. Malcolm MacDonell, President of STFX; Dr. A.J. Motyer, Academic Vice-president of Mount Allison; and Jeffrey Holmes, Executive Director of the AAU as representatives of the AAU. Dr. W.A. Bridgeo, Chairman of APICS, appointed Dr. Wasson of UNB, Dr. A.W. Betz of Memorial, Mr. Caryi, Co-ordinator of APICS and himself as representatives of APICS.

The representatives of the AAU attended the meeting of the Computer Sub-committee on September 28, 1973 to obtain an idea of matters the sub-committee dealt with and then met separately. They recommended (a) that no specific terms of reference be set for the APICS Computer Sub-committee until the APICS Committee on Roles and Structures had time to report; and (b) that a committee be established to advise the AAU on the academic, administrative and political aspects of campus computers. The committee would be composed of a university president who would act as chairman, academic vice-president, business officer, registrar, chairman of the APICS sub-committee on computers, and two other members of that sub-committee representing other provinces, with the executive director of the AAU acting as secretary.

Subsequently, the AAU decided to delete formal representation from the APICS sub-committee and appointed three members from the academic community who were nominated by Dr. Bridgeo. The AAU committee prepared and submitted a proposal on computer networking to the Department of Communications and requested funds to hire professionals to carry out a survey of computer usage and existing links between universities in the Atlantic universities. Professor Ron Mackinnon, on leave from STFX, was appointed to study computer usage, science and educational needs, and usage potential in Atlantic universities.

Whereas the first use of computers in the Atlantic region was research oriented, application of the technology rapidly diversified with computer science courses being taught and increasing use being made for administrative data processing. The Computer Sub-committee believed that it should continue to be concerned with computer science as an academic discipline. Professor MacKinnon recommended that UPEI be added to the New Brunswick Education Computer Network as a formal member and that a working network committee report to a board of directors consisting of the university presidents of

New Brunswick and Prince Edward Island institutions and the chairman of MPHEC. He proposed an analogous arrangement for Nova Scotia and for Newfoundland, a similar arrangement incorporating the College of Trades and Technology and the College of Fisheries. Following submission of the report, no action was taken and everything appeared to be in a state of limbo.

In the spring of 1975, A.A. Mufti of Acadia, acting on the recommendation that the sub-committee confine its activities to computer science and education, proposed that the membership be broadened to include those in charge of computing courses in Atlantic institutions and that the mission be to:

1. promote computer science as a catalyst for new research and other activities in those areas which characterize and stimulate modern universities and form the basis for a technological economy;

2. maintain a file on computer facilities in the Atlantic region;

3. discuss computer science courses at the graduate and undergraduate level and the theoretical and applied research being conducted at Atlantic institutions.

The sub-committee accepted the thrust of the proposal and passed a motion that a group of university computer centre directors be formed under the auspices of the AAU to attend to co-operative administrative service and hardware aspects. Mr. Bart Claus of UNB and Dr. A. Mufti presented the motions to the Central Committee at the fall meeting in 1975. The Central Committee concurred, but recommended that the initiative for the establishment of a committee at the directors level, and responsibility for reporting channels, be the responsibility of the computer centre directors and the AAU. The Central Committee asked for a definition of computer science.

As a result of discussion at the meeting of the sub-committee on September 26 at Mount Allison, A. Mufti agreed to write to the AAU asking that a directors' committee be formed under the auspices of the AAU; he also contacted the academic vice-presidents (or deans of science where appropriate), outlining the changed role of the sub-committee and asking that the institution's representation be reviewed and new appointments made as required. The following terms of reference for the APICS Computer Science Sub-committee were adopted:

1. The role of the committee is to promote computer science "as a catalyst for new research and other activities in those areas which characterize and stimulate modern universities and form the basis for a technological economy".

2. The committee should maintain a liaison with computer centre directors in the Atlantic region.

4. The committee should discuss computer science courses at the graduate and undergraduate level; also discuss computer science - the theoretical and applied research being conducted at Atlantic institutions.

At that meeting the sub-committee considered a proposal for establishment of a Science Education Committee, but withheld endorsement until more information was available on how disciplines would be represented and whether such a committee would duplicate the efforts of existing sub-committees.

The request for a definition of computer science, and information about the academic programs at each institution during 1976, brought forth a variety of definitions and detailed outlines of courses being offered. The submissions included a comprehensive statement of computer science goals, an outline of the honours program at Memorial and the proposals of Memorial and Acadia for a master's program in computer science. The plethora of definitions made the task of selecting one difficult, as each depended on underlying concepts of how computers were being used. A. Mufti listed the definitions and asked for a vote. That most acceptable was suggested by W.D. Wasson of UNB: "Computer science is devoted to the representation, storage, manipulation and presentation of information and to the study of the algorithms and the corresponding hardware/firmware/software systems required to implement these actions".

An illustration of the rapid growth in computer science education was the appointment in 1976 of Dr. A. Mufti as head and sole member of the Department of Computer Science at Acadia and growth by May 1978, when Dr. Mufti moved to TUNS, to a department of nine and establishment of course work leading to a bachelor of science degree in computer science at Acadia.

The Computer Science Committee met each spring and fall with different universities acting as hosts. The spring meeting usually was a discussion and planning session for major projects, such as the student conference; the fall meeting, which was always well attended, consisted of discussion topics, workshops, presentations of papers by students and lectures by guest speakers. Computer science curricula, computer science education in the high schools, educational goals, needs of the market place, effective teaching methods and tools were some of the subjects discussed. The workshops focused on special topics, such as the teaching of introductory courses or the use of microcomputers in education and research, innovations in computer science curricula and standards for a master's degree. Workshops on the use of microcomputers in high schools and on computer modelling of various processes and experiments organized at the Science Education Seminar in 1980 were popular with participants. Little use was made of the visiting lecture program of APICS; rather, the emphasis was placed on the annual student conference, workshops and special projects.

The committee conducted periodic surveys of computer science research and maintained a cross-listing of computer science courses available in Atlantic universities which proved to be a valuable resource for counselling students. Members of the sub-committee were directly responsible for developing a high degree of co-ordination in courses offered at Atlantic universities, and exchange of course credits. The committee established a computer based information exchange and message system that was initially operated out of UNB with a starting grant of $200 from APICS. In 1980, the committee conducted and published a survey of computer usage in Atlantic industry; the survey revealed that little innovation in the use of computers was occurring, a deficiency that the committee did what it could to correct by periodically repeating the survey and suggesting solutions.

In 1981, the committee established a student programming competition with an award of $100 for the best program and began publication of symposia held at its meetings. In 1982-83, the committee also undertook a survey of first-year courses in computer science at all Canadian universities with the goal of summarizing similarities and differences in syllabus across the country. W.D. Wasson of UNB wrote a review article entitled "New Developments in Computer Science-Education and Practice" which was reproduced and made available by APICS. By 1983, with 84 registrants (42 students) and 17 student papers presented, the annual student conference had become a significant event for those associated with use and application of computers in Atlantic universities. The 1984 conference had 125 registrants and the grant from APICS in support of the committee's activities had grown to $2,750. The 1985 fall conference on artificial intelligence at Dalhousie was similarly well attended. Memorial was host to the 1986 conference for which APICS provided a grant of $4,000 to help defray student travel costs. There was no general theme; papers covered the whole spectrum of computer science. The 1987 conference was held at Acadia on the occasion of its 150th anniversary.

In 1984, the committee undertook to prepare a position paper on "A Policy for APICS on Computers in Schools". After reviewing the draft that fall, Dr. Heald, Chairman of APICS, recommended that the title be "A Policy for Education Departments on Computers in Schools" and a revised draft be submitted to the ministers of education in the four provinces for comments. The concern of the committee was that though much attention was being given to the purchase of hardware, no consideration was being given as to the configuration required for a predetermined program of instruction. No curriculum had been established nor was there any commonality between schools as to standards of achievement. A survey revealed that 90% of the funds were being spent on hardware, whereas the standard rule of thumb, based on past experience, was one-third on hardware, one-third for software and one-third for personnel costs and training. The brief urged that a standard curriculum be established and that two in-service training courses for teachers be organized, one for those responsible for teaching computer science and another for those wishing to use the computer as a teaching tool. A final draft of the position paper was prepared by S. MacEachern and B. Fawcett.

Members of the Nova Scotia Department of Education met with the committee on June 28, 1985, to discuss the report; subsequently, the minister of education for Nova Scotia, the Honourable T. Donahue, responded in writing, outlining activities underway and acting on several recommendations. The department established in-service training courses which focused on formulating a computer education policy, supporting teacher training and establishing curriculum objectives. Nova Scotia established a resource centre to provide mobile training and demonstration facilities for various hardware and software configurations. In co-operation with other education departments across Canada, the province entered into a co-operative program to share information and to identify and evaluate educational software. The committee was delighted with the response; however, there was no response from the other Atlantic provinces.

Members of the Computer Science Committee deserve accolades for their vigorous leadership in the development of computer science in universities in the Atlantic region, especially the establishment of comparative courses in the different universities so as to allow the transfer of credits. The committee provided direction and assistance in the teaching and management of

computer usage in the high schools. Unfortunately, relatively few high schools outside of Nova Scotia took advantage of the expertise and experience freely offered by members of the committee.

Engineering

The sub-committee was convened at the inaugural meeting of APICS on the 26 May, 1962. At that meeting the sub-committee strongly recommended that, as in Nova Scotia, all senior and graduate work in engineering was done at NSTC while pre-engineering work was carried out at other universities, and that as a close liaison of faculty and research activities was required, APICS allot funds to support the exchange of engineering faculty on a yearly or shorter term basis and provide funds to support summer research fellowships of about $1,000 each. APICS was urged to provide support for periodic technical seminars such as one on fluid mechanics. At a meeting of members on December 27, 1962, it was also recommended that funds (about $500) be made available annually to support short lecture tours by faculty members. The recommendations for lecture tours and student summer scholarships were acted upon by the Central Committee. The symposium on the "Teaching of Fluid Dynamics" was held as part of the polytechnical seminar of the Second Science and Education Planning Seminar held at NSTC on May 22, 1964.

The sub-committee was inactive until 1967 when Dr. R.J. Kavanagh convened a meeting on October 28 at UNB to discuss involvement in the Fourth Science Planning Seminar planned for May 1968 at UNB and the possible role of the sub-committee. It was noted that a number of APICS summer research scholarships for engineering were not filled, which was attributed to the relatively low stipend; yet mechanical and electrical engineering students had difficulty in obtaining work in their fields of study. Though NSTC and UNB
had used the APICS visiting lecture program to exchange engineers, the program was not being used by engineering schools in other universities. At a meeting held at Université de Moncton on May 30, 1969, the sub-committee questioned the rule that student summer scholars be required to hold these at institutions other than their own. The recommendation was that students be permitted to hold scholarships at their parent institution when no other university in the Atlantic provinces was engaged in the area of research being sought, and when the language of instruction at a university was such that the only applications received for scholarships come from within that university. The Central Committee agreed that such would be allowed, but that each instance would be decided on its merits. The occasion to do so evidently never arose.

The sub-committee next met on January 30, 1971 at NSTC. The role of the sub-committee was again a topic of discussion with a suggestion that student conferences on specific subjects of interest to undergraduate students be organized by the students under the guidance of the sub-committee. In view of the apparent scarcity of jobs for engineering students, Dr. F.R. Wilson of UNB, undertook to compile records of employment characteristics of B.Sc. engineering students in the Atlantic region as a base for evaluating future demand. The survey revealed that of students graduating, a relatively high percentage, 19%, intended to proceed to graduate work of whom 86% had summer employment. Of the remaining 81% who did not plan to proceed to graduate work, 80% had accepted employment offers. Engineering graduates apparently were doing as well as, if not better than, other science graduates.

The sub-committee met again in November, 1971 and supported the organization by students at UNB of the Fourth Congress of Canadian Engineering Students, March 9-11, 1972, having the environment as its theme. A grant of $1,000 was made by APICS. The role of the sub-committee was again a major item of discussion by Atlantic engineers attending the congress with the conclusion that the sub-committee serve (a) as a forum for the discussion of problems of engineering education in the Atlantic provinces, (b) as a nucleus for the arrangement of lecture tours and exchange of information, and (c) as a forum for philosophical discussions related to the engineering discipline in the Atlantic provinces.

During the next two years the sub-committee arranged several lecture tours, but the difficulty remained of carrying out a role distinctive from that of the various professional engineers' associations. In addition to the lecture tours, a suggested role was organizational support for workshops such as the effective teaching workshops organized by members of the American Society for Engineering Education at UNB in April 1972 and May 1973. In 1974, APICS provided a grant of $400 in support of the Third Annual Effective Teaching Institute's workshop held at UNB. APICS supported the effective teaching workshops for the next three years and increased the amount to $1,000. The workshops were organized by the staff at UNB and the Engineering Committee did not participate, nor did it meet. The financial crunch that APICS experienced in 1977, with the introduction of memberships fees, ended financial support for the workshops.

Several attempts were made to establish an active committee by various members of the engineering fraternity in response to pleas from APICS' Executive. Dr. W.M. Carson of TUNS polled the engineering community in 1977 and held a meeting on April 14, 1978, with representatives from each university, ARL and BIO. Though APICS was performing a useful role in support of science, the conclusion was that the committee should be abolished. Engineers already met routinely through their provincial and federal organizations and the variety of engineering interests made focus on any one issue difficult. APICS was at the bottom of a list of priorities prepared by members of the engineering profession. In the absence of an Engineering Committee, Dr. D.A. Roy of NSTC was appointed to Council as a representative of engineering.

In 1980, Dr. J. Read, Chairman of APICS, prevailed upon Dr. Roy to try once again to form an active committee. Dr. Roy canvassed the universities granting engineering degrees, obtained an outline of their major undergraduate programs and submitted a report in which he questioned the role of an engineering representative on Council. Dr. R.J. Kavanagh and R.M. Francis of UNB took up the challenge in 1981, but again received an uninterested response. In 1985, Dr. P. Heald, Chairman of APICS, tried again without success. As affirmed earlier, engineering, like agriculture, is too broad a subject to be covered by a single committee and as with agriculture, most needs of the various disciplines within the profession were already effectively being met.

Fundy Environmental Studies

In the late nineteen seventies, the rapid rise in the price of oil and increasing energy demands led to renewed interest in developing the tides in the Bay of Fundy for generating electricity. Scientists at BIO, ARL/NRC, Mount Allison (The Chignecto Research Group) and McMaster University began a series of studies on the geology, hydrodynamics and biology of the Bay of

Fundy. The interdisciplinary nature of the studies increased with the involvement of scientists at other institutions, namely Acadia, Dalhousie, UNB, several federal and provincial government agencies and commercial firms. Dr. W. Ford, Director of BIO, recognized the need for an umbrella organization to co-ordinate the multidisciplinary and inter-sector activities that included social-political input in addition to science and engineering. He suggested that APICS would be an appropriate body. Dr. Don Gordon of DFO and Dr. Fred J. Simpson, Director of ARL/NRC, prepared a brief to APICS recommending the establishment of a Fundy Studies Committee. The discussions occurred as APICS was examining a revised structure that included membership fees and committee representation on a Council replacing the sub-committees and the Central Committee.

The proposal was that the Fundy Environmental Studies Committee would consist of scientists and engineers who were currently meeting informally to review and discuss research and development work in the Bay of Fundy. The executive of the committee was to be drawn from members of APICS, but as the purpose was to organize broad and open forums for reporting and discussing work conducted in the Bay of Fundy and to stimulate research and public awareness as well as to institute forward planning, participation and membership would be open to all working or supporting work in the Bay of Fundy.

The concept of APICS serving as an umbrella organization for an interdisciplinary task force with membership outside of APICS was foreign to the current operating principles of APICS that restricted membership on its committees to those organizations who were members and who paid the membership fee. The need for a multidisciplinary task force was recognized, but there was opposition to having it under APICS. The question was referred to the Natural Resources Sub-committee whose Chairman, Dr. P. Ogden, supported the proposal, recommending that the Fundy committee be established separate from that on natural resources. On October 14, 1978, APICS' Executive Committee agreed in principle to the establishment of a Fundy Environmental Studies Committee as an ad hoc committee of APICS.

At a research workshop of the Bay of Fundy working group on November 22-23, 1978, hosted by the Chignecto Research Group at Mount Allison, the proposed formal organization under APICS, terms of reference and working relationship were discussed. Some participants preferred the existing loose relationship supported by DFO, the Department of Energy, Mines and Resources, and ARL, but the majority concurred that the socio-political and commercial engineering inputs required a non-government affiliation. The formal organizational meeting was held in conjunction with a work planning session on 19 February, 1979, at ARL, where Dr. Don Gordon of the Marine Ecology Laboratory of BIO was elected Chairman; Dr. M. Thomas of UNB, Vice-Chairman; and David Arnold of Mount Allison, Secretary. The terms of reference adopted were:

1. provide a mechanism for the convening of broad and open forums for the reporting and discussion of research conducted in the Bay of Fundy region;

2. serve as a central clearing house for the transfer of information among scientists involved in Fundy research and between these scientists and other groups;

3. function as a co-ordinating body for the organization of co-operative research programs in the Bay of Fundy region.

The committee was to consist of an elected executive, members of which would be drawn from the Council membership to hold two-year terms of office. The committee, however, would consist of representatives of organizations and scientists conducting or supporting research and development work in the Bay of Fundy, whether they be members of APICS or not. The executive was directed to schedule an annual meeting in each calendar year, at which election of officers and other business of the organization would be conducted, with other meetings of a special nature to be called by the executive as needed. The chairman and the institution of which he is a member was expected to host, or arrange for the hosting of, meetings during his term of office and the secretary to arrange for secretarial services. The chairman, or in his absence, the vice-chairman or secretary, represented the committee at meetings of Council and reported on the activities of the committee. In addition to the annual meeting, the committee was responsible for organizing workshops on current research, co-ordinating laboratory and field work, and planning symposia on specific topics.

