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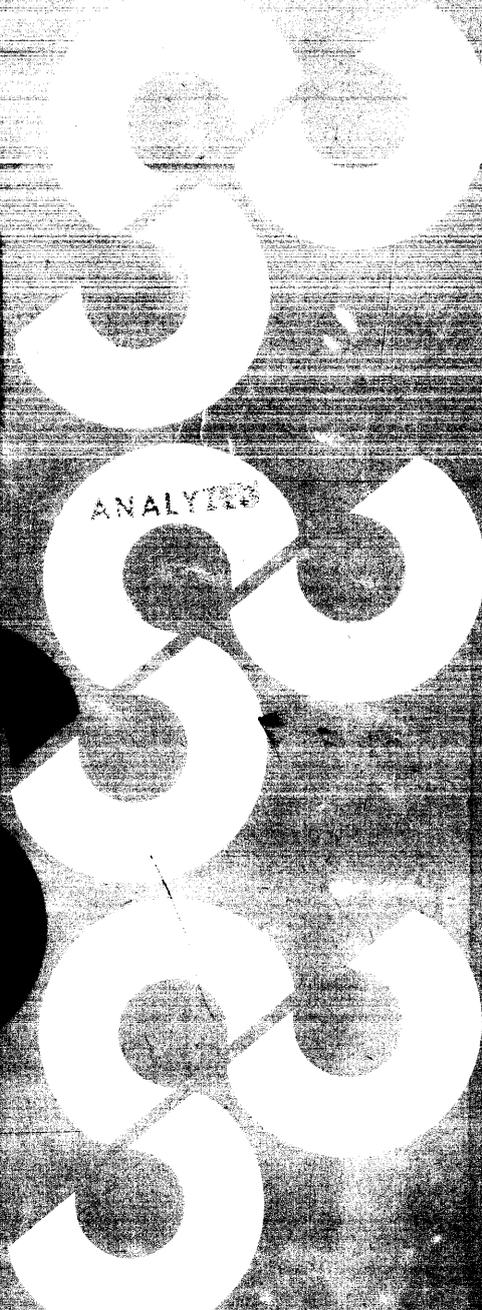
by Peter Aucoin and Richard French

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Knowledge, Power and Public Policy

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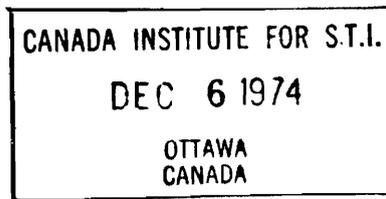
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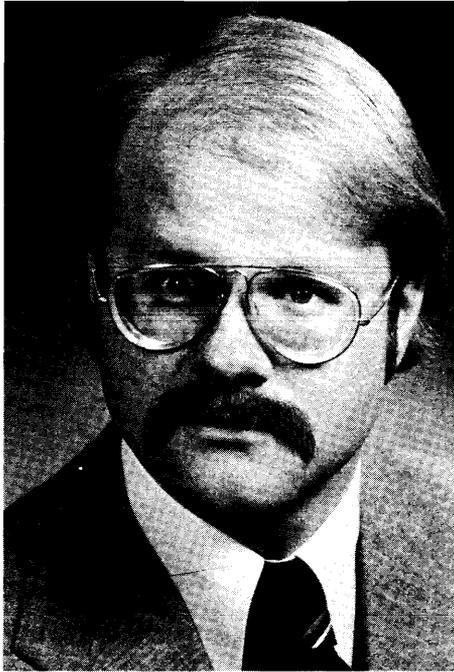




Peter Aucoin

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He is currently a member of the Board of Directors of the Canadian Political Science Association and a member of the Editorial Board of *Canadian Public Administration*. He is co-editor and co-author with G. Bruce Doern of *The Structures of Policy-Making in Canada*. He has also published approximately one dozen articles and book chapters on various aspects of Nova Scotian and Canadian politics and government. His research interests focus generally on public policy formulation with special emphasis on science and health care policies.

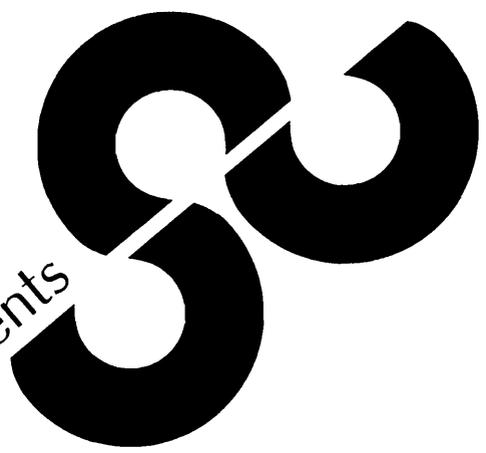


Richard D. French

Richard French was born in Montreal in 1947. He received his BSc (Biological Sciences) from the University of British Columbia in 1968 and his DPhil (History) from Oxford University in 1973. He has held a Rhodes Scholarship and a Woodrow Wilson Fellowship. In 1971-72 he was Assistant Professor of History of Science at Princeton University and since that time has filled various positions in science policy with the federal government.

His research interests centre on the social and political issues arising from the practice of science and medicine. He has written a number of articles and *Antivivisection and Medical Science in Victorian Society*, to be published by Princeton University Press in February 1975.

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Foreword

A study of this sort is bound to be dated because events do not stand still, while the writing, polishing and printing of such a background study take a finite length of time. I think it is important, therefore, that the reader bear in mind that the study *per se* was principally carried out in the final quarter of 1973 with the bulk of the writing being done in the first quarter of 1974. During this period of time, both authors were on the staff of the Science Council.

The two authors undertook this work because it was felt that a sympathetic but critical examination of the experiment of “Ministries of State for—” at this time might be very useful to all those who are concerned directly or indirectly with the experiment itself.

The Council approved this background study for publication from the same standpoint, judging that the authors had diligently gathered the facts, made careful and proper use of their data, were reasonable and justifiable in their analysis, and were straight-forward in their presentation.

As with all background studies published by the Council, this study represents the views of the authors and are not necessarily the views of the Council. The Council is publishing this study because it thinks it makes an important contribution to our understanding of the strengths and difficulties in an innovative approach to tackling one of the structural problems of our form of government.

We hope this study will help to clarify both the perceptions of the problem and the focus of the debate.

P. D. McTaggart-Cowan
Executive Director
Science Council of Canada

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A number of individuals assisted us in the preparation and writing of this study and we wish to acknowledge our gratitude.

Unfortunately, the manner in which our research was undertaken makes it impossible to identify the many public officials and others who kindly responded to our enquiries. Although they must remain anonymous, we wish to express our appreciation for their generous cooperation.

Dr. P. D. McTaggart-Cowan and Mr. Jim Mullin, Executive Director and Deputy Executive Director of the Science Council respectively, provided encouragement and support throughout this study. We always appreciated the former and often needed the latter. We are most thankful to them for both.

Two individuals, Professor J. Stefan Dupré, University of Toronto, and Professor Peter Larkin, a Member of the Science Council of Canada, furnished us with thoughtful criticisms and suggestions without which this study would have been the weaker. We take this opportunity to thank them publicly for their contributions. They are not, of course, responsible for the use which we have made of the same.

We also wish to thank the Editor of *Canadian Public Administration*, Professor Donald Smiley, for publishing earlier this year a brief summary article which dealt with some of the matters considered in this study.

Miss Nancy McLaughlin, our secretary and typist, endured a number of drafts of various parts of this study. Her patience, good humour, and steadfastness contributed in no small measure to the speed with which this study concluded. We thank her for her fine work.

P. A.

R. F.

I. Introduction and Background

When the Honourable C. M. Drury, President of the Treasury Board, stated in the House of Commons that “knowledge and power, in this world in which we live, are synonymous”,¹ he was not mouthing a platitude but stating a principle underlying the substantial changes in policy-making machinery contained in part of the Government Organization Bill, 1970.² The remark was fitting because the specific organizational change under consideration was the establishment of ministers and ministries of state responsible for designated policy fields that were not encompassed within the jurisdiction of any single existing government portfolio. Drury’s remark highlighted the degree to which the proposal for ministries of state was a departure from the principles of organization implicit in the existing structure of government. The new ministers of state would have neither significant statutory authority nor a major program capability. Rather, they would be assigned the responsibility for the formulation of policy and for coordination of those parts of the programs of existing departments and agencies which impacted upon the newly designated policy field.

Thus, the ministers of state would be faced with a novel task. The organizations that would serve them would not be departments in any traditional sense, but rather ministries whose initiatives would inevitably and consistently involve the responsibilities of other ministers. Fundamental to the notion of a ministry of state is the idea that the activities of research and policy analysis can provide an adequate basis for successful policy formulation and coordination. The logic underlying such a ministry derives from the “knowledge is power” hypothesis: i.e., that research, information and analysis will carry the day in Cabinet and Cabinet committees against the traditional sources of political and bureaucratic power.

In this study we shall examine this hypothesis as manifested by one of the organizations which emerged from its acceptance by the Cabinet. Following the passage of the Government Organization Act in 1971, two ministers of state were appointed to preside over newly created ministries. These were the Minister of State for Urban Affairs and the Minister of State for Science and Technology. Our interest here is primarily with the latter ministry, although we shall also make reference to the former in order that we might overcome, to the extent possible, the limitations of examining only one case. Secondly, we shall be primarily concerned with the role of ministries of state, and shall limit severely our discussion of substantive questions of science policy. The latter questions will not be introduced for their own sake but only to the extent that they illustrate the accomplishments and prospects of ministries of state. As we shall make clear, we regard the existence of ministries of

1. Canada, *House of Commons Debates*, Ottawa, 5 April 1971, p. 4932.

2. Although the literal context in debate was slightly different from the construction which we put upon this statement here, those who read the paper which follows will agree that the statement admirably epitomizes government thinking behind ministries of state.

state not as a part of, say, science or urban policy, but as a part of an approach to government organization developed in response to activity in these, among other, policy fields. This distinction is fundamental to the approach in our study.³

The Conception of Ministries of State

Ministries of state are something new and experimental in the machinery of Canadian government. It is tempting to interpret the establishment of the Ministry of State for Science and Technology as the consequence of the prodding of Senator Maurice Lamontagne and the Senate Special Committee on Science Policy,⁴ O. M. Solandt and the Science Council of Canada,⁵ Alexander King and the OECD,⁶ and several other science policy participants. It is equally tempting to interpret the formation of the Ministry of State for Urban Affairs as the consequence of the prodding of the Honourable Paul Hellyer and his Task Force on Housing and Urban Development,⁷ Professor Harvey Lithwick and the report on *Urban Canada*,⁸ and other analysts of federal obligations in the urban area. While both interpretations bear an important element of truth, they beg the most fundamental questions about the new Ministries of State. The conception of ministries of state represents not only the objective of better formulated and co-ordinated policy in specific fields, but also the attempt to alter in the most fundamental way the scope and nature of Cabinet decision making. An insight into the origins of MOSST and MSUA is an insight into the efforts of the Trudeau government both to increase the flexibility and prerogative of the government in dealing with "priority problems" (policy issues which are not being effectively dealt with by existing government departments or agencies),⁹ and to enshrine rational analysis and planning in place of the interplay of traditional sources of power in Cabinet.

3. This study is based primarily on interviews conducted by the authors with senior officials in the public service of Canada, in provincial governments, and with a smaller number of observers. Government officials were interviewed on a confidential basis and were asked for their personal views, not for those of the departments or levels of government in which they were employed.

4. See, Senate of Canada, *A Science Policy for Canada*, Ottawa, Queen's Printer, Information Canada, Volumes 1 and 2, 1970 and 1972.

5. See, in particular, Science Council of Canada, *Annual Report 1970-71*, Ottawa, Information Canada, 1971.

6. *Reviews of National Science Policy, Canada*, Organisation for Economic Cooperation and Development, Paris, 1969.

7. See, *Report of the Task Force on Housing and Urban Development*, Ottawa, Queen's Printer, 1969.

8. *Urban Canada: Problems and Prospects*, A Report Prepared by N.H. Lithwick for the Honourable R.K. Andras, Minister Responsible for Housing, Government of Canada, Ottawa, Central Mortgage and Housing Corporation, 1970.

9. For a discussion of the government's general approach to "priority problems", see Donald Gow, *The Progress of Budgetary Reform in the Government of Canada*, Economic Council of Canada Special Study No. 17, Ottawa, Information Canada, 1973, pp. 41-45.

During the 1960s, it became widely recognized that the structure of the federal government, as embodied in law and in the folkways of the civil service, was increasingly inadequate to deal with a good number of the problems facing it.¹⁰ Many problems arose with great speed to political visibility, were quite without precedent, and highly protean. Frequently, they defied existing demarcations of substantive responsibilities among departments and agencies, and the legislative machinery necessary to alter such responsibilities was too cumbersome to permit effective response. In any case, the evolving nature of some of the outstanding issues indicated that the establishment of new bureaucracies by legislation would inevitably demand further government reorganization at some point in the future.¹¹ The traditional mechanisms for dealing with such problems – Royal Commissions, task forces, even ministers without portfolio – were not perceived as adequate to provide the Cabinet with the desired apparatus for advising on policy.

The search by the Trudeau government for a new type of organization to handle these priority problems took place in a milieu of considerable confidence in the use of systems analysis and other such contemporary methods of policy planning. As Professor Bruce Doern has noted,

the presence of Prime Minister Trudeau and his advisers seems to indicate a change in the philosophy and in the conceptualization of policy-making. Much of it seems to be congruent, on a philosophical plane, with those political scientists who have argued we ought to view the political system in cybernetic terms as a goal seeking and error correcting information system that will “learn how to learn”.¹²

The Prime Minister himself was quite explicit in his enthusiasm for this approach. In a major speech to the Liberal party he said:

We are aware that the many techniques of cybernetics, by transforming the control function and the manipulation of information, will transform our whole society. *With this knowledge*, we are wide awake, alert,

10. The most important public acknowledgement of this general problem was the establishment in 1960 of a Royal Commission on Government Organization. The Glassco Commission as it came to be called after its chairman, J. Grant Glassco, initiated a major examination of the entire organization of the Government of Canada. The recommendations of this report have played a significant role in the many structural changes of the 1960s. Cf. Canada, *Report of the Royal Commission on Government Organization*, Ottawa, Queen's Printer, Volumes 1–5, 1962, 1963.

11. The attempts of successive governments to reassign policy responsibilities and program tasks to the most appropriate portfolio are admirably documented in J.E. Hodgetts, *The Canadian Public Service: A Physiology of Government*, Toronto, University of Toronto Press, 1973, especially pp. 87–137.

12. G.B. Doern, “The Development of Policy Organizations in the Executive Arena”, in G. Bruce Doern and Peter Aucoin (eds.), *The Structures of Policy-Making in Canada*, Toronto, Macmillan, 1971, p. 67. The use of the concept of “cybernetics” in political thought is discussed in Karl Deutsch, *The Nerves of Government*, London, Collier-Macmillan, 1966.

capable of action; no longer are we blind, inert powers of fate.¹³

In addition to this emphasis on a systems approach to policy planning and evaluation, the changes in the central structures of policy making, particularly in the organization and roles of the Privy Council Office (PCO) and the Cabinet Committee system, were quite obviously part of the design of a more "rational" system of governing.¹⁴ It was also considered important that innovations be made that would increase the policy awareness of federal departments and agencies and, given the Prime Minister's call for "participatory democracy",¹⁵ of appropriate non-governmental groups. This was accomplished in two closely related ways: first, via intradepartmental and interdepartmental reviews of major public policy areas, for example, the foreign policy review;¹⁶ and, second, through the mixed government-private sector task forces, for example, the recent health services reviews.¹⁷ During the first years of the Trudeau government changes were also made in the parliamentary standing committees to increase the opportunities for Parliament to become more aware of the policies and programs of the federal government.¹⁸

Despite these efforts and the considerable emphasis on the analysis of public policies, lingering dissatisfaction with the existing mechanisms at the disposal of the political executive for dealing with urgent problems was evident.¹⁹ The device of the Royal Commission, politically useful in

13. Office of the Prime Minister, "Notes for Remarks by the Prime Minister at the Harrison Liberal Conference", 21 November 1969, quoted in Doern, in Doern and Aucoin, *op. cit.*, p. 65.

14. See, once again, Doern, in Doern and Aucoin, *op. cit.*, and George Szabrowski, "The Optimal Policy-Making System: Implications for the Canadian Political Process", in Thomas L. Hockin (ed.), *Apex of Power*, Scarborough, Ontario, Prentice-Hall, 1971, pp. 135-145. For a discussion of the constraints of "rational" policy-making models, see Peter Aucoin, "Theory and Research in the Study of Policy-Making", in Doern and Aucoin, *op. cit.*, pp. 10-38.

15. Trudeau's ideas on the role of non-government groups in the political system are briefly presented in Hockin, "Pierre Trudeau on the Prime Minister and the Participant Party", in Hockin (ed.), *op. cit.*, pp. 96-107. A critique of Trudeau's ideas on this subject is presented in Charles Taylor, *The Pattern of Politics*, Toronto, McClelland and Stewart, 1970.

16. A fairly extensive analysis of this policy review, particularly in terms of the process employed, is to be found in Bruce Thordarson, *Trudeau and Foreign Policy: A Study in Decision-Making*, Toronto, Oxford University Press, 1972.

17. A succinct account of these reviews is presented in R.L. Jones, "From Health Insurance to a Health System", *Canadian Forum*, December 1972, vol. 52, pp. 13-15.

18. See, for example, C.E.S. Franks, "The Dilemma of the Standing Committees of the Canadian House of Commons", *Canadian Journal of Political Science*, December 1971, vol. 4, pp. 461-476, and A.D. Doerr, "The Role of White Papers", in Doern and Aucoin, *op. cit.*, pp. 179-203.

19. See, for instance, R.G. Robertson, "The Canadian Parliament and Cabinet in the Face of Modern Demands", *Canadian Public Administration*, Fall, 1968, vol. 11, pp. 272-279, and A.W. Johnson, "The Dynamics of Federalism in Canada", *Canadian Journal of Political Science*, March 1968, vol. 1, pp. 18-39. In addition to the useful analyses these two writers present, their views are of importance because both individuals occupied very senior positions in the federal government during this period of change. At the time of writing, Robertson was secretary to the Cabinet and Johnson, the secretary of the Treasury Board.

some circumstances for avoiding policy decisions, did not offer the appropriate mechanism for a government that wanted to tackle a pressing problem. Government is not able normally to influence the time taken by a Commission to accomplish its work. Besides, government is not able to influence the formulation of the recommendations of a Royal Commission. Accordingly, one of the alternatives to the Royal Commission, the Cabinet-commissioned task force, was employed with greater frequency than previously.²⁰ Unlike the Royal Commission, the task force can be linked much more closely with the government. Its personnel and work schedule are more subject to the discretion of the Cabinet. But, like the Royal Commission, the task force is an interim, *ad hoc*, planning operation carried out to supplement the activities of the permanent centres of government policy making and administration. This planning device, therefore, cannot provide an on-going capacity to monitor or coordinate the implementation of policy. A further structural innovation was thus required to plan and implement policies in areas that demanded concerted action but which did not fall clearly into the domain of any given department or agency.

The initial attempt of the Trudeau government to deal explicitly with these so-called “priority problems” was to assign them either to a minister whose primary responsibility lay elsewhere, as in 1968 when the Honourable Paul Hellyer, Minister of Transport, was given a policy responsibility for housing and urban development, or to a minister without portfolio, as later when the Honourable Robert Andras was given the responsibility for housing and urban development policy and the Honourable Herb Gray was assigned the problem of foreign ownership. This procedure was less than satisfactory, especially for the broader, more persistent, and more intractable priority problems,²¹ for which something more formal and concerted was required. The constraints of the legislative process, as noted previously, made piecemeal legislation for organizations to deal with each of these major priority problems an unsuitable option. Furthermore, the traditional “vertical” demarcation of the responsibilities of government departments was unsuitable in that priority problems were usually novel aggregations of fragments of the responsibilities of a number of existing departments. Moreover, these fragments could not be removed from departmental mandates. They constituted important components of the capability necessary to achieve the mission of a given department. Thus, the policies and programs of a variety of departments impacted undirected on a priority problem, often at cross purposes. A flexible mechanism was required to coordinate “horizontally” the activities of departments relative to the problem and

20. A brief but useful overview of both these devices is provided by V.S. Wilson in his “The Role of Royal Commissions and Task Forces”, in Doern and Aucoin, *op. cit.*, pp. 113–129.

21. That this device was not feasible in the context of the Cabinet system is the major thesis of Lloyd Axworthy’s, “The Housing Task Force: A Case Study”, in Doern and Aucoin, *op. cit.*, pp. 130–153.

to add to the policy and planning resources at the disposal of the Cabinet.²² The PCO was inspired for part of its solution by what it took to be the British system of government organization, where the Crown retains the right to organize its affairs as it judges appropriate, without necessary recourse to legislation and Parliamentary approval before appointment of a Minister and staff to get on with the job.²³

The sensitivity of government reorganization is such that planning for it is carried out in an atmosphere of confidentiality by the PCO in close cooperation with the Prime Minister, whose residual prerogative and responsibility government organization is. Without this confidentiality, vested interests within the bureaucracy might mobilize to frustrate reorganization proposals. The preparation of the Government Organization Bill of 1970, which was submitted to Parliament in December of that year, was no exception.²⁴ Its leading architects were the Prime Minister and a few PCO advisers, including the Secretary of the Cabinet and the Deputy Secretary (Plans). The Bill embodied not only a response to the difficulties of dealing with the most serious priority problems, but also provision for the establishment of the Department of the Environment, for an increase in the number of Parliamentary Secretaries, and for a few other organizational matters.