The committee did, indeed, carry out its mandate, holding spring and fall workshops to co-ordinate the work in the Bay of Fundy and organizing special symposia on different aspects of the physical and biological attributes and environmental impacts of the Bay of Fundy and tidal power. APICS and the federal government agencies provided grants in support of symposia at which registration fees were charged, including the simultaneous translation in French and English at the larger summation symposium at Moncton. The proceedings of the symposia and some of the workshops were published as special reports either by DFO or by ARL/NRC. Bibliographies containing over 800 citations of publications and articles on all aspects pertaining to the Bay of Fundy were prepared by Dr. Gordon with the assistance of the librarians at BIO and ARL. Supplements were issued annually. An inventory of environmental data collected in the Bay of Fundy was prepared with the assistance of committee members and compiled by means of a contract let by DFO.
The workshops held in the spring prior to the summer's research were directed at presentations and reviews of work proposals and co-ordination of projects, especially those involving ships of BIO. Workshops in the late fall or winter consisted mainly of presentations and discussions of results. Participants in the workshops, planning sessions, field and laboratory work included representatives from Acadia, Dalhousie, McMaster, Saint Mary's, University of Guelph, Université de Moncton, UNB, the Atmospheric Environment Service, Atlantic Oceanographic Laboratory, Marine Ecology Laboratory, ARL, AGC, Canadian Hydrographic Service, Environment Canada, Environmental Protection Service, St. Andrews Biological Station, Huntsman Marine Laboratory, Inland Waters Directorate, Montreal Engineering Co. Ltd., Marine Resource Associates, Martec Ltd., R.H. Locks Oceanology Ltd., Canadian Wildlife Service, Nova Scotia Department of Environment, New Brunswick Department of Environment, and the Nova Scotia Tidal Power Corporation. Representatives from the University of Maine, the University of North Carolina, and the Department of Marine Resources, Booth, Maine, participated in discussions at the symposia.

Much work was done with normal university and government resources. The intensity of the effort during the summer months was significantly increased by use of the Canada Employment

and Immigration Department's Youth Summer Job Program managed by Mr. Don Robson of ARL. The Employment and Immigration Department provided funds to pay salaries and benefits for university students while ARL, AGC and DFO provided operational resources that augmented those provided by institutions to whom students were assigned by ARL. Under this co-operative arrangement, the students became active participants in the workshops and symposia and were allowed to use data obtained during the summer's work for their bachelors or graduate theses. Not only did the Youth Summer Job Program reinforce research being done in the Bay of Fundy, but through increased research activity and provision of required materials, strengthened the biology and chemistry departments of the participating universities. Several students obtained a masters degree under the program and some went on to successfully complete a doctorate degree at another university. The co-operative arrangement was considered by the Department of Employment and Immigration as one of the more successful applications of the Youth Summer Job Program in Canada. At the height of activity, 57 students were employed during the summer months.

The Acadia University Research Institute hosted a one-day workshop on the Annapolis River Tidal Development on December 20, 1979, at which selected members of the Fundy Environmental Studies Committee were invited to exchange information on the Annapolis River Basin and provide commentary on probable environmental consequences of a tidal power station at Annapolis Royal. This meeting was the forerunner of a research program on the Annapolis River ecology managed out of Acadia.

The 1980 fall workshop and annual meeting of the Fundy Environmental Studies Committee was held at UNB. The program and arrangements were made by Dr. Matin Thomas and included a field trip to Upper Rockport, N.B., the Peck's Cove mudflat to view ecological work being undertaken and to one of the proposed sites for a dam. There were seventy participants. The transactions of the workshop were compiled, mimeographed and distributed by Dr. Thomas.

A symposium on the Dynamics of Turbid Coastal Environments, nicknamed the Muddy Waters Symposium, was organized by Dr. Gordon and held September 29 - October 1, 1981, at BIO. Financial support was provided by DFO, AGC and ARL. Over 150 scientists participated in a review of research on turbid waters. The speakers presented data from studies on the Severn Estuary (Great Britain), the Seine Estuary (France), the Ems Estuary (Netherlands), the Elbe Estuary (Germany), the Yangtze Estuary and mudflats of China, the Mississippi Delta and estuaries on the east coast of the United States, the Knight Inlet and Fraser River in British Columbia as well as the Miramichi and Fundy Bay systems. The successful multidisciplinary and international symposium, the first to concentrate on the dynamics and biology of estuarine and turbid waters, was attended by over 150 scientists. The proceedings were published as Supplement 1 of the Canadian Journal of Fisheries and Aquatic Sciences, Volume 40, 1983.

The Nova Scotia Tidal Power Corporation and the Fundy Environmental Studies Committee sponsored a symposium at Université de Moncton on November 8-10, 1982 to review the acquired environmental data and re-evaluate predictions of tidal power impacts on the marine environment. The program was developed by Dr. Gordon while Dr. Lakshiminarayana of Université de Moncton made the local arrangements. Simultaneous French translation was available. There were four sessions: the first, consisting of invited review papers summarizing

research conducted in the Bay of Fundy since 1976; the second, a description of the most probable engineering design and options; the third, a reassessment of the tidal power impacts based on a review of data of the most probable sites; followed by the fourth session, a discussion including representatives from government agencies, environmental groups, politicians and engineering firms on the adequacy of the present environmental understanding and requirements from various points of view. Over 100 people
participated, including representatives from the media, in a lively discussion despite recognition that some inferences were tentative because of inadequate data. The symposium was taped and a special program based on the workshop content was prepared by the CBC for the television program, Land and Sea. The proceedings were compiled by Dr. Don Gordon and Dr. Michael Dadswell and published in 1984 by DFO as Technical Report No. 89 (Update on the Marine Environmental Consequences of Tidal Power Development
in the Upper Reaches of the Bay of Fundy) with a dedication to Dr. Fred Simpson on his retirement as Director of ARL and Chairman of APICS.

In 1983, the fall meeting was held at NSAC where the focus was on the biology and dynamics of the salt marshes. Dr. Gordon organized a workshop at BIO, February 9-10, 1984, on the construction of a computer ecosystem simulation model based on work being done by a group of Dutch scientists. Thirty people attended. A follow-up workshop was organized by Dr. Daborn on March 5-9, 1984, at Acadia on the further development of the simulation model. These were part of a co-operative effort on modelling involving Acadia, BIO and the Biologisch Onderzoek Ems-Dollard Estuarine group at Texel, Netherlands, which included periodic workshops at all three locations. The three groups participated in an international workshop held at BIO in June, 1984. Subsequently, the computer ecosystem simulation model of the Bay of Fundy was further developed as a method for examining interactions in coastal zone environment studies.

The regular fall meeting of the committee was held at St. Andrews Biological Station, N.B., on November 8-9, 1984, at which, in addition to the reports on the summer's work, a full day of study was devoted to the simulation model of the Cumberland Basin and of the Bay of Fundy/Gulf of Maine. At this meeting it was noted that the co-ordinating activities of the Fundy Environmental Studies Committee were now part of the U.S. Congressional Record as a consequence of testimony presented at a hearing in Maine, U.S.A., on the impacts of tidal power.

In 1984, with the major studies on the Bay of Fundy largely completed, ARL concentrated resources on compilation and publication of data from studies on the Bay of Fundy and withdrew from active field work.

Environment Canada, in order to facilitate the exchange of information between Canadian and American scientists with respect to probable impacts of tidal power, made a grant of $2,500 in support of a joint meeting of Canadian and American scientists. The joint meeting with the New England Estuarine Research Society was held at Yarmouth, N.S, on October 24-25, 1985. The meeting was attended by 19 Canadians, 32 Americans, one Netherlander, and 21 students. The first day was devoted to discussions on probable anthropogenic changes in sea levels in the Gulf of Maine-Bay of Fundy system, whereas the second day was devoted to the presentation of papers and a workshop on the computer simulation model. At this meeting it was announced that because of newly imposed budget constraints and the lack of further developments in tidal

power, the Marine Ecology Laboratory of DFO/BIO would conclude its work on the Bay of Fundy during the winter of 1985-86.

Though the work of the Bay of Fundy Environmental Studies Committee was largely completed, work at Acadia under Dr. Daborn continued on the Annapolis River as an in-house project. The committee did not meet in 1986 and at the Council meeting on April 24-25, 1987, the successful, interdisciplinary, project-oriented committee was disbanded.

Geology

The first meeting of the Geology Sub-committee was held on May 26, 1962, at the inaugural meeting of APICS. The participants reviewed the state of geology in the Maritimes, the actions that APICS might undertake and made several recommendations. The principal recommendation was that since access to expensive special instrumentation was critical to research progress, APICS should encourage the interinstitutional use of special instrumentation that existed in various universities and government laboratories and should act to obtain instruments that were lacking in the region. Instruments the region lacked included an electron probe analyzer, a high resolution nuclear magnetic resonator, an electron-spin resonator, an electron microscope with facilities for electron diffraction and reflection, an emission spectrograph, and a neutron activation analyzer. Though APICS was not in a position to directly provide grants for research, it might be in a position to accept grants from private corporations for specific or general projects. There was little support for the suggestion of making a key research appointment, one of the original objectives set by Dean Trost; rather, the participants believed APICS should act to make better use of geology specialists in the region by providing support for special short courses, visiting and exchange lecturers and extending co-operative projects, such as that for the geological sciences in field work at Crystal Cliffs in Antigonish County.Professor C.M. Allen, on behalf of the sub-committee, circulated a questionnaire to obtain information for an inventory of major equipment, student enrolment, staff projects and future plans of each department with respect to staffing, equipment and research. The resulting comprehensive document led to the conclusion that geology was not getting its fair share of the better students, largely because of omission of geology as a subject in the high schools. The recommendation was that geologists, in co-operation with the departments of education in each province, sponsor career conferences to students and organize field trips that would introduce high school teachers to geology. The survey revealed that the region's universities were offering a similar array of undergraduate courses dictated by requirements of curricula in the humanities, mathematics and supporting sciences. Senior courses and the few graduate programs offered were a reflection of the personal interests of professors. Geology at all universities suffered from inadequate staffing and space. There was unanimous agreement that Dalhousie and UNB should further develop and expand their facilities to offer graduate training in all major branches of geology.

At a meeting on November 9, 1963 in Fredericton, the sub-committee drew up guidelines for a proposed annual APICS award for scientific merit. Nominations were to come from each of the sub-committees with the final selection to be made by the Central Committee; thereby supporting the submissions of the Chemistry Sub-committee. Considerable correspondence and discussion about the proposal occurred with members of the Central Committee, but action was deferred.

The sub-committee, with financial support of $1,000 from APICS, presented a special course on Incident Light Ore Microscopy at NSTC in May 1963. The course, organized by Dr. G. Aletan, was part of APICS' effort to promote science in the region, especially to enhance communication among geologists in the fields of sedimentation, oceanography and pleistocene geology. APICS provided financial support for the commencement of a new quarterly journal entitled "Marine Sediments" with Dr. J. Stanley of Dalhousie as the editor.

Most members of the Geology Sub-committee believed that items of interest to geologists were covered thoroughly through existing established agencies, such as the National Advisory Committee on the Geological Sciences, its associated sub-committees and regional branches, the spring and fall meetings of the Nova Scotia Mines Branch, and the Maritime Geology Students' Convention held annually in November. Accordingly, the sub-committee did not meet between 1964 and 1967, though requests were made to APICS for financial support ($300) for the student conferences. The grants, however, were frequently returned as support from industry and registration fees were often adequate.

The sub-committee met on November 11, 1967, in conjunction with the geology students' convention at STFX, to discuss a proposal for an award for the best paper presented by an undergraduate student. The proposal was accepted and the Central Committee subsequently agreed to provide $75. On the recommendation of the committee, Dr. C. Milligan of Dalhousie prepared a field guide, and in co-operation with the Nova Scotia Department of Education, organized field excursions with selected high school teachers to demonstrate how geology influences the geography, history and economy of an area. Though participation by teachers was light, the field excursions were successful. Little use was made of the APICS visiting lecture program. The sub-committee arranged tours of visiting lecturers with expenses being paid by the host university, NRC, or through the Nuffield Distinguished Lecturer program. The exchange of lecturers, mainly between geology professors at Dalhousie and Memorial, was usually conducted without the use of funds from APICS until 1978 when it provided $500 to support a visiting lecture tour of geologists in the Atlantic region. Henceforth, the lecture tour by several speakers from Atlantic universities became an annual event with the annual grant gradually increasing to $1,300 by 1987.

UNB hosted a meeting of the Atlantic and Maine University geologists on November 7-9, 1969. Twenty university staff members attended, but the program was primarily an undergraduate student conference with 98 students attending. At that meeting, the first annual APICS student award of $75 was presented to the outstanding student speaker (David Constable of Mount Allison). The Geology Society presented an award to the student Geology Club presenting the best group of papers (Mount Allison). In 1970, Ricker College, Houlton, Maine, reciprocated by hosting the 1970 joint Maine - Atlantic Region Geology and Student Conference. The Geology Sub-committee did not conduct business at the joint meeting nor did it meet in 1971.

In 1972, Dr. E.R.W. Neale convened a meeting of the sub-committee at Memorial in conjunction with the Atlantic Universities Geological Conference to examine the raison d'etre of the APICS Geology Sub-committee. There was a wide ranging discussion which resulted in participants reaffirming the importance of the exchange speaker program and desire for its continuance.

Opinion was divided on whether the sub-committee was duplicating activities undertaken by other geological groups; participants suggested that the sub-committee be actively involved in interdisciplinary activities in Atlantic universities, particularly with respect to research on the environment and co-ordination of faculty interchanges between member organizations.

The sub-committee continued to meet once a year at the Atlantic Undergraduate Geology Conferences held in October or November, with presentation of the APICS award for the best student paper and the Geology Society's Award to the student chapter presenting the best group of papers. In 1973, the sub-committee published its first geology newsletter. A successful one-week training course for geological technicians in Maritime institutions was held in the spring of 1969 at UNB. A similar course was given in 1970 and in 1973. APICS provided $400 in support of travel costs for a two-day technician conference held at Dalhousie on December 3-4, 1973.

In 1973, Mount Allison began a series of special summer courses in geology. Known as the Summer Institute in Earth Sciences, they were supported by the university, the Canadian Geological Foundation and Canadian mining and oil companies. The summer course helped to alleviate a growing need for summer courses in geology for high school teachers, but the background knowledge required in geology was greater than that possessed by most teachers. In September 1975, Truman M. Layton, Science Consultant for the Nova Scotia Department of Education, wrote to Dr. Shaw of STFX, Chairman of APICS' Geology Sub-committee, about the problem of upgrading teachers in the area of geology and earth sciences. The geologists agreed to assist the universities in establishing specially designed summer courses for high school teachers without adequate background in geology. The sub-committee asked Mr. Layton to ascertain how many teachers would be interested in upgrading and how many might be interested in pursuing a major so that an adequate program could be established. The response from teachers was disappointing and insufficient to establish a program.

In 1976, with a grant of $500 from APICS to help defray travel costs, the Geology Sub-committee proposed a co-operative student exchange program in geology with UWI. The exchange of one student per year was to be subsidized by the host universities, the first two to be placed at Dalhousie and UWI. Unfortunately, UWI did not respond and no exchange occurred.

The role of APICS and proposed changes in structure were discussed at the fall meeting at Saint Mary's in 1977. The members emphasized that many of the functions of APICS had been carried out by geologists long before APICS was formed, as evidenced by the annual Atlantic Undergraduate Geology Conference begun in 1949 and the Inter-university Geology Field School at Antigonish that was in its eighteenth year. While endorsing the Summer Student Research Scholarships, the geologists noted that the stipend was small in relation to what students could obtain from industry and that awarding them to third and fourth year students did little to meet the greater need for assistance by first and second year students. So few awards were made to geology students that the program was of limited value. Alternatively, the sub-committee proposed that the funds be used to support the exchange of undergraduate students for an academic year between universities with the understanding that a full academic program be undertaken. Such was recommended as providing students with an opportunity to meet more of their peers, obtain a broader education, and facilitate inter-university co-operation. The funding would be restricted to travel costs between institutions and resettlement costs, but no stipend

would be paid. The merit of the proposal was recognized, but the scholarship program was under review and subsequently, APICS decided to abolish student summer scholarships.

Except for the award of $75 by APICS for the best paper prize presented at the student conferences, support for the annual lecture tour and the odd summer student scholarship, the co-operative activities of the geologists had been financed largely by industry, the universities and fund-raising activities of the students. In 1978, a contingency grant of $1,000 was made for the undergraduate student conference to be held in the fall at Acadia.

The contingency grant was not required, whereupon APICS followed with a contingency grant of $1,000 for the proposed student conference at Memorial in 1979. Again it was not required. In 1980, the sum of $750 was used from the contingency grant for the undergraduate conference at Dalhousie. The meeting was a tremendous success, but unfortunately marred by rambunctious activities of some students at a local hotel for which damages had to be paid. Subsequent contingency grants for undergraduate conferences were set at $750. The 1981 undergraduate conference was held at STFX and the 1982 conference at Mount Allison.

In 1982, the APICS Geology Committee undertook a survey of major equipment in universities in the Atlantic region and produced a document in table form which was distributed to all members of APICS and the Atlantic Geoscience Society. The listing was prepared as a basis for co-ordinating major equipment requests to NSERC. Geologists recommended that a regional x-ray fluorescence facility be established. Members expressed a concern about the somewhat overlapping activities of the Geoscience Society and the APICS committee, an overlap that frequently had been resolved by meeting at the same place. APICS' Executive did not view this as a problem, but rather as a reinforcement of each others activities.

In 1983, the award for the best student paper presented at the Atlantic Undergraduate Geology Conference was increased to $100. APICS also provided $400 to support a high school teachers' workshop on geology in Halifax on November 27-29. The 1984 geology student conference was held at Saint Mary's in November at which the career booklet prepared by the Canadian Geosciences Council and purchased by APICS was distributed to students. The contingency grant again was not required. APICS support for the lecture tour was set at $1,500 for 1984. In 1984, the committee commenced the annual preparation and distribution of a list of student theses in geology in preparation at Atlantic universities in support of co-operative research activities. The committee proposed that in addition to the $100 award for the best student paper, Council provide funds not to exceed $200 for a wall plaque to contain the names of all student recipients. The objective was to give more visibility to APICS by having the plaque displayed at the winning student's university for one year, then passed on to the university having the next year's winner. The proposal was supported and a suitable plaque was designed and presented in 1984. This innovation did heighten interest in APICS by students and was copied by other committees.

Two geology students died in a field accident in 1984, which prompted geologists to organize a public seminar on occupational safety for geologists to which students were invited to attend. The seminar was hosted by the Atlantic Geological Society and held at Dalhousie on September 25, 1985. APICS contributed $350 in support. Over 100 people attended, half of them students.

The proceedings were published by APICS. Under the chairmanship of Dr. Piper and with contributions from J. Colwell, R.A. Jamieson, P. Wallace, B. Crocker, S. Barr, G.C. Milligan and A. Logan, a guide entitled "Safety on Geological Field Trips" was prepared and printed by APICS and distributed. Demand was heavy as the guide attracted keen interest across Canada.

In 1985, the Atlantic Undergraduate Geology Conference was held at Acadia in November. The three-day program consisted of papers presented by students, special lectures by guest speakers, field trips and concluded with a banquet. The 1986 conference, having a similar format, was held at Memorial on October 23-26. Seventy students from six universities attended. The 1987 conference was held at Dalhousie and repeated the success of former conferences. The Geology Committee commenced making plans to establish a six-week field trip course for students, so that they could obtain experience that would avoid the trap of being unable to secure employment because of lack of experience. The committee began soliciting financial assistance from industry and government agencies.

APICS granted the geologists $1,000 from the New Initiatives Fund in support of a workshop organized in association with the Atlantic Geoscience Society on Petroleum Maturation Studies. The workshop was held at Fredericton in January 1987, with Lloyd Snowdon of the Institute of Sediment and Petroleum Geology, Calgary, as the keynote speaker. The success of the workshop led to plans to hold another workshop in 1988 on geological software, possibly in February at Antigonish. As all the workshop instructors paid their own travel expenses, illustrative of the value placed by participants on the workshop, the APICS grant was returned.

The synergy experienced by members of geological organizations in the Atlantic region is a sterling example of how scientists can meld resources from universities, government agencies, industry and APICS into common thrusts directed at the support and promotion of science and the training of students.

Mathematics and Statistics

The first undertaking by the Mathematics Sub-committee, initiated at the inaugural meeting of APICS in 1962, was the organization of the first mathematics summer school at Dalhousie in co-operation with the Canadian Mathematical Congress. Dr. A.J. Tingley of Dalhousie, Dr. R.L. Jeffery and Dr. K.D.C. Haley of Acadia met with Dean Trost and the Co-ordinator, Dr. D. Jamieson, on October 18, 1963 to discuss the proposal which received the support of Dean Trost. The course, primarily for graduate students and teacher specialists, was intended to run for six weeks and, for administrative simplicity, to coincide with the usual summer school classes. The Canadian Mathematical Congress offered financial support for one lecturer and APICS provided support for a second lecturer and scholarships for six science students. The registration fee was set at $10 and APICS provided a grant of $4,000. In addition to the students, 22 scientists attended the summer school held in 1964 at Dalhousie; the topic was "Advanced Algebra and Fourier Series".

Because of the success of the first summer school, the Mathematics Sub-committee and the Canadian Mathematical Congress (each contributing between $3,000 and $4,000) jointly sponsored two courses on mathematics at an advanced level during the summers of 1965-67,

with attendance rising each year to 44 in 1967. The subject matter and the instructors changed each year. The professors were recruited from British Columbia, Saskatchewan and Ontario, as well as from the Atlantic provinces. The high calibre and intensity of the courses attracted graduate students, scientists and some high school teachers. Dalhousie granted university credits for completion of each course. In 1968 the tuition fee was raised from $10 to $35.

The Canadian Mathematical Congress Summer Schools for school teachers at the elementary university level held concurrently with the APICS-Congress school received support from the Nova Scotia Department of Education and the International Nickel Company. In 1968 each contributed $7,500 and the total budget, including tuition fees, was over $40,000. The reputation and co-ordination of the two levels of courses, in addition to raising competence in mathematics, attracted teachers to the Dalhousie campus resulting in a greater impact than if the courses had been offered at separate times and locations. The high level of the APICS-Congress summer program attracted some participants from outside the Atlantic region.

The Mathematics Sub-Committee wanted to correct a lack of courses during summer school for students at the senior undergraduate level. As this was beyond the purview of APICS, they approached the Nova Scotia Department of Education. The department increased its grant, enabling a course in modern algebra designed for students at the junior and senior university undergraduate levels to be given by Father Ginivan in 1968. Twenty-five persons attended, of whom half were high school teachers. In 1969 the deficiency was met by the presentation of third-year courses in analysis and differential equations in the Teacher's Seminar School.

Although the APICS-Canadian Mathematical Congress graduate summer school was financed separately from the joint Mathematical Congress-Nova Scotia Department of Education Summer School, no effort was made to distinguished between the two in actual operation. Qualified students and teachers were admitted into either stream. Thus, participants were not conscious of any operational distinction and despite the care that was taken to feature the name APICS, the programs began to be referred to as "the Mathematics Summer School". There were more students from Dalhousie than from other universities. Dalhousie provided the facilities and indirect costs without charge.

Some members of the Central Committee, despite the obvious success of the joint APICS-Congress program, began to question why APICS was supporting a program that they perceived as being a Dalhousie summer school. There were no mathematicians on the Central Committee to state the sub-committee's case. The desire by the Central Committee to use the funds to initiate other projects, parochial interests and the perception that the summer school was just part of Dalhousie's summer school, prevailed. The Central Committee decided to reduce its contribution from $4,000 to $2,000 for the summer school in 1970, and ruled that further support be denied. The news was conveyed by the Co-ordinator, Mr. Barteaux, at the meeting of the sub-committee on October 15, 1969 and the reaction was less than polite, especially as arrangements for the 1970 program had been progressing for some time. The sub-committee protested vigorously on the grounds that less than 10% of the APICS budget was committed to the support of mathematics, and that a shortage of trained mathematicians was developing in Canada. The protest was to no avail. The mathematicians finally accepted the $2,000 of support for the 1970

graduate student summer school and organized the last of the jointly supported graduate summer schools.

When UWI became a member of APICS in 1967-68, the Mathematics Sub-Committee recommended that funds be made available for one student from the West Indies to attend one of the special graduate courses offered at the Dalhousie summer school. This was rejected by the Central Committee, but two exchange scholarships were awarded in other sciences. The sub-committee, however, continued to correspond with UWI, keeping them informed about the sub-committee's activities and the courses being offered in the summer school with the thought that an exchange scholarship would be awarded in the future. In 1969, another two students from the West Indies were granted exchange summer scholarships. Both scholarships were held at Dalhousie in sciences other than mathematics. Moreover, there were no awards to mathematic students under the APICS summer student scholarship program. The mathematicians, consequently, did not support the concept of student scholarships, recommended that the program be abolished and placed their emphasis on training projects and committee work.

Following the cancellation of financial support for the mathematics summer school, the Mathematics Sub-committee regrouped and through the office of Dr. A.J. Tingley and that of Father Ginivan, began to utilize the APICS visiting lecture program more fully, arranging the exchange of lecturers between Memorial and those on the mainland on a budget of about $500 a year. Dr. Tingley compiled a list of holdings of mathematical journals in universities in the Atlantic region for the use of the committee's members. During 1969 and early 1970, the sub-committee met to compile data and discuss requirements for mathematics in preparation for the fifth APICS planning seminar.

Dr. L.P. Edwards, Head of UNB's Department of Mathematics, reported the loss of support from APICS for the graduate summer courses to the Graduate Committee of UNB. The committee recommended that the Department of Mathematics organize a two-week regional summer research congress to be held at UNB during the latter part of May or early part of June, provided that support was made available from APICS. The cost of bringing 20 mathematicians and 10 students from the Atlantic region and two outside lecturers was estimated at $6,000. The university offered to provide facilities and secretarial services. During 1970 and early 1971, plans were developed by the sub-committee and by Dr. Brian Tupper, who succeeded Dr. Edwards as head of the Department of Mathematics. APICS pledged $1,500 provided that support was also obtained from NRC. In response, Dr. Schneider, President of NRC, who was concerned about the supply of mathematicians in Canada, suggested that a symposium be organized involving people from the universities, government and industry to discuss Canada's requirements for mathematicians and to decide which branches of applied mathematics should be emphasized in degree programs. President Schneider provided a conference grant of $2,500.

The Mathematics and Management Seminar, organized by Professor Z. Star and Dr. R. Lee, was held on May 10-14, 1971, at UNB. Sixty-seven people attended. There were ten lectures given by three invited speakers from industry, government and the universities, and twelve contributed papers followed by an open discussion with industrial managers. Copies of the presentations were distributed to participants and the NRC.

The favourable feedback from participants of the conference on mathematics and management prompted members of the sub-committee to arrange a similar conference on geometry, particularly in relation to teaching and curricula at secondary schools and colleges of the Atlantic provinces. The topic arose out of concerns about the poor grounding in geometry exhibited by university entrants. The proposal and a request for $4,000 was presented in the fall of 1971 to the Central Committee who deferred comment or action until the sub-committee presented a detailed program. The sub-committee thereupon began to prepare detailed plans for the seminar, while at the same time responding to the request of the Central Committee for feedback on potential topics for long range planning. The acting head of the Mathematics Department at UWI, Mr. Matin Aub and Mr. Ballamy of the Cave Hill Campus, Barbados, wanted to participate in the seminar on geometry and asked for travel assistance. Such was included in the submission of the sub-committee presented in March to the Central Committee. The Central Committee denied financial support. Unfortunately, the Co-ordinator, Mr. Barteaux, had resigned and there was no written communication of the Central Committee's decision to the sub-committee. The sub-committee eventually learned of the decision orally and without any explanation. Finally in the absence of a co-ordinator, Mr. Doherty of the AAU wrote to Mr. Tingley on May 11, informing him that the Central Committee rejected the proposal because it was submitted too late. The explanation of tardiness was incorrect and the consequence was bitterness within the sub-committee and disappointment at UWI.

The sub-committee proceeded with its plans without participation by APICS and held the seminar on geometry on May 26-28 at Dalhousie through arrangements made by Dr. Tingley. The highly successful seminar was attended by 71 people of whom 36 were high school teachers and 11 university students. Following the seminar, the word was passed down that the Central Committee did not wish to support seminars which emphasized teachers rather than research. The sub-committee thought this was a narrow operational focus, particularly as the health of research was dependent on a vigorous mathematics community and qualified university entrants. In addition other sub-committees were active in improving educational standards in high schools and were being supported. Dr. Tingley recommended that the mathematicians give serious consideration to withdrawing from APICS and continuing to work on their own. After ten years of superb leadership and diligent work, Dr. Tingley resigned. He was succeeded by Professor J. Ivan Dowling of UPEI.

The mathematicians met in October 1972 and expressed disappointment at the lack of support by the Executive and Central Committees for the study of mathematics, the selection of mathematics students for summer scholarships and the exchange of students with UWI. The sub-committee went on record as being against student scholarships and recommended that the funds liberated be used to sponsor seminars and workshops. The sub-committee then directed their attention to planning seminars to be held over the next four years with the first on application of topology to be held at Memorial under the chairmanship of Professor Blundon. A detailed proposal was prepared and submitted to the Central Committee in November 1972; the committee allotted $1,000, a sum similar to that being given to other sub-committees for their conferences. The conference, organized by Dr. S. Thomier, was held on May 7 - 11, 1973 and was an enormous success. The Marcel Dekker Publishing Company of New York City published several of the presented papers in its "Series in Pure and Applied Mathematics".

In June 1973, the sub-committee submitted a request to the Central Committee for financial support for a conference on applied statistics to be held at Dalhousie in May 1974, and one on specific aspects of Fundy tidal power with an emphasis on mathematical modelling to be held at Acadia in November 1974. The Executive and Central Committees urged that the organizers seek support from other government agencies and industries and asked the organizers to meet with them on November 17 to discuss funding. Subsequently, the Executive agreed to provide funds for each conference, but the total funds obtained were inadequate, resulting in cancellation of the Fundy power conference. The conference on applied statistics was held on May 2-4, 1974 as organized by Dr. R.P. Gupta. It was attended by 95 participants with presentation of 45 papers of which 20 were accepted for publication by the North-Holland Publishing Company.

The sub-committee obtained funds from APICS for travel expenses of lecturers for short seminar-courses held during 1974-75. The purpose was to bring together faculty and students from local universities and focus on topics of common interest. A short course on statistical mechanics was organized by W. Melnyk, W.R. Smith and Y. Tago and presented between January and April 1974, at different universities. During the winter of 1974-1975 a short course (APICS grant of $800) on optimization and applications with special reference to the Atlantic provinces, designed for graduate and advanced undergraduate students, was presented at Acadia, Mount Allison, Dalhousie, STFX, UNB and UPEI. The program was organized by the Secretary, Dr. W.R.S. Sutherland with arrangements at each university made by local members of the sub-committee. Subsequently, copies of the lectures in the short courses on statistical mechanics and that on optimization were prepared and distributed to each university. The travelling courses or seminars were well attended, especially as the topics and in-depth approach were beyond that available through normal university courses. However, these seminars required a major commitment of time by the speakers, were often interrupted by winter travel difficulties and were beyond the scope of APICS' finances; therefore, they were discontinued.

With financial support from APICS, I.B.M. Canada Ltd., NRC and UNB, Professors Tupper, Lewis and Lund of the sub-committee organized a successful conference on computations in algebra and number theory at UNB on August 25-28, 1975. The objective was to give people of varying interests and backgrounds an introduction to computational methods and computer usage in algebra, graph theory, mathematical programming and number theory, and to provide an opportunity for participants to participate in open discussion about application of the techniques. There were 104 participants who praised the high quality of the speakers and interdisciplinary nature of the program.

Following the conference, the members of the sub-committee discussed a proposal received from other sub-committees to establish a science education committee. The response was unenthusiastic since it was believed that such a committee would duplicate the main thrust of work by the mathematicians. The proposed revised structure of APICS, however, met with full approval as it would give mathematicians a voice on the Central Committee.

At the meeting on March 19, 1976, the sub-committee endorsed a suggestion by Professor T. Howroyd of UNB that the sub-committee hold an Atlantic Mathematics Day in conjunction with the annual meeting of the sub-committee with the host institution being responsible for the

program and exercising priority over selection of guest lecturers. The visiting lecturer program was discontinued as most universities were issuing invitations to specific people and covering expenses incurred. At the fall meeting on November 16, 1976 at Saint Mary's, the committee endorsed Dr. Star's suggestion that the committee publish an Atlantic Math Bulletin in the form of a newsletter and that it contain mathematical notes, survey and research articles of a non-specialist nature. The support of other committees of APICS was sought and obtained.

The first Atlantic Mathematics Day was held in conjunction with the spring meeting of the committee at UNB on May 6, 1977; it was here that the first edition of the Mathematics Bulletin, prepared by Professor Z. Star of UNB, was distributed. APICS provided a grant of $100 to cover paper costs for the Mathematics Bulletin. The second edition, published by the Department of Mathematics, Statistics and Computer Science of Memorial, appeared in October together with an "Inventory of Mathematical Interests", which was a list of mathematicians in the Atlantic region, their research interests and subjects taught, prepared by Professor W.J. Blundon. The inventory was updated in 1979. Another initiative was the development of an inter-university "Course Equivalents Table" that was periodically updated. The success of these ventures resulted in them becoming regular activities of the committee, each Mathematics Day having a central theme for presented papers, invited speakers, and an undergraduate student competition. The second Mathematics Day was held on October 20-21, 1978 at UPEI supported by a grant of $1,075 from APICS. The program included a problem solving competition by pairs of students; a $100 prize was awarded to teams from UNB and Saint Mary's.

Under the leadership of Professor C. Edmunds of MSVU, the sub-committee prepared a diagnostic test for students entering university. In September 1978, the test was given to more than 2,000 students and the results were used as background information for interaction and liaison with teachers' organizations.

On June 15-16, 1979, UNB (with support of $300 from APICS for speakers) organized a Maine-Maritimes mathematics discussion on falling enrolments, problems of interfacing with high schools and problems of inter-campus co-operation in improving classroom instruction. Thirty-nine people attended, eleven of whom were from Maine. The third Atlantic Mathematics Day, organized by Dr. R. Kruse, was held in October 1979 and was jointly supported by Saint Mary's and Dalhousie, and by APICS. The guest speakers were Anton Kutzig of the Université de Montréal and Fred Wan of the University of British Columbia. The theme was "Mathematics in Use" with an emphasis on applications of elementary analysis.

The sub-committee had issued a standing invitation to the presidents of the high school mathematics teachers' associations of the four Atlantic provinces to attend its meetings. At the April 11, 1980 meeting at STFX, the presidents from Newfoundland and Nova Scotia attended. Among the topics discussed were possible affiliation with the Canadian Mathematical Society without financial commitment. The committee again recommended that as NSERC was establishing summer student scholarships, APICS should abolish their program and devote more resources to student conferences and co-operative activities like education seminars. The recommendation to abolish the student summer scholarships was acted upon by APICS following a detailed review by Dr. Merrill Edwards. The committee made arrangements, beginning with Volume 5 under the editorship of M. Nutt at Acadia, for the Atlantic Mathematics Bulletin to be

fully supported by subscription. Subsequently, the editorship of the Mathematics Bulletin, which had been published on an irregular basis, was transferred to Dr. Edgar Williams of Memorial. At the time there were 18 subscriptions, nine from outside the Atlantic provinces. A major project was the updating of the Inventory of Atlantic Mathematicians and its publication in 1984.

The fourth Atlantic Mathematics Day was organized by Dr. T. Pham Gia and held at Université de Moncton on October 24-25, 1980. There were more than 80 participants, including some from Maine and Quebec, and 25 students from Atlantic universities. The fifth Atlantic Mathematics Conference was held at Memorial. Organized by Dr. Edgar Williams, it was another success with 110 attendees, five invited speakers and 30 students participating in the regular undergraduate student competition. The proceedings were published and distributed via the Atlantic Math Bulletin. The theme was "Accessible Research in Mathematics and Statistics". At this meeting, the members of the committee decided to honour Professor Blundon of Memorial for his distinguished service to the Mathematics Committee by establishing one of the lectures at the Atlantic Mathematics Day as the Jack Blundon Lecture. The first lecture was given by Dr. John Wilker of the University of Toronto at the sixth Atlantic Mathematics Days (1982) held at Dalhousie and organized by K.A. Dunn. There were 100 participants with 25 students writing the undergraduate competition. The above format became standard for subsequent Atlantic Mathematics Days, each having a different theme for contributed papers and each having an undergraduate student competition.