The Government Organization Bill proposed ministers and ministries of state, appointed and established through an Order in Council authorizing the issuance of a proclamation. The powers, duties, and functions assigned to ministers of state would be specified in the proclamation, and their purpose would be to develop policy and co-ordination mechanisms relating to specified policy fields. Ministries of state would exist "for the time being" as warranted by policy requirements, and their powers, duties, functions and existence could be modified by further proclamations. In the Bill as originally presented, Parliament was asked to permit the establishment by proclamation of up to five such ministries of state.

The PCO thinking behind the legislative proposal envisioned substantial planning efforts during a summer, when Parliament would normally be recessed, giving the government and its senior advisors time to examine problems and forecast future needs. One major advantage was that the legislation would have permitted the establishment by proclamation during Parliamentary recesses of ministries of state which

22. Writing in 1970, Hodgetts, in concluding his exhaustive study of government organization, stated: "A Cabinet, made up of ministerial heads of equal status, carrying responsibilities for operating programmes, is itself inclined to spend more time arbitrating jurisdictional squabbles and settling operational decisions rather than conferring its attention to larger issues of policy. . .if we are to escape the consequences of this structural block a real venture in organizational innovation lies before us." Hodgetts, *op. cit.*, p. 349.

23. The constitutional interpretations of the Canadian and British traditions in this regard are outlined by Hodgetts, *ibid.*, pp. 59-69.

24. Canada, House of Commons, *Bill C-207, An Act respecting the organization of the Government of Canada and matters related or incidental thereto*, Third Session, Twenty-Eighth Parliament, 19 Elizabeth II, 1970, Ottawa.

could be in operation by the time Parliament reconvened. Of course, ministries of state could have been established at other times as well. The emphasis was to be on small, policy-oriented ministries whose primary product would be cabinet memoranda and advice to central agencies such as the PCO and Treasury Board. Such ministries could be established rapidly and equally rapidly dissolved when the need for them had passed.

Some of these intentions were to be frustrated by the stiff Parliamentary opposition which the Bill encountered.²⁵ Because it was felt that the Prime Minister's participation would absorb too much of his time and divert attention from the Bill itself, the measure was piloted through the House by Mr. Drury. The Opposition focussed at first on objections to the omnibus nature of the Bill, claiming that the aggregation of a number of disparate issues into a single bill prohibited effective debate on each issue. In the event, the Bill indeed took a considerable amount of Parliamentary time from first reading in December 1970, to Royal Assent in June 1971.²⁶

It was the provision in the Bill for ministers and ministries of state which engendered the greatest criticism. Opposition members repeatedly accused the government of arrogating to itself powers which properly belonged to Parliament, to organize the civil service and expend funds. They pursued this line at such length that they in turn were accused of a filibuster. This reaction was not unexpected; before its presentation the Bill's original provision for eight ministries of state had been trimmed to five. The efforts to avoid stalemate were insufficient, and, as the debate dragged on, it became evident that concessions would have to be made. The Government's arguments that Parliament would obtain sufficient leverage over newly created ministries through its power of the purse failed to satisfy the Opposition. In April, the government offered an amendment to the effect that newly established ministries might be subject to a *post hoc* negative resolution of the House. This attempt to appease the Opposition while preserving the prerogative of Cabinet to establish ministries of state through Order in Council, without prior reference to Parliament, failed. The Opposition demanded, and ultimately won, agreement for an amendment requiring that the passage of an Order in Council authorizing issuance of a proclamation for a ministry of state be approved beforehand by resolution of the House of Commons. This "affirmative procedure" greatly disappointed those who had framed the Bill, for it significantly reduced the flexibility they had hoped to have in dealing with priority problems. It should be noted, however, that the existence of ministries of state may still be terminated by proclamation, without reference to the House of Commons.

25. Canada, *House of Commons Debates*, Ottawa, 9 December 1970 – 10 June 1971.

26. *Revised Statutes of Canada*, 1971, 19-20 Elizabeth II, c. 42.

The Establishment of Ministries of State

Although debate in the House on the Government Organization Bill made little reference to specific policy fields for which ministries of state might be created, there was no doubt that urban affairs and science and technology were two prime candidates. The Speech from the Throne in October 1970, had (after strengthening at the initiative of the Honourable Robert Andras) promised “re-organization of . . . urban activities under the direction of a Minister of State for Urban Affairs and Housing”.²⁷ It had also proposed that “a programme will be introduced to gather and focus . . . sometimes divergent and competitive scientific resources”.²⁸ The choice of urban affairs and science as the first (and thus far the only) ministries of state arose from the problems encountered in these policy fields during the preceding several years. Now that the background to the conception of ministries of state as an administrative modality has been drawn, it may be worthwhile to briefly explore developments in these specific policy fields. An exploration will show that these fields had by 1970 matured to the point where the Cabinet felt that it had to be seen to be taking *some* concrete action in response. The action chosen turned out to be the establishment of the two ministries of state. But the conception of ministries of state was not significantly influenced by the exigencies of the particular policy fields to which it was ultimately applied, nor were the reasons for the establishment of the two ministries of state identical.

In the urban policy field, the immediate chain of events that was to result in the establishment of the Ministry of State for Urban Affairs began in 1968 with the designation of the Honourable Paul Hellyer, Minister of Transport, as minister responsible for Central Mortgage and Housing Corporation (CMHC). Hellyer was also given a mandate by Cabinet to establish a task force on housing, the purview of which he quickly interpreted to encompass urban development.²⁹ The resulting inquiry and report were rapidly executed, highly independent of the government policy structure currently in place, and unquestionably stamped with the personal style of the minister. The *Report of the Federal Task Force on Housing and Urban Development*,³⁰ transmitted to the Prime Minister in January 1969, was notable for a number of sweeping recommendations addressed to various levels of government. Among them was a forceful call for a major federal role in urban affairs, stronger than that represented by CMHC, to be embodied in a Department

27. Canada, *House of Commons Debates*, Ottawa, 8 October 1970, p. 2.

28. *Ibid.*

29. D.M. Cameron, “Urban Policy”, in G. Bruce Doern and V.S. Wilson (eds.), *Issues in Canadian Public Policy*, Toronto, Macmillan, 1974, pp. 228–252. Cameron’s is the best available account of the background to the establishment of the Ministry of State for Urban Affairs and the summary which follows is greatly indebted to it.

30. See notes 7, 21 and 29.

of Housing and Urban Affairs.³¹ Hellyer pressed his recommendations (insofar as they were addressed to the federal government) upon the Cabinet with vigorous persistence. His inability to persuade his colleagues to his point of view precipitated his resignation from the Cabinet in April 1969.

Hellyer's efforts had not been entirely in vain, if for no other reason than that press coverage of his task force and its political aftermath had gained widespread public attention for the issues involved. The government incorporated some of his report's recommendations in housing legislation, and signalled its continuing commitment by the designation of the Honourable Robert Andras as Minister with full-time responsibility for housing.

Like his predecessor, Andras soon found that the problems of housing could not be dealt with in isolation from the overall problems of urbanization. About a year after the establishment of the Hellyer Task Force, Andras was instructed by Cabinet to prepare a report on urban development in Canada. It was hoped that this report would provide a deeper assessment of urban problems and evaluate the consequences of various possible federal postures toward them. Thus the Cabinet expected it would be in a better position to respond to the public concern raised by Hellyer. Andras chose Professor Harvey Lithwick, an economist from Carleton University, to carry out this study. Lithwick began research in November 1969, and submitted his report to Andras in March 1970.³²

Where Hellyer's approach had involved barn-storming across the country with public hearings, Lithwick's emphasized the accumulation of evidence, careful analysis, and a conceptual presentation.³³ As a result, *Urban Canada: Problems and Prospects* was the starting point for whatever broadly-based urban policy Canada may be said to possess. For our purposes here, it is sufficient to note that the burden of Lithwick's extensive investigation and analysis was that the country desperately needed a national urban policy. In terms of government organization for formulating and implementing such a policy, the report put forward three principal structures for possible adoption: a National Urban Council, in which the three levels of government could meet to articulate their interests, reconcile their objectives and develop planning; an Urban Research Unit; and, in the event the government accepted the necessary "total federal approach", a "distinct spokesman for the Federal Government urban objectives".³⁴ The latter was necessary,

so that these objectives are always clearly articulated and promoted as a guide to the delivery of policy. All federal agencies with an urban impact would need to consider their policies in the light of these objectives, and

31. *Report of the Federal Task Force on Housing and Urban Development*, *op. cit.*, pp. 71-72.

32. See note 8.

33. Cameron, "Urban Policy", in Doern and Wilson, *op. cit.*

34. *Urban Canada: Problems and Prospects*, *op. cit.*, pp. 213-221.

the development of programs to meet these objectives would permit the authority to draw on various relevant agencies as a matter of priority, not courtesy. Conflicts between objectives of different agencies could be resolved at the Cabinet level, so that the urban interests would not be downplayed for lack of an appropriate level of input.³⁵

Lithwick's report was considered by the Cabinet in the early spring of 1970, and it received a reasonably good reception. His emphasis on bold federal initiatives confronted the government with the same sort of problem posed earlier by Hellyer: given the jurisdictional problems in the urban sphere vis-à-vis the three levels of government, what was the appropriate machinery to carry out a federal role? The parliamentary caucus of the Liberal party is said to have adopted with enthusiasm the notion of a federal body to deal with urban affairs.³⁶ The Cabinet, however, moved more slowly.

It was not until the early summer of 1970 that the then novel concept of ministries of state was married to the urban policy field. The decision was made explicit in the Speech from the Throne of October 1970. By this juncture Andras had recruited Lithwick for a senior position in the nascent and rather vague federal government portfolio for urban affairs. While the debate over the Government Organization Bill dragged on far into 1971, Andras and Lithwick laid the foundation for what was to become the Ministry of State for Urban Affairs. MSUA was unveiled to a generally sympathetic House of Commons in June 1971 and proclaimed in July of that year.³⁷

As in the case of urban policy, ample discussion of possible Cabinet-level representation for science and technology had taken place in the years preceding 1970. Until the mid-sixties, this discussion was sporadic, informal, hypothetical, and informed largely by the experiences of other countries. The United States, for example, experienced a prolonged controversy over the relative merits of centralizing federal science responsibilities in a department of science along the lines of those European countries which had ministers for science and/or technology. In 1967, Senator Maurice Lamontagne broached the Canadian problem publicly and explicitly in his maiden speech in the Senate.³⁸ Lamontagne pointed out that the multiplicity of responsibilities of the Prime Minister, and the budgetary role of the President of the Treasury Board, made either an unsuitable choice as the minister primarily responsible for science. Lamontagne put the case for a department of scientific affairs which would not only formulate science policy but be responsible for the funding of university research. Accordingly, Lamontagne sketched out a

35. *Ibid.*, p. 220.

36. See Cameron, "Urban Policy", in Doern and Wilson, *op. cit.* and the discussion on the tabling of the Lithwick report in the House of Commons, *House of Commons Debates*, Ottawa, 5 March 1971, pp. 3984-3987.

37. *House of Commons Debates*, Ottawa, 28 June 1971, pp. 7415-7426, 7428.

38. Canada, *Senate Debates*, Ottawa, 29 June 1967, pp. 249-254 esp. p. 252.

blueprint for a highly centralized and powerful department, stopping short only at the consolidation in the proposed department of in-house government research laboratories. The idea of a centralized department of science has generally been greeted with ambivalence, not to say hostility, by the scientific community, whose ideology rejects the threat of monolithic control of research funding which such a department seems to represent. Lamontagne's concern for the issue was not ill-timed, for whatever the community's views were, it must be said that there was continuing dissatisfaction in Ottawa with the established science policy machinery.

By the sixties, the advisory role of the National Research Council in relation to general science policy matters had been recognized as dormant for some years.³⁹ Following the Glassco Commission recommendations on government science organization,⁴⁰ and C. J. Mackenzie's follow-up report to the Prime Minister in January 1964,⁴¹ a bipartite science policy structure was put in place. First, in 1964, the Science Secretariat was established in the Privy Council Office to provide confidential advice to Cabinet. Somewhat later, in 1966, the Science Council was created as a national public advisory body on policy issues involving science and technology. During the first two years of the Science Council's existence, the Science Secretariat provided it with staff support. By doing so, the Secretariat found itself playing both a confidential governmental role and a quasi-public role. For this and other reasons, the Secretariat and the Council were formally separated in 1968. The Science Council became a Crown Corporation the following year.⁴² Although the Science Council's role as a public forum for science policy issues seemed at that time relatively clear,⁴³ there were persistent problems with the Science Secretariat. Great difficulties emerged in recruiting individuals with stature in the scientific community who were capable of effectively playing a policy advisory role to high level decision makers. Even after its separation from the Science Council, the Science Secretariat was torn between its putative constituency (the scientific community with traditions of open public discourse) and its actual position in the bureaucracy (a section within the PCO suffering the severe constraints

39. G.B. Doern, *Science and Politics in Canada*, Montreal, McGill-Queen's University Press, 1972, pp. 21-53.

40. See, Canada, *The Report of the Royal Commission on Government Organization*, Volume 4, Ottawa, Queen's Printer, 1963.

41. C.J. Mackenzie, "Report to Prime Minister on Government Science", Ottawa, unpublished, January 1964.

42. G.B. Doern, *Science and Politics in Canada*, *op. cit.*, pp. 77-100 and Canada, Senate, *Proceedings of the Special Committee on Science Policy*, Ottawa, vol. 1, 21 March 1968, pp. 127-150 and vol. 22, 30 January 1969, pp. 3357-3382.

43. G.B. Doern, "The Role of Central Advisory Councils: The Science Council of Canada", in Doern and Aucoin, *op. cit.*, pp. 246-266.

of official confidentiality).⁴⁴ As Lamontagne saw it, the Council and the Secretariat were merely a beginning, for “the reform needed is much more drastic”.⁴⁵

Lamontagne’s sentiments are of more than academic interest, for he was the chairman and guiding spirit of the Senate Special Committee on Science Policy, which was established by the Senate in 1968. Lamontagne’s chairmanship ensured that the committee would be sympathetic to recommendations that science be given a spokesman at Cabinet level. There remained, however, the question as to the powers, duties, and functions that might be recommended for such a minister. The Chairman and Vice-Chairman of the Science Council were concerned that a full-fledged Department of Science would over-centralize research granting powers, and possibly separate departmental research capabilities from departmental objectives. Lamontagne’s commitment to a powerful department of science with extensive operating functions forced the Science Council to articulate an alternative, perhaps somewhat prematurely in terms of the development of their own thinking on the subject. In their testimony, Dr. O. M. Solandt and Dr. Roger Gaudry gently steered the committee toward a department or ministry with responsibility for policy advice and coordination, but without operating responsibilities in the area of science programs. This “staff” organization would avoid fear of monolithic control, and, equally important, conflict of interest between the policy function and the operating function. Solandt emphasized the need for a Cabinet voice on science policy uncompromised by operating responsibilities. The minister would be supported by a very small staff, which, on a confidential basis, would prepare policy and advice to the Cabinet and the central agencies. The Science Council would retain its public function and longer term perspective in reporting to the new minister.⁴⁶ The Senate Committee pursued the possibility of a minister for science in its discussions with several other witnesses.

The concept of such a minister was given further currency in 1969, when the OECD review of Canada’s science policy recommended the establishment of a portfolio, to be filled by “a senior member of Cabinet, without departmental responsibility, and deriving his authority direct from the Prime Minister”.⁴⁷ According to the OECD, the portfolio should not be combined with the Presidency of the Treasury Board, nor should science policy decisions be dominated by financial considerations. The OECD proposal was, in essence, similar to that put forward in Solandt’s and Gaudry’s testimony before the Senate Committee.

Accordingly, ample support was available from the discussions within the science policy community for the decision to establish a ministry of state to deal with science. The Senate Special Committee

44. G.B. Doern, *Science and Politics in Canada*, *op. cit.*, pp. 55–100.

45. See note 38.

46. Canada, Senate, *Proceedings of the Special Committee on Science Policy*, Ottawa, vol. 11, 26 November 1968, pp. 1259–1282.

47. *Reviews of National Science Policy*, Canada, p. 410.

Report's portrayal of the manifold shortcomings of Canadian policies provided a further impetus to action. Little disagreement was evident in the House of Commons in June 1971 when the Order in Council authorizing the issuance of a proclamation to establish the Ministry of State for Science and Technology was debated and then passed.⁴⁸

The precise impact of the lengthy discussion of science policy and urban policy on the PCO planning for ministries of state is not easy to divine. However, it seems that the PCO saw the ministries primarily as administrative mechanisms which would increase flexibility and the Cabinet's capacity to make policy decisions. Ministers of state were to be agents of the rational pursuit of governmental goals, and co-ordinators of at least some of the policies and programs of departmental fiefdoms, although they were not to become massive bureaucracies themselves. Rather, their influence was to be brought to bear through the excellence of the information, analysis, and policy developed by their staff. It was thought that the ministry of state mechanism could thus be applied to any one of a number of problem areas: women, youth, information, economic affairs, and intergovernmental affairs were later mooted in Parliament and the press, if not in the PCO. Whether the antecedent discussion in the PCO was significantly informed by the particular exigencies of the science or urban fields is most unclear.

The conception of ministries of state, for instance, emphasized their transitory nature. Their governing legislation provided specifically for termination of their existence, and the Honourable C. M. Drury, in supporting the Government Organization Bill, spoke of them as "in most instances of a temporary nature". When the policy problems were resolved, the ministry of state would quietly pack its computers, accept the thanks of a grateful clientele (no longer to be confused with a "priority problem"), and ride off into the bureaucratic sunset. Two kinds of difficulties arise with this idea. First, it is by no means clear how the demise of a ministry of state could occur in practice. How, to be blunt, does a government kill a whole ministry? Second, and of greater interest for present purposes, the problems of any significant policy field are most unlikely to be resolved by a few years of analysis and policy formulation, however brilliant. For example, as was recognized quickly within the PCO, the problems of the cities will always demand explicit initiative at the federal level.

The argument can, of course, be made that emphasis upon the temporary nature of ministries of state was simply a tactic to aid passage of the Government Organization Bill through Parliament. This immediately leads one to ask, to what extent was the entire conception of ministries of state inspired by short-term political considerations? Despite the lip service paid to the need for competitive ideas in the policy process or for the decentralization of the power of Treasury Board or line departments, other factors – such as the need for the government to

48. Canada, *House of Commons Debates*, Ottawa, 21 June 1971, pp. 7165–7174, 7207.

be seen to be doing something in certain policy fields, the provision of additional Cabinet portfolios, and the need to avoid confronting constitutional problems – loom as key political incentives.⁴⁹ Pursuing this line of reasoning, it might be suggested that the analysis and public debate over issues of urban and science policy placed the government in a dilemma for which ministries of state, without budgetary power or the ability to deliver on programs, seemed an impressive yet non-threatening response. In the urban area, the smokescreen of rhetoric on the “temporary nature” of ministries of state, and their seemingly innocuous research, policy and co-ordination roles could mask the constitutional implications of a federal intervention which might well metamorphose into a full-blown department, given the enthusiasm of the caucus. The science policy field was paradoxically both more extensively analyzed at the federal level, and far less mature as a policy field than urban affairs. (Some of the reasons for this will be discussed in a subsequent section.) For example, objectives in the urban policy field could command a degree of consensus unknown in science policy, and the degree of disagreement over the means to achieve these objectives was a measure of the amount of relatively sophisticated analysis on urban problems carried out by a variety of social scientists and planners, rather than of the struggles of a field like science policy, which, in planning and research terms, was no more than embryonic in the Canadian context. Provincial and municipal governments, of course, had been dealing with urban problems for many years. Thus, the decision to establish the Ministry of State for Science and Technology was a decision predicated not on constitutional niceties but rather upon the perceived need to mobilize more expertise in a neutral locus to advise as to just what should be done in response to the plethora of recommendations emanating from the Science Council, the OECD, the Senate Special Committee, and elsewhere. It was, therefore, a decision “to get ready to get ready” to do something.

To raise the variety of political and bureaucratic motivations which may have provided the rationales, either implicit or explicit, for each of the two ministries of state is not to impugn the wisdom of their creation. It does, however, bring to the fore the question of the extent to which the vague, experimental nature of the ministry of state, with its lack of statutory definition and budgetary authority, could provide an infinitely elastic mechanism for the pigeon-holing of policy fields. If the ministry of state concept could comprehend such a variety of fields, with widely divergent needs and constraints, then, one must ask, what would be the basis within the federal power structure of any one specific ministry of state?

The respective proclamations establishing the two new ministries of state⁵⁰ provide little guidance on this subject. On the contrary, both

49. See also G. Bruce Doern, “Horizontal and Vertical Portfolios in Government”, in Doern and Wilson, *op. cit.*, pp. 310–336.

50. Canada, *House of Commons Debates*, Ottawa, 21 June 1971, p. 7207 and 28 June 1971, p. 7428. These are reproduced as Appendices A and B.

proclamations make clear the combination of extraordinarily broad mandate with rather meagrely detailed policy, research, and coordination functions, which was to plague both ministries.

The Role of Ministries of State

The mandate given to the first two ministry of state portfolios were viewed as experiments in the policy-making system.⁵¹ In the preceding section we discussed the principal reasons why the federal government selected the ministry of state mechanism for the fields of science and technology and urban affairs rather than establishing full-fledged departments for them. Before examining the performance of one such ministry, the underlying conception of this new mechanism should be placed in the context of the structure of the federal government's policy-making system.

The concept of a minister and ministry of state advanced by the federal government in 1970 was a novel one in the Canadian experience because it envisioned a portfolio with responsibility for the development and co-ordination of policies but without the statutory authority to deliver or co-ordinate programs.⁵² The minister of state for a designated policy field is thus in a purely staff position in the Cabinet. His or her responsibility is to advise colleagues on policy initiatives that they will implement either by administering programs or by enforcing regulations. Co-ordination is thus in effect the responsibility of the entire Cabinet. A minister of state thus finds himself in a role in which it is imperative that he receive both the guidance and support of the Cabinet in general, and the Prime Minister in particular, in the selection of priority areas for policy formulation. The same is true of his ministry's attempts to examine and analyse such matters. This guidance and support are critical because ministers of state are unlikely, for reasons which we will develop below, to have either the portfolio authority or political influence which would constitute the kind of power required to co-ordinate activities in the portfolios of Cabinet colleagues.

In general terms, the rationale for creating a specific portfolio of this kind reflects an acknowledgement that an area of general concern requires policy development and co-ordination. Responsibility for setting the terms of reference for such a minister rests with the Prime Minister and the members of the Cabinet. These terms of reference should not be

51. The two ministries were given a long list of duties to perform but neither proclamation made clear the relationships that were to exist between these ministries and other agencies of government, nor did they provide them with any specific powers to carry out their functions other than the authority to initiate and to undertake research, analysis and study of their respective policy fields. In this latter respect they were not given any statutory powers of investigation as, for example, might be afforded a Royal Commission of inquiry. See Appendices A and B.

52. For a discussion of the "congeries" of the Canadian portfolio system, see Hubert L. Laframboise, "Portfolio Structure and a Ministry System: A Model for the Canadian Federal Service", *Optimum*, Winter, 1970, vol. 1, pp. 29-45.

so restrictive as to hamper the freedom of a minister to tackle problems in previously unplanned ways. Nevertheless, some sense of direction is needed to avoid a situation in which the creation of the Cabinet portfolio itself (and its ministry) becomes the sum and substance of the government's policy in the designated field.⁵³ Cabinet direction should provide the minister with the necessary power to examine the relevant policies and programs of the departments and agencies for which his or her Cabinet colleagues are responsible. To maintain this legitimacy is no small accomplishment, given not only the natural desire of ministers to minimize outside interference in the formulation of policies for their respective fields, but also the distaste of most executives for outside scrutiny of their own responsibilities.

More specifically, the support of the Prime Minister and the Cabinet is critical for a minister of state because of the realities of the distribution of power at the highest levels of political decision making. The exigencies of national political support have produced in Canada a federal Cabinet that is much more complex than a reflection of the government party's most able men and women. It is this and more. It also reflects, in varying degrees at various times, the need to be seen to be representing a number of diverse regional, ethnic, religious, occupational, professional, economic and other interests.⁵⁴ The result of this, in comparison to many other Western representative governments, is a large Cabinet in which the vast majority of members have portfolio responsibilities. Nevertheless, within this large assembly of political leaders there is a coterie of members with more than their equal share of political power. This pecking order results from the differences in authority inherent in the several portfolios and the personal influence of individual members with the Prime Minister, two highly interactive factors.⁵⁵ In the former instance, leverage results from the control function of the portfolio's role in overall government policy (for example, the portfolios of Justice or Finance), the sheer impact of the portfolio's responsibilities (for example, Health and Welfare, or Regional Economic Expansion), the political significance of the portfolio's constituency (for example, Industry, Trade, and Commerce, or Agriculture), or, as is often the case, some combination of these factors. The personal influence of individual members of the Cabinet with the Prime Minister, on the other hand, stems from the member's

53. The creation of a minister and ministry of state, if intended as the government's principal response to demands for action, would then be analogous to a government's use of Royal Commissions as "policy outputs". A discussion of this latter phenomenon is found in Wilson, "The Role of Royal Commissions and Task Forces", in Doern and Aucoin, *op. cit.* Also see T.E. Hodgetts, "Should Canada Be De-Commissioned?", *Queen's Quarterly*, Winter, 1964, vol. 70, pp. 475-490.

54. See Paul Fox, "The Representative Nature of the Canadian Cabinet", in Paul Fox (ed.), *Politics: Canada*, McGraw-Hill, Toronto, 1970, pp. 140-143, and F.W. Gibson (ed.), *Cabinet Formation and Bicultural Relations*, Royal Commission on Bilingualism and Biculturalism, Study No. 6, Ottawa, Queen's Printer, 1970.

55. The most explicit attempt to evaluate this structuring of power and influence within the Cabinet is presented in Doern, "Horizontal and Vertical Portfolios in Government" in Doern and Wilson, *op. cit.*

status within the political party, his popular support within a region or province or with a particular group such as finance, agriculture or labour, his experience in matters of governmental leadership, his ideological stance vis-à-vis that of the Prime Minister and/or any number of personal factors. The actual distribution of power within the Cabinet, however, invariably exhibits a high correlation between the members' political influence and the importance of the portfolios which they are assigned.

Our purpose in listing all of the above reasons why some members of the Cabinet have more power than others is simply to make explicit the number and range of factors that must be considered in analysing the position of an individual member in the Cabinet and, therefore, his or her actual role in political policy making. Our specific concern is, of course, where a minister of state might normally be expected to fit into this structure of power. This question brings us to the crux of the hypothesis that knowledge and power are synonymous in that the Minister of State's mandate does not include a control function, his operations do not involve the expenditure of funds or the distribution of services to the community, nor is his ministry responsible for administering programs for a particular clientele. In addition, however, at least on the record of past experience, one would normally expect such a portfolio to be held by a member of the Cabinet junior in terms of government experience, party stature, and personal influence with the Prime Minister. (The most obvious exception to this would probably be in cases where the policy field designated was an extremely controversial or politically sensitive one and required immediate attention.)

In short, a minister of state has no power except knowledge. He or she is dependent upon the force of the argument contained in the policy proposals put forward by his or her ministry. As such, he must assume that ministers affected by his proposals will exhibit a good deal of cooperation in allowing him to intervene in their spheres of authority. A minister of state cannot wield the power his colleagues possess by virtue of their regulative or allocative responsibilities.

The distribution of power within the Canadian Cabinet extends, of course, down into the bureaucracy. As a horizontal staff agency the concept of the ministry of state is an explicit attempt to meet what Professor Stephen Dupré has called the "crises of co-ordination" in contemporary policy making without imposing an additional degree of centralized authority on a system that is already highly centralized.⁵⁶ Fundamental to this attempt is the expectation that research and analysis, rather than bureaucratic control, will inspire the political will to integrate an erstwhile *mélange* of policies and programs. Insofar as it departs from the traditional strategies for relating policy responsibilities and political power, this experiment introduces a new twist to the policy formulation system within the federal bureaucracy.

56. As noted in Doern and Aucoin, *op. cit.*, pp. 272-273.

Since it does not possess programs of its own and, even more important, since it is created to formulate *new* policy rather than simply to accept responsibility for a policy or policies established elsewhere, a ministry of state has no choice but to plunge directly into the policy-making process. It cannot assume only an administrative stance. Moreover, because its designated policy field is one that encompasses the interests of more than one government department or agency, its role is similar to that of a central executive staff agency, the two most important of which are the PCO and the Treasury Board secretariat. Like the PCO, a ministry of state, by virtue of its mandate, must organize itself to perform a scanning function, informing itself of where and when the government should take action. It must accept responsibility for defining problems, identifying needs and recognizing opportunities and it must do all this in the context of the general political objectives and intentions of the federal government. As the experience of the PCO, indeed of central planning bodies in a number of countries, has shown, this task is by no means a simple or straightforward one. It requires the development of a broad overview of the problems and prospects of public policy.⁵⁷ Unlike the two central agencies of the federal government, however, a ministry will possess neither the influence of the Cabinet secretariat (the PCO), nor the power of the government's budgetary agency (the Treasury Board secretariat).⁵⁸

The guidance and support required by a minister of state from Cabinet colleagues and especially the Prime Minister thus must extend to his or her ministry in its relations within the rest of the government. This means that it must have the joint support of the PCO and the Treasury Board secretariat in its policy formulation activities. The effectiveness of any agency within the federal government in formulating new policies is in large measure determined by its ability to meet the expectations of the central agencies regarding the overall policy thrust of the government.⁵⁹ As the general policy and budgetary support staff to the Prime Minister and the Cabinet, the PCO and the Treasury Board secretariat exercise significant leverage in the policy-making process. To have its policy proposals satisfy the demands of these agencies, a

57. The necessity of central planning agencies developing such a broad overview or comprehensive framework is the central thesis of two recent and influential works: Y. Dror, *Public Policy-Making Re-Examined*, San Francisco, Chandler Publishing Co., 1968, and E. Jantsch, *Perspectives in Planning*, Paris, OECD, 1969. A brief analysis of this thesis in the Canadian context is presented in M. Rowan, "A Conceptual Framework for Government Policy-Making", *Canadian Public Administration*, Fall, 1970, vol. 12, pp. 277-296.

58. See, especially, Doern, "The Development of Policy Organizations in the Executive Arena", in Doern and Aucoin, *op. cit.*, and Michael Hicks, "The Treasury Board of Canada and its Clients: Five years of change and administrative reform", *Canadian Public Administration*, Summer, 1973, vol. 16, pp. 182-205.

59. The operating roles of the two central agencies are spelt out quite nicely in Gordon Robertson, "The Changing Role of the Privy Council Office", *Canadian Public Administration*, Winter, 1971, vol. 14, pp. 487-508, and A.W. Johnson, "The Treasury Board of Canada and the Machinery of Government of the 1970's", *Canadian Journal of Political Science*, September 1971, vol. 4, pp. 346-366.

ministry of state must not only fulfil governmental intentions, it must also be able to undertake intelligence and research activities that are not performed within the line departments or central agencies. Its proposals, in other words, must exhibit a degree of policy expertise that is not at the disposal of the collective Cabinet's principal staff agencies or those of individual departmental ministers. To achieve this, a ministry of state must place priority on the orchestration of its research, intelligence gathering, and policy development functions.

To elicit the confidence and cooperation of the departments and agencies which administer programs within its policy field, a ministry of state needs the leverage of central agency support for its intragovernmental initiatives. At the same time, however, it must be constantly aware not only of the objectives and priorities of these departments and agencies but also of the demands made upon them by their non-governmental constituencies. There is not much doubt that for the total range of programs in any given policy field there will be instances of goal displacement, duplication, overlapping, gaps in coverage, indecision, and some waste of resources. The attempts of a ministry of state to discover these problems in any given field must be dependent upon its ability to converse with departmental and agency experts on the most salient issues in its policy field. The officials of a ministry, in interacting with officials of other branches of the administration, will not be in a staff position to them, but neither will they be their executive superiors. Moreover, they will be generalists vis-à-vis the operating and managerial personnel of other government departments. Without the cooperation of those managing the programs affecting its policy domain, a ministry would invariably find itself not cognizant of the problems and the prospects of its policy field; duplicating work done elsewhere, probably by more technically competent people; or, worst of all, being undermined in its efforts to develop integrated policy. The consequences of a failure to establish cooperative relationships with departments would, in most cases, frustrate the purpose of creating a ministry of state.

The traditional structure of power and influence within the federal bureaucracy makes this experiment a rather bold one. The strengthening of the staff and planning functions of the two central agencies, the major innovation in the policy-making system of the previous decade, was, it should be recalled, conceived in the interests of the entire political executive, especially that of the Prime Minister.⁶⁰ Just as these changes in the central agencies have caused some disquiet in the media, the

60. An examination of the ways in which these changes were in the interests of especially the Prime Minister is presented in Thomas A. Hockin, "The Prime Minister and Political Leadership: An Introduction to Some Restraints and Imperatives"; Fred Schindler, "The Prime Minister and the Cabinet: History and Development"; and George Szablowski, "The Optimal Policy-Making System: Implications for the Canadian Political Process", in Thomas A. Hockin (ed.), *The Apex of Power, op. cit.*, pp. 2-21, 22-50, 135-145.

opposition,⁶¹ and in the Cabinet itself,⁶² one might expect similar ambivalence about the introduction of ministries of state – not least from those ministers most immediately affected.

The Role of a Ministry of State for Science and Technology

As indicated earlier in this study, the science policy field in Canada has been subject, in recent years, to a great deal of study and analysis.⁶³ The examinations of science policies in this country have laid bare the extent to which (a) stated objectives have been mis- or reinterpreted by those managing various agencies and programs, (b) co-ordination has not obtained between groups with similar or related interests and responsibilities, and (c) disparities of resources among disciplines and fields of science and technology have not been resolved. Our purpose here is neither to enter into the debate on the substantive policy proposals put forward by the various studies nor to discuss the policy issues themselves. We shall examine the conceptual problems of science policy in terms of their consequences for governmental organization.

Insofar as organization is concerned, the debate on the Canadian effort in the fields of science and technology has centred around two conflicting opinions. On the one hand there is the position articulated by many scientists, especially basic or pure researchers, that they be left alone to determine the research and development work that should be undertaken.⁶⁴ This position takes for granted, of course, public financing of such activities. On the other hand, a growing number of politicians and bureaucrats, and even some members of the scientific community, argue that science and technology should be developed in relation to

61. See, for instance, Walter Stewart, *Shrug: Trudeau in Power*, Toronto, New Press, 1971. The account by Stewart, a journalist whose articles on changes in the Prime Minister's Office and the PCO were relished by members of the opposition parties and many editorial writers and newsmen, places great emphasis on the use of the "super technocrats" during the first years of the Trudeau administration. For a critique of these developments in terms of our parliamentary system of government, see Denis Smith, "President and Parliament: The Transformation of Parliamentary Government in Canada", in O.M. Krulak *et al.* (eds.) *The Canadian Political Process*, Toronto, Holt, Rinehart and Winston, 1970, pp. 367–382.

62. Douglas Fisher, "Ottawa at the Centre: How the Zip Changed to Drift", *Executive*, February 1974, vol. 16, pp. 25–27.

63. In addition to the references cited in this study the reader is referred to *Scientific Policy, Research and Development in Canada*, A Bibliography prepared by the National Science Library, Revised to June 1970, and Supplement to June 1972. It should be noted that the Science Council of Canada is also preparing a bibliography for the field of science policy and has published policy reports and background studies on over two dozen selected topics on science and technology in Canada.

64. Numerous expressions of this position, labelled by the Senate Committee, the "republic of science" argument, can be found in Senate of Canada, *A Science Policy for Canada*, Vol. 1, chapters 7–10, pp. 161–286. The most frequently quoted articulation is presented by Michael Polanyi, "The Republic of Science", in E. Shils (ed.), *Criteria for Scientific Development*, Cambridge, Mass., M.I.T. Press, 1968, pp. 1–20.

ultimate social objectives.⁶⁵ In each case, however, there is often the assumption that science and technology can be considered a distinct entity, something that can be regarded logically and practically as the object of an overall policy or a highly integrated set of policies. From this debate has emerged the term “science policy”, a term which, since it emanated from a clash of opinions, is seldom adequately clarified, even by those engaged in the formulation of science policy.

Much of the confusion over the nature of science policy, particularly in the Canadian context, is due to the way in which the science policy debate has evolved in terms of issues and participants.⁶⁶ The most visible issues have centred on the need for a “rational” approach to decision making in science policy, a “comprehensive” and “national” science policy, a “balanced” scientific effort, and, of course, an organizational “reform” in the structures of policy making to bring about all of the above. The most active participants have been Senator Maurice Lamontagne and his Special Committee on Science Policy, various government officials with an interest in science (notably in the Science Secretariat and later in MOSST), the members and staff of the Science Council, the scientific press, professional associations, and several members of the scientific community (including both university and federal government scientists).

With some exceptions, the debate on these issues has floundered in a morass of ambiguity and confusion. On one side there is promised salvation through the development of the “science of science” (that is, the systematic study of the development and use of science), rational planning (the elimination of the role of prejudice, bias, vested interest and other unenlightened attitudes in the formulation of policy), cost-benefit analysis (the use of hard data rather than “gut feel” or “seat of the pants” judgement in the evaluation of existing and proposed programs), and comprehensive policy (the total integration of all programs related to the promotion and deployment of science and technology). On the other side looms the spectre of the domination of experts by the uninformed (that is, the control of scientists by laymen), the introduction of bureaucracy (the introduction of unnecessary red tape and multiple

65. The Senate Special Committee is, of course, one of the strongest proponents of this position, a position maintained throughout all three volumes including its final volume released in 1973. In addition to these reports the Science Council of Canada had earlier articulated a similar mission-oriented policy report. See its *Towards a National Science Policy for Canada*, Report No. 4, Ottawa, Queen's Printer, 1968.

66. It would be impossible and probably not very fruitful to assemble in a footnote a compilation of all the articles and editorials emanating from this debate as it has been carried on in conferences, speeches and the professional journals. Fortunately the journal, *Science Forum*, has been a principal focus for the debate. Cf. *Science Forum*, February 1968, Vol. 1, and published every second month thereafter. As analysis of the debate to the late sixties is presented in G. Bruce Doern, *Science and Politics in Canada*, *op. cit.* There are, in addition, the proceedings of the Senate Special Committee. See Senate of Canada, *Proceedings of the Special Committee on Science Policy*, Second Session, Twenty-Seventh Parliament, 1967-68, and First Session, Twenty-Eighth Parliament, 1968-69, Ottawa, 1968, 1969.

layers of administrators), the politicization of the research support system (the demise of the peer review process), and a flight from excellence (the tyranny of utilitarian criteria over those of quality and originality). For the purposes of generalization, the former set of objectives and methods have been proposed by those advocating a national and overall science policy, while the latter set of fears has been the nightmare of the basic researchers.

It would be incorrect to suggest that this debate has been resolved one way or the other or that either of these stereotyped positions represents the official position of the federal government. Recent administrations have attempted, nevertheless, to rationalize their research and development programs along the lines suggested by the comprehensive science policy approach. As a result there has been a search both for an overall set of objectives for science and technology and for mechanisms to evaluate research performance and prospects in the light of such objectives. The federal government chose to apply the ministry of state concept to science and technology in order to accomplish such planning and co-ordination.

Scientific and technological activities have been singled out for this kind of operation because of the presumption of a close relationship between research and technological development, on the one hand, and economic and social development, on the other. In attempts to ascertain and evaluate the appropriate levels of support for and organization of R & D activities, an effort has been made to bring to bear on these matters an additional measure of expertise, specifically related to questions of science and technology. In introducing this further perspective, the Ministry of State for Science and Technology has assumed a role in some ways similar to the Treasury Board in its function as the assessor of the budgetary implications of programs and proposals. This kind of horizontal evaluative role is also performed by a number of other government departments and agencies in the exercise of some of their responsibilities. The most obvious examples are the PCO with regard to certain matters of government organization, the Department of Justice on various constitutional and legal questions, the Department of Finance with respect to the use of a number of instruments for economic policy, and the Department of External Affairs regarding government programs with international implications. In all of these cases, however, either the logic and principles of such intragovernmental interventions are well established or the intervening agency possesses sufficient clout to carry out its initiatives. Without much clout given its status as a ministry of state, it is necessary that MOSST establish the logic and principles of its role in this kind of exercise.

For the same reasons that the field of science and technology policy was designated as a priority problem, it has been a difficult one for which to organize. The relationships between basic research and development activities and technological innovation, for example, are not nearly as straightforward as is often presumed. In many fields there is doubt

that the continued expansion of programs for the support of R & D has led to significant improvements in the pursuit of ultimate objectives, be they economic growth, on the one hand, or social welfare, on the other. There is an emerging consensus that we simply do not have sufficient knowledge of the linkages between research and innovation to be able to manipulate the crucial processes to suit our purposes. A number of extremely important issues are thus outstanding in this policy field, in large part due to the fact that there is as much disagreement over the effectiveness of many R & D programs as there is divided opinion on the priority to be given to them.

This lack of consensus has important implications for the policy-making system and stems from the fact that most research and development programs cannot logically be justified on the grounds that they serve "science" objectives. These programs are meant to assist in the accomplishment of non-scientific objectives, for example, industrial development, economic growth, improved health care, environmental protection, and so forth. Accordingly, they should be directed and evaluated in light of these objectives. Thus policy makers and program managers in fields other than science will have a major say in the development and deployment of science and technology, and scientists and technologists will be mobilized for policy-making activities only insofar as technical expertise is required to consider the substantive questions of R & D programs or proposals. It follows, therefore, that major objectives of any science policy should involve optimization of the use of R & D as an instrument for other government policies.

The nature of this policy field thus demands that those responsible for the formulation of science policies synthesize the objectives of several policy fields and R & D programs in the federal government. The policy development and co-ordination functions of the Ministry of State for Science and Technology are performed, accordingly, at a secondary level, to subserve objectives which are in the provinces of other departments and agencies. It is at this point that the roles of the Ministry of State for Science and Technology and the Ministry of State for Urban Affairs differ in an important way. The latter ministry has the responsibility to propose objectives and to formulate policies for the federal government in a field, urban affairs, where such objectives are perceived as ends in themselves in the sense that they are popularly comprehensible and politically highly visible. Its attempts to co-ordinate the programs of the several federal government departments and agencies which impact on urban affairs are undertaken within this context. The relationships of this ministry to the departments and agencies with which it interacts are thus different from those MOSST has in its intragovernmental relations. In comparing the experiences and prospects of the two ministries of state this critical distinction must be kept in mind.