The standard of mathematics instruction in the high schools continued to concern members of the committee. At the fall meeting in 1983, the new high school mathematics curricula for Nova Scotia was the major topic of discussion. At the April meeting in 1984, Mr. Elchuck, Supervisor of Mathematics, Pictou School Board and Mr. McKillop, Mathematics Consultant to the Nova Scotia Department of Education, participated in the discussion. The intent of the new curriculum was to better prepare students for university programs such as science, mathematics and computer science and to provide advanced training for more mathematically-talented students. The Mathematics Committee emphasized the variability in competence of high school graduates, wanted a return to provincial examinations to ensure standards, and failing that, proposed that all students be subjected to a university entrance diagnostic mathematics test. The committee referred the matter to an ad hoc Nova Scotia committee with Dr. Dunn as chairman and passed a resolution that a diagnostic test be administered to each university entrance student with the results being given to the home high school. The proposal was submitted to the Dalhousie committee that was examining the possible establishment of university entrance examinations. The discussion on application of entrance diagnostic tests continued at the Seventh Mathematic Days (supported by an APICS grant of $2,500) held at Mount Allison on October 26-27, 1984, and at the meeting on April 27, 1985, at Université de Moncton. The universities took the recommendations under advisement.

In 1984, the name of the committee was changed to Mathematics and Statistics Committee to more accurately reflect the interests of members. As a new initiative, mathematicians at Acadia agreed to establish an electronic billboard for those institutions which subscribed to the computer NETWORTH linkage for notices of interest to area mathematicians. This became a popular means of exchanging news.

In response to the call for new initiatives in celebration of APICS' twenty-fifth anniversary, the committee held a problem workshop at Dalhousie on April 25-26, 1986. In addition to four guest speakers, individuals from science, government and industry were invited to submit in writing mathematical and statistical problems that they would like to have solved for discussion and possible solution at group workshop sessions. Eighteen problems were submitted ranging from Modelling Optimal Stand Density for Planted or Spaced Forest Stands to Modelling of Forest Landowner Behaviour to the Optimum Design of Ship's Curves. The organizer, Dr. J. Clements, co-ordinated follow-up activities that illustrated the application of mathematics to practical problems.

The eleventh annual Atlantic Mathematics Days held at MSVU on October 30, 1987, exemplified both its continuing success and popularity, a tribute to the work of committee members and cohesive support of mathematicians in the Atlantic region. In support of the Blundon Lectures, individual members subscribed a total of $4,000, a fund that enabled the committee to invite outstanding mathematicians as guest speakers (Dr. John Conway of Cambridge University in 1986 and Professor Ronald Eddy of Memorial in 1987). The committee decided to publish the Blundon Lectures as a special issue of the Atlantic Mathematics Bulletin.

Though the mathematicians in their endeavours did not conform to the standard format envisaged by members of the Central Committee, nevertheless they were effective in raising the standard of teaching in the Atlantic region, in improving the competence of students, teachers and professors and in developing mathematical science. In retrospect, they were innovative and went at tasks in the right way, augmenting their resources with those of others. The problem workshop organized by J. Clements illustrated one method whereby members of APICS could apply their expertise to the solution of industrial and scientific problems.

Math, Science, and Engineering Education

On August 20-22, 1980, APICS held a science education conference at Mount Allison. Over 250 people attended, half of whom were high school teachers. Following the conference, one recommendation made by the conference review panel, who met on October 4 at Queen Elizabeth High School in Halifax, was that APICS establish a High School-University Math and Science Education Committee which would encompass the Atlantic region and involve representatives from the different levels of government, high schools and universities. The mandate of the proposed committee was perceived as improving high school-university liaison, organizing workshops on special topics, and establishing standards for math and science teachers. The committees of APICS did not wholeheartedly endorse the concept because they believed that the efforts of the new committee might duplicate (or dilute) their own. APICS' Executive, however, decided to proceed.

The organizational meeting was held on April 11, 1981, at Mount Allison under the chairmanship of Dr. J. Read. Nineteen people attended, including representatives from provincial education administrations, teacher organizations (with the exception of Nova Scotia and Newfoundland), and government agencies. Though no formal terms of reference were formulated at this meeting, the discussion ranged over many topics: the need of workshops for teachers; the development

and distribution of a resource directory of science materials and formulation of teaching and resource modules with a maritime flavour; a list of speakers (university, government, and businesses) for relating science to application and to careers; a list of research laboratories offering tours for students and teachers; the possibility of serving as an advocate for science and as a co-ordinator of input to provincial curriculum committees. An executive committee was appointed consisting of Dr. Bob Hawkes of Mount Allison (Chairman), Professor Adeline Toussaint of Université de Moncton, and Dr. Tik Liem of STFX. A representative teacher from Nova Scotia and one from Newfoundland were to be added.

Dr. Hawkes immediately wrote to all who attended the meeting (and others with special expertise who had been identified as likely to participate) soliciting further input for a program of action. A meeting was tentatively scheduled for fall 1981. The response was disappointing, with travel costs to attend the proposed meeting being one impediment. APICS' Council granted $2,000 in support of the fall meeting and $400 for travel expenses for a meeting of the Executive, with the proviso that in future members be encouraged to look for other sources of travel funds such as provincial departments of education.

SCC had initiated a study of science education at Canadian elementary and secondary schools. As part of the study, it began in 1981 to issue a "Bulletin of the Science Education Study" every three months. This was forwarded to Dr. Hawkes by the Co-ordinator, Gillian Dalziel, along with information about FOSTER, a program operated by the Ontario Science Museum. Members of APICS suggested that the committee focus on a contribution to SCC's study. Bob Hawkes made a presentation to the study group when they met at Halifax in June.

Dr. Graham Orwood, Project Officer of SCC's study group, was the guest speaker at the fall meeting of the committee (eighteen members present) held on October 31, 1981, at Université de Moncton. Dr. Orwood outlined the objectives of the federal program and the three-phase, four-year study. The first phase, which was already underway, was identification of main issues and concerns of educators related to science education. The second phase was documentation of the characteristics of science education across Canada. (Twelve hundred fact-finding questionnaires had been distributed to schools in every province). The third phase was an attempt to answer the question "Where do we go from here?" in each province and region. Members of the APICS committee agreed to assist in the collection of data.

The committee was also informed about the Maritime Junior High Curriculum project sponsored by the Atlantic Institute of Education. The program, begun in 1977 under the direction of Dr. Charles McFadden, had undergone three phases: (1) a questionnaire to science teachers in the region which provided an overview of the situation in junior high schools; (2) a series of workshops at Maritime universities at which units on specific subjects in the curriculum were developed; (3) distribution of the units to schools and review of comments received. The feedback from these activities led to the conclusion that a major need existed for science textbooks suitable for grades 7, 8 and 9 in Atlantic schools with local and Canadian examples of the application of science to everyday life. Dr. McFadden stated that two years of work with the participation of over 100 educators had resulted in a draft of nineteen units that were being reviewed and class-tested. The need now was for specialists to check on accuracy, on appropriateness of selections, and on provision of examples of scientific developments and

activities in the region that could be incorporated. This was an area where members of APICS could help. Committee members agreed to assist and Dr. Fred Dobson volunteered to serve as a central resource person.

In 1983, the Atlantic Institute of Education was dissolved and continuation of the project was in jeopardy. Dr. Simpson, Chairman of APICS, wrote a letter of support for use by Dr. McFadden in seeking financial resources to continue the project. Dr. Simpson met with Wendy Paguette, Secretary of the Maritime Provinces Education Foundation and Assistant Secretary of CMP. She was supportive and influential in arranging for TUNS to act as the corporate body with respect to publication rights. Dr. Simpson appealed to the Honourable Serge Joyal, Secretary of State, Ottawa, for a grant from the National Program of Support for Canadian Studies. The Honourable Gerald Regan, Minister of State, expressed his support and concern that the project might flounder for lack of finances. On behalf of the committee, Dr. Bob Hawkes wrote to the departments of education and university presidents seeking their backing. Financial resources were made available by the federal and provincial governments which enabled Dr. McFadden to complete the project. The texts were published as the Science Plus series. They proved to be popular, becoming the standard curricula text in Nova Scotia and later considered by the Province of New Brunswick for introduction into junior high schools, and by some in the United States.

Out of the discussion at the first meeting of the Math, Science and Engineering Committee, three possible primary roles emerged:

1. acting as a commentator on the place of science education in the school curriculum, including the preparation and presentation of briefs to appropriate organizations - curriculum advisory boards, school trustee associations, and home and school groups. Dr. F.W. Dobson undertook to prepare a brief on educational policies for the committee's consideration;

2. acting as a facilitator to improve science instruction by direct services to teachers with special reference to obtaining resource documents, materials, speakers, student tours, etc.;

3. organization of student-science workshops in specific areas.

Bob Hawkes submitted a request for $400 in support of the first proposed student workshop on "Introduction to Microcomputers" to be held in 1982. Council refused to authorize a grant. In informing Dr. Hawkes of Council's decision, Dr. Simpson pointed out that members of Council did not believe APICS should be involved in teaching high school students, but rather should focus on helping school teachers establish comparable and improved courses of instruction and an appreciation of science. Council appeared to favour support for teacher-university workshops rather than high school-student workshops. The negative response to the request for $400 was devastating, the workshop being the first activity of the committee in response to its perceived mission. Dr. Hawkes revised his request for funds, restricting support to defray the travel costs of invited speakers. The workshop was held on February 19, 1982, at the Sugarloaf Senior High School, Campbelltown, N.B., with vendors (via Mr. Brown of Radio Shack) providing the

computers. Resource people were drawn from UNB, Université de Moncton, and the office of the superintendent of schools. The workshop organized by John Jewett was attended by 99 students from the surrounding area and was an unqualified success from the viewpoint of participating teachers and students. It cost APICS $135.

The spring meeting of the committee was held on March 27, 1982 at the Nova Scotia Teacher's Building in Halifax. Dr. Edgar Williams was elected Secretary. The members reviewed information provided about the foster program in Ontario with the consensus that Dr. Tuzo Wilson of the Ontario Science Museum be invited to make a presentation to members with representatives of Atlantic museums being invited to participate. The committee heard representations from Jules Gribble, Mary Crowley and Phil Read of the Mathematics Committee for support of a new quarterly journal, "Nova Math", directed primarily at high school and university educators for encouraging closer communication, understanding and co-operation at the high school and university levels. The plans were to distribute the first few issues with the support of the Department of Mathematics and Statistics and the Department of Education at Dalhousie, with subsequent distribution by subscription. The committee on Math, Science and Engineering Education passed a motion in support, requesting that APICS supply a starter grant of $400. APICS did make the grant; the journal was warmly received and shortly thereafter became self supporting.

Dr. J. Tuzo Wilson, Director General of the Ontario Science Centre, was the guest speaker at the fall meeting held at the Dalhousie Faculty Club on October 23, 1982. He outlined the history and methods of operation of the foster program in Ontario. The concept was to establish local chapters of foster, recruiting people in communities who were not primarily university scientists, but who could communicate to and not intimidate people about science. Twenty such branches had been formed. Membership was $5 for children and $10 for adults; members received a foster newsletter together with the Ontario Science newsletter. Mr. David Whiston of the Association of Science Teachers, Nova Scotia, arranged to attend a meeting of foster convenors on October 29-30, in Toronto as a representative of APICS. He reported to the committee at the meeting on April 9, 1983, that it would be possible to establish a foster Maritime network of science clubs in the Atlantic region, but that a lot of hard work by volunteers, fund-raising and resource people would be required. Seed money would be essential to start the groups. The most likely fertile ground for participation would be in areas near universities. Dr. Bob Hawkes endeavoured to organize such a group at Sackville, N.B., but the response was not encouraging.

Dr. Williams prepared a comprehensive set of terms of reference for the committee, listing 14 specific items, which were subsequently revised and adopted by Council at the April 1983 meeting. The adopted terms of reference were:

"The Committee exists to advise and make recommendations to Council on (a) any matters referred to the committee by APICS' Council and (b) on any other matters of an educational nature which the committee deems of concern to APICS, for example:

1. to identify concerns relating to the teaching of mathematics, science, and engineering at Atlantic high schools, post-secondary and adult education levels, and to express these concerns to Council for action;

2. to promote good relationships between APICS' institutions and teachers by fostering improved lines of communication and interaction between both groups, such as assisting in recruiting resource people to speak or interact at meetings of mathematics, science and engineering teachers;

3. to collect, collate and disseminate information on mathematics, science, and engineering education on behalf of APICS to appropriate parties to keep them informed of new developments, including effects of new educational technology, which could be accomplished through the sponsoring of meetings, conferences, workshops and publication of proceedings of such meetings and other documents as deemed appropriate by the committee;

4. to assess and comment on curriculum developments (including textbooks) in mathematics, science and engineering at school and undergraduate levels in Atlantic Canada and to communicate information on same to all interested groups;

5. to consider and make recommendations for improvements in the education and training of mathematics, science and engineering teachers at all levels."

Dr. Hawkes resigned in 1983. The new Executive consisted of Dr. Dobson (BIO), Chairman; Truman Layton (Science Consultant, Nova Scotia Dept. of Education), Vice-chairman; and Dr. Williams (Memorial), Secretary. The committee endorsed a request from the Canada-Wide Science Fair for financial support for a fair to be held at Saint Mary's, May 13-20, 1984. Council granted $1,000.

The draft of the brief on science education in Atlantic Canada, prepared by Dr. Dobson, underwent several revisions. Comments received from committee members on the first draft (1982) were reviewed and numerous suggestions were made for a more comprehensive presentation. Members of APICS submitted written comments on the brief along with the names and addresses of those to whom the brief should be submitted. The Brief on Educational Policies addressed concerns that the educational system in Atlantic Canada under-emphasized mathematics, science and technology, particularly in the teaching of non-mathematics and non-science majors. The comprehensive seven-page document was submitted by Dr. Simpson to members of Council to vet with the request that each consult with appropriate people in their organization, especially the universities, and report back so that suggestions could be incorporated. The feedback was extensive and helpful. The final draft was prepared by Dr. Dobson and translated into French by Dr. Stefansky of ARL and Dr. F. Weil of Université de Moncton. The brief was submitted in 1983 to the Nova Scotia Royal Commission on Post-Secondary Education, to provincial science councillors, ministers and deputy ministers of education and the Atlantic Provinces Association of Continuing Education. SCC requested four copies. Dr. John Keyston, Executive Director of the AAU sent copies of the brief to the AUCC, the Council of Ontario Universities, the Council of Western University Presidents, and to the Conference des Recteurs et des Principaux des Universités du Québec. The feedback indicated that the brief was given serious consideration and was forwarded by recipients to those persons

responsible for developing provincial curricula. Compliments were received from the ministers of the departments of education of New Brunswick and Nova Scotia, from CMP and SCC.

At the fall meeting of the committee held at Dalhousie on December 8, 1984, the decision was made to organize, in co-operation with MSVU, a conference on the recommendations of SCC's report on education: "A Blueprint for Action." The conference was organized by Ilya E. Blum of the Department of Mathematics at MSVU and held on April 19-20, 1985. The presentations were edited and distributed to participants and members of SCC. The success of the meeting led to the decision to organize similar small conferences at different localities and invite executive members of the various teacher associations to join the committee and participate. The first of these was held at Fredericton, N.B. and the second, organized by Dr. T. Liem with the theme "Educational Transitions...from Elementary to University...Student and Teacher Problems" was held at STFX in April 1987. Following a review of its past activities at the fall meeting at Mount Allison on September 25, 1987, the committee received a proposal from Truman Layton, former science advisor to the Nova Scotia Department of Education, to undertake a study to determine how APICS could assist high school teachers. This resulted in a decision to organize a "Third APICS Science Education Conference" to be held in Halifax in 1989. Truman Layton agreed to serve as chairman.

Though the Math, Science and Engineering Committee got off to a rocky start, it settled into a role that did not, as feared, conflict with activities of other committees. Its efforts to establish a closer liaison between the departments of education, public school officials and the scientific community, and its efforts at improving the standards of science education in public schools were an essential component of fostering consideration of a career in science by young people.

Physics

The Physics Sub-Committee was established in 1962 at the inaugural meeting of APICS. A primary concern was the inadequate preparation in high schools for university physics. A few high schools were providing excellent preparation, but many were not. The universities and colleges, when staff was available, had introduced special introductory courses. STFX had special introductory courses for arts and pre-medical students. Université de Moncton offered separate introductory courses for selected students. Mount Allison, Saint Mary's, St. Dunstan's and Dalhousie each had a single introductory course and Acadia planned to establish one.

In 1968, a special Committee on High School Physics was established with Dr. Allen E. Boone as Chairman and with one member from each Maritime province. The special committee was asked to examine curricula of high school physics and organize discussions between members of the sub-committee and representatives of the provincial departments of education. The intention was to present a report to the planning seminar at Truro on May 19-20, 1970. Dr. Boone wrote to each appointee asking them to serve and received an unenthusiastic response in that they were disillusioned by committee work and believed from past frustrations that little would be accomplished. Dr. Hubisx of STFX responded with a detailed outline. He desired the teaching of science to be integrated into the curriculum from kindergarten through to grade 12 and the teaching of mathematics and science courses to be continually cross-referenced. He believed that physics should be taught as a subject for its own worth and that teachers should be free to

choose from many alternatives the topics to be taught in their classes; moreover, he asserted that the topics should be handled in depth as facilities permitted, that a resource centre be established with free access by teachers, that each school establish a paperback library through central purchasing arrangements, that each school have access to computer facilities, and that a summer school program in physics become a permanent activity. Dr. Hubisx' response was circulated to the other members of the committee as a basis for discussion. A few thought that the first objective should be to establish the philosophy and aims for physics in the high schools while others felt that science in the high schools should be separated into physical and life sciences. Because of the reluctance of the members to participate in a panel discussion to attain a common position, Dr. Boone concluded that resolution of the differences of opinion could not be achieved in time for the APICS planning seminar at Truro and that the proposed discussion with representatives of the departments of education should not be held.

Meanwhile, the sub-committee proceeded to recommend that the Central Committee act to establish a program of specialist licensing for all school subjects in the upper three secondary grades in accordance with recommendations made by the biologists. The physicists recommended that certificates be issued to teachers who completed specific preparation in a given subject as prescribed by completion of a range of university courses. The members of the sub-committee recognized that to be effective, specialization would have to be accompanied by increased remuneration and maintenance of a determined effort to have subjects, for which specialist certificates were awarded, taught by holders of certificates. Therefore, they recommended that some means of financial incentives be established that would encourage teachers to undertake periodic refresher courses. The provinces did not accept the recommendations.

Topics discussed at subsequent meetings of the sub-committee included the broader utilization of visiting lecturers in the region by using support from APICS for travel expenses between universities, the selection of students for summer scholarships, affirmation of the opinion that students should be allowed to hold summer scholarships in their own university, and the continuing problem of inadequate preparation of high school students in physics. Though the discussions were useful in arriving at a consensus, action was deferred.