It is because of the great conceptual and practical obstacles to the effective implementation of its roles that a number of prominent science policy observers, prior to the creation of MOSST, questioned the theory

on which the idea of a Ministry of State for Science and Technology was predicated. For instance, Professor Harry Johnson, claimed, in terms of policy making for financial support for basic research, “it appears virtually impossible to establish any empirical basis for. . . [such] decisions.” To construct a “set of rational decision rules” for determining these allocations is to engage in, “about the most difficult problem in cost benefit analysis one can think of, because of the complex nature of the production and utilization of scientific knowledge, and because the scientists, who will inevitably participate largely in the decision-making process, have their own traditional standards for judging the value of scientific work, and these standards may be at once essential to the self-government of the scientific community and strongly at variance with political concepts of the social and economic public interest in science.” Johnson was dubious about the ability of a central science policy organization to establish “an operational framework for making science policy effective”, that is determining general guidelines for the appropriate role of science and technology in a wide range of government missions and programs. For Johnson, the attempt to do so, especially through the budgetary process, would probably be analogous to “borrowing eggs from the neighbours, making an omelette and then giving the eggs back to their owners.”⁶⁷

Doern was likewise skeptical of the idea of a Ministry of State for Science and Technology. His argument was in many ways similar to Johnson’s, but focussed in a more pronounced way on the actual structures of policy making in Canada. While he recognized, along with Johnson, the logical and empirical difficulties of organizing this field for government purposes, he felt that “there must be a government and political commitment to give science policy a higher priority than it appears to have now, and a relatively more aggressive and continuous short-term budget role along with the heretofore extensive preoccupation with the long-run, and with general data gathering.”⁶⁸ Doern concluded, however, that there was little likelihood, given the present structure of power within the Cabinet, of science policy matters being afforded the political commitment necessary to create a strong role for a minister and his or her staff.

The Senate Special Committee on Science Policy, on the other hand, had argued in 1970 in favour of “the macroscopic approach that only a coherent overall science policy can provide”. According to Volume I of the Committee’s report, “If general science policy is to accomplish its crucial role effectively, it must also develop a *system of control*, to make sure that the strategy will be respected in the detailed decision-making

67. Harry G. Johnson, “Comments on Senator Grossart’s Paper”, *Minerva*, vol. 9, p. 545. Johnson, it should be noted, was replying to an address by Senator Allister Grossart, a member of the Senate Special Committee on Science Policy, to the Canadian Economics Association, 4 June 1971. This address is also contained in *ibid.*, pp. 538–544.

68. G. Bruce Doern, “The Political Realities of Science Policy-Making in the Federal Government”, *Science Forum*, June 1970, vol. 15, p. 24.

process, and *review mechanisms*, to make sure that priorities, strategies, and programs are adjusted to the rapid change that is so characteristic of the whole sector of science and technology. Perhaps more than any other sector of policy, science policy requires the careful *application of systems analysis*." The Committee emphasized that "the role of an overall science policy, like that of a macro-economic policy, is not to replace specific policies but to support them with a basic framework, broad terms of reference, and criteria to assess their efficiency."⁶⁹

The first report of the Senate Committee made no recommendations with regard to the federal government's science policy machinery. Its sweeping criticism of what then existed, nevertheless, indicated clearly that the Committee was very much in favour of a central control and review structure designed explicitly for science policy. Its advocacy of an "overall science policy and a global strategy" to govern the development of the federal government's science and technology programs, moreover, implied that such a policy-making structure had to operate at the level of the Cabinet. The second volume of its report was published almost simultaneously with the establishment of the Minister of State portfolio. Although it did not discuss the actual structure of this new organization, it did recommend that it be responsible for a number of extensive reviews and assessments of science and technology programs.⁷⁰ The Committee quite obviously perceived that, with the Minister and Ministry of State for Science and Technology, the federal government had accepted its proposal for the development of a "rational science policy".

While Johnson, Doern and the Senate Committee, to single out three of the most articulate discussants of the limitations of a ministry of state for science policy, concurred on some of the problems facing such a ministry, their agreement resulted from a significant difference in interpretation of the nature and meaning of "science policy". For Johnson, "the Canadian government and Canadian public opinion have been cozened into serious consideration of non-policies for dealing with undefined problems – specifically science policy. . ."⁷¹ According to him, the creation of a portfolio and government agency for dealing with science policy was likely to result in "a lot of empty speech-making, and a lot of effort wasted in creating the statistical and budgetary illusion of a coordinated and comprehensive policy that does not in fact exist."⁷² Doern's doubts about the then proposed ministry of state for science policy, although less extreme than Johnson's, also stressed the fact that science, with the possible exception of basic research, "is itself not a goal".⁷³ Like the Senate Special Committee, he referred to the crucial question of the role of the proposed ministry in the budgetary process. But, he concluded, unless major changes were made in the structure of

69. Senate of Canada, *A Science Policy for Canada*, Vol. 1, 1970, p. 282.

70. *Ibid.*, Vol. 2, 1972, pp. 565–596.

71. Johnson, "Comments on Senator Grossart's Paper", *op. cit.*, p. 546.

72. *Ibid.*

73. Doern, "The Political Realities of Science Policy-Making in Canada", *op. cit.*, p. 22.

the federal Cabinet system, the most practical option would have been to retain and improve the structure that existed immediately prior to the creation of MOSST, that is a Science Secretariat in the PCO, a neutral Treasury Board staff with its President the *de facto* permanent chairman of the Cabinet committee on science, and the relatively independent Science Council.⁷⁴ But Doern and Johnson agreed that the policy-making system found in Canada, the realities of science and scientific communities, and the place of science and technology in socio-economic and industrial policies, would continue to be such as to militate strongly against anything like a comprehensive policy emerging from a central source. Even Doern's guarded concession that under certain conditions a strong spokesman for scientific concerns could be established was based on the interpretation of science as an instrument to be used in widely different ways to meet the objectives of non-scientific missions.

The Senate Special Committee agreed that science must be used to achieve goals that lie outside science but, unlike Johnson and Doern, it argued that it is possible to develop, for this use of science, a management science similar to, for instance, the science of economics. Since governments have been able to employ this latter kind of science to formulate and make public policies, the Committee sees no logical reason why a comparable effort could not be made to utilize a social science of science and technology. As our understanding of the roles of science and technology increased, so presumably would our abilities to manipulate them. A comprehensive theory would guide our overall priorities and objectives and something like an econometrics of science would constitute the criteria for individual program decisions. As a first step, the Committee recommended that the Ministry of State for Science and Technology begin work on a comprehensive policy while simultaneously developing the "decision rules" to be used in evaluating science and technology programs, especially their budgetary demands.

In the final analysis it appears that the differences between the views of the Senate Committee and those of Doern and Johnson related not so much to the need for public policies for science and technology and their usage but rather to the consequences for such policies of different kinds of policy organizations. The latter two observers are much less horrified at the prospects of a decentralized and pluralistic set of structures in these fields, so long as there exists at the centre another set of structures to provide some semblance of policy direction and budgetary review (rather than direction and review of science and technology in isolation). They caution, however, that this direction and this review, as they relate to science and technology are important only to the extent there is a political will to tackle problems which from time to time impinge upon or are affected by science and technology. Given the pervasiveness and varied usage of science and technology, both Doern and Johnson felt there should not be a single specialized agency

74. *Ibid.*

to perform this high-level policy-making function. The Lamontagne Committee, on the other hand, has welcomed the creation of MOSST and argues further that these functions should be performed by a single specialized agency, a strengthened MOSST. Science and technology would remain component parts of a number of government missions, but policy making for science and technology and the evaluation of its use would be performed by a single science policy ministry.

II. Assessment

As the first annual report of the Ministry of State for Science and Technology put it: "August 11, 1971, is generally regarded as the birthday of MOSST with the passage of the Order-in-Council (P. C. 1971-1695) establishing the new ministry and setting out the broad purposes for it".¹ On that date, the Ministry took over from the Science Secretariat of the Privy Council Office responsibility for the development and co-ordination of the federal government's policies in the field of science and technology.² In the process the staff and the budget of the Science Secretariat were transferred to MOSST. A Minister was appointed and a Secretary (Deputy Minister) was hired. The Ministry of State for Science and Technology was put into operation.

In the past two and one-half years the Ministry has grown both in terms of staff and financial resources. From a total of 57 work years in 1971-72, the staff of the Ministry has increased to 90, 112 and 168 (estimated) for the fiscal years 1972-73, 1973-74 and 1974-75 respectively. During the same period of time, its expenditures have increased from \$1 117 129 to \$2 918 000, \$5 106 000 and \$4 054 000 (also estimated).³

The organization of the Ministry has also been subject to some considerable change since the fall of 1971. In Figure 1 is the tri-partite structure which was finalized, by and large, in the fall of 1973. The functions of the three principal branches are as follows:

Policy Development – Assessment of the impact of science and technology on Canadian society; forecasts of likely developments in science and technology; conduct or sponsorship of science policy studies; formulation, development and recommendation of objectives and priorities of science and technology; advice and counsel of the science and technology implications of government policies or proposals; and development of policies related to science and technology in university, industrial and international affairs and to the coordination of intramural research programs.

Program Review and Assessment – Advice in the budgetary process on matters with a significant science and technology content; recommendations on the organization of research and development activities; advice to departments and agencies on the conduct of science and technology programs and activities; and development and promotion of methods of evaluating the effectiveness of science and technology policies and programs.

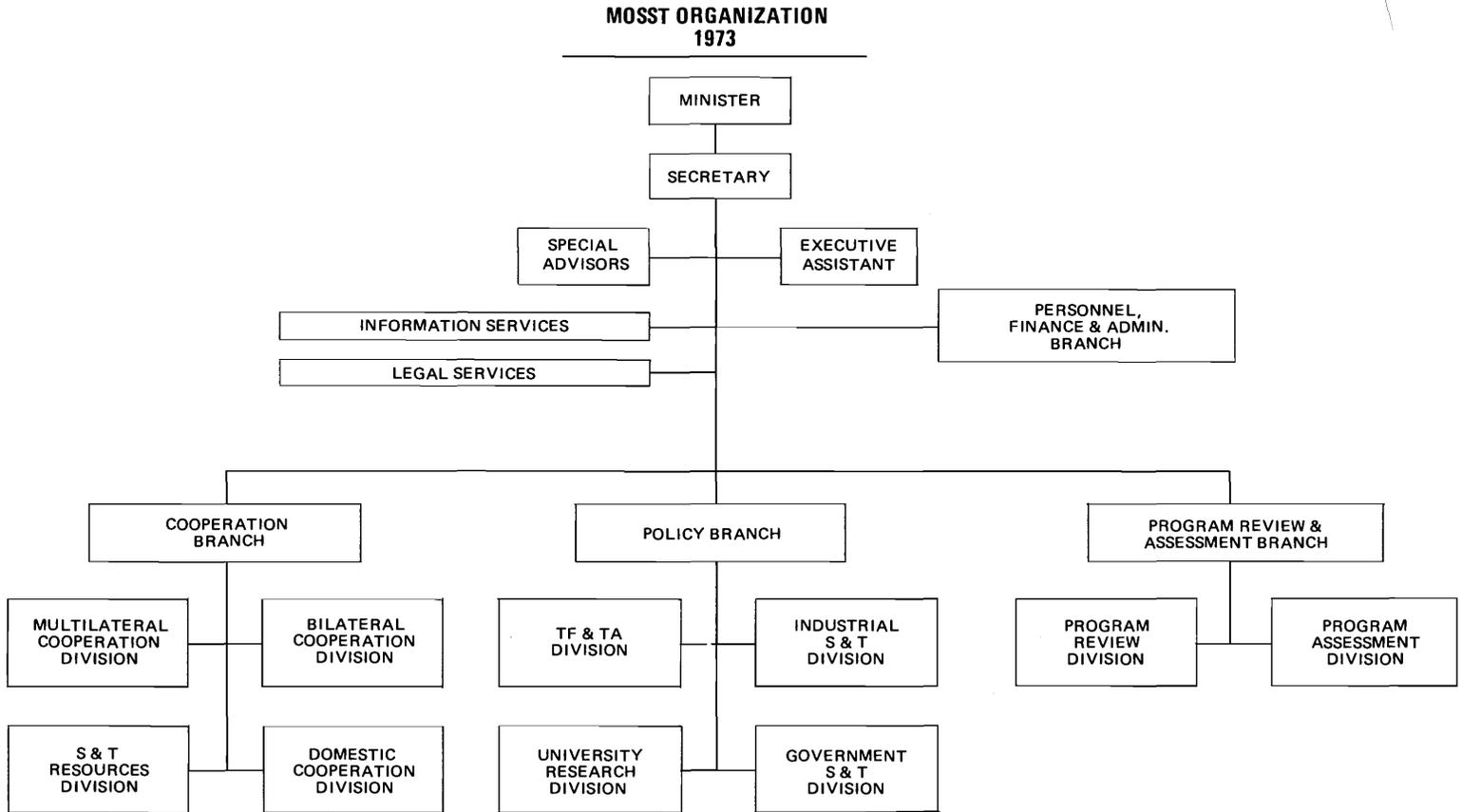
International and Domestic Cooperation – Facilitation of the exchange of information on domestic and international scientific activities, programs and results among all major users; recommendations on the

1. Ministry of State for Science and Technology, *Annual Report, 1971-72*, Ottawa, Ministry of State for Science and Technology, January 1973, Letter of Transmittal.

2. See Appendix B.

3. These figures are taken from Canada, *Estimates*, (for the fiscal years ending March 31, 1973, 1974, and 1975) Ottawa, Information Canada, 1972, 1973, 1974.

Figure 1 - Organization of MOSST in 1973



extent and nature of participation in national and international scientific activities; assistance in the management of Canada's agreements and other cooperative relationships in science and technology with other countries; organization of government sponsored scientific missions and visits; and functional direction of a science counsellor network abroad.⁴

The activities carried out in line with these functions are obviously of a complex character. Because the Ministry is an experimental, horizontal policy agency whose outputs are information, advice and evaluation – delivered through a variety of mechanisms and used principally to assist decision making by the Cabinet and the federal bureaucracy – an assessment of the Ministry inevitably suffers from the same conceptual and practical difficulties that have hampered the Ministry in defining and achieving objectives within its mandate. Complications are added by the fact that the Ministry is a mere two and one-half years old. Finally, it is not easy to assess the performance of departments or agencies of the federal government because of the confidentiality that shrouds much of the internal operations of government, and because of the absence of clear, consistent, and generally accepted criteria for evaluating the relative success or failure of a department or agency in achieving its particular objectives.⁵

To circumvent these problems to the limited extent possible, we have employed two strategies. First, to control for variables common to both ministries of state, we have developed a modest comparison of the Ministry of State for Science and Technology and the Ministry of State for Urban Affairs. Second, to attempt to overcome the restrictions of confidentiality and the fact that the Ministry's product is delivered within the bureaucracy and the Cabinet, we have made extensive use of personal interviews with senior officials of central agencies, granting councils, ministries of state, and several of the major science-based line departments. We have also conducted a few interviews with senior people in provincial governments and universities. All interviewing was carried out on a not-for-attribution basis and individuals were asked to express their personal views rather than to speak on behalf of their organization. In general, the questions asked of interviewees fell into the categories of assessment used below, with individuals being encouraged to volunteer additional information or opinions. We are convinced that the more than forty interviews upon which the analysis which follows is based constitute the best available source of information from which to develop an assessment of the Ministry, especially since there were some remarkable consistencies in the responses of interviewees.⁶

As a novel organizational type, in a conceptually difficult policy

4. *Ibid.*, 1974, p. 23–6.

5. D.G. Hartle, "A Proposed System of Program and Policy Evaluation", *Canadian Public Administration*, Summer, 1973, Vol. 16, pp. 243–266, is an attempt "to outline a conceptual framework" to establish such criteria.

6. One of the authors (R.D.F.) worked for the Ministry on a short term basis.

field, plunged into a highly structured bureaucracy, subtle in balance and complex in procedures, the Ministry of State for Science and Technology has had burdens rather greater than those typical of most new departments and agencies. More than most such, it has found itself affected by its environment, for it has not only had to try to develop science policy, but also to attempt to realize the ambitions which were held for the role of the Ministry of State in changing the nature of government decision making. We shall argue below that the successes and failures of the Ministry of State for Science and Technology are not simply its own, but are shared with some of its maturer departmental colleagues. Innovation in government, both structural-procedural and substantive, seems less often the prerogative of a powerful minister or department, for it can be seen to demand a series of changes in a system, all of which must equilibrate satisfactorily if a significant innovation is to succeed.

In what follows, we present a four part assessment of the experience of this Ministry to date. The first part deals with MOSST in the bureaucratic arena; the second, with MOSST in the executive arena; the third, with MOSST in the national political arena; and the fourth, with MOSST as an organization. The four parts are so divided in order to allow us to examine conveniently the structure and the various roles of this new government organization as they relate to the immediate governmental environment and the general political environment. The four sections constitute no more than different perspectives from which one can approach the Ministry, for the issues and factors dealt with in the various parts are heavily interdependent.

MOSST in the Bureaucratic Arena

As noted above, the most immediate targets for MOSST's product – information, analysis, and policy advice – are within the federal government. Only through influencing decision making in Cabinet, Cabinet committees, and at high levels within departments can the Ministry hope to see its initiatives implemented. In order to be effective in this role the Ministry must develop close relationships with the central agencies and the major science-based line departments. The sensitivity and complexity of the Ministry's position in this regard has been touched upon above.

The Ministry's interaction with the two principal central agencies, the Privy Council Office and the Treasury Board, is crucial for its success, for it is in a sense a mini-central agency for science and technology, which must deliver its recommendations through the secretariats of Cabinet and Cabinet committees (including Science, Culture and Information, Treasury Board, and Priorities and Planning). Like the other central agencies, MOSST is to play a co-ordinative role from a position as a neutral agency without program delivery capability. Unlike them, MOSST lacks the automatic access to power, based upon traditional prestige, statute, ministerial seniority, and so forth, which they enjoy.

Hodgetts has noted of such "staff agencies" that "if they are too 'pure', that is, too divorced from the line, too uncommitted, they invariably wither on the organizational vine".⁷ It is the task of the Privy Council Office and the Treasury Board to see that MOSST does not "wither on the organizational vine". In the third volume of its Report, the Senate Special Committee on Science Policy seemed clearly to fear that, in the Ministry's present form, it will.⁸

If the Senate Special Committee's fears are well grounded, part of the responsibility must lie in the failure of the Privy Council Office and the Treasury Board Secretariat to have agreed in 1971-72 on (1) the viability of the ministry of state concept and (2) precisely what the immediate work assignments of the two newly created ministries of state were to be. Having created the two ministries of state with very broad and open-ended mandates, the central agencies proceeded to treat them much as if they were departments with a history and resources comparable to the typical line department. In fact, with respect to work assignments⁹ for MOSST, the PCO and the Treasury Board Secretariat have pursued substantially divergent directions in their requests for policy advice. The PCO seems to have looked to MOSST for comprehensive policy frameworks, while the Board Secretariat has sought budgetary evaluation of individual science and technology programs. While these two functions might be reconcilable in the long run, their *prima facie* incommensurability resulted in fragmentation in MOSST's first efforts.

From the central agencies, ministries of state need (1) realistic and mutually consistent expectations about what kinds of functions they can perform; (2) intelligence about the major policy initiatives and budgetary submissions on the horizon that may impact on their policy fields; and (3) strong and continuing support in dealing with line departments. In return, a ministry of state should provide the central agencies and the Cabinet with types of information, analysis, and policy advice which are based upon a unique expertise and a breadth of perspective sufficient to justify the existence of a separate agency for the particular policy field.

This has proved to be a difficult task. In the case of MOSST, the best, and possibly the only, example in the public domain to date has been the so-called "Make or Buy" or "Contracting Out" policy, announced in the summer of 1972.¹⁰ Briefly, the "Make or Buy" policy is an attempt to foster industrial development and to control the growth of

7. J.E. Hodgetts, *The Canadian Public Service: A Physiology of Government*, Toronto, University of Toronto Press, 1973, p. 215.

8. Senate of Canada, *A Science Policy for Canada*, Vol. 3, Ottawa, Information Canada, 1973, pp. 650-665.

9. "Work assignment" is obviously an extremely crude term for the process by which the Privy Council Office and the Treasury Board Secretariat indicate to MOSST the matters on which its advice would be valuable, but we use it for lack of a better shorthand. There is a valuable general discussion of these relationships in R.J. Uffen, "How Science Policy is Made in Canada", *Science Forum*, December 1972, Vol. 30, pp. 3-8.

10. For one commentary, see Science Council of Canada, "Contracting Out", in *Annual Report, 1972-73*, Ottawa, Information Canada, 1973, pp. 27-32.

federal laboratories by systematically contracting to the private sector (and to a much lesser extent, to universities) those research and development requirements which do not meet specific criteria justifying the expansion of the in-house science and technology capability. Although the concept underlying this policy was scarcely novel, the Ministry's determined effort to develop a proposal and obtain a commitment for its implementation was, the merits of the policy aside, an excellent practical demonstration of the way a ministry of state could play its policy role. It is too early to assess the impact of this new policy and of MOSST's role in aiding and monitoring its implementation, but it must stand as the Ministry's first and so far its only major accomplishment. No other approved policy comparable in its immediate financial and procedural consequences has since been credited publicly to the Ministry, though it is understood that additional dimensions to this particular policy are being developed by MOSST.