The Central Committee provided a grant of $1,000 and UNB contributed $1,000 for a summer school on special topics in physics held at UNB, May 25-June 13, 1970. Expenses, in addition to facilities provided free by UNB, were about $15,000. The course was organized by Dr. W.B. Baker and attended by 29 students, of whom nine were from universities other than UNB. In addition to the lectures and demonstrations during the day on atmospheric physics, biophysics, elementary particles, and the physics of lasers and masers, there were four evening lectures and special social events. Comments received from the students were complimentary, especially as what was offered was generally outside the normal university program and included discussion on the social impact of developments in physics. The course required a total commitment of time on the part of lecturers who abandoned their summer research. The organizers concluded that future summer schools should be presented at other universities on a rotating basis and that some form of remuneration should be given to participating lecturers.

In April 1972, the sub-committee asked the co-ordinator to inform teachers' associations and provincial education departments of the availability of university personnel for participation in science seminars on topics of interest and concern to the teachers. The recommendation arose from the successful science seminar held at Université de Moncton organized by Dr. R. LeBlanc at the request of science teachers. There is no record if this was done as the co-ordinator retired shortly after. The sub-committee went on record as opposing the proposal by Dr. B.P. Sinha for a linear accelerator for the Atlantic provinces as few physicists in the region were nuclear physicists, that budgets would not permit the addition of physicists with required backgrounds, and that time was available on the linear accelerator at Toronto. There was, however, support for the installation of a slow poke reactor in the region.

Dr. Allen E. Boone, Chairman of the special Committee on High School Physics was able to organize a meeting on April 5, 1972, with Professor Earl Wonnacott of UPEI, Mr. Fred Davison, a physics teacher in Antigonish, and Mr. Harvey Weir of Memorial. Weather and flight problems prevented Mr. Weir's attendance, but he contributed by telephone. Each, except Mr. Davison, were members of the physics curricula committees in their own provinces. The conclusion of the discussion was that a common core program in physics should be designed whether or not a single text could be recommended. Some members of the committee prepared and submitted an outline of a possible core program in physics.

In accordance with the recommendation of the Physics Sub-committee that the special Committee on High School Physics be enlarged to include teachers, Dr. Boone, with difficulty, was able to gather together seven people (Professor Wonnacott of UPEI, Professor Hodgett of Memorial, Mr. Outhouse of Holland College, Mr. Granter of Corner Brook, Newfoundland, Mr. Simmons of Fredericton High School and Mr. Davison of Antigonish Regional High School) who met on November 4, 1972. After a long day of discussion, they established a preliminary outline of a core program for high school physics and agreed to consult colleagues and meet again in February 1973. The Central Committee had agreed to pay travel expenses of delegates to the meeting, but subsequently made only $500 available, less than that incurred, and would not commit themselves to further support. This put Dr. Boone in an embarrassing position with the consequence that he cancelled the proposed meeting in February and henceforth insisted on written approval before undertaking any further operations requiring financing.

The Physics Sub-Committee then petitioned the Central Committee for additional funding ($750) for the Committee on High School Physics and, because of inflation, for an increase in the stipend for summer scholarships. The frustration of members for what appeared to be arbitrary action by the Central Committee on the sub-committee's recommendations resulted in requests for appointment of a representative of the Physics Sub-committee on the Central Committee. Similar requests for sub-committee representation on the Central Committee and for increased student stipends were made by other sub-committees. In response, the Central Committee raised the stipend for the summer scholarships with part of the increase to be contributed by APICS and part by the host institution. Because of the apparent large variation in contributions by host institutions, the Physics Sub-committee conducted a survey and obtained data that led to a recommendation that the Central Committee adopt the pay schedule of the Defense Research Establishment. No action was taken.

The Central Committee approved a grant of $750 for what they considered to be the final meeting of the Committee on High School Physics. The committee met on September 28, 1973 at Université de Moncton and drafted a fifth report. However, the Physics Sub-committee believed that the special committee should continue to meet once a year and have as it next goal the organization of a high school physics laboratory course that all students would complete before commencing university physics. Dr. Boone was asked to mail copies of a revised fifth report that included the outline of the proposed core physics program to high school physics teachers and curriculum committees with a request for feedback. Several hundred copies were distributed to high school principals and physics teachers in the Atlantic provinces, provincial departments of education, provincial curriculum committees and members of the Central Committee. Most of the feedback, a mixture of complimentary and critical comments, came from members of the sub-committee and members of provincial curricula committees.

The Central Committee agreed to support further meetings of the Committee on High School Physics to a maximum of $1,200 provided that a portion of the funds were used to contact concerned physics teachers in French language high schools. The committee met at Université de Moncton on September 27-28, 1974 with Mr. J. Carpenter of the Regional High School at Souris, replacing Mr. Outhouse as the representative from Prince Edward Island. Comments received from recipients on the fifth report were reviewed and changes made to the proposed core curriculum. This was circulated by Dr. Boone to members of the sub-committee who then canvassed their constituents by telephone for comments. The lack of interest by high school teachers was discouraging with the result that Dr. Boone quietly dropped them from further consultations.

The final report of the Committee on High School Physics and the recommended core program was submitted to and accepted by the sub-committee at the meeting on October 31, 1975 at Saint Mary's. The Committee on High School Physics was then dissolved. The report was distributed by the co-ordinator to all high schools and departments of education in the Atlantic region; feedback was slow but positive. Mr. L.B. Bartlett, Director of the Program Development and Implementation Branch of the N.B. Department of Education, was impressed and complimented the sub-committee for the work done. He incorporated most of the recommended topics for course studies and laboratory experiments in a revised science program for New Brunswick's schools. Dr. Boone, whose persistence and work was largely responsible for developing the core program, retired in 1978.

The 1975 meeting of the sub-committee was the last for which travel support to committee meetings from APICS was available. Henceforth, members had to secure travel funds from their own department or travel at their own expense, but participation by members was not affected. The committee concentrated on utilizing the visiting lecture program and co-ordinating a series of workshops on physics patterned after the successful workshop sponsored by Université de Moncton to assist teachers. The first Physics Teachers Summer Workshop was organized by Dr. Roy L. Bishop and held at Acadia 1977. Mount Allison mounted a math-astronomy summer school that year. On July 10-14, 1978, the second Physics Teachers Summer Workshop was held at STFX, organized by Dr. E.W. Grundke with financial support from the university, the N.S. Department of Education, the Association of Science Teachers, and the Antigonish Regional High School. The workshop dealt with the general topic of wave phenomena. There were 23

registrants, 11 high school teachers, 11 university physicists and a representative from the N.S. Department of Education. The high school teachers were enthusiastic and a third Physics Teachers Summer Workshop was held at Halifax on July 3-5, 1979, co-hosted and financially supported by Dalhousie, by Saint Mary's and by registration fees.

On February 26-27, 1977, the first Atlantic Undergraduate Physics Conference (AUPC) was held at Saint Mary's with financial support from APICS, Dalhousie and the host university. Organized by the Undergraduate Physics Society of Dalhousie (Robert Haywood, President), 12 papers and two guest lectures were presented. A best paper award ($100) was given to Paul H. Weir for his presentation on "Plasma Studies in Gas-Filled Tubes". The second AUPC was held at UNB in October 1979, and the third at Memorial in 1981. The inauguration of the student conferences brought to an end the high school teachers workshops.

The cessation of the student summer scholarship program in 1979-80 (because of the newly established NSERC student summer scholarships) and a decision to use fewer financial resources to support the work of the committees, caused a short but intensive debate within the committees of APICS. The physicists from the smaller universities concluded that they would be most affected as they did not have the fiscal resources to compete for students with the larger institutions.

In 1981, D.J.G. Irwin of UCCB, as requested by the Physics Committee, prepared a Directory of Physics Personnel that included data on courses taught and research interests at academic institutions in the Atlantic provinces. The comprehensive compilation was published and made available to all members of APICS and libraries in the region.

Following the AUPC held at Université de Moncton on Feb 5-6, 1982, the Physics Committee decided to meet only once a year to save travel costs. Henceforth, committee meetings usually coincided with the undergraduate student conferences such as that held at Mount Allison in 1983 and Dalhousie in 1984. Invited keynote addresses by scientists in the Atlantic region became a program highlight. Student enthusiasm and interest steadily increased which served to enhance communication among students and with faculty. The improved finances of APICS also resulted in higher financial support with Council increasing the subsidy from $500 in 1977 to $1,200 in 1984. Registration fees to cover incidental costs increased from $10 to $45. Attendance increased from around a dozen to 60-80 students a year. Support for the annual physics lecture tour increased to $1,500 a year, sufficient to provide for lecture tours by three to five scientists a year. The 1984 AUPC was held at Dalhousie on February 12-13 and a combined Atlantic undergraduate and Canadian undergraduate physics conference was held in Fredericton on October 11-14. APICS provided a grant of $1,500 to support student travel and a book prize to the Atlantic undergraduate student presenting the best paper (Denise Gaudet).

In 1985, Dr. Brian Hede, Chairman of the Physics Committee, undertook to revise the physics directory. The task was completed and printed in the fall, then distributed in January 1986. The 1986 AUPC was held at STFX on February 14-16 and plans were made to hold the next conference at Memorial on February 6-7, 1987. The bound program provided information about the university and physics department, an outline of the work and interests of the invited

lecturers including abstracts of their talks, and abstracts of papers presented by students. The organizer, Joanna Hughes, deserved the compliments she received.

The development of the core physics program for high schools and its establishment in New Brunswick was the outstanding achievement of the Physics Committee. The teachers physics workshops, somewhat analogous to the mathematics summer school, provide an example of how summer courses can be designed to benefit not only teachers, but also students and professors, permitting an in-depth approach on special topics that is not generally possible. Such may be an effective means of imparting knowledge and improving communication between teachers, professors and students.

Psychology

During the fall of 1964, the psychology department heads at Acadia, Dalhousie, Mount Allison, Prince of Wales College, St. Dunstan's and UNB applied to APICS for status as a sub-committee on psychology. Chemists and physicists questioned whether psychology was a science and Dr. W. Jones, APICS' Co-ordinator, relayed a request from the Central Committee for the applicants to (1) describe the relation of experimental psychology to the natural sciences, and (2) state the functions of the proposed sub-committee.

Dr. E.D. Lawson of Acadia, on behalf of his colleagues, responded that experimental psychology's claim as a science rested upon its use of the experimental method and its reliance upon objectively recorded observations. Experimental psychology had severed its relation with philosophy more than half a century ago, and substituted observable events for introspection as its data. Since then psychology has been exclusively concerned with the systematic study of the lawful relations which exist between measurable changes in stimulation and measurable changes in responses, and with the construction of theoretical models which account for the observed relationships. The methods differ in no essential respect from those used in modern biology and physiology and its hypotheses are verified in the same manner as those in all other sciences. Dr. Lawson pointed out that psychology was regarded by NRC, the National Science Foundation of the United States and the Department of Scientific and Industrial Research in the United Kingdom as a science and received grants from these organizations in support of research. Nearly a quarter of the research reports published in Science in the past year emanated either from psychological laboratories or from psychologists working in physiological, pharmacological and other scientific laboratories.

Dr. Lawson outlined the terms of reference of the committee as follows:

1. to recommend psychology students for the summer student research scholarships;

2. to recommend the support of suitable visiting lecturers who would give lectures at the departments of psychology of the member universities;

3. to prepare recommendations and make arrangements for the participation of experimental psychologists in future APICS science planning seminars;

4. to prepare recommendations for approval and make arrangements for co-operative graduate courses in experimental psychology at Dalhousie under the joint sponsorship of Dalhousie and other member institutions of APICS;

5. to act as a co-ordinating committee of the departments of psychology in member universities which would take such steps as might be advisable from time to time to foster and strengthen research and training in experimental psychology within the Maritime region.

The Executive and Central Committees of APICS accepted the application and the Psychology Sub-committee became the first sub-committee of APICS to have defined terms of reference. The first meeting was held at Dalhousie on February 27, 1965, with Dr. P.H.R. James, Head of the Department of Psychology, as host. Initially, the sub-committee meetings were held as joint meetings with the Atlantic Provinces Psychology Association (APPA), an independent body with its own fee structure. Having frequent changes of secretaries, APPA had difficulty maintaining records. In 1968, Mr. W. Barteaux, APICS' Co-ordinator, received a request from the sub-committee's Chairman, Dr. W.H.D. Vernon, to serve as a central office for APPA because of the difficulty in maintaining records with the shifting of the secretarial office from one institute to another. Mr. Barteaux offered to provide assistance such as central record keeping, mail distribution and whatever else he could do. The secretary of the Psychology Sub-committee became the recording and corresponding secretary for APPA until 1972, when all records were transferred to Dr. J. Easterbrook of UNB and President of APPA. The sub-committee then terminated its affiliation with APPA.

In 1970, the sub-committee lost all of its executive through transfers out of the Maritimes and had to be reorganized. Dr. J.J. MacDonald, Chairman of APICS, met with psychologists on January 15, 1971, and emphasized the importance of the voluntary efforts of APICS members in strengthening communication and research in the Atlantic region. A new executive was elected and the sub-committee continued to meet twice a year. A continuing concern among members was the difficulty that psychology students were having in winning summer research scholarships. The low number of awards was attributed to inadequate preparation of applications, comparatively lower marks granted by departments of psychology and the few openings available. As experimental procedures in psychology were of relatively long duration, the sub-committee recommended that consideration be given to allow students to hold summer scholarships at their own institution, but the Central Committee maintained its original position of insisting that students work at institutions other than their own. The sub-committee also recommended that the host institution of summer scholars pay up to one-half of the stipend in order to increase the number of scholarships awarded. At first, the Executive and Central Committees declined to ask host institutions to do this, but subsequently with the onset of rapid inflation in the 1970's and pressure from other sub-committees, APICS did encourage host institutions to "top up" the stipends from APICS for summer scholarships.

Usage of APICS' program of travel support for visiting lecturers by the sub-committee was initially sporadic, but gradually increased until by 1972 the scheduling of lectures in the region became a regular item of business. In 1973, at modest cost with travel support from APICS, STFX and Mount Allison established a co-operative lecture program involving an exchange of

lectures by professors of the two universities. In 1974, the sub-committee arranged a lecture tour of Atlantic universities by Dr. Roger Myers, Executive Officer of the Canadian Psychological Association and professor at the University of Toronto.

The Psychology Department at Université de Moncton organized a workshop on "Behaviour Therapy" held between May 25 and June 5, 1970. An application was submitted to APICS for travel assistance for members of the sub-committee to attend, but support was denied. Registration was set at $100 to defray expenses; attendance was larger than expected and the success of the workshop created a demand for a continuing series of special topic workshops.

One recommendation made at the closing session of APICS' Fifth Planning Seminar held in 1970 at Truro was that greater attention be paid to social problems arising from industrial development. A suggestion was that as part of any large scale industrial development, adequate funds should be provided for the investigation of accompanying social problems. In response, Dr. Moors with the assistance of members of the sub-committee prepared a directory of psychological manpower in Atlantic universities. Copies were distributed to members of the sub-committee. At the spring meeting in 1971, the sub-committee formed a working group to investigate the feasibility of placing consulting services for such studies at the disposal of governments, universities and industry; that is harnessing the talents of psychologists and other social scientists working in the Atlantic region to solve problems of a social nature arising out of economic change. The working group, consisting of Dr. G. Gordon, Dr. D. Moors and Dr. K.L. Ozmon, compiled a directory of interested people. The compilation had its counterpart at the national level of a directory being prepared by the Advisory Council of the Provincial Associations of Psychologists. The sub-committee's directory served as the input from the Atlantic region. The directory was periodically revised and in 1974 extended to include not only the name, degrees held and area of research, but also project titles, sources of funding, and a list of publications. This massive compilation was assembled by Dr. George Woods and Dr. Murray Schwartz and deposited with the co-ordinator, Mr. J. Caryi, for publication and distribution to interested persons. There is no record on file of provincial or federal government agencies or of industry taking advantage of the offer made by psychologists. A joint effort in 1985 by the CMP and APICS to organize a conference on social impacts of technological developments had to be deferred because of lack of sponsors.

At the fall meeting in 1971, the sub-committee had accepted a suggestion by Dr. Ozmon that it would be worthwhile for students from different universities to get together annually and exchange views on matters of common interest. The first such gathering was organized by students of Université de Moncton in conjunction with the annual spring meeting of the sub-committee on February 11, 1972. Unfortunately, only one student from another university attended with the consequence that each sub-committee member was urged to either bring or send a selected student to the next meeting.

A second effort to involve students occurred when planning for the fall meeting of 1972. An application was made to APICS for $300 to help defray costs of student travel. Because of severe financial constraints, the Central Committee was unable to provide funds. The meeting was held at MSVU on October 20, 1972. In addition to students from MSVU, one student from UNB and one from STFX attended. The students met separately and then reported to the sub-

committee that it was difficult to obtain student interest because of the lack of an agenda and the necessity for more advanced planning.

The recommendations of the students were accepted and a formal agenda that included an opening lecture was prepared for the following meeting held at UNB on February 15-16, 1973. The lecture, "A Student Interview Approach to Teaching Introductory Psychology" was presented by Dr. M. Schwartz during the evening of the first day and was followed by a social gathering. Students from five universities attended, meeting separately during the morning of February 16 and then with the sub-committee in the afternoon. The students were frank in their assessment of instruction methods and curricula, an input that resulted in a reassessment by professors of their teaching approach and an awareness of the need for improved communication. This successful format established the basis for the organization of future sub-committee meetings and exchanges of information between students and members of the sub-committee.

The first student conference was held at Halifax in May 1977, the second at Mount Allison in 1978, and the third at Dalhousie in 1979 with APICS providing grants of $500 to help defray student travel and accommodation expenses. Professors often took students in their own cars and a registration fee of $12 - $15 was charged to cover local expenses. The conferences usually consisted of a sub-committee meeting on Friday afternoon with a dinner and guest speaker in the evening followed by a full day of presented papers by students and one or two keynote presentations by a guest speaker. Attendance ranged from 40 to 100 or more depending on the location. In 1980 the student conference was held at Memorial assisted by a grant from APICS of $2,000 and a 20% reduction on air fares for students by Eastern Airlines. Memorial paid the students' air fares and hosted a meeting that was considered a memorable event and an outstanding success.