MOSST's involvement in the development of many other important policies and projects has, of course, been reported consistently in the press. It must be pointed out that one of the most serious complications in the relations between MOSST and the central agencies (and, as we shall see, between MOSST and the line departments) has been the frequency with which possible MOSST policy initiatives have been discussed in detail in the press in advance of their submission to Cabinet. Central agencies have historically discharged their sensitive responsibilities in an atmosphere of confidentiality vis-à-vis the press and even, as noted earlier in this study, vis-à-vis other parts of the bureaucracy. Given this traditional mode of operation, it is predictably difficult for officials to reside their complete confidence in a ministry whose Cabinet memoranda and study projects are so frequently described in newspaper articles.¹¹

We mentioned above that the Privy Council Office has tended to see the primary desideratum for MOSST as a so-called "conceptual framework" for science policy, which would amount to the overall planning and comprehensive interlocking policy approach which the Prime Minister and the Privy Council Office have attempted to develop for other fields. The details of the interaction between the PCO and the Ministry on this subject are not in the public domain, but we may simply note that insofar as the "conceptual framework" sought requires the setting of science objectives, its pursuit runs precisely into those conceptual problems of science policy (science as a goal versus science as an instrument for national goals) discussed previously. To sort out an appropriate set of objectives from the morass of analysis, testimony, and discussion extant in the science policy field has been among the most difficult possible challenges for this new ministry. It requires an excursion into

11. The Ministry's public information policy will be discussed in greater detail below.

national goals and objectives far beyond the immediate orbit of science and technology. To date such a framework has not been developed, at least not to the point where it is available for public discussion.

The same problems of the linkage between science objectives and national goals arise when we consider aspects of the relations between MOSST and the Treasury Board Secretariat. The third volume of the Report of the Senate Special Committee on Science Policy addressed itself extensively to these aspects of MOSST's role in the federal bureaucracy. The crux of the Senate Special Committee's criticism of Canada's federal science policy machinery lay in what it saw as the "purely advisory" role which has been given the Ministry of State for Science and Technology. "Conceived mainly as a service agency to assist departments and agencies that remain free to accept or reject that assistance, the Ministry has been placed on a sideroad. . . and its role in the decision-making process can only be marginal."¹² According to the Committee, if something is not done to alter a situation in which the Ministry is "easily ignored", the Ministry will face a "dead end" of frustration, demoralization, and ineffectiveness.¹³ If this happens, many of the important problems of federal science policy will presumably remain unsolved.

The Senate Committee argued that the appropriate avenue for strengthening the Ministry would be to grant it "specific authority to review and approve the science budget within the broad budgetary guidelines approved by Treasury Board". The Committee recommended that the Ministry be responsible for reviewing and making recommendations upon proposed federal expenditures for science and technology to an interministerial Committee composed of the ministers responsible for major science budgets and chaired by the Minister of State for Science and Technology. This Committee would determine the overall science budget, which would be approved or reduced *in toto* by the Treasury Board. Should the Treasury Board decide that reduction is necessary, the Interministerial Committee, supported by its secretariat in the Ministry, would decide how and where in the science budget reductions would be made. In effect, "the Minister and Ministry personnel become, for the purpose of the science budget, the focus of a concerted planning and control procedure with responsibilities similar to those of the President of the Treasury Board and his staff". Only by exercising budgetary

12. Senate of Canada, *A Science Policy for Canada*, vol. 3, p. 651.

13. *Ibid.*, pp. 651-661.

authority in this way, according to the Senate Committee, will the Ministry possess the leverage needed to tackle the problems of science policy.¹⁴

The Senate Committee's proposals for a budgetary role for the Ministry of State for Science and Technology are of fundamental importance and have far reaching implications not only for science policy but also for organization and fiscal control in government. Broadly speaking, two sets of concerns are raised. There are, first, a set of essentially practical questions surrounding the procedures recommended by the Senate Committee, and, second, a set of conceptual questions involving the idea of a science budget.

Consultation with individuals in a sample of line departments with major science budgets and in central agencies revealed a considerable degree of open-mindedness with respect to a possible role for the Ministry in the budgetary process for science and technology expenditures. There was wide, though not unanimous, willingness to entertain the general thrust of the Senators' proposals on the part of individuals in some of the departments which would be principally affected. Many of these officials felt that, notwithstanding the existence of MOSST, there is at present a lack of effective mechanisms for priority choice among broad areas of scientific expenditure and between scientific and non-scientific expenditures. In particular, some officials would welcome the opportunity to present their science and technology expenditure submissions to people who have some familiarity with the technical area involved and with the exigencies of research and development. They felt that current procedures victimize vital long term R & D programs at the dictation of short term fluctuations in the priority attached by the government to the departmental mission under which the R & D is subsumed. Thus the Ministry was seen as potentially capable of giving

14. *Ibid.*, pp. 655-667. This Senate Committee recommendation was strongly endorsed by Dr. O.M. Solandt, the founding chairman of the Science Council of Canada, who stated that "a powerful influence on budgets' would be the only leverage the Ministry could have". The budgetary advice of the Ministry, he argued, should not be rejected by the Treasury Board "without damn good reasons which they are prepared to explain to the Prime Minister". Solandt, however, is far from enthusiastic about the performance or record of MOSST. See Lydia Dotto's report of her interview with him in Toronto's *The Globe and Mail*, 3 October 1973. For an analysis of the Senate Committee's proposals in this regard, cf. G. Bruce Doern, "Lamontagne's Proposal for a 'Science Budget': How Realistic is it?", *Science Forum*, December 1973, vol. 36, pp. 7-9. Doern also agreed that, "if more authority is needed for MOSST, it must ultimately be derived from a budgetary role". But, he insisted, the recommendation that MOSST assume such a role rested on "convoluted logic". Aside from the conceptual ambiguities of a "science budget", Doern suggests that the Senate Committee, in arguing that a science budgetary review group should not be staffed by scientists and engineers without policy formulation or management experience, "inadvertently lends credence to the view that the Treasury Board may well be another option". On the scientific community's response, see J.D. Babbit, "The Infinitely Wise Spider", *Canadian Research and Development*, November-December 1973, vol. 6, pp. 36-37, 47; P. Morand, "Mosst - Some Questions", *Chemistry in Canada*, January 1974, vol. 26, pp. 4-5; R.W. Yip, "Towards a Science Budget," *ibid.*, pp. 16-17.

additional perspective in the assessment of science and technology expenditures, and, in the narrow sense, as a potential ally for line departments in their dealings with Treasury Board.

There were some reservations expressed about the precise machinery proposed by the Senate Committee. The disaggregation of science and technology expenditures from the remainder of departmental budgets, their submission to the Ministry and their progress through a cycle including both an Interministerial Committee and Treasury Board were regarded as an unwarranted elaboration of extra steps in the budget process. There was a belief that the time and effort involved in additional scrutiny of the budget would be unlikely to bring proportional benefits, especially in an area where "lead time is very important". There was a fear that setting up special apparatus of the kind proposed by the Senate Committee for science expenditures would lead to demands for similar apparatus for expenditures in other broad policy areas, with consequent burdens upon line departments and Treasury Board. Finally, there was a sense that an Interministerial Committee which was composed of the ministers of line departments with major science budgets might result in a "mutual back-scratching" or "log-rolling" exercise, generating unreasonably expansionary science and technology budgets. This would force Treasury Board to demand reduction, entailing delay, acrimony, and possibly the repetition, by the Treasury Board Secretariat of the detailed scrutiny already carried out by the Ministry. For all these reasons, a less radical variation of present procedures was preferred. Possibly, submissions for expenditures in science and technology could be made to integrated committees composed of officials of both Treasury Board and the Ministry. These committees, or some similar arrangement, could be responsible for joint assessment of submissions and appropriate recommendations to the Board proper. The Ministry-Treasury Board relationship could be formally structured to ensure the significance of the Ministry's role, thus taking account of the Senate Committee's fears that the Ministry may remain an "easily ignored" advisory agency.

Aside from the practical issues raised by the nature of the budgetary machinery proposed by the Senate Special Committee, there are also a number of conceptual questions surrounding the notion of a science budget. If the Ministry is to become involved in scrutinizing all of the broad range of submissions for government expenditures on science and technology (including the social sciences?) rather than, as heretofore, in a few *ad hoc* studies of certain science and technology programs at the request of Treasury Board, questions of objectives, expertise, and general approach will have to be dealt with explicitly. For example, there is strong sentiment that the concept of a science budget is relatively meaningless when, as at present, there are far too few science objectives or guidelines to link budgetary decisions for science and technology with broader government objectives. Unless a comprehensive set of such objectives can be developed and operationalized, the proposed changes would make little sense. In short, budgetary scrutiny must be informed

by broader policy and thus such policy must be a prerequisite to any change in procedures. A related point is that marginal science and technology programs need be assessed not only against one another, but against all of the marginal programs of government. Clearly such assessment will not be aided by a science budget isolated from overall government objectives.

Another way of approaching this general problem would be to ask, to what degree will scrutiny of a science budget involve priorities between general areas of spending in various programs and to what degree will it involve assessment of the technical substance of such programs? Research managers were adamant that technical assessment can only be carried out within departments and that the Ministry cannot hope to staff itself with enough expertise for effective technical assessment even in the major scientific and technological areas carried out within the broad spectrum of government activities.¹⁵ Perhaps the Ministry could attack some of the most obvious kinds of duplication and waste, but there was skepticism that the format of science and technology budget submissions would permit "the detection of new opportunities that are not being adequately explored by individual departments and agencies" which is envisioned by the Senate Committee. The Senators spoke of the Ministry as utilizing "skilled people" who are "adequately trained in evaluating scientific activities". Elsewhere they suggested that experienced research managers "must be able to apply proper evaluative techniques".¹⁶ Recognizing the importance of judgement based on experience in managing research and development, it should be pointed out that no analytical apparatus nor quantitative methods exist to deal with the problems of allocating resources to R & D programs.¹⁷ The Senate Committee's suggestion that the Ministry recruit more social scientists and management specialists interested in science, research, and innovation, rather than research scientists and engineers with no experience in policy formulation or management, seems entirely appropriate.¹⁸ But insofar as budgetary decision making is concerned, no false mystique of "training" and "technique" should be raised to imply there is a substitute for mature judgement taken in a context of departmental missions and government social, economic and cultural objectives. The Programming, Planning and Budgeting System (PPBS), the most elaborate approach yet to systematizing government budgetary decision making,

15. The Senate Committee suggests that the review and assessment of the science budget would not require a large staff since "The R & D portion (of government expenditures) is about the same as the R & D expenditures of the Bell Telephone Laboratories in the United States". Whatever the relative sizes of expenditures, surely the R & D effort of a single communications company is scarcely comparable in complexity and variety to that of the Government of Canada. See Senate of Canada, *A Science Policy for Canada*, Vol. 3, p. 659.

16. *Ibid.* The question of expertise required for budgetary scrutiny of science and technology expenditures was discussed by Dr. B.M. McGugan of mosst in a speech entitled "Towards a Science Budget", given in Ottawa, 23 October 1973. The text of the speech is available from mosst.

17. Harry G. Johnson, "Comments on Senator Grossart's Paper", *Minerva*, vol. 9.

18. Senate of Canada, *A Science Policy for Canada*, Vol. 3, p. 664.

has failed to resolve the difficult problems of budgeting for science.¹⁹ Any expanded role for the Ministry in relation to a science budget can only be predicated upon the mobilization of experience rather than upon budgetary methodologies that the Treasury Board is utilizing to the limits of the present state of the art. Where expertise in a specific scientific and technological field is required, the Ministry should tap such expertise, on a short term contract basis, for a particular project or program.

A first step toward co-operation on science expenditures between the Ministry and the Treasury Board Secretariat was taken in 1973 through their joint exercise of developing descriptive information on current and past scientific expenditures. This activity was, however, far from the systematic role in scrutinizing scientific and technological expenditures envisioned for MOSST by the Senate Committee. In light of the discussion above, it should be obvious that the only way for the Ministry to realize the fairly general willingness to see it play a role in the budgetary cycle would be for it to prepare, in consultation with the Treasury Board Secretariat, a memorandum on the science budget for the appropriate Cabinet Committee. Such a memorandum would detail the conceptual basis and operation of the Ministry's role and it would interlock with the priority choices made through the exercise of developing the so-called "conceptual framework" for science policy discussed earlier. Science objectives, linked to government objectives, and functionally related to budgetary analysis for science and technology, need to be enunciated and accepted. Without such criteria to assess proposed programs, budgetary scrutiny will be little improved. Furthermore, the memorandum should detail exactly what the actual contribution of the Ministry to the budgetary process would be, and specify the precise relationships which would obtain between the Ministry and the Treasury Board. The preparation and acceptance of such a memorandum would provide a solid foundation for an expanded role by the Ministry in the budgetary process. Above all else, such a role must depend upon the extent to which the Ministry can demonstrate a unique capability, not to be found elsewhere, in the evaluation and assessment of proposed expenditures in science and technology.

We mentioned above the distinction between scrutiny of the technical substance of science and technology expenditures and scrutiny of their suitability in the context of overall government objectives, priorities, and resources, and noted the opinion that MOSST should find its role primarily in the context of the latter rather than the former.²⁰ This line of argument can be expanded beyond the budgetary context. Various officials argued that the Ministry must avoid becoming involved in

19. Note the scepticism about PPS in its application to science manifested by the scientific community in the articles by Yip and Morand cited in note 14 above.

20. B.M. McGugan of MOSST, in the general discussion of the Ministry's budgetary role in his speech "Towards a Science Budget", Ottawa, 23 October 1973, seems clearly to recognize this distinction.

feasibility studies or support of research either in or very close to scientific and technological areas that are already the responsibility of existing departments or agencies. Nor, it is felt, should the Ministry permit itself to become the court of last resort for specific individuals and organizations frustrated in their search for funding from federal science and technology programs. Too great an involvement on an *ad hoc* basis in the operational responsibilities of existing departments and agencies would inevitably jeopardize the Ministry's position as a neutral "honest broker". This is deemed to be crucial for MOSST's interaction with departments in the fulfilment of its primary roles of policy formulation and program review and assessment.

Our discussion with individuals in various departments indicated that the "honest broker" posture is one which could be used by MOSST to help rationalize certain major areas of government-supported research and development activity which fall within the responsibility of a number of government departments. To some extent, it is understood that this is what the Ministry is attempting to do in the area of oceans research and development. Some of the officials with whom we talked indicated that they feel that MOSST could usefully select and chair research and development advisory panels which would be composed of experts from appropriate federal and provincial government departments, industrial concerns, consulting firms, and universities. It is felt that MOSST could co-ordinate the provision of advice to government in this way where similar initiatives by a line department would stimulate suspicion that the department might merely be feathering its own nest. Once again, the Ministry's function would be to mobilize technical expertise as needed rather than to attempt to maintain it on a full-time basis.

This positive disposition of some departmental officials to the development of the "honest broker" role for MOSST has been somewhat hampered by Ministry public information practices. A great deal of importance has been attached to the role of the Ministry of State in developing hitherto unavailable data; analysis of these data by experts and the resultant policy formulation was to have been one major basis for the exercise of a ministry of state's influence in the decision-making process. It was assumed, however, that knowledge would be translated into power by being delivered *in a confidential context to senior officials and ministers*. On the contrary, a number of officials see MOSST as attempting to develop constituency in the scientific and technological communities in the country at large by extensive speech-making and especially by operating under what is in fact a very "open" public information policy.

MOSST was born in an atmosphere of considerable debate over science policy and thus aroused considerable expectations and public attention. The press scrutiny of the Ministry has been intense and has been rewarded by a considerable amount of copy in such newspapers as the *Globe and Mail* and the *Ottawa Journal*. There can be no doubt that the extensive press coverage accorded to the Ministry has discomfited

the officials of other departments. News stories, frequently quoting an unnamed Ministry official, have revealed joint initiatives between MOSST and other departments without the permission of the other departments, have announced studies of the programs of departments and agencies without prior notification from MOSST to such departments and agencies, and have discussed extensively the details of memoranda which the Ministry was in the process of submitting for consideration by Cabinet. Such revelations in the press have significantly reduced the Ministry's effectiveness by reducing the confidence with which officials may provide information or otherwise deal with it on sensitive policy issues.

It is not clear whether the continuing stream of news articles is the result of a specific MOSST public information policy or of a lengthy series of accidents. Some officials inclined to the former interpretation, citing a speech partially devoted to the subject given in November 1972, by the Secretary of the Ministry, which ended "a more open door is the *only* sensible policy in information today."²¹ In fairness, however, the treatment of the issue in the speech explicitly recognizes the need for limitations to openness with respect to policy formulation; unfortunately, such limitations have not been observed in the event. Whatever the merits of a more open information policy for government, such a policy can scarcely be functional when indulged in unilaterally by a brand new ministry with aspirations to play a part in the resolution of sensitive policy issues.

The discussion of the role of MOSST in the bureaucratic arena has touched upon the most critical aspects of the relations between the Ministry, central agencies, and line departments and agencies. The Ministry of State for Urban Affairs has encountered a number of the same kinds of difficulties, both with respect to central agencies and line departments. There remain one or two major departments with which each Ministry of State has less than ideal cooperative relations. Urban Affairs has been able to date to establish a much stronger presence with respect to line departments than has MOSST, perhaps because its mandate lends itself to a spatial definition which provides an effective justification for its involvement in particular issues and projects. Urban Affairs' strategy has been to bring together appropriate line departments to articulate a co-ordinated federal policy (say, in conferences with provinces or municipalities) rather than to attempt to formulate a policy on its own. In the past year, Urban Affairs has also succeeded in getting Cabinet attention for certain long range policy initiatives, which are ongoing. MSUA's relative success may be due to a number of factors,

21. Address by A. Beaulnes, Secretary of MOSST to the Canadian Science Writers' Association, Halifax, 18 November 1972. Available from the Ministry. The Ministry has, of course, been under a good deal of pressure from the press. See especially, J. Carruthers, "Is Playing Politics with Science the Science Ministry's Game?", *Science Forum*, October 1972, vol. 29, pp. 20-22; P.A. Forsyth, "Let's Take the Secrecy Out of Science Policy", *ibid.*, December 1972, vol. 30, p. 2; and J. Carruthers, "Controversy in Mosst: What should its Image Be?", *ibid.*, pp. 16-17.

such as the political appeal of urban issues, the seniority of the Minister, the relative maturity of the policy field, and so forth. However, neither Ministry of State can be said to have had the kind of policy success that was envisioned when they were created. Certainly experience thus far indicates that development of effective working relations with central agencies, as with line departments, will demand continuing and explicit emphasis in MSUA and especially in MOSST. In the area of science and technology, effective working relations within the bureaucracy are a *sine qua non* for successful fulfilment of a policy mission.

MOSST in the Executive Arena

Studies of the policy-making process in Canada have placed much importance on the relationships between the executive and bureaucratic sectors in the formulation and co-ordination of public policies. Since ministries of state are to be established to formulate “new and comprehensive policies”,²² the interaction of a minister of state and his ministry with his colleagues in the Cabinet and their officials is most critical. Moreover, since a minister of state is in an advisory role in the Cabinet, it is imperative that he receive the support of the Prime Minister and his Cabinet in order that his undertakings be effective. In this section we discuss these relationships. Our discussion is limited, of course, by the constraints on public information imposed by the norms of secrecy which govern the operations of the Cabinet. There are, however, three perspectives from which we can analyse the role of the Minister of State for Science and Technology. These are the importance that appears to be attached to the portfolio by the Prime Minister and the Cabinet by virtue of the appointments to the portfolio, the profile it is afforded, and the mandate it is given.

In spite of Prime Minister Trudeau’s 1970 statement that, “the new system will give to the Prime Minister more flexibility in assigning *senior ministers* to tackle important problems that require policy development”,²³ his two appointments to the science and technology portfolio have been from the ranks of junior members of the executive. On this criterion, the portfolio has been designated low in the Cabinet pecking order. This has meant that the incumbents of the portfolio have had to attempt to co-ordinate and develop policies for fields encompassed within the portfolios of individuals who are more senior in the Cabinet. The significant challenge that this situation presents is obvious, as was noted in our previous discussion of Cabinet structure.

The problems besetting the two Ministers of State for Science and Technology have been compounded by their brief tenure. Every department of government is faced with periodic changes in executive as part and parcel of the realities of Cabinet government. However, for a policy ministry, especially in a novel field, continuity of leadership can be

22. *Revised Statutes of Canada*, 1971, 19–20 Elizabeth II, c. 42, p. 851.

23. Canada, *House of Commons Debates*, Ottawa, 9 October, 1970, p. 36. Emphasis added.

extremely important. In the case of the Science and Technology portfolio, the incumbent must develop an understanding of a broad field encompassing a wide range of government policies and programs. This is necessary in order that he can effectively communicate to his colleagues proposals which directly involve their responsibilities. It is not possible to specify the length of time required for the development of this understanding. But, since a minister must learn on the job, one can say that it is unfortunate from this perspective that in the brief history of the portfolio there has already been one change in Cabinet representation.

A policy portfolio of this kind, regardless of the stature of its holder, would be a difficult position under most circumstances. Perhaps the best evidence of this is to be found in the Cabinet system of Ontario. Two years ago the Ontario government reorganized its highest levels of decision making by creating portfolios responsible for policy in the specified fields of justice, resources development, and social affairs. In addition, the previously created portfolio for finance and intergovernmental affairs was given expanded responsibilities. However, this "super Cabinet" structure did not do away with existing departmental portfolios.²⁴ Rather, an attempt was made to distinguish within the Cabinet between those responsible for policy development and those charged with program implementation. Within the first two years of the establishment of this system there were increasingly persistent rumours to the effect that the occupants of these policy portfolios, all senior members of the Cabinet, were concerned about their lack of public exposure, compared with that of their colleagues with departmental responsibilities. The Premier of Ontario admitted that the concerns of his policy ministers were real ones. Although he was of the opinion that the public did not fully appreciate the role of such ministers, he also confirmed that "there is no question that ministers of operating departments are involved in the political process day to day to a greater extent."²⁵ Hence, notwithstanding the public stature of the individuals occupying these positions, the nature of their roles removed them from the public arena.