In 1981 the sub-committee met jointly with the New Brunswick College of Psychologists at Université de Moncton. The differences in approach and philosophy between the experimental work of the academics and the clinical practices of members of the college resulted in disagreements on principles and a lively meeting. The aftermath, however, was low attendance at the meeting in 1982 at MSVU. When the incoming chairman, Dr. R. Sampson, endeavoured to obtain invitations for the site of the 1983 meeting, none were forthcoming. Discouraged and unable to again offer the services of MSVU, Dr. Sampson resigned as chairman and solicited the help of Dr. Fred Simpson, APICS' Chairman, in developing a new thrust and locating a new chairman.

Dr. Simpson wrote to several psychologists and met with Dr. Richard Brown of Dalhousie, who in a whirlwind of activity, updated the list of university psychologists in the Atlantic region, mailed out a questionnaire and organized a meeting of representatives from UNB, Memorial and Saint Mary's, assuming the task of both chairman and secretary on the condition that he be replaced in 1984. On May 3-4, 1984, a successful meeting and student conference was held at Dalhousie. Thursday evening was a welcoming reception with papers and discussion sessions occurring on the following day, ending with an evening banquet and guest speaker. This format was followed at subsequent student conferences. Finances consisted of a $10 registration fee and a grant from APICS of $1,864. Sixty-four students from nine universities attended; eight posters and 21 papers were presented. Dr. J.C. Fentress of Dalhousie informed members that the

Psychology Department had received a three-year grant from NSERC to assist in the maintenance of the Dalhousie Animal Behaviour Station at the Wild Life Park and invited others to actively participate in activities and support of the facility.

Dr. Rudy Kafer of MSVU re-established the visiting lecture tour, which usually consisted of two to three speakers a year, and Dr. John Harper undertook to organize the next conference. APICS provided a grant of $1,500 and the registration fee was set at $15. Additional support was provided by the psychology departments of Mount Allison and UNB. The ninth student psychology conference with 58 participants was held at the UNB on May 2-3, 1985 and abstracts of the papers presented were published in a proceedings. The president of the National Canadian Psychological Association was the guest speaker at the closing banquet. The Chairman, Dr. John Harper, undertook to prepare a directory of academic psychologists, their research activities, and willingness to present seminars. The directory was published and distributed in 1986.

At the tenth student conference on May 2-3, 1986 at Mount Allison, there were 76 participants, including a student from the University of Maine who presented a paper; Dr. Marc Baranowski was the guest speaker. The large number of participants resulted in a budget overrun that had to be made up from subsequent activities. On October 31, coinciding with the fall meeting of the committee at Dalhousie, Dr. A. Wilson organized a computer workshop where demonstrations of commercial and "self-developed" software were held. Dr. R. Klein, who had assumed responsibility for the visiting lecture program and later the chairmanship, agreed to serve as co-ordinator for software exchange. Members of the committee, in common with others in APICS, expressed a concern about diminishing finances for libraries in Atlantic universities and its impact on literature resources.

The eleventh undergraduate student conference was held on May 7-8, 1987, at Acadia where expenditures were kept to a minimum because of the generosity of the host university. There were 21 oral presentations, 18 posters, and the guest speaker was Dr. Paul McDonnell of UNB who outlined how engineers and psychologists collaborate on designing and testing new artificial limbs for young children.

The meetings of the psychologists underwent a gradual change from rather informal discussions about mutual problems to formal programs that included successful student conferences. The exchange of information between students and professors at the annual gatherings served to improve instruction methodology in psychology at Atlantic universities and to provide faculty and students with a means of enhancing communication. The numbers participating at the annual student conferences and the topics discussed are proof of their value. Though the initial responses were discouraging, the committee should continue efforts to interest governments and industry in utilizing the expertise of psychologists for assessing social impacts of government programs and industrial developments.

Water Resources
Natural Resources

On January 26, 1967, Dr. J.B. Sprague of the Biological Station at St. Andrews, N.B., and a member of NRC's Associate Committee on Water Pollution Research informed Dr. R.W. Frei,

Co-ordinator of APICS, that the committee had recommended that special support be made for research into waste treatment processes and water quality criteria. Thirteen proposals were received via members of the associate committee, three of which had been recommended to NRC for funding. All dealt with research on new methods of waste treatment and required $40,000 in aggregate. Dr. Sprague asked APICS to inform its members of NRC's interest in promoting research on pollution problems and the opportunity for financial support. Dr. Frei complied, by means of the APICS newsletter, and in asking for more information, informed Dr. Sprague of his and Dr. D.E. Ryan's work on development of micro-analytical methods for water pollution control.

SCC recommended that water resources research be concentrated in a limited number of "centres of excellence". During 1968, Dr. Ira Beattie and colleagues of UNB organized a Water Resources Research Colloquium, securing speakers and panel members from various government agencies, industries and universities. The colloquium, financially supported by the Department of Energy, Mines and Resources through the NACWRR, was held on March 6-7, 1969, at UNB. There were seventy participants. Out of a discussion on the question of "How do We Develop an Interdisciplinary Program in Water Resources Research?" came the suggestion that APICS establish a Water Resources Sub-committee. Dr. L.W. Shemilt, Chairman of APICS, prepared a proposal for establishment of an interdisciplinary Water Resources Sub-committee. The responsibilities were to maintain communication with the NACWRR, to be conversant with problems, priorities and activities in the Atlantic provinces and to take the initiative in planning regional seminars and co-operative research activities. The proposal was presented at meetings of the Executive and Central Committees of APICS on April 25-26, 1969, and resulted in a decision to form an ad hoc committee.

Dr. Beattie of UNB and Professor D. Waller of NSTC met with Mr. Barteaux, Co-ordinator of APICS, in August 1969 and formulated plans to hold a meeting of an ad hoc committee on water resources in the form of a luncheon at NSTC. At this meeting, which lasted all afternoon and was attended by representatives of seven universities, the term "water resources" was interpreted to include fresh water, estuarial and marine waters. The areas of interest were defined as the application of the natural, social and applied sciences to problems in fresh water, estuarial and marine water resources. The following terms of reference were prepared:

1. to develop and maintain communication among APICS members as well as between members of APICS and other agencies, organizations and institutions relative to programs and research in water resources;

2. to maintain the greatest possible awareness of water problems in the Atlantic provinces;

3. to take the initiative in planning meetings, seminars, visiting lecturers, publications etc., and to initiate requests for financial support for such from appropriate granting agencies;

4. to act, on request, as an advisory group to appropriate agencies and/or APIC member institutions with regard to the development of water resource programs in the Atlantic provinces.

The members of the Central Committee, at a meeting held on November 14, 1969, were unanimous in endorsing the establishment of a Water Resources Sub-committee and adopting the proposed terms of reference. The first meeting was held on December 12, 1969 at Dalhousie. D.H. Waller was elected chairman and the representatives were asked to assist Mr. Barteaux in preparing an inventory of research on water resources by sending him the required information as a basis for planning at the next meeting.

During February 1970, the Arrow, a Liberian registered oil tanker under single voyage charter to Imperial Oil, ran aground and eventually sunk in Chedabucto Bay. About 6.8 million litres of heavy bunker oil was spilled into waters along the Cape Breton coast, the first massive spill on Canada's east coast. A task force under Dr. P. McTaggart-Cowan was quickly assembled to contain and clean up the mess which involved most scientists in the Maritimes in an intensive effort. This formed the background for the next meeting of the committee which was held at UNB on March 19-20, 1970.

APICS provided financial assistance for one official representative from each member institution and invited representatives from government agencies and provincial departments to attend. Working groups were established; one to survey water resources research in the Atlantic area and avenues of federal support with a representative from each university (Prof. Winter, Dr. Bridgeo, Dr. Ogden, Dr. Warner, Prof. Martin, Prof. Hawley, Prof. Waller, Dr. J.J.MacDonald, Dr. Mehra, Prof. Beattie and Prof. Cheverie); a second group to organize conferences and lectures on selected topics (Dr. Davar, Prof. Winter, Dr. J. Craigie, and Dr. P. Ogden); and, because of the spill of bunker C oil from the grounding of the Arrow in Chedabucto Bay, a third group on oil pollution (Dr. Bridgeo, Dr. Warner, Dr. Mann and Dr. Saunders). The sub-committee heard presentations by Dr. R. Trites of BIO on pollution in the open sea and a review of the work done by the task force established to clean up the oil spill from the Arrow in Chedabucto Bay. Dr. Fletcher of the Department of Energy, Mines and Resources outlined the developing program on water resources and the possible position of APICS as a co-ordinating and communicating body, one that might initiate proposals for research in the Atlantic region, especially on its special problems. As a result of the discussion, the research priorities for the region were listed as: (a) municipal sewage -collection and treatment; (b) salt water intrusion; (c) biocides, pesticides, and herbicides; (d) siltation; (e) oil pollution; (f) indicators of water quality - bioassay, chemical assays, standards, etc.; (g) water supply for various uses; and (h) industrial wastewater treatment.

Professor Waller, Professor Winter and Dr. Bridgeo of the working group on water research held a meeting on June 8, 1970 following which Professor Winter, through a questionnaire to members of the group, provided each with an opportunity to contribute to the preparation of a proposal to the NACWRR. No replies were received and activity languished until Dr. Fletcher met with the AAU at Fredericton on November 20, 1970. Dr. J.J. MacDonald, Chairman of APICS, was present. Dr. Fletcher informed the AAU that the Department of Energy, Mines and Resources would entertain an application for support of program planning in the field of water resources in the Atlantic region and that the proposal must be submitted to the department by December 31, 1970. He outlined what the proposal should include. Though the proposal should be made by APICS, it must be endorsed by the executive heads of UNB, Dalhousie and NSTC. Dr. Fletcher also met separately with Dr. J.O. Dineen of UNB, Dr. H. Hicks of Dalhousie and Dr.

Holbrook of NSTC. Dr. J.J. MacDonald immediately informed members of the Water Resources Committee.

The message catalyzed considerable activity, including a letter from Dr. Beveridge, President of Acadia, to Dr. Hicks, President of the AAU, that Acadia as well as other universities in the region should be included. Professor Waller of NSTC went to Ottawa and discussed with Dr. Fletcher the formulation of a regional water resources proposal that would be compatible with the interests of NACWRR and would recognize the special interests of Dalhousie, NSTC, and UNB, as well as those of the other Atlantic universities. On his return to Halifax and acting under the instructions of the Central Committee at a meeting on November 27, Prof. Waller prepared a proposal on behalf of APICS and submitted it to the AAU, whereon it was passed to the Central Committee of APICS for further action. As insurance, should the APICS proposal be unacceptable, Pro. Waller prepared another proposal on behalf of Dalhousie and NSTC. Meanwhile Prof. Beattie, in conjunction with President Dineen of UNB, prepared a separate proposal and submitted it to Dr. Fletcher.

Prof. Waller's proposal was reviewed on January 6, 1971, by a special APICS committee on "Federal Support of University Research" consisting of Dr. J.J. MacDonald, Prof. Winter, Prof. Waller, Dr. Bridgeo, Prof. Beattie and Mr. Barteaux. Several modifications were suggested and the revised proposal was sent to Dr. MacDonald on January 8 with copies to the presidents of UNB, Dalhousie and NSTC for their endorsement. The proposal called for the establishment of a single regional institute with continuing support from the federal Department of Fisheries and Forestry; the institute was to have a full-time director, a policy committee appointed by the AAU on nomination of individuals by APICS, and an initial budget of $50,000 of which $32,000 would be for salaries and administrative expenses, $10,000 for program development and $8,000 for seminars, lectures, and exchange of staff between the universities. Four proposed activities that included some current research were outlined. This occurred while the federal government was establishing the Department of
Environment which realigned several of the government's agencies. Consequently, Dr. Fletcher was unable to act on the proposals from UNB, Dalhousie, NSTC and APICS. Meanwhile, the sub-committee was active in several directions.

The Water Resources Sub-committee met on February 19, 1971 at Saint Mary's with all members in attendance. In addition to discussion on details of the proposals, decisions were made to update and publish the Inventory of Water Resources Research in a format consistent with that in SCC's Report #3. Status reports were presented by the working group on seminars and from the working group on oil pollution. New officers for the sub-committee were elected.

At a meeting of the sub-committee on May 13-14, 1971 at Acadia, Prof. Winter reported that the Department of Energy, Mines and Resources had delayed acting on the proposals and recommended that they be rewritten with more precise statements of future strategies for program development; it was also recommended that the proposal from UNB be revised and integrated with the other two proposals. The difficulties of establishing a cohesive research program embracing different institutions and different individual priorities delayed agreement; it was not until fall that a document attained general consensus and was submitted to Ottawa.

The working group on seminars recommended that the program of visiting lecturers on various aspects of water resource research and management be submitted as a separate program to Energy, Mines and Resources for financial support as a means to stimulate the intra-regional co-operation of scientists. This was done and a grant of $2,000 was received from the Department of Environment for the program in 1971, and $1,000 for each of 1972 and 1973. The first speaker in the Distinguished Lecture Program, Dr. Warren Hall of the University of California and Principal Advisor on Water Resources to the Executive Office of the President of the USA, presented a lecture on the "Analysis of Large Scale Water Resources for Optimal Management" at UNB, Université de Moncton and Dalhousie during October 1971.

Financial support for students to work during the summers of 1971 (12), 1972 (3) and 1973 (2) on research on water resources was provided by the federal government's Opportunities for Youth Program through the Department of Environment. Two students worked mainly out of Saint Mary's under Dr. Bridgeo on the preparation of the Inventory of Water Resources Research (a bibliography of prior water resources research, a listing of research projects and results). A summary of law and legislation relevant to water management in the Atlantic provinces was prepared. The other students worked under the guidance of supervisors at their respective universities on preparing an assessment of the potential for water resources research in the Atlantic region. A few copies of the massive documents were deposited with the co-ordinator as reference sources. Concurrently NRC established a computer-based national data bank on water resources and a Pollution Information Project file that was being integrated with the comprehensive water resource management documentation system of the Department of the Environment and the Quick-Law computerized system of the Department of Justice.

The sub-committee served as a means of providing information to members about recent developments such as that of remote sensing, and liaison with the newly established "Council of Centres at Universities for Research on the Environment". After much debate, APICS joined the latter organization, appointing Prof. Winter as the APICS delegate. Members of the sub-committee prepared a report on a proposed interdisciplinary approach to the Dunk River Project in Prince Edward Island. They endorsed a proposal from Prof. Arseneau of the Chemistry Sub-committee for a seminar on "Bras d'Or Lakes Development". Members of the sub-committee, with the co-ordinator's office acting as accountant, instigated by membership fee, a subscription to the WATDOC information network. The account was dissolved in 1977 at the time of the dissolution of the APICS secretariat. At the request of the Central Committee, the members of the Water Resources Sub-committee established a working group under the direction of Prof. Cheverie to prepare a report for a survey on research being conducted by APICS. The working group canvassed members of the sub-committee and responded to the questionnaire in some detail. Dr. Bridgeo, Chairman of APICS, remarked that the report was one of the better ones received.

On February 10, 1972, at a meeting in Ottawa of the annual review of requests for grants from NACWRR, Prof. Winter spoke in support of the proposal from APICS for establishment of an institute; he outlined the formation and activities of APICS, the establishment and actions of the Water Resources Sub-committee, water resource problems in the region with particular reference to Nova Scotia, the need for close interaction of several institutions and disciplines, and the problems of mobilizing human resources and obtaining financial support. He outlined the

accomplishments of the students employed under the Opportunities for Youth Program. A decision on support for the proposed institute was deferred as the agency's programs were undergoing review.

The review by the Department of the Environment of its policies and programs of grants-in-aid of research resulted in a major change as revealed by publication in October of an "Information Guide" that outlined the revised terms and conditions for support of water related research and which replaced the program of the NACWRR. Grants were replaced by research agreements with universities or development centres that would be managed by the Inland Waters Directorate. This did not appear to be compatible with the concept of a government supported institute managed by APICS.

On May 24, 1973, Dr. Bridgeo, Prof. Winter and his assistant Ross Landers met in Ottawa with Mr. E. Cornford and D.H. Cullen, Water Research Incentives Office, Inland Waters Directorate of Environment Canada to discuss the possibility of an agreement between APICS and Environment Canada. Follow-up discussions between members of the sub-committee proceeded on an informal basis; at a meeting of the sub-committee on November 15, 1973, the decision was made to propose a study on the impact of upstream activities on the coastal zone given that it was a major concern of the Atlantic provinces.

Dr. Bridgeo drafted a letter of intent which was vetted by Dr. Craigie and Professors Waller, Winter and Cheverie before being submitted with supporting documents to Mr. Cornford. The response was positive and the sub-committee followed up on January 7, 1974, with a request for financial support for a proposal definition study on coastal zone research that would encompass three phases: (1) a meeting of the sub-committee to consider and identify research topics and expertise available; (2) a meeting of the participants to specify the terms of reference for each proposed research topic; and (3) a workshop to develop specific details for research projects. The first phase was to be completed by March 31, 1974.

The first step was taken at a meeting of the sub-committee on January 31, 1974 at Saint Mary's. Mr. Hal Mills of the Environmental Management Service was present and outlined the views of the Department of Environment. The decision was to concentrate on initiation of an interdisciplinary program of research on coastal zone problems in the Atlantic provinces leading to the development of a specific project in the dynamics of estuarine systems. Prof. Winter was appointed as chairman of a working committee responsible for completing Phase 1. The members undertook to identify possible participants for the project. A follow-up meeting was held on February 20, 1974 at which Mr. Cornford outlined the reorganization of the Department of Environment and the current philosophy on research support stating that the emphasis was on objective or applied research and that the directorate "buys" research applicable to its aims and objectives. He outlined the recently revised criteria to be applied in selecting projects and stated that the deadline for the submissions would be November 1, 1974. The request from the sub-committee for financial support to prepare a submission was approved and $3,300 was received in May 1974.

The next meeting of the sub-committee was held on July 23 at Dalhousie; it was decided that it would be difficult to design and develop a research proposal with a high degree of acceptability

to the Inland Waters Directorate within the new guidelines outlined by Mr. Cornford. The sub-committee met again on November 16 when Dr. Bridgeo reported that follow-up discussions with Mr. Cornford confirmed that the objectives and priorities of the directorate were such that APICS could participate only in a restricted way, if at all, but individuals could seek support for specific projects. The remainder of the grant ($2,407) was returned. The Inventory of Water Resources Research in the Atlantic Provinces prepared by members of the sub-committee was distributed to all APICS committees, to industrial representatives and others who participated in the activities of the sub-committee.