24. For an account of these changes by the Executive Director of the Committee on Government Productivity which proposed these changes, see James D. Fleck, "Restructuring the Ontario Government", *Canadian Public Administration*, Spring, 1973, vol. 16, pp. 55-68. Fleck was subsequently appointed to the post of chief executive officer in the Premier's Office. For an excellent interpretation of this restructuring, see Kenneth Bryden, "Structural Change in the Ontario Government", A Paper Presented to the 46th Annual Meeting of the Canadian Political Science Association, Toronto, 6 June 1974.

25. See Orland French's interview with Premier Davis in Ottawa's *The Citizen*, 8 November 1973. In announcing that his Secretary for Social Development was to be given responsibility for the Ontario Housing Corporation, Davis departed from the original concept of purely policy portfolios for his four "super ministers". In early 1974, it appeared this system had collapsed: Davis, in a Cabinet shuffle, not only expanded his executive in number, but also combined the policy secretary for justice portfolio with the attorney-general portfolio and appointed as two of the policy secretaries individuals who clearly do not possess the stature of the original policy ministers. See Harold Greer, "Davis Dumps His 'Super-Ministers'", *The Citizen*, Ottawa, 2 March 1974. Also see Bryden, *op. cit.*

For many of the same reasons the minister of state portfolio places its occupant in a low profile position. As Professor Doern has expressed it, "for a politician who is anxious (as is normal) to claim credit and to receive credit (usually from the media) for successes, the minister of state portfolio contains many built in frustrations."²⁶ The first Minister of State for Science and Technology, the Honourable Alastair Gillespie, seemed to favour this low profile position. In fact, shortly after his appointment, he suggested his would be an "invisible ministry" operating primarily within the executive and bureaucratic arenas. Whether he would have maintained this approach over a period of time is a hypothetical question. His tenure was brief, and much of it was spent establishing the new ministry. His successor, the Honourable Jeanne Sauvé, on the other hand, does not even have the advantage of heading a novel ministry. In general, moreover, she has received little attention from Parliament as her public role has been restricted to non-policy functions, such as speeches in Canada and abroad on the role of her Ministry and its attempts to develop a national science policy. On very few occasions has she had the opportunity to announce, to defend, or to interpret government policy. The realities of this kind of portfolio have also impacted upon the role of the Minister of State for Urban Affairs. In this case, however, the occupant of the portfolio has benefited from the fact that two Crown corporations, Central Mortgage and Housing Corporation and the National Capital Commission, report to him in parallel to MSUA.²⁷ For the most part, nevertheless, the occupants of this portfolio have experienced the same frustrations associated with heading a policy development ministry.

The low profile associated with a policy development role has been reduced even further in the case of the Science and Technology portfolio by the low political appeal of the science policy field. Academic observers, the mass media, prophets of the future, and even the odd politician may make much of the power inherent in science and technology. However, as most practising politicians are aware, science and scientists are normally means to other ends. Science policy, as Andrew Wilson has noted, "is – and will remain – a dependent policy, a policy that follows much more often than it leads, a policy that has no . . . sex appeal."²⁸ As such, political leaders have often been content to permit the scientific establishment to regulate its own affairs. Some observers have viewed the development of this self-regulation as an indication of the rise of an "apolitical elite". But, as Doern succinctly puts it, "it must be remembered that one of the primary reasons why 'scientists' were able to adopt a self-regulator stance is that Canadian politicians to a unique degree

26. Doern, "Horizontal and Vertical Portfolios in Government", in G. Bruce Doern and V.S. Wilson (eds.), *Issues in Canadian Public Policy*, Toronto, Macmillan, 1974, p. 329.

27. For this reason there are obvious and important differences between the duties assigned to the incumbents of the two first minister of state portfolios.

28. A.H. Wilson, "Science Policy: Who Cares?", *Chemistry in Canada*, February 1974, p. 14.

(relative to other areas of government policy) let them.”²⁹ Likewise, the “managers” of the deployment of science and technology in science-oriented missions such as defence, health, natural resources, energy, and communications have been granted considerable autonomy to determine the kind of work to be done in research and development and its level of support in their respective fields. Here the prevailing attitude of politicians has been to “let the managers manage”.³⁰

While these attitudes conformed to the norms of the scientific community and the bureaucratic establishment, in the Canadian context they are also due to the fact that science and technology, for the most part, have had neither a major military-industrial-scientific complex to accommodate nor prestigious national missions to accomplish. In short, science policy in Canada has seldom generated first order demands on the political system. Issues of science policy, for instance, do not often reach the floor of the House of Commons and have never been a major subject in campaign rhetoric.

The field of urban affairs, on the other hand, cannot be considered to have a low profile. If anything its contemporary significance has thrust the Minister of State for Urban Affairs into too highly visible a policy arena in terms of provincial sensitivities. The establishment of a federal presence in this field was meant to signal not only a greater co-ordination of federal government policies and programs but also an interest in a concerted plan to direct the “process of urbanization”. Notwithstanding the priority attached to the problems of the cities and the establishment of intergovernmental consultative mechanisms, the Minister of State for Urban Affairs seems to derive much greater visibility from his role as the Minister responsible for Central Mortgage and Housing Corporation (and, in a more limited way, the National Capital Commission). This experience suggests that the visibility of a field, while perhaps necessary to gain political stature for a minister, is not in itself sufficient to provide political leverage in the executive arena.

Our third perspective on the role of the Minister of State for Science and Technology is the mandate that has been given to this portfolio. In creating this Cabinet position the federal government obviously meant to tackle science policy as a “priority problem”. As indicated earlier, the problem was considered to be in part an organizational one. It was felt that the establishment of a horizontal planning agency with Cabinet representation would put an end to the lack of direction and goal displacement exhibited in the field.

One of the principal defects of Canada’s overall scientific and technological effort, the disproportionate share of R & D undertaken in

29. G.B. Doern, *Science and Politics in Canada*, Montreal, McGill-Queen’s University Press, 1972, p. 216.

30. For the same reasons the Senate Committee was critical of the previously discussed “republic of science” position, it was also critical of what it called the “republic of management” phenomenon. Senate of Canada, *A Science Policy for Canada*, Vol. 1, pp. 272–275.

the government sector compared to the private sector (industry and universities), was tackled immediately. As noted in the preceding section, the Cabinet approved the "Make or Buy" policy within a year of the creation of the science policy portfolio; a Cabinet voice for this long-standing proposal, in the person of the Minister of State for Science and Technology, was considered an important factor in its acceptance. Secondly, and more generally, the portfolio, it is said, has also brought to Cabinet a constant reminder of the desirability of participation by Canadian industry in high technology projects purchased or supported by the federal government. Both of these examples of a policy thrust by the Minister of State for Science and Technology, one a specific policy program, the other a policy guideline, indicate, however, the instrumental position of science policy. Although important, these two thrusts are not sufficient evidence to conclude that science policy has been given much priority.

In fact there is evidence to suggest that the Minister and the Ministry have not been successful in one of their major attempts to co-ordinate government policy. This is the case of the Ministry's efforts to develop an oceans policy for Canada. Although a general statement of intent was prepared through interdepartmental deliberations and released by the Minister of State for Science and Technology,³¹ it has apparently not yet had its intended impact upon program areas affected. The Ministry, for instance, seems to have had little success in establishing precise guidelines for the co-ordination or the enforcement of the principles contained in the general statement. We are informed that, as a result, it was apparently at first unaware of, and then unable to deter, departmental plans to pursue programs running counter to the statement of intent.

This example is not an isolated one. As such, it is illustrative of the difficulties the Minister and the Ministry have had both in developing comprehensive policies and in co-ordinating the program affected by them. This brings us to the nub of the assumption that knowledge is power on which is based the role of the Minister of State. The mandate of this portfolio makes clear the Minister's responsibilities to develop and co-ordinate policy on the basis of research and analysis. Yet, unless such

31. Office of the Minister of State for Science and Technology, *News Release - New Oceans Policy*, Ottawa, 12 July 1973.

a Minister is given power through the Prime Minister's support, his chances of being effective in Cabinet decision making are not great.³² In a nutshell, the Minister needs power to gain knowledge to exercise power; he simply has no other cards to play. As Daniel Greenberg says of science policy-making in the United States, "the essential fact about science in Washington is that knowledge is power only when the political element accepts the knowledge as being politically palatable."³³ Science policy must be considered a political priority, not just a "priority problem", to enable a Minister of State for Science and Technology to exercise any real influence in the executive arena.

MOSST in the National Political Arena

The mandate of the Ministry of State for Science and Technology specifically states that it "shall formulate and develop policies with respect to . . . (c) the fostering of cooperative relationships with respect to science and technology with the provinces, with public and private organizations, and with other nations".³⁴ This responsibility flows naturally from the nature and structure of the federal system of government and of the scientific and technological communities. The Ministry, in addition to its intragovernmental role, is thus to perform a broader inter-governmental and general political role. The performance of MOSST in this larger arena has been affected by the kinds of demands to be found in this arena and by the uncertainties of its own role in it.

An immediate difficulty faced by the Ministry was the identification of appropriate government organizations in provincial administrations. This resulted from the fact that science policy has been primarily a federal government concern. Provincial governments have been involved in the Canadian scientific effort insofar, for example, as their programs of support for higher education have required significant outlays of funds, portions of which provide for the infrastructure of university-based science. While there are variations in the efforts of the ten provincial governments, they have also supported research in several different kinds

32. The argument that mosst does not have sufficient power to plan and co-ordinate the science policies of the federal government was advanced by a member of the House of Commons' Standing Committee on Miscellaneous Estimates during that Committee's examination of the 1973-74 estimates for the Ministry. While the late Wallace Nesbitt, Conservative science critic, stated he was in favour of "this kind of department" because he thought science and technology policies and activities "should be co-ordinated under one government administration", he stated "no coherent national plan" had been forthcoming from the government. The Minister, he argued, "should be charged with more authority to co-ordinate existing agencies and research programs and to institute fresh programs". To that date, he said, the ministry "seems to have all the earmarks of another Information Canada, an agency that would seem to fritter away taxpayer's money without adequate return". Canada, House of Commons, *Minutes of Proceedings and Evidence of the Standing Committee on Miscellaneous Estimates*, First Session, Twenty-ninth Parliament, Wednesday, 28 March 1973, Ottawa, 1973, pp. 22:11-22:13.

33. Daniel S. Greenberg, "Once Again, A Call to Reorganize Scientific Advice", *Science and Government Report*, 1 December 1973, p. 5.

34. See Appendix B.

of institutes or councils in a more direct way.³⁵ Finally, of course, provincial governments have been involved in the application and use of science and technology in those fields where they have program responsibilities. Notwithstanding these activities, however, the provinces have not played a major part in the science policy debate of the past decade.

One reason for the low level of participation by the provinces in this debate is that so much of it has dealt with federal structural arrangements for the formulation and implementation of science policies. With one exception, the provinces have only recently begun to develop specific policy organizations to deal with the field in a comprehensive manner.³⁶ Policies and organizations for the support and development of science and technology in the provinces have been, for the most part, diffused throughout the administrative structures of the provincial governments. As a result, MOSST has had to stimulate provincial governments to designate foci for science policy issues, and these have varied greatly in nature and relative importance from province to province.

The question of appropriate mechanisms for intergovernmental relations has been a facet of MOSST's role which exhibits a good deal of uncertainty, even confusion. In the case of science policy, the ambiguities respecting the Ministry's authority and role have compounded the intrinsic complexities of federal-provincial relations. The meetings MOSST has had with provincial agencies, including universities, generally have not amounted to much more than information and intelligence exchanges. On the one policy question, that of university research support, where it could be said that the Ministry has begun to engage in policy deliberations with provincial authorities, albeit in an *ad hoc* manner, the result so far has been less than satisfactory from the vantage point of intergovernmental relations.

In this particular instance the Ministry initiated with the provinces and the universities discussions on the future development of federal government policies for the support of university research. Briefly, MOSST was attempting to develop a framework that would identify national objectives with regard to research in the universities and would rationalize the federal government's programs that support such research. The Ministry sought provincial government input not only because universities, as institutions of higher education, fall within the jurisdiction of the provinces, but also because most, if not all, of the federal government's university research programs demand that additional resources be provided by the universities (and, therefore, their provincial govern-

35. A description of the wide variety of provincial research institutions can be found in Andrew H. Wilson, *Research Councils in the Provinces: A Canadian Resource*, Science Council of Canada, Background Study No. 19, Ottawa, Information Canada, 1971.

36. This one exception is the Province of Quebec which established, in 1971, a Cabinet Committee on Science Policy and, in 1972, a Science Policy Council, comprised of representatives from both the public and private sectors. Several other provinces are now in the process of creating mechanisms to handle science policy matters.

ments) to enable the research so supported to be undertaken.³⁷ This is particularly the case with respect to research which is not supported by contracts (where most costs are borne by the contractor). Although in most instances the federal government provides the major share of the financial resources required by researchers in the universities, the granting programs of the federal government have the same effect as formal federal-provincial shared-cost programs, that is, they provide initiatives for which provincial governments must bear a significant share of the costs.

Having initiated these discussions with provincial governments, the Ministry soon found itself in a most difficult situation. It did not intend, for instance, that its own inputs into these discussions be regarded as constituting a stance of the federal government on these questions. Indeed, it neither had the authority to negotiate with the provinces (or the universities) on these matters, nor did it have a mechanism to engage the relevant departments and agencies of the federal government in formal discussion with provincial authorities. But, despite MOSST's initial intentions and its later protestations to the contrary, the provinces used the occasion of this federal-provincial interaction to respond to what the provinces claimed were "proposals" from the Ministry.³⁸ Accordingly, the provinces challenged the constitutional authority of the federal government's role in this field and demanded a greater say in the way the federal government allocated financial resources to the universities.³⁹

37. See John B. Macdonald *et al.*, *The Role of the Federal Government in Support of Research in Canadian Universities*, Science Council of Canada Background Study No. 7, Ottawa, Queen's Printer, 1969.

38. The press releases issued after the closed meeting of provincial ministers of education of January 1974 described MOSST's initiatives as "the proposed federal policy" and "the proposed new approach". See Council of Ministers of Education, Press Releases, "Two important resolutions voted by Council of Ministers of Education, Canada" and "United and Strong Position on the Question of Federal Funding of University Research Taken by Ministers of Education of Canada", Montreal, 11 January 1974.

39. At their January meeting, the provincial ministers of education "thought it important that a partnership be achieved among the federal government, the provincial governments and the universities in the matter of research". This partnership, it was said, "is rooted in the fundamental premise that all parties involved will recognize:

(a) That there are areas of federal responsibility delineated by the constitution and, therefore, federal authorities may pursue research related to these areas in conjunction with universities; but notification and consultation should take place with provincial authorities in order to assure a balance of activities within a university and between universities within a province;

(b) That there are areas of joint federal/provincial responsibility and that research related to these areas should be a matter of joint consultation and decision making, to protect the balance between and within universities, and to secure a provincial input and active participation in the determination of priorities;

(c) That there are areas, such as education and natural resources, which are constitutionally the responsibility of the provinces and that major federal research programs related to these areas should not take place without prior consultation and the express consent of the provinces concerned".

Accordingly, the ministers "insisted that proper mechanisms . . . be established to assure the flow of current information, appropriate consultation and joint decision making in research policy and financing". *Ibid.*

The formal constitutional question aside, this case illustrates the problems which can quickly emerge when a policy development agency involves itself in intergovernmental deliberations prior to the formulation and acceptance of a new policy (or even a new strategy) by the federal Cabinet. This is not the only instance where MOSST has had interactions with provincial governments. It is, none the less, the policy question where the most serious provincial input has been generated. As such, it lends support to the view, expressed by a number of officials, that ministries of state cannot engage successfully in intergovernmental consultations in the absence of Cabinet, or at least interdepartmental, commitment to do so.

Our investigations revealed that the Ministry of State for Urban Affairs has experienced similar problems. MSUA found itself in its first year or so of operation in a situation where, although there was urgent need for immediate and extensive intergovernmental liaison, a national urban policy had not been developed. Those involved in intergovernmental co-ordination were forced to develop *de facto* policy largely independent of the as yet undeveloped policy formulation activity intended for the Ministry. The efforts of the federal government in this field, as a result, have been governed by a series of decisions on specific projects, where MSUA has had some success in bringing various departments together. These decisions could not be said to have been taken in the context of an overall federal policy.

A similar problem of approach has faced the Ministry in its international role. Here, the logic of the functions to be performed by MOSST respecting the development of policies which impinge on the duties of other federal government departments, for instance, Industry, Trade, and Commerce and External Affairs, has exhibited the same lack of clarity as is found in its intergovernmental role. From the outset, there has been some considerable confusion over whether the Ministry's involvement in international affairs constitutes an operational, as opposed to a policy formulation, role. The tendency on the part of the Ministry officials involved in this arena to view their functions as operational, if only quasi-operational, has contributed to a measure of conflict with other government departments functioning in the same arena. In the process, the Ministry has had little success in co-ordinating Canadian government activities in the international scientific arena.

On a second front, the Ministry is responsible for developing communications with associations and organizations representing the scientific and technological communities. Here the Ministry has been confronted with a host of such groups, ranging from scientific societies to industrial associations.⁴⁰ The task facing the Ministry is to develop principles and procedures for the interaction between it and these organi-

40. For a description of some of these groups, see Management Committee of SCITEC and Allen S. West, *National Engineering, Scientific and Technological Societies of Canada*, Science Council of Canada Background Study No. 25, Ottawa, Information Canada, 1972.

zations. In undertaking this task two questions have been of utmost importance: (1) what role should be expected of non-government organizations in relation to the development of public policies affecting their communities; and (2) what role should be expected of the government in terms of supporting such organizations? Put another way, how ought the federal government and the private sector relate to one another on matters of science and technology policy?

These questions are important ones for MOSST precisely because the creation of the Ministry was meant to alter in a fundamental way the previous pattern of interaction between the government and the scientific and technological communities. The traditional pattern of public policy-making in which government responded in a highly disjointed manner to proposals from a widely dispersed research and development constituency was to be transformed into a system in which government attempted to aggregate the demands of this constituency in light of national objectives and priorities. To accomplish this, however, the government must make clear to the scientific and technological communities what kind of response it desires from them and what initiatives the government might offer in return.⁴¹

Because neither the federal government nor the affected communities have much experience in formal or at least relatively open consultations in science policy, it is incumbent upon the Ministry, itself a government initiative in this regard, to formulate a policy for such interactions. The effectiveness of governmental science policies in general depends to a large extent upon the effectiveness of communication of the purpose, objectives and priorities of government policies to those whose role in fulfilling them will be all-important. The promotion and use of science and technology in the war years and the two decades or so that followed them rarely raised the agonizing questions of limited resources and expanding demands, which have forced both government and the scientific and technological communities to re-examine the purpose, objectives, and priorities of the various programs now in operation. Change has affected not only the policy concerns of the federal government, but also the structure of the scientific and technological communities of Canada. Because the organizations of the scientific and technological community are themselves in a period of transition, the federal government has an important opportunity to influence the way these organizations develop.

The performance of the Ministry in relating to the scientific and technological community can hardly be considered a success to date.

41. According to the Management Committee of SCITEC "the long debate on science policy has tended to ignore the need for a mechanism by which the government, in developing and implementing policy decisions, may communicate with the scientific community. The lack of rapid and reliable communication with the scientific community has caused repeated embarrassment to government, and frustration to scientists and engineers. It is now generally accepted that such communication is necessary and should be organized on a continuing, formal basis. . . ." *Ibid.*, p. 8.

For this, MOSST is only partly responsible – the community itself has remained incapable of participating in a meaningful dialogue with the government on science policy issues. This state of affairs is perhaps inevitable. The scientific and technological community as a community does not really exist. Rather, there are as many communities as there are disciplines and technologies, as well as sectors in which they are found, industry, government and academia. They all have certain characteristics in common, especially vis-à-vis other professional and occupational groups, but in terms of their interests in public policy they exhibit few common concerns. In only a very few instances do they act, or can they be expected to act, in a united manner. The Senate Committee on Science Policy, on the basis of its exposure to these organizations via its hearings, commented that “it found the scientific and engineering community deeply divided and ill-equipped to add significantly to the discussion of science policy matters. . . . The briefs submitted to the Committee seldom dealt with the broad issues of science policy and when they did they largely reflected myths about the innovation process.”⁴²

The difficulties which have faced the Ministry because of this state of affairs have been recognized only implicitly, if at all, by those who have been participants in the recent science policy debate. On the one hand, a number of recommendations have been made respecting government support for the professional societies of the scientific and technological communities. These recommendations have regarded the promotion and support of these societies as important to the intellectual development of science and technology in Canada. On the other hand, there have been recommendations respecting the role of the scientific and technological communities in the development of science policy. The latter have argued for the enunciation of principles and the establishment of procedures to bring about more effective participation by scientists and engineers in the formation of science policies. What has not been recognized explicitly is that these two kinds of recommendations, which have been viewed as complementary, are in fact quite different in terms of the kinds of policies they require.

The support of scientific and technological societies by the federal government can be justified on a number of grounds. Such support, for example, would assist the societies in promoting the nationalization of the communities they organize, a particularly important consideration in Canada, given the attraction of foreign societies. It could also enable them to better develop their bilingual and bicultural character. More generally, then, this kind of support would help to foster concern in the several scientific and technological communities for Canadian interests. The federal government has, in fact, channeled a certain amount of such support through its granting councils. Not only are there problems with these arrangements, most of which developed in an *ad hoc* way, but the

42. Senate of Canada, *A Science Policy for Canada*, Vol. 3, p. 751.

federal government, again through its councils, has assumed a number of responsibilities that might more appropriately be fulfilled by non-governmental organizations, such as the publication of scientific journals and the representation of Canada on international non-governmental bodies.⁴³ Such government initiatives are in the realm of operating programs. As such they should not be confused with questions about the role of the scientific and technological communities in the formulation of public policy. They have been so confused, however, by the Senate Special Committee and several scientific organizations.

It has not been appreciated clearly enough that the scientific and technological associations are not organized, nor perhaps can they be, to speak for their communities in a comprehensive way on policy issues. The most prestigious Canadian society, the Royal Society, has not been able to perform this function; it simply does not represent the entire range of communities nor does it have their confidence.⁴⁴ SCITEC (The Association of the Scientific, Engineering and Technological Community of Canada), a federation of more than fifty societies, recently was formed to encompass the entire range of communities. It has an open membership whereas the Royal Society has a restricted one. Its composition and structure have not removed the inherent cleavages within this range of communities, despite excellent intentions. To date at least, its principal function has been to provide a forum for discussion and debate on science policy issues.

In spite of this state of affairs, the Senate Special Committee recommended that MOSST recognize the Royal Society and SCITEC as "the two main spokesmen of the Canadian scientific and engineering community in the areas of science for policy and policy for science respectively".⁴⁵ Thus the Committee recommended that both the Ministry and the Science Council contract out to these two societies studies of science policy whenever appropriate. In addition, it proposed that both national bodies be given unconditional grants by MOSST "for the purpose of enabling them to maintain an efficient secretariat, to undertake a few studies on their own initiative, to hold periodic symposia, and to finance their publications".⁴⁶ The Senate Committee recommendations, in effect, call for the aggregation of advisory and demand inputs at the level of these two national organizations, each responsible for a particular kind of input aggregation. The Ministry, accordingly, would relate chiefly to these two and thus would be presented with a limited number but presumably comprehensive set of inputs.

In making these recommendations the Senate Special Committee did not appear to realize it was in fact advocating government support

43. For a presentation and discussion of these problems, see Management Committee of SCITEC and West, *op. cit.*, pp. 89-93 and 97-106, and Senate of Canada, *A Science Policy for Canada*, Vol. 3, pp. 746-751.

44. Management Committee of SCITEC and West, *op. cit.*, p. 104.

45. Senate of Canada, *A Science Policy for Canada*, Vol. 3, p. 756.

46. *Ibid.*, p. 757.

for the political activities of these organizations. While it may be appropriate for the government to increase opportunities for the participation of these organizations in the policy-making system, the precedent of financially supporting, via unconditional grants, improvements in their lobbying capabilities is somewhat less appropriate. It is necessary to distinguish the establishment of administrative mechanisms for receiving policy inputs from affected communities from financial support for the pressure group activities of professional organizations.

To date, the Ministry has not developed administrative mechanisms for interacting with these communities. The absence of such mechanisms is in part due to the Ministry's recognition of the lack of legitimacy afforded either of the two umbrella organizations of the communities, the Royal Society and SCITEC, by scientists and engineers in either the academic or industrial sectors (or, for that matter, in government research establishments). Secondly, of course, it is absurd to suppose that industrial organizations with R & D interests would allow scientific and technological professional associations to speak on their behalf. Finally, in regard to the universities, the Ministry is confronted by a sector whose national organization, the Association of Universities and Colleges of Canada, can speak authoritatively on behalf of its members on only a very limited range of questions. The strategy followed by the Ministry's Cooperation branch has focussed, as a result, on informal and *ad hoc* meetings between its officials and various interested parties.

This strategy does have some considerable merit given what we have said about the nature of these communities. At the same time, none the less, the Ministry's efforts have not overcome the uncertainties and frustrations now extant in these communities. The industrial sector remains in a state of uncertainty as to the role MOSST is attempting to play in the formulation of policies affecting industrial R & D programs and is frustrated by the multiplicity of government officials involved in this field. Similarly, academic scientists and engineers are uncertain about the future of federal support programs and frustrated by the apparent indecision of the government on proposals which remain in the "formulation" stage. Ironically, however, the Ministry has created, perhaps unintentionally, the impression that it is courting a constituency outside Ottawa in order to make up for its lack of impact in the federal government. In certain bureaucratic quarters, a concern was expressed that MOSST is attempting to go it alone in science policy, ignoring the departments and agencies whose programs directly affect the membership of this constituency.

On the basis of our investigation, it appears that some of the difficulties MOSST has had in this respect have resulted from its frequent statements, either through its press releases or public appearances by its officials, which have mooted significant, even radical, changes in government policy. References to the development of policy frameworks, the establishment of objectives and priorities, and the rationalization of science policy, have done little to endear the Ministry to a constituency

whose traditions abhor such politicization but whose future is so dependent upon government support.

In addition to the above, effective communication with the scientific and technological communities has been limited because the Ministry has not made it clear to these communities that the needs of the Ministry are twofold. In the first place, it must have well articulated statements on the requirements of the various segments of these communities. Second, it must be able to mobilize technical advice from experts within these communities on specific policy and program questions. A distinction must be made, therefore, between the legitimate pressure group role of these communities and the deployment of individuals or groups from these communities to provide the government with technical assistance. To satisfy the first requirement, the Ministry needs either formal mechanisms for consultation or informal accessibility to such representations. For the second function, procedures are necessary for identifying and obtaining the services of relevant experts in order to develop micro-policies for specific fields of science and technology.

The experience of the Ministry of State for Urban Affairs in the national political arena appears to be quite instructive with respect to the above considerations. MSUA, for instance, immediately had to face the challenge of interacting not only with provinces but also with municipalities and various private groups and organizations whose interests relate to urban policies. Facing a constituency like that found in MOSST's policy field, MSUA had to initiate consultations with a wide range of interested parties. For the same reasons that MOSST has had problems in interacting with the scientific community and the universities, MSUA has found it difficult to communicate with municipal governments. The universities and the municipalities share the characteristics of being heterogenous and widely dispersed. The Canadian Federation of Mayors and Municipalities, for instance, is similar to the Association of Universities and Colleges of Canada in its authority and structure. As a "representative" organization, it has a very limited range of subjects on which it can speak for its members.

Unlike MOSST, however, the Ministry of State for Urban Affairs tackled this question of its role in the national political arena by establishing, with the provinces and their municipalities, a series of official consultation mechanisms, the Tri-Level Conferences. These conferences were initiated at the national level and are now in the process of being extended to the individual provincial and urban levels. Although, as one observer put it, the two national Tri-Level Conferences held so far were "hardly landmarks in inter-governmental relations", the Ministry's efforts at the level of individual urban centres have been considered an important contribution. Consultation with the provinces and municipalities and, just as important, co-ordination of federal government programs have paid off, it was felt, in direct relation to the specificity of the issues involved.

The experience of MSUA suggests, therefore, that a ministry of state

can be an effective mechanism in the national political arena, even in the absence of comprehensive policy, if it attempts to co-ordinate federal efforts on individual urban, rather than national urban, problems. The lesson this has for MOSST, to the extent it is possible to cross policy fields, is that its consultative and co-ordinative roles are perhaps best performed when they are highly focussed to allow for both the identification of the specific projects of priority areas to be dealt with and the participation of the relevant government (federal departments and agencies) and non-government parties. The logic upon which the role of a ministry of state in the bureaucratic arena is predicated should also be extended to its role in the national political arena.

MOSST as an Organization

The accomplishments and problems of the Ministry discussed above are the product of the nature of ministries of state as a bureaucratic entity, of the nature of science and technology as a policy field, and of the personnel, organization and mode of operation of the Ministry itself. This concluding section of the assessment of the Ministry is concerned with the staffing, structure and management of its operation. It will be clear that some of the considerations raised here are part and parcel of the issues discussed previously, and that they are mutually interdependent. We break them down simply in the interests of clarity and convenience of presentation.

One of the fundamental hurdles facing Canadian science policy, and science policy organizations, is the extremely limited supply of qualified people available in this novel field. Like the Senate Special Committee, we would point out that experience in science, especially a laboratory research role, is insufficient in itself to qualify an individual to develop science policy.⁴⁷ Indeed, it is not even a necessary condition for effective participation in science policy formulation. Other kinds of background are at least as important: education in the social and policy sciences, especially as they relate to social study of the natural sciences; experience in research administration roles; and experience in policy roles in government, especially the federal government. Former government science adviser, Dr. Robert Uffen, has given an interesting account of some aspects of the science policy role for which a scientific education and research experience provide little or no preparation.⁴⁸ The ability to develop policy to utilize science and technology for government objectives, and to get that policy accepted by the appropriate departments

47. *Ibid.*, p. 664.

48. R.J. Uffen, "How Science Policy is Made in Canada", *Science Forum*, December 1972, vol. 30, pp. 3-4, 6.

and Cabinet committees, is far more important than knowledge of the substance of a science or technology.⁴⁹

The number of individuals, then, who combine a policy capability with a knowledge of the problems of scientific and technological programs is not great. Hence, the Ministry must have a challenging assignment under the best of circumstances in locating, assessing, and hiring the people best able to contribute to its objectives. Unfortunately, the best of circumstances have not obtained. On a number of occasions when the Ministry has located appropriate personnel, it has been unable to hire them. The reasons for this are complex. The Ministry, for instance, did not lack quantity of applicants in response to its initial recruitment efforts; nor was it unable to offer attractive working conditions and salaries. But, since the first group of Ministry officials were transferred from the Science Secretariat of the PCO and the most senior of them then occupied the great majority of the handful of executive positions afforded the new Ministry, MOSST did not have many science adviser vacancies with the job classifications desired by the best of the middle level personnel already in government who possessed some measure of policy capability and experience.⁵⁰ Accordingly, the intrinsic difficulties of locating and recognizing the rather rare combination of capabilities appropriate to science policy development have been compounded for the Ministry by the relatively unattractive job classification it had to use.

A speech by Dr. Blair McGugan, Assistant Secretary of the Program Review and Assessment Branch of MOSST, clearly indicates the complex and demanding nature of the duties facing the Ministry: "These tasks require a rather rare combination of scientific peer acceptance, a non-threatening approach *and* a thorough knowledge of the management systems of the government and the fiscal and political realities of the day. . . . Rather special conceptual and analytical talents are the order of the day here as well as a thorough knowledge of the innovation process, and heaven knows what else!"⁵¹ In light of these comments, it is interest-

49. This was clearly recognized by Dr. B.M. McGugan of MOSST, when he said "the tasks (policy formulation opportunities) set for Mosst are far from simple and require many inputs, few of which are of a straight disciplinary nature. Disciplinary expertise is rather more important in the departmental context where subordinate policies are being defined and specific programs conceived and conducted". See his "Towards a Science Budget", notes for a speech given in Ottawa, 23 October 1973. The text of this speech is available from Mosst.

50. The Ministry, in its first two years of staffing, relied principally on Science Adviser (SA) and Administrative Services (AS) classifications in its recruitment of science advisers and assistant science advisers respectively. Our investigations revealed that these classifications have not been attractive to those already within the public service who, familiar with the significance of job classifications for career patterns in the public service, have preferred to compete for the more prestigious and at least equally remunerative Executive (SX) and Economist-Statistician (ES) categories. During the last year, the Treasury Board has begun to provide the Ministry with both more executive positions for its science advisers and a new classification for its assistant science advisers. For evidence of the former development, see Canada, *Estimates For the Fiscal Year Ending March 31, 1975*, Ottawa, Information Canada, 1974, p. 23-8.

51. McGugan, "Towards a Science Budget", *op. cit.*

ing to note that the Program Review and Assessment Branch is being staffed very much more slowly than was the rest of the Ministry.

Another problem in this area which was mentioned during our investigation was the rapid turnover of professional staff which the Ministry has experienced. In part this has been due to extensive use of the practice of contracting to bring individuals into the service of the Ministry for a finite period of time. On balance, this personnel contracting policy has probably been useful for it facilitates the mobilization of expertise without long term commitments and permits disengagement of the services of an individual whose performance is less than satisfactory. There is an important drawback to this policy, however. The rapid turnover of personnel and the rapid changes in staff assignments within MOSST place the MOSST officer who is trying to develop a policy in concert with the officers of line departments in a relatively weak position. Insofar as these officers disagree with the policy being initiated by the Ministry, they may stall and frustrate its development until the MOSST officer leaves the Ministry or is reassigned. Then the matter may be dropped or, if a new officer is assigned, the process may begin again. Within the Ministry, it is clear that rapid turnover of senior personnel has caused instability and uncertainty in the middle and junior levels of the professional staff.⁵² The fact that the three Assistant Secretary positions of the Ministry have seen no less than seven different incumbents in its two and one-half year history is both symptom and cause of this instability and uncertainty.

Like MOSST, the Ministry of State for Urban Affairs has experienced some difficulties with personnel. A major problem for both Ministries has been that significant recruitment took place in advance of the emergence of a clear concept of the structure and operation of the Ministries. MSUA has had somewhat less of a problem locating suitable people, presumably because urban affairs is somewhat better developed than science policy in Canadian universities and in the non-federal levels of government; and because the conceptual gap between urban planning and urban policy is rather less than that between scientific research and science policy. Nevertheless, MSUA has experienced a significant rate of staff turnover and in the recent past has had a large number of vacant positions. We may note that with the appointment of a new Secretary for MSUA virtually all of the Ministry's senior personnel have had extensive experience in the federal government. MOSST, on the other hand, has been staffed at its senior levels with personnel, some of whom have not had extensive or varied experience in government.

In addition to personnel, a second major area of concern for any department or agency is its structure. If the turnover of senior people has caused some uncertainty within the Ministry of State for Science and

52. The Senate Special Committee worries that the frustrations of the Ministry's purely advisory role in science policy will cause "the organization . . . to lose its best people and fail to attract able replacements, so that the quality of its services will decay". Senate of Canada, *A Science Policy for Canada*, Vol. 3, p. 654.

Technology, so too have the constant organizational changes which the Ministry has undergone, including three Ministry-wide reorganizations in less than that number of years. Government officials whom we consulted regularly remarked on the proportion of MOSST's resources which seemed to be devoted to such internal matters. Designing the appropriate structures, within which the highly interdependent set of activities essential for successful policy formulation may best be carried out, is of course a very difficult task under any circumstances and must be based on a clear idea of the role and objectives of the policy agency. It is perhaps unfortunate that central scrutiny of budgetary submissions and of organizational changes requires certain kinds of commitments which may be premature in terms of the development of the intrinsically fluid policy, research, and co-ordination functions set out for ministries of state. Further in this vein, some individuals from both Ministries of State argued strongly to us that the appropriate organizational structure for such a ministry was a horizontal one composed of a small number of relatively senior and highly capable personnel. In contrast, their argument went, MOSST and MSUA have been organized as pyramidal structures ("so many Indians for each chief"), creating problems such as the need to make work for junior people, and preventing the recruitment of sufficient numbers of senior policy-capable staff.

The overriding problem with the structure of MOSST has been communication between its divisions and branches, which is crucial for the integration of the efforts of the various organizational units. In this regard, the inevitable challenges of co-ordinating and integrating such activities as policy and research have been compounded by the fact that the Ministry has been working under a severe handicap – it has had to house its people in no less than three separate buildings, thus hampering formation of the innumerable informal personal contacts which are necessary to establish a new organization with a complicated mission and to maintain cohesion in its continuing efforts. It is difficult to understand why one of the smallest departments in Ottawa should have had to shoulder this persistent and serious burden.

The question of communication and integration of effort within the Ministry arises in connection with its present structure, outlined in the introduction to this chapter. As the list of functions that is outlined there makes clear, the Cooperation Branch is fundamentally a service branch supporting the activities of the other two branches, which are to carry out most of the policy, research, and co-ordination functions. The historical development of the Ministry thus far has not been strictly in accordance with this model and indeed both the present list of functions and the actual historical interrelations of various functions raise a host of important questions, a few of which we may discuss here. For example, although in general it is clear that the new Program Review and Assessment Branch is to carry much of MOSST's emerging relationship with the Treasury Board while the Policy Development Branch is responsible for development of new policy initiatives and advice on the scientific

and technological implications of policies proposed by other departments, obviously the closest co-ordination and the most delicate division of responsibilities will have to be effected between these two branches. To take a single instance, it is interesting to see that the list of functions above allocates responsibility to the new Program Review and Assessment Branch for "Recommendations on the organization of federal R & D activities", despite the fact that thus far a significant proportion of the Policy Branch's efforts have been devoted to precisely such recommendations and that the latter branch has its own "Government Science and Technology Division". The two branches will have constantly to ask themselves, where do "Recommendations of objectives and priorities for science and technology" end, and "Advice on the conduct of scientific and technological programs and activities" begin? These are issues which will have to be faced in the future, as the Program Review and Assessment Branch develops. There are other questions, at least equally serious, which have already emerged.

Probably the most important of these concerns the place of the international scientific relations activities within the Ministry. Responsibility was originally embodied within a separate International Branch, and now resides in the Multilateral and Bilateral Cooperation Divisions of the Cooperation Branch. The international science and technology activities have developed in almost complete isolation from the other activities in the Ministry, such that they are seemingly conducted for their own sake rather than as extensions of, and aids to, the policy, research, and co-ordination activities which are ongoing for the national science and technology arena. Although the time of senior officials of the Ministry has been amply devoted to international scientific missions and visits, such as to China, Japan, France, and Britain, linkages between international scientific activities and other activities within the Ministry have not developed on a working basis and information flow has been negligible. As noted in the preceding section, jurisdictional questions with respect to responsibilities in the area of international science have developed between MOSST and External Affairs. As we argued above, such questions are bound to arise around the mandate of any ministry of state, and these particular questions would appear to be the most serious which have yet emerged for MOSST. Another organizational question facing the Ministry is that of the relationship between the Domestic Cooperation Division of the Cooperation Branch, and the Policy Development Branch. This is highly relevant, for example, to the discussion above of the role of the Ministry in relation to provincial governments. Once again, the question is one of the integration and co-ordination of functions and activities within the Ministry.

In a similar vein, it is not entirely clear just what the Ministry's response is to the challenge of the outstanding conceptual and informational problems of science policy. The Ministry has launched two major initiatives in this regard: the first, a study of highly qualified manpower in Canada; the second, an ongoing presentation of federal government expenditures in the natural and human sciences – and the latter has

been one of its most significant achievements thus far.⁵³ Nevertheless, it is ironic that the Ministry, a policy development agency with the mandate to “initiate and undertake such research, analyses and policy studies as may be required to further knowledge and understanding of the impact of science and technology on society”,⁵⁴ has not yet mounted a systematic research program aimed at attacking these problems nor has it attempted to develop science policy expertise in Canadian universities to any degree. (Nor, for that matter, has MOSST ever had its Minister request the Science Council of Canada to undertake specific research enquiries).⁵⁵ Rather, the Ministry’s research activities to date have been primarily *ad hoc* and short term in nature, and aimed solely at immediate policy problems. Moreover, responsibility for such investigations appears to be diffused throughout all three branches of the Ministry. For instance, the Science and Technology Resources Division of the Corporation Branch has been responsible for the above noted major initiatives undertaken to date, even though the Policy Development Branch is responsible for “studies of science policy”. At the same time, however, the Program Review and Assessment Branch is considered to be the unit principally responsible for providing the Policy Development Branch with the background information and data needed to formulate policy.

There seems to be general agreement that the Ministry of State for Urban Affairs has in the past suffered from some of the same sorts of structural problems as its counterpart in science and technology.⁵⁶ The policy function of MSUA, for instance, was the last to be developed and thus for some period of time the Coordination Wing (Branch) was forced to develop its own *de facto* policies and priorities. Secondly, without guidance from the Ministry’s embryonic Policy Wing of the Policy and Research Branch, the Research Wing developed its very extensive program in isolation from the rest of the Ministry. On this point MSUA shows the opposite pattern to that of MOSST. The reasons for the isolation of the activities of the Research Wing from the policy and co-ordination functions of MSUA are both historical and conceptual in nature. The lesson of MSUA’s experience in this regard should be clear. If MOSST is to mount a cohesive research program, it should do so through the contract mechanism. This strategy is most likely to prevent

53. Ministry of State for Science and Technology, *Scientific Activities, Federal Government Costs 1958-59 to 1971-72*, Ottawa, November 1971; *Scientific Activities, Federal Government Costs and Expenditures 1963-64 to 1972-73*, Ottawa, September 1972; *Federal Scientific Resources 1972 to 1974: Natural and Human Sciences*, Ottawa, December 1973; available through Information Canada.

54. See Appendix B.

55. The Science Council of Canada Act enables the Minister to “refer to the Council for its consideration and advice such matters relating to science and technology in Canada. . . as he thinks fit”. In pursuance of this authority, the Minister may “direct” the Council to conduct “studies” with respect to “such matters”. In the period that the Minister of State for Science and Technology has been designated to act as the “Minister” for the purposes of this Act, that is, in the past two and one-half years, this authority has not been exercised. See, *Revised Statutes of Canada*, 1970, S-5, pp. 6693-6698.

56. Cameron, “Urban Policy”, in Doern and Wilson, *op. cit.*, pp. 247-250.

the development of an entrenched in-house research program, going its own way at the expense of policy relevance and insulated from the critical influences of universities and other private sector institutions.