With the demise of the interdisciplinary, interinstitutional concept of research on water resources, interest languished, though Prof. Winter and a few members of the sub-committee met again on December 10, 1976, and on March 11, 1977. At a meeting on April 14, 1978 a new executive was elected with Dr. J.G. Ogden as Chairman. Members decided to move the direction of the Water Resources Committee away from the Inland Waters Directorate and to broaden its perspective on natural resources. The objective was to increase membership and obtain a broader view of problems in the region. A motion to that effect was made by Dr. Winter, seconded by Dr. Liengme and passed at the Council meeting held at ARL on April 15, 1978. Henceforth the Water Resources Sub-committee was known as the Natural Resources Committee.

During the summer of 1978, Dr. F.J. Simpson of NRC, and Dr. P. Ogden discussed the possibility of establishing under the APICS umbrella, the working group on environmental aspects of tidal power in the Bay of Fundy. Dr. Ogden, who was a member of the Fundy Tidal Power Environmental Assessment Panel, stated that the large multidisciplinary working group that was being assembled should be established as a separate committee. The Chairman of APICS, Dr. Read, and Council concurred and a separate committee, the Fundy Environmental Studies Committee, was established.

The Committee on Natural Resources held an organizational meeting on November 4, 1978, at Mount Allison. Prof. G.B. Ward of UNB was elected Chairman. At a meeting in April 1979, several regional problems were discussed, including the spruce budworm problem, wetlands protection and management, land and toxic waste disposal, phenological research on relationships between climate and biological phenomena, and forest management, but a decision on a major thrust was held in abeyance.

Committee members were asked by Dr. Simpson to assist with the organization of a conference being planned by the Department of Forestry of UNB on forest utilization. APICS provided $2,000 in support. The conference entitled "Fuel or Fibre? Hardwood Utilization and Marketing Opportunities" was held at UNB on March 16-17, 1982. Registration was set at $25 ($5 for students). The keen interest in the subject resulted in attendance from a broad base of people in the forestry, pulp and paper, and furniture industries and included representatives from Maine. The organizers, Professors R.B.B. Dickison and I. Methven, and staff of the Department of Forest Resources of UNB organized what was the most comprehensive review of the forestry situation in the Maritimes. The APICS co-ordinator collected the papers presented and Dr. J.C. Lees, of the Canadian Forestry Service, Maritimes Forest Research Centre at Fredericton, N.B., had the presentations published in an attractive format. The workshop stimulated an exchange of

views on long term forestry planning, especially between the New Brunswick Forest Products Association and the New Brunswick Department of Natural Resources. The efficient organization of the conference and support by UNB and participants resulted in the grant of $2,000 being returned to APICS.

As a follow-up of the conference, Dr. Simpson, Chairman of APICS, explored the possibility of adding forestry to the activities of APICS only to discover that Nova Scotia, New Brunswick and Prince Edward Island already had good working arrangements and that Newfoundland did not have a keen interest. The conclusion was that APICS could best serve by sponsoring periodic workshops on special topics like that on hardwood.

Following the conference, F.E. Webb, Special Advisor on Research and Development to Forest Protection Limited, recommended that APICS concentrate on co-ordinating university, federal and industry research on forestry insect pests and overcome the sector isolation. Dr. Simpson responded by meeting with entomologists in the universities, in agriculture and forestry to discuss their common problems and by sponsoring a meeting of representatives at ARL in June 1982 to explore the possibility of establishing an APICS committee on insect research and control. The consensus from that meeting was that there were in existence a number of federal and provincial committees and professional societies that provided more than enough communication and co-ordination.

In 1982, the Natural Resources Committee welcomed the AFRO as a participating member of its committee. The terms of reference were:

1. to investigate the biology, agronomy and commercial use of the fern, Matteuccia struthiopteris, (fiddle head or ostrich fern) and related plants in the Atlantic region by co-operative research and development activities of people in universities, government agencies and industry;

2. to hold a meeting once a year to report on research and development, exchange information, formulate directions for future work, vet and assist in preparing proposals and submissions for resources to carrying out the work ;

3. to elect a chairman, vice-chairman and secretary who will, on election, hold office for two years;

4. to disband when the committee's co-operative research and development activities have been completed or terminated;

5. to be subject to the constitution and by-laws of the Atlantic Provinces Council on the Sciences.

Robert Prange of NSAC was elected Chairman. On April 9-10, 1984 at NSAC, the Natural Resources Committee organized a conference on "Novel Food Crops" that included a review of research by AFRO. The participants concluded that there was sufficient evidence to support a major research thrust in developing fiddleheads as an agricultural crop and that opportunities

existed for exploratory research on several other useful plants. Robert Prange edited and published the proceedings and made them available through NSAC's Book Store at $5.50 a copy.

The AFRO group made significant progress, including the selection and development of genetic lines and establishment of field trials. Much of the work was supported by ARL, but when resources had to be withdrawn because of budget cuts in 1985, the group disbanded.

The Natural Resources Committee organized a workshop at TUNS on April 16, 1983, on "Enhancing Understanding Between the Scientist and the Journalist". One of the philosophical differences discussed between journalists and scientists was the desire by journalists and the public to obtain hard facts or "scientific truths". Denying fulfilment of that request tended to destroy the credibility of scientists. The scientific method, however, is not conducive to formulating immediate truths; rather, it is a process of accumulating evidence from many experiments and observations, sometimes conflicting, that lead to certain conclusions. In the process of arriving at a conclusion there exists a large grey area of uncertainty. The journalists view was stated as being simplistic and as a consequence the journalists failed to intelligently inform the public and failed the scientist.

Tim O'Neil of the Department of Economics at Saint Mary's and the committee's chairman, R.B.B. Dickison of UNB, organized the next major conference that was held on April 30 - May 1, 1985 at Halifax. The topic was "Acid Rain - The Current State of Knowledge". Speakers were drawn from several organizations representing different disciplines and interests from the federal government departments of forestry, fisheries and oceans, and environment including meteorology, from provincial government agencies, power commissions, and universities. Forty people attended of whom 19 served on several discussion panels. The conference began with discussions on the sources, transmission and deposition of acid rain and its impact on water systems and plants and animals; it concluded with a discussion on approaches to dealing with terrestrial impacts of acid rain. The cost of the conference to APICS was $1,064. Publication of the proceedings was supported by grants from Saint Mary's, TUNS, N.S. Department of Environment and a grant of $1,100 from APICS.

In 1987, the committee made arrangements for a lecture tour to universities in the Atlantic region by Dr. Lloyd Dickie of BIO. The tour was sponsored by a grant of $2,000 from a fish marketing firm, Clearwater, and $420 from APICS. The topic was "Balancing Economic and Ecological Considerations in Fisheries Management". The lecture tour occurred during the fall and winter season. A major undertaking by the committee in 1987 was a gathering of data for a compendium of "Theses from Atlantic universities of interest to natural resource and environment managers". The project updated an inventory prepared in 1980. Over 1,000 theses at the masters and doctorate level were identified. The project was partly financed by the Canada Employment and Immigration Commission, by sale of the publication at $5 a copy and a grant of $1,520 from APICS.

Though the committee's effort to establish a co-ordinated thrust in the Atlantic region on water resource research failed, the committee had been successful in focusing attention and assembling multidisciplinary groups for discussions on specific aspects of natural resources that deserve more intensive research and development.

APPENDIX

by JOAN ATKINSON

CHAIRMEN - TREASURERS - SECRETARIES - CO-ORDINATORS

EXECUTIVE MEMBERS-AT-LARGE

CHAIRMEN
SUB-COMMITTEES (1962-1975) COMMITTEES (1975-1987)

RECIPIENTS of the AWARD for EXCELLENCE in RESEARCH
The APICS/FRASER MEDAL

RECIPIENTS of the AWARD for EXCELLENCE in TEACHING
The APICS/NORTHERN TELECOM SCIENCE TEACHING AWARD

RECIPIENTS of APICS SUMMER STUDENT

SCHOLARSHIP (ASSISTANTSHIP) AWARDS

Chairmen

Usually, terms of office were for two years beginning on July 1st.

Dr. W.R. Trost	Dalhousie University	1962 - 1966
Dr. L.W. Shemilt	N.B. Research and Productivity Council	1966 - 1969
Dr. J.J. MacDonald	St. Francis Xavier University	1969 - 1972
Dr. W.A. Bridgeo	Saint Mary's University	1972 - 1975
Dr. K.T. Leffek	Dalhousie University	1975 - 1977
Dr. J.F. Read	Mount Allison University	1977 - 1981
Dr. F.J. Simpson	Atlantic Research Laboratory NationalResearch Council	1981 - 1984
Dr. P.J. Heald	Memorial University of Newfoundland	1984 - 1986
Dr. M.A. Edwards	University of New Brunswick	1986 -

Treasurers

Father W.A. Stewart	Saint Mary's University	1962 - 1966
Rev. Dr. C. Cheverie	St. Dunstan's University	1966 - 1969
Dr. J.R. Duffy	University of Prince Edward Island	1970 - 1976
Dr. J.T. Sears	St. Francis Xavier University	1976 - 1978
Dr. B. Liengme	St. Francis Xavier University	1978 - 1983
Dr. F. Weil	Université de Moncton	1983 -

Secretaries

Father W.A. Stewart	Saint Mary's University	1962 - 1966
Rev. Dr. C. Cheverie	St. Dunstan's University	1966 - 1968
Dr. C.F.O. Langstroth	Dalhousie University	1969 - 1972
Ms. C. MacKinnon and Ms. C. Fraser	Association of Atlantic Universities	1973
Dr. K.T. Leffek	Dalhousie University	1973 - 1975

After 1975, the Co-ordinator served as Secretary.

Co-ordinators

Dr. E.S. Hansen	Acadia University	1962 -1963
Dr. W.D. Jamieson	Atlantic Regional Laboratory/NRC	1963 -1964
Dr. W.E. Jones	Dalhousie University	1964 -1966
Dr. R.W. Frei	Dalhousie University	1966 -1967
Mr. W.L. Barteaux	APICS Office at AAU	1967 -1972
Mr. J.E. Caryi	APICS Office at AAU	1972 -1976
Mrs. P. Frick	Mount Allison University	1976 -1979
Ms. S. Stanley	Mount Allison University	1979 -1981
Mrs. G.M. Dalziel	Atlantic Research Laboratory/NRC	1981 -1982
Ms. G. Genik	Atlantic Research Laboratory/NRC	1982 -1984
Ms. J. Kean	Memorial University of Newfoundland	1984 -1986
Mr. T. Murphy	Memorial University of Newfoundland	1984 -1987
Ms. J. Atkinson	Memorial University of Newfoundland	1987 -

Executive members-at-large

Rev. Dr. C. Cheverie	St. Dunstan's University	1962 - 1965
Dr. W.S.H. Crawford	Mount Allison University	1962 - 1966
Dr. L.W. Shemilt	University of New Brunswick	1962 - 1966
Dr. B.S. Sheehan	Saint Mary's University	1966 - 1967
Rev. P. Bourque	Université de Moncton	1966 - 1968
Dr. J.J. MacDonald	St. Francis Xavier University	1966 - 1968
Dr. E.C. Smith	Acadia University	1967 - 1969
Dr. G.F.O. Langstroth	Dalhousie University	1968
Dr. L.J. Haynes	University of West Indies	1968
Dr. L. Harris	Memorial University of Newfoundland	1968 - 1969
Dr. C.F. Poole	Mount Allison University	1969 - 1970
Dr. V. Ross	Université de Moncton	1969 - 1971
Dr. S.W. Brecken	Memorial University of Newfoundland	1969 - 1971
Dr. R.W. Wright	University of West Indies	1969
Dr. A.D. Skelding	University of West Indies	1970
Dr. J.F. Read	Mount Allison University	1970 - 1976
Dr. R.J. Kavanagh	University of New Brunswick	1971 - 1973
Dr. W.R. Chan	University of West Indies	1971 - 1974
Dr. J.J. MacDonald	St. Francis Xavier University	1972 - 1973
Dr. W.D. Machin	Memorial University of Newfoundland	1972 - 1976
Mr. H.H.V. Hord	Fisheries Biological Station, St. Andrews, N.B.	1973 - 1976
Dr. J.T. Sears	St. Francis Xavier University	1975 - 1976

Dr. C.S. MacLatchy	Acadia University	1976 - 1977
Dr. F.J. Simpson	Atlantic Research Laboratory/NRC	1977 - 1979
Dr. W.J. Blundon	Memorial University of Newfoundland	1977 - 1979
Dr. J.M. Roscoe	Acadia University	1977 - 1978
Dr. R.J. Kavanagh	University of New Brunswick	1978 - 1979
Dr. R. Kruse	Saint Mary's University	1978 - 1982
Dr. L. Ferguson	Mount Allison University	1979 - 1981
Dr. P. Odense	Department of Fisheries and Environment	1979 - 1980
Dr. P. Heald	Memorial University of Newfoundland	1980 - 1984
Dr. D.C. Gordon	Department of Fisheries and Oceans	1980 - 1985
Dr. F. Weil	Université de Moncton	1981 - 1982
Dr. M.A. Edwards	University of New Brunswick	1982 - 1986
Dr. I. Dowling	University of Prince Edward Island	1983 - 1985
Dr. G. Daborn	Acadia University	1984 - 1986
Dr. L. Drake	University of Prince Edward Island	1985 - 1987
Dr. G. Mason	University of New Brunswick	1986 -
Dr. T. Pearson	Acadia University	1986 -
Dr. G. Williams	Atlantic Geoscience Centre/Energy, Mines and Resources	1986 -

Chairmen of sub-committees (committees)

Animal Care

G. Hilliard	Dalhousie University	1970 - 1971
R.A. McAllister	Memorial University of Newfoundland	1971 - 1973
C.E. Johnston	University of Prince Edward Island	1973 - 1975
U. Paim	University of New Brunswick	1975 - 1977
J. Love	Dalhousie University	1977 - 1978

The Committee was disbanded by Council on November 1978 but reinstated in April 1979.

C.E. Johnston	University of Prince Edward Island	1979 -1982
D. Crowe	University of New Brunswick	1982 -1986
W. Threlfall	Memorial University of Newfoundland	1986 -

Biology

W.B. Stallworthy	Mount Allison University	1962 - 1965
A.R.A. Taylor	University of New Brunswick	1965 - 1967
O.P. Kamra	Dalhousie University	1967 - 1968
Sister Mary Lua	Mount Saint Vincent University	1968 - 1969
A.R.A. Taylor	University of New Brunswick	1969 - 1971
J.S. Bleakney	Acadia University	1971 - 1973

A.R.A. Taylor	University of New Brunswick	1973 - 1974
W.B. Stallworthy	Mount Allison University	1974 - 1975
G. Daborn	Acadia University	1975 - 1978
M.S. Mounib	Department of Fisheries and Oceans	1978 - 1979
D. Brewer	Atlantic Research Laboratory/NRC	1979 - 1982
N. LeBlanc	University of Prince Edward Island	1982 - 1985
J. Foulds	University College of Cape Breton	1985 - 1986
M. Burt	University of New Brunswick	1986 -

Chemistry

L.R. Barclay	Mount Allison University	1962 - 1963
G.E. Cheney	Acadia University	1962 - 1964
A.G. McInnes	Atlantic Research Laboratory/NRC	1964 - 1965
Z. Valenta	University of New Brunswick	1965 - 1966
B. Newbold	Université de Moncton	1966 - 1967
W.T. Foley	St. Francis Xavier University	1967 - 1968
I. Unger	University of New Brunswick	1968 - 1970
E.E. Zinck	Acadia University	1970 - 1972
D.F. Arseneau	University College of Cape Breton	1972 - 1974
A. Fallis	Memorial University	1974 - 1976
J. Roscoe	Acadia University	1976 - 1978
D.H. Davies	Saint Mary's University	1978 - 1982
V. Reinsborough	Mount Allison University	1982 - 1984
D. Bunbury	St. Francis Xavier University	1984 - 1986
T.B. Grindley	Dalhousie University	1986 -

Computer Science

B.S. Sheehan	Saint Mary's University	1966 - 1968
D.A. Bonyun	Acadia University	1968 - 1970
E.M. Tory	Mount Allison University	1970 - 1971
R. MacKinnon	St. Francis Xavier University	1971 - 1973
A. Betz	Memorial University of Newfoundland	1973 - 1975
A. Mufti	Acadia University	1975 - 1977
C. McCandless	Mount Allison University	1977 - 1978
W.D. Wasson	University of New Brunswick	1978 - 1980
R.L. Kruse	Saint Mary's University	1980 - 1982
W.D. Slysz	Mount Allison University	1982 - 1984
A. MacEachern	St. Francis Xavier University	1984 - 1986
J. Dawe	Memorial University of Newfoundland	1986 -

Engineering

O. Cochanoff	Nova Scotia Technical College	1962 - 1966
R.J. Kavanagh	University of New Brunswick	1966 - 1968
N. Marcotte	Université de Moncton	1969 - 1970
C.H. Miller	University of New Brunswick	1970 - 1971
F.R. Wilson	University of New Brunswick	1971 - 1974
D.B. Warner	Saint Mary's University	1974 - 1976
W.M. Carson	Technical University of Nova Scotia	1977 - 1978

Fundy Environmental Studies

D. Gordon	Department of Fisheries and Oceans	1978 - 1982
G. Daborn	Acadia University	1982 - 1986

Geology

C. Allen	Mount Allison University	1962 - 1965
G.C. Milligan	Dalhousie University	1965 - 1967
B. Pelletier	Atlantic Geoscience Centre/EMR	1967 - 1968
A.L. McAllister	University of New Brunswick	1968 - 1971
G. Stevens	Acadia University	1971 - 1972
E.W.R. Neale	Memorial University of Newfoundland	1972 - 1973
N. Rast	University of New Brunswick	1973 - 1975
W.S. Shaw	St. Francis Xavier University	1975 - 1977
L. Ferguson	Mount Allison University	1977 - 1980
D. Skevington	Memorial University	1980 - 1981
D. Piper	Atlantic Geoscience Centre/EMR	1981 - 1985
G. Williams	Atlantic Geoscience Centre/EMR	1985 - 1987

Mathematics and Statistics

H.S. Heaps	Nova Scotia Agricultural College	1963 - 1965
F. Jackson	Nova Scotia Agricultural College	1965 - 1967
R.G. Ginivan	St. Francis Xavier University	1967 - 1972
W. Crawford	Mount Allison University	1972 - 1974
J.I. Dowling	University of Prince Edward Island	1974 - 1976
W.J. Blundon	Memorial University of Newfoundland	1976 - 1978
P. Kruse	Saint Mary's University	1978 - 1980
R.P. Sealy	Mount Allison University	1980 - 1984
G. Mason	University of New Brunswick	1984 -

Math, science & engineering education

R. Hawkes	Mount Allison University	1981 - 1983
F. Dobson	Department of Fisheries and Oceans/BIO	1983 - 1984
I. Blum	Mount Saint Vincent University	1984 - 1987
R. Boyd	Dalhousie University	1987 -

Water Resources (1969 -1978) (Natural Resources (1978-)

D.H. Waller	Nova Scotia Technical College	1969 - 1971
R. Winter	Acadia University	1971 - 1972
Rev. J.C. Cheverie	University of Prince Edward Island	1972 - 1973
J.G. Ogden	Dalhousie University	1973 - 1974
K. Winter	Memorial University of Newfoundland	1974 - 1976
J. Lakshminarayana	Université de Moncton	1976 - 1978
J.G. Ogden	Dalhousie University	1978 - 1979
W.A. Bridgeo	Saint Mary's University	1979 - 1980
G. Ward	University of New Brunswick	1980 - 1982
J.L. MacLachlan	Atlantic Research Laboratory/NRC	1982 - 1984
R.B. Dickison	University of New Brunswick	1984 - 1986
A. Ghaly	Technical University of Nova Scotia	1986 - 1987

Physics

E.W. Guptill	Dalhousie University	1962 - 1965
A. Levin	Dalhousie University	1965 - 1967
J.F. MacFarlane	Mount Allison University	1967 - 1969
R. LeBlanc	Université de Moncton	1969 - 1973
J.H. Matthews	Mount Allison University	1973 - 1974
C.S. MacLatchy	Acadia University	1974 - 1977
E. Grundke	St. Francis Xavier University	1977 - 1979
M.A. Edwards	University of New Brunswick	1979 - 1983
B. Hede	Mount Allison University	1983 - 1985
D. Rendell	Memorial University	1985 -

Psychology

E.D. Lawson	Acadia University	1964 - 1966
J.W. Clark	Dalhousie University	1966 - 1967
S.B. Schnitzer	University of New Brunswick	1967 - 1968
W.M. Draper	Acadia University	1968 - 1971
G. Gordon	Saint Mary's University	1971 - 1972
G.T. Woods	University of New Brunswick	1972 - 1974

M. Schwartz	St. Francis Xavier University	1974 - 1975
H. Mikaelian	University of New Brunswick	1975 - 1979
D. Likely	University of New Brunswick	1979 - 1982
R. Sampson	Mount Saint Vincent University	1982 - 1983
R. Brown	Dalhousie University	1983 - 1984
J. Harpur	Mount Allison University	1984 - 1985
A. Wilson	University of New Brunswick	1985 - 1986
R. Klein	Dalhousie University	1986 -

APICS/Fraser Medal Recipients

1972	Michael J. Kennedy	Geology	Memorial University of Newfoundland
1973	David F. Strong	Earth Sciences	Memorial University of Newfoundland
1974	Brian K. Hall	Biology	Dalhousie University
1975	Charlotte E. Keen	Geology	Atlantic Geoscience Centre, Bedford Institute of Oceanography
	Fabrizio Aumento	Geology	Dalhousie University
1976	Roger W. Doyle	Marine Biology	Dalhousie University
1977	W. Ford Doolittle	Biochemistry	Dalhousie University
1978	David J.W. Piper	Marine Geology	Dalhousie University
1979	Norman F. Haard	Biochemistry	Memorial University of Newfoundland
1980	Choy-Leong Hew	Biochemistry	Memorial University of Newfoundland
1981	Trevor Platt	Biological Oceanography	Dept. of Fisheries & Oceans, Bedford Institute of Oceanography
1982	Michael W. Gray	Biochemistry	Dalhousie University
1983	Russell J. Boyd	Chemistry	Dalhousie University
1984	Brian Fryer	Earth Sciences	Memorial University of Newfoundland
1985	Sandra Barr	Geology	Acadia University
1986	William K.W. Li	Biological Oceanography	Dept. of Fisheries & Oceans, Bedford Institute of Oceanography

1987	William Driedzic	Biology	Mount Allison University

APICS/Fraser Medal Judges

1972	J.M. Anderson	Director General, R&D Fisheries, Environment Canada
1972-1974	D.J. LeRoy	Vice-president, Scientific, National Research Council
1972-1974	L.W. Shemilt	Dean of Engineering, McMaster University
1972-1974	L. Kerwin	Recteur, Université de Laval
1972-1975	R.J. Uffen	Dean, Faculty of Applied Sciences, Queen's University
1973-1975	R. Gaudry	Université de Montreal
1975-1977	D.J. McLaren	Director General, Geological Survey of Canada
1975-1977	P.A. Larkin	Institute of Animal Resource Ecology, University of British Columbia
1975-1977	B. Etkin	Dean, Faculty of Applied Science & Engineering, University of Toronto
1976-1978	W.R. Trost	Chairman, Alberta Environment Conservation Authority
1976-1978	A.N. Bournes	President & Vice-chancellor, McMaster University
1978-1980	A.D. Booth	Retired President & Vice-chancellor, Lakehead University
1978-1980	A.E. Douglas	Head, Spectroscopy, National Research Council
1978-1980	W.S. Hoar	Head, Dept. of Zoology, University of British Columbia
1979-1980	E.R.M. Neale	Geological Survey of Canada
1979-1981	R. Cvetanovic	U.S. Dept. of Commerce, Centre for Thermodynamics & Molecular Science
1981-1983	R.P. Langlois	Dean & Director, Polytechnical Institute, Montreal
1981-1983	T.P. Parsons	Dept. of Oceanography, University of British Columbia

1981-1983	R.R. Jackson	Manager, Electrical Engineering, Bell Northern Research Ltd.
1981-1983	C.C. Gotlieb	Dept. of Computer Science, University of Toronto
1981-1984	R. Hutchins	President, Huntec '70, Engineering Physics
1982-1984	A.S. Perlin	Dept. of Chemistry, McGill University
1984-1986	M. Bergeron	Dept. of Physiology, Université de Montreal
1984-1986	E. Dudgeon	Director, Mechanical Engineering, National Research Council
1984-1986	M. Spencer	Plant Science, University of Alberta
1985-1987	I. Thomson	Geology, Placer Development Co.
1985-1987	B. Michel	Civil Engineering, Université de Laval
1987-1989	M. Dunbar	Oceanography, McGill University
1987-1989	K. Ingold	Chemistry, National Research Council

APICS/Northern Telecom Science Teaching Award Recipients

1984	Martin Schwartz	High School Science Teacher, New Waterford, N.S.
1985	Michael Burt	Biology Professor, University of New Brunswick
1986	John Wagstaff	Teacher, Saint John High School, Saint John, N.B.
1987	Zdenek Valenta	Chemistry Professor, University of New Brunswick

APICS/Northern Telecom Award Judges

1984	J. Terry Commission	Chairman, Maritime Provinces Higher Education
1984-1986	T. Layton	Science Consultant, N.S. Dept. of Education
1984-1986	F.J. Simpson	Retired Director, Atlantic Research Laboratory/NRC

1984-1986	B. Paddock	Faculty of Education, Memorial University
1984-1987	L. Drake	Dean of Science, University of Prince Edward Island
1985-1988	F. Girouard	Dept. of Mathematics, Physics & Computer Science, Université de Moncton
1987-1988	F. Dobson	Atlantic Oceanographic Laboratory, Bedford Institute of Oceanography
1987-1988	M. Brosnan	Dept. of Biochemistry, Memorial University of Newfoundland
1987-1988	M. Schwartz	Head, Science Dept., Cape Breton Education Centre, New Waterford, N.S.

APICS Summer Student Scholarship (assistantship) Awards

1963

Calder, D.	Acadia University
Hung, Yuk-yung	St. Francis Xavier University
Gaudin, Urbain	St. Dunstan's University
Sanford, L.N.	Mount Allison University

1964

Beals, H.L.	Mount Allison University
Burke, J.F.	St. Dunstan's University
Clancey, K.F.	Saint Mary's University
Friedlaender, M.J.	Saint Mary's University
Johnson, F.W.	Nova Scotia Agricultural College
MacGregor, H.	Mount Allison University
McGovern, F.P.	Saint Mary's University
Osyany, M.	St. Francis Xavier University
O'Sullivan, K.	St. Francis Xavier University
Tweedie, S.	Mount Allison University

1965

Campbell, J.C.	Mount Saint Vincent University
Clancey, K.F.	Saint Mary's University
Estabrooks, M.F.	Mount Allison University
de Geus, C.M.	Acadia University
Hounsell, R.W.	Acadia University
MacIntyre, M.S.	St. Francis Xavier University

McGoldrick, F.J.	University of New Brunswick
Morse, R.	Acadia University

1966

Adams, K.L.	Prince of Wales College
Bodley, F.H.	University of New Brunswick
Cale, D.D.	Mount Allison University
Deveau, D.M.	Mount Saint Vincent University
Fay, D.F.	Mount Allison University
Gass, D.A.	Mount Allison University
Hadley, N.H.	Acadia University
Hartley, J.M.	Mount Saint Vincent University
Hicks, J.L.	Acadia University
Matooane, M.T.M.	Mount Saint Vincent University
Moyse, C.	Mount Allison University
Narayan, J.W.	Mount Allison University

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1967

Bonn, B.	Acadia University
Brady, H.G.	Memorial University
Dunwell, L.E.	Dalhousie University
Fay, D.F.	Mount Allison University
Fitzgerald, P.A.	Nova Scotia Technical College
Gass, D.A.	Mount Allison University
Lambert, S.B.	Mount Allison University
Lightle, T.E.	Mount St. Vincent University
MacDonald, M.A.	Mount Allison University
MacPherson, C.M.	Mount Saint Vincent University
Moyse, C.A.	Mount Allison University
O'Brien, E.F.	St. Dunstan's University
Poirier, B.J.	St. Dunstan's University
Robertson, V.J.	Dalhousie University
Shaw, R.	Mount Allison University
Sobey, D.G.	Mount Allison University
Stockton, C.A.	Mount Allison University
Trainor, M.E.	St. Dunstan's University

1968

Andrews, G.	University of New Brunswick
Bourque, G.	Université de Moncton
Brady, N.H.	Mount Saint Vincent University
Carson, J.H.	University of New Brunswick

Eagles, T.E.	Acadia University
Hanley, P.	University of the West Indies
Higgs, G.W.	University of New Brunswick
Lambert, S.	Mount Allison University
Lawrence, J.	Dalhousie University
MacDonald, M.	Mount Allison University
Phillips, W.	Mount Allison University
Pritchard, M.	University of New Brunswick
Robertson, V.	Dalhousie University
Shaw, R.	Mount Allison University
Sobey, D.G.	Mount Allison University
Stockton, C.A.	Mount Allison University
Trainor, M.E.	St. Dunstan's University
Wright, H.	University of the West Indies

1969

Achong, A.	University of the West Indies
Arsenault, M.A.	University of New Brunswick
Auffrey, J.M.	Université de Moncton
Bourque, G.L.	Université de Moncton
Cooley, J.M.	Dalhousie University
Doyle, D.J.	St. Francis Xavier University
Hadley, D.J.	University of New Brunswick
Henheffer, P.M.	University of New Brunswick
Hirtle, S.E.	Mount Allison University
Husk, G.S.	University of New Brunswick
Masterton, J.L.	University of New Brunswick
McKinnon, M.D.	Saint Mary's University
Middlemiss, J.E.	Mount Allison University
Mungra, P.	University of the West Indies
Murphy, D.J.	Dalhousie University
Pritchard, M.E.	University of New Brunswick
Renwick, D.	University of the West Indies
Spencer, B.M.	St. Francis Xavier University
Swan, J.R.	Mount Allison University

1970

Barrett, E.	St. Francis Xavier University
Bishop, R.L.	University of New Brunswick
Clarke, D.	Mount Allison University
Davis, D.	Université de Moncton
Dyer, A.	St. Francis Xavier University
Felderhof, C.	Dalhousie University
Henheffer, P.M.	University of New Brunswick

Keddy, M.	Dalhousie University
Langille, B.	Acadia University
MacKinnon, E.	Mount Saint Vincent University
MacRae, M.	Dalhousie University
Merritt, A.	Mount Allison University
Pothier, C.	Mount Saint Vincent University
Robidoux, S.	Mount Allison University
Russell, G.W.	St. Francis Xavier University
Simms, M.A.	Mount Allison University

1971

Carter, L.J.	Acadia University
Clarke, D.	Mount Allison University
Cunningham, D.S.	Acadia University
Kazi, M.	University of the West Indies
Legay, D.S.	Mount Saint Vincent University
MacKay, G.R.	Acadia University
Robidoux, S.J.	Mount Allison University
Russell, G.W.	St. Francis Xavier University
Strain, P.M.	University of New Brunswick
Surrette, R.	Université de Moncton
Walker, V.K.	Acadia University
Williams, J.L.	Mount Allison University

1972

Ashby, W.R.	University of the West Indies
Atkinson, S.R.	Mount Allison University
Cunningham, R.S.	Acadia University
Dawson, W.M.	St. Francis Xavier University
Dempsey, S.R.	Saint Mary's University
Dwyer, A.M.	Dalhousie University
Goff, B.M.	Mount Saint Vincent University
Higman, D.P.	Mount Allison University
Humphrey, G.K.	University of New Brunswick
Linton, A.E.	Acadia University
MacKay, G.R.	Acadia University
Maxwell, A.	University of the West Indies
Munro, W.A.	Mount Allison University
Sharpe, J.F.	Mount Allison University
Smith, L.M.	Mount Allison University
Steer, P.	Mount Allison University
Walsh, L.M.	University of New Brunswick
Wentzell, B.R.	Acadia University

1973

Allen, P.L.	Mount Allison University
Chen, L.A.	University of the West Indies
Daigle, G.	Université de Moncton
Foley, M.E.	University of New Brunswick
Garbary, J.D.	Acadia University
Godin, J.J.	St. Francis Xavier University
Harris, E.J.	Acadia University
Linton, A.E.	Dalhousie University
Livingstone, M.J.	Mount Saint Vincent University
MacDonald, B.H.	Acadia University
Mageau, C.M.	Dalhousie University
Mandy, M.E.	Acadia University
Mullen, E.J.	Acadia University
Ross, S.M.	Mount Allison University
Singh, J.	University of the West Indies
Smith, L.M.	Mount Allison University
Walsh, L.M.	University of New Brunswick

1974

Bleakney, J.E.	Acadia University
Burns, G.R.	Mount Allison University
Christian, B.H.	University of New Brunswick
Fife, A.J.	Acadia University
Gammon, P.H.	University of New Brunswick
Guptill, J.E.	Acadia University
LeBlanc, M.J.	St. Francis Xavier University
Lee, M.B.	University of the West Indies
Livingstone, M.J.	Mount Saint Vincent University
McTavish, J.L.	University of the West Indies
Prince, W.S.	Mount Allison University
Richards, L.J.	Dalhousie University
Shyu, H.	University of New Brunswick
Sweet, J.R.	Acadia University
Tonner, P.D.	University of New Brunswick
Walker, L.J.	University of New Brunswick

1975

Barry, A.E.	St. Francis Xavier University
Boudreau, R.C.	St. Francis Xavier University
Farrell, J.B.	Acadia University
Gammon, P.H.	University of New Brunswick
Landry, C.D.	Dalhousie University
Lee, J.M.	University of New Brunswick
MacInnis, W.K.	Acadia University
MacKinnon, B.W.	St. Francis Xavier University
Moase, E.H.	University of New Brunswick
Montoya, D.R.	Memorial University
Smith, M.L.	St. Francis Xavier University
Stokoe, P.K.	Dalhousie University

1976

Brown, B.	Dalhousie University
Cameron, C.J.	Mount Allison University
Chambers, P.W.	Acadia University
Dahn, D.C.	Dalhousie University
Davies, R.	Dalhousie University
DeRoche, P.L.	St. Francis Xavier University
Gaudet, B.E.	Acadia University
Graves, M.M.	Mount Saint Vincent University
Livingstone, W.J.	Dalhousie University
McCurdy, E.P.	Acadia University
Montoya, D.R.	Memorial University
Myketyn, K.M.	Mount Saint Vincent University

1977

Alam, T.	Memorial University
Glines, M.V.	Dalhousie University
Hajela, R.	Dalhousie University
Holm, H.L.	Mount Allison University
Johnson, S.D.	Dalhousie University
Matthews, D.R.	Mount Allison University
Myketyn, K.M.	Mount Saint Vincent University
Oliver, B.A.	University of New Brunswick
Pennachetti, C.A.	Memorial University
Porter, J.M.	Acadia University
Rodger, R.M.	Dalhousie University
Romcke, J.L.	Acadia University
Watt, S.M.	University of New Brunswick

1978

Gilbert, G.	Memorial University
Harvey, B.D.	University of New Brunswick
Jamieson, I.G.	Acadia University
MacPherson, W.R.	St. Francis Xavier University
Marr, R.	Mount Allison University
Matheson, P.A.	University of New Brunswick
Morley, C.M.	St. Francis Xavier University
Murphy, C.H.	Dalhousie University
Taylor, L.A.	Acadia University
Winter, H.M.	Mount Allison University

1979

Bates, K.R.	Dalhousie University
Brittain, R.W.	Dalhousie University
Burley, D.G.	Memorial University
Coggar, G.E.	Acadia University
Dubois, A.G.	Acadia University
Kent, M.D.	Saint Mary's University
Matthews, M.A.	Mount Allison University
Maybee, S.H.	Mount Allison University
Ruohoniemi, J.M.	Dalhousie University
Woolgar, E.R.	Memorial University

1980

Baines, K.M.	Saint Mary's University
Beed, S.D.	Saint Mary's University
Burley, D.G.	Memorial University
Daniels, N.J.	Dalhousie University
Grantmyre, J.D.	Dalhousie University
Gratto, K.A.	Acadia University
O'Connor, D.P.	Mount Allison University
Sharkey, M.C.	St. Francis Xavier University
Szabo, J.P.	University of Prince Edward Island
Wickens, G.	Mount Saint Vincent University