Questions of communication and integration of activities within a ministry of state are as much managerial as structural. The management of a staff which is to be capable of policy, research, and co-ordination functions is demanding in several ways. In the first place, the kind and quality of the inputs and outputs involved are, because of the nature of science policy, ill-defined and extremely difficult to judge. Furthermore, the duties of the individuals being managed are so demanding and so interdependent that, to maintain morale and effectiveness, each individual must understand fully where the particular project for which he is responsible is supposed to fit into the overall current work program of the Ministry. In the case of MOSST, an important consideration for management must be the limited size of a ministry of state and especially the limited pool of capable science policy personnel. Limitations on resources dictate a ruthless priority choice among the great variety of science and technology policy issues, which have been discussed so extensively over the last decade. All of these managerial considerations remain extremely important for MOSST.

A single example, priority choice, may highlight this. Priority choice is an absolute necessity, given limited resources, to prevent a simultaneous and thus generally superficial attack on the broad gamut of science and technology policy problems. As Russell Drew, the Director of Science and Technology Policy at the National Science Foundation, emphasized in testimony before the United States House of Representatives, "I should note that the potential for attempting to address too many and too diverse and intractable a series of questions must be guarded against. I am therefore planning to restrict our initial emphasis to very high priority policy areas and to build upon this foundation in expanding the role and activities of my office."⁵⁷ The wide range of ongoing projects in MOSST as of August 1973 is reproduced as Appendix III. In order to carry particular initiatives through to fruition by mobilizing adequate resources and maintaining their full commitment until resolution of the issue, a policy ministry is faced with the necessity of ruthlessly pruning lower priorities.

Such choice is by definition a matter of decision making and, especially for a developing organization, this requires leadership from top management. In the case of both ministries of state, severe problems have emerged. The involvement of the Ministry of State for Science and Technology in numerous areas of government policy has required the participation of scarce resources of senior personnel in a plethora of interdepartmental, intergovernmental, national and international meetings and communications. Too often, priorities have fluctuated and the

57. H.J. Lewis, "Who is Advising the Science Adviser?", *Public Science*, vol. 4, October 1973, p. 2.

organization has had its senior personnel concerned with short term issues to the detriment of their work on the relatively few fundamental and long term questions. In the process, focus and coherence in the Ministry's total effort have been lost.

Professor Cameron's study of the Ministry of State for Urban Affairs indicates that its early history was marked by serious managerial problems, including "absence of . . . leadership from the Secretary's office" producing confusion, conflict and discontent.⁵⁸ Whether such problems remain as severe as they were, their existence indicates the absolute necessity for an organization, in its development phase, to have clear and consistent choices made on the nature of the collective efforts of its personnel. This requirement is naturally of even more importance for a new kind of organization with broad policy responsibilities in a complex organizational environment.

58. Cameron, "Urban Policy", in Doern and Wilson, *op. cit.*, p. 246.

III. Conclusion

In the foregoing, we have analysed the Ministry of State for Science and Technology from two perspectives: first, as a ministry of state within the federal government, and second, as an organization responsible for the formulation and co-ordination of science policy. Our examination found that MOSST has had some successes – notably the “Make or Buy” policy. There is, further, a good deal of openmindedness about the potential functions that an agency like the Ministry might perform, mixed with deep concern about its present directions. The experimental nature of the ministry of state and the practical and conceptual problems of science and technology as a policy field have perplexed, frustrated, and confused the various actors, both inside and outside the Ministry. Little of which the public or Ottawa cognoscenti are aware has been accomplished in the attack upon the substantive problems of science policy, though there have been announcements aplenty. Why, with all this smoke, has there been so little fire?

We will try to approach the question through a series of considerations relating to both the ministry of state concept and to the particular challenges facing this Ministry. Our investigation has not led us to conclude that the ministry of state is an unworkable concept, though the balance of the evidence over the short period since the summer of 1971 would appear to so indicate. Nor can we conclude that the concept is inapplicable to the policy field of science and technology. Finally, we cannot lay all of our emphasis upon the difficulties experienced by particular officials who have found themselves in positions of responsibility in or relating to MOSST. We can only suggest that the lack of progress on the problems of science policy is due to a combination of factors found at all of the above levels of analysis. The frustrations of MOSST are traceable to a system failure. The factors involved can be reiterated, but no one of them can at this point be considered paramount and fundamental. Experience has been short, the system is extraordinarily complex, and thus the factors are as yet incompletely dissectible one from another.

The ministry of state concept is based on the “knowledge is power” hypothesis. The view that research, consultation, analysis, and policy formulation can be successfully carried out by an agency lacking the relevant program capability stems from this hypothesis, as does the belief that ministers and agencies who do possess program responsibilities will accept and implement policies formulated elsewhere. When ministries of state were established, rational planning within a context of stated objectives was expected to replace power brokerage and horse-trading in Cabinet decision making. A ministry of state, in and of itself, gives its minister little power in the sense in which ministers have understood that term and, hence, little or nothing to trade. Our investigation has convinced us that in the federal government as it currently operates this traditional power – program and/or control responsibilities – is required to get access to information and especially intelligence upon which policy and planning must be based. Thus ministries of state have apparently

rarely been able to supply their ministers with the kind of policy (knowledge) which has proven acceptable to Cabinet (power). Ministries of state are thus outside a closed circle of program or control responsibility (power), intelligence and information, which they might be forgiven for regarding as vicious.

The application of the “knowledge is power” hypothesis to the policy machinery of government in fact involves a confusion of knowledge of natural phenomena – the power of which, in the hands of technologists, humanity has ample reason to respect and fear – with knowledge of social and political phenomena. The rudimentary development of the social sciences, given the complexity of the phenomena, severely limits the “power” of such knowledge when applied to most areas of public policy. As we have been at pains to point out, this undoubtedly applies to the policy field of science and technology in the Canadian context. Even if ministries of state could get access to all the information they wanted and could become full members of the bureaucratic network in their designated fields, it is still doubtful that the analytical apparatus available from the social sciences is at a sufficiently high level that the ministries’ exclusive devotion to its employment would give them any significant edge over the departments actually managing the programs within the designated fields. We would add that it remains to be seen whether the “horizontal” purview of a ministry of state, its putative mandate to develop policy for a spectrum of germane programs operated by various departments, gives it a significant comparative advantage. What is clear is that any such comparative advantage could not be a conceptual or analytical one but rather a political one, requiring adroit management within the bureaucracy for its effective exploitation.

We should note here that in respect to the comments made thus far, the Minister of State for Urban Affairs is in a very different position from the Minister of State for Science and Technology. Unlike the latter, he has two major operational agencies in the urban field reporting to him in parallel with MSUA: the Central Mortgage and Housing Corporation and the National Capital Commission.

Why were ministries of state conceived without either program responsibilities or the control functions of the central agencies? Most of the strictly historical background, including the ostensible rationale, has been developed in an earlier section of this study. Here we may simply re-emphasize the importance of an atmosphere of optimism about the possibilities of systems analysis and rational planning applied to government problems and a naïveté about the analytical power of the so-called “policy sciences”. It may, however, be worthwhile to move back one step further to look at this question, for the ministry of state concept is only partly the child of the foreshortened golden age of planning in Ottawa.

Some of the most significant constraints on the efficacy of ministries of state lie in the very nature of the bureaucracy and the Cabinet – the attitudes and norms internalized by officials as they rise through the

system and the experiences of ministers as they attempt to make the system work. The "republic of management" and the doctrine of ministerial accountability lie as major roadblocks between ministries of state and the acceptance of horizontally conceived policies.

Surely, however, similar factors, equally deeply ingrained in the system, were responsible for the apparent attractiveness of ministries of state in 1970-71. We may crudely characterize the objectives of the bureaucracy as the formulation and implementation (but not the decision upon) *policies* and *programs* to achieve national goals. We may characterize part of the problem in pursuing these objectives as the deployment of the most capable personnel in the most appropriate organizational structures for formulating and implementing policies and programs. The system, then, may be oversimplified into the objectives, *policies* and *programs*, the product of political choice, which are in turn based upon the mutually interacting means to those objectives, *personnel* and *structure*.

Now, from the perspective of the central agencies and senior Cabinet ministers, the fact of apparently urgent but usually vaguely specified demands upon the system, with respect to some policy field such as science or urban affairs, may be quite easily perceived. However, the policy and programs required to meet these demands will often be extraordinarily elusive, especially in newer policy fields such as those mentioned. Furthermore, the public service personnel responsible for the existing programs impacting on the policy field or responsible for whatever policy formulation functions that may exist will probably be inappropriately trained or experienced, or simply incapable of meeting the new demands. Given the nature of the constraints on personnel management in the public service, however, these officials may be virtually impossible to reassign or otherwise dislodge. Thus, structure is often the most accessible point of attack when ministers and central agencies perceive demands in policy fields that are not obviously within the mandate of an existing portfolio. In lieu of immediate policy and programs, in lieu of or as a convenient excuse for personnel shuffles and recruitment of supposedly better qualified people, and rather than burden the central agencies with additional continuing responsibilities, new agencies or mechanisms for policy and co-ordination have been set up to signify a response to the new demands being articulated. Ministries of state are the best and purest example. Other agencies with less than overriding operational responsibilities have also been given quite ambitious policy and co-ordination mandates: for example, Information Canada in relation to departmental information services, the National Librarian in relation to federal library services. It would be unfair and premature to say that such mandates outside the central agencies are inevitably vacuous. Certainly, they have been no more than minimally successful so far.

To the extent that new mandates for policy and co-ordination are conceived without threatening to disturb existing portfolio responsibilities

and prerogatives, they will be acceptable or at least tolerable to officials and ministers, while at the same time making visible the government's concern about the policy area in question. To the same extent, such new mandates will be subject to the frustrations detailed in this study. What we have described is the result of both lack of realism about policy machinery and lack of resolve at the political level. The evidence to date indicates that, as *policy fields*, science and urban affairs (and information, for that matter) are still perceived as luxuries at the federal level. They are hostage to the power of line departments, with urban affairs suffering the additional burden of seeming to threaten provincial sensibilities.

So much for the concept of the ministry of state and its workability within the system to date. What about the application of the concept to the policy field of science and technology? We have suggested above that the concept of ministries of state was developed principally as a new policy agency, without more than the most general reference to the fields to which it might be applied. The result was very flexible, perhaps too flexible, in its design. There were, and are, as many opinions of its efficacy and of its potential fields of usefulness as there are actors and observers. One of the most fundamental insights resulting from our own analysis and from the comments of those who cooperated with us in our study is that bureaucratic machinery must be tailored to the exigencies of the particular field in which its mission lies. Thus, a ministry of state might happen to be entirely appropriate for one policy field, and quite inappropriate for another.

Here the contrast between urban affairs and science and technology as policy fields is most instructive. Urban affairs is a policy field with objectives – the improvement of the quality of life in cities – which are readily understandable by, and important to, many citizens. There are political kudos to be won for a minister and a government which succeed in identifying themselves in the minds of the voter with an effective attack upon urban problems. It is in this context that the Minister of State for Urban Affairs may make his or her policy proposals and play a co-ordination role in relation to Cabinet colleagues, many of whom will be from urban ridings. We do not claim that this consideration has been decisive in the experience of MSUA thus far. We simply suggest that it makes MSUA's relations with departments, and its minister's relations with other ministers, a good deal simpler, and potentially easier, than those of MOSST. For MOSST is charged with policy and co-ordination for science and technology, which are principally tools for the achievement of a myriad of other government objectives, including, for example, such things as transportation, pollution control, housing standards, and other prerequisites for healthy cities. Policy for science and technology is not readily explicable or even interesting to wide sections of the public. Those who are principally interested in science and technology, its practitioners, are widely scattered geographically and by sector of employment. They constitute no coherent political bloc and they swing no

elections. Obviously these factors leave the Minister of State for Science and Technology in a radically different position vis-à-vis his or her colleagues than that of the Minister of State for Urban Affairs.

There is, indeed, a real question as to whether a ministry of state for a policy field that principally involves the instruments for other government objectives makes any sense at all. How can that ministry comprehend all of the diversity of government objectives subserved significantly by science and technology? By what virtue is a Ministry of State for Science and Technology to recommend one government objective over another? Surely such recommendations are not to be based solely upon the scientific and technological possibilities underpinning those objectives? Yet upon what other criteria is a Ministry of State for Science and Technology likely to be more qualified than any other agency to advise? These are fundamental questions. They were not, it would seem, broached at the time when the ministry of state concept was married to the science and technology policy field. In the passage of time, they may have been obscured, but they have become even more significant.

This brings us to the creation and the experience of MOSST over the past two and one-half years. Here we may be brief, for we have explored the issues at length in the assessment part of the study. The Privy Council Office, the Treasury Board, and the Public Service Commission bear a major share of the responsibility for aiding in the establishment of new organizational entities within the government. There is ample evidence, arising not only in connection with ministries of state, but also with respect to Information Canada and several other new departments and agencies, that the central agencies failed to provide strong and consistent support to new organizations during the spate of structural change undertaken by the first Trudeau government. One of the most important findings of our study is that the central agencies' special role in relation to a new organization is only beginning once its mandate has been articulated, staffing begun, and funding arranged. Instead of treating the new organization as essentially fully grown once these "birth processes" are over, the central agencies must collectively advise and support the new organization for at least its first two years, on the basis of a *mutually agreed* plan for its development. The PCO and the Treasury Board must jointly guide the new organization and actively involve themselves with the Public Service Commission's efforts to ensure only the highest quality staff for it. It is clear that a balance will have to be struck between coddling, suffocating, or dominating the new organization on the one hand, and leaving it unaided to the bureaucratic struggle for survival on the other. It is equally clear that recently the balance has tipped much too heavily in the direction of the latter. The result is organizations which may never recover from the trauma of rapid staffing, unending struggles over budgets, organization, and job classifications, and a cruel and disheartening initiation into the policy process.

The mention of these difficulties brings us to our final topic: the prospects of the Ministry of State for Science and Technology. There is no need to reiterate the experience of the ministry in its frustrating and as yet unresolved search for a role. What can the future hold for MOSST?

As this study goes to press, there are signs that certain federal science agencies may be about to undergo a substantial reorganization, initiated outside MOSST.¹ Such a reorganization might have consequences which would render this document of more historical, rather than immediately practical, importance. Other changes, depending upon the results of the forthcoming election, might have similar effects.² Nevertheless, we summarize the implications of our investigation for MOSST's future on the assumption that such a ministry of state will continue to exist in more or less its present form.

Proposals to "strengthen" the ministry by allocating to it some formal authority in its policy area hold no reasonable prospect of improving science policy at this stage in MOSST's history. Incidentally, the same is true of proposals for a Department of Science including an operating role built around the nucleus of MOSST. Both recommendations fly in the face of the perceptions of and attitudes toward the present ministry held by senior people in the science policy field.

In these circumstances, then, the most promising strategy for MOSST may well be a more modest, more pragmatic, more incrementalist, and less visible role than heretofore. This strategy would envisage approaching departments with a non-threatening *service* posture rather than a somewhat directive policy and co-ordination stance. It would avoid the temptation of seeking operating roles by exploiting to the maximum the neutral "honest broker" role that can be played by an agency without operating responsibilities. It would permit the development of broader policy and co-ordination roles by building upon credibility with departments in convening R & D advisory panels with broad representation from inside and outside government, in co-ordinating multi-departmental interaction with provinces on science and technology matters, and similar modest but constructive activities. It is no coincidence that MOSST's major success to date has been the acceptance of the micro-policy, "Make or Buy". This policy has had important consequences, but it is based on only the vaguest vestige of a more comprehensive policy direction.

Such a strategy for MOSST runs entirely counter to the philosophy of policy making which has characterized the central agencies under Trudeau and to the ambitions held for ministries of state when they

1. Canada, *Minutes of the Proceedings of the Senate*, No. 1, Wednesday, 27 February 1974, p. 4.

2. *Science and Technology*. A Background Paper for Discussion Purposes at the General Meeting of the Progressive Conservative Party of Canada, 17-19 March 1974, Ottawa, Progressive Conservative Party Headquarters, PCHQ-1800-25-9. The document states that: "A Progressive Conservative government would upgrade the responsibilities of the Ministry of State for Science and Technology from that of an ineffectual advisor to the government to that of a full fledged Department of Science and Technology".

were established. Our investigations show, however, that the broad mandate established for the Ministry of State for Science and Technology threatens to overburden the machinery which has actually been put in place to achieve it. This is certainly the case as long as ministers confer such a low priority upon general policy and co-ordination in the area of science and technology as they have hitherto. As the first chairman of the Science Council has noted, "staff ministries are only as powerful as other ministers think the Prime Minister wants them to be. If the Prime Minister won't tolerate anybody ignoring the advice of any ministry of state, they become quite powerful."³

3. Toronto, *Globe and Mail*, 3 October 1973.

Appendices

Appendix A – Order in Council Authorizing the Issuance of a Proclamation Establishing the Ministry of State for Urban Affairs

Whereas the implications of increasing urbanization profoundly affect the well-being of Canadians and the future of Canadian society as a whole;

And whereas the close co-operation of governments is required to ensure that the urban environment evolves in a manner beneficial to all Canadians;

And whereas many of the activities of the Government of Canada substantially affect, directly or indirectly, the urban environment and it is desirable that the Government of Canada give careful attention to those aspects of its activities that affect the urban environment by formulating and developing comprehensive policies in respect of those federal activities;

And whereas it appears to the Governor in Council that the requirements for formulating and developing such policies warrant the establishment of a special portion of the public service presided over by a minister charged with that responsibility.

Now therefore His Excellency, the Governor General in Council, on the recommendation of the Prime Minister, pursuant to sections 14 and 15 of the Ministries and Ministers of State Act, is pleased to direct that a proclamation do issue establishing a Ministry of State for the purpose of formulating and developing policies in relation to the activities of the Government of Canada that affect the urban environment, to be known as the Ministry of State for Urban Affairs and to be presided over by a Minister of State to be known as the Minister of State for Urban Affairs.

His Excellency in Council is further pleased to specify that the Minister of State for Urban Affairs shall formulate and develop policies for implementation through measures within fields of federal jurisdiction in respect of

(a) the most appropriate means by which the Government of Canada may have a beneficial influence on the evolution of the process of urbanization in Canada;

(b) the integration of urban policy with other policies and programs of the Government of Canada; and

(c) the fostering of co-operative relationships in respect of urban affairs with the provinces and, through them, their municipalities, and with the public and with private organizations.

His Excellency in Council is further pleased to specify that the Minister of State for Urban Affairs shall, in relation to the formulation and development of the aforementioned policies, which are policies for

implementation through measures within fields of federal jurisdiction, have assigned to him the following powers, duties and functions:

(a) in respect of policy development he may

- (i) initiate proposals for new policies, projects and activities,
- (ii) evaluate proposals for new policies, projects and activities and seek to ensure their consistency with federal urban policies,
- (iii) evaluate existing policies, projects and activities of the Government of Canada that have an influence on urban affairs and recommend changes therein where required,
- (iv) where appropriate, participate in projects and activities of the Government of Canada that may have an influence on urbanization in Canada, and,
- (v) seek, in consultation with other authorities concerned, the co-operative development of urban policy in Canada;

(b) in respect of research, he may

- (i) initiate research and policy studies relating to urbanization,
- (ii) co-ordinate, in co-operation with other departments and agencies of the Government of Canada, research relating to urbanization that has been undertaken or financed by those departments or agencies, and
- (iii) recommend priorities for research in urbanization; and

(c) he may perform the following co-ordination functions:

- (i) he may co-ordinate, promote and recommend national policies in respect of urban affairs among departments and agencies of the Government of Canada,
- (ii) he may co-ordinate the activities of the Government of Canada in establishing co-operative relationships with the provinces and their municipalities for the enhancement of the urban environment, and
- (iii) he may co-ordinate the involvement of the Government of Canada with other governments and non-government organizations in urban policy matters.

Appendix B – Order in Council Authorizing the Issuance of a Proclamation Establishing the Ministry of State for Science and Technology

Whereas science and technology vitally affect the well-being of Canadians and the future of Canadian society as a whole;

And whereas many of the policies and programs of the Government of Canada substantially influence directly and indirectly the development of science and technology in Canada;

And whereas the close co-operation of departments and agencies of the Government of Canada is required to ensure that the development and use of science and technology advances in a manner beneficial to all Canadians;

And whereas the need for policies directed toward the most effective use of science and technology in the achievement of Canada's national goals has become increasingly urgent;

And whereas it appears to the Governor in Council that the requirements for formulating and developing such policies warrant the establishment of a special portion of the public service presided over by a minister charged with that responsibility.

Now therefore His Excellency, the Governor General in Council, on the recommendation of the Prime Minister, pursuant to sections 14 and 15 of the Ministries and Ministers of State Act, is pleased to direct that a proclamation do issue establishing a Ministry of State for the purpose of formulating and developing policies in relation to the activities of the Government of Canada that affect the development and application of science and technology, to be known as the Ministry of State for Science and Technology and to be presided over by a Minister of State to be known as the Minister of State for Science and Technology.

His Excellency in Council is further pleased to specify that the Minister of State for Science and Technology shall formulate and develop policies with respect to

(a) the most appropriate means by which the Government of Canada may, through measures within its fields of jurisdiction, have a beneficial influence on the application and development of science and technology in Canada,

(b) the co-ordination of programs and activities regarding science and technology with other policies and programs of the Government of Canada, and

(c) the fostering of co-operative relationships with respect to science and technology with the provinces, with public and private organizations, and with other nations.

His Excellency in Council is further pleased to specify that the Minister of State for Science and Technology shall, in relation to the

formulation and development of the aforementioned policies, have such duties as may be assigned to him by law, and without limiting the generality of the foregoing, shall assist departments and agencies of the Government of Canada in the formulation and development of advice to the Governor in Council with regard to

(a) the optimum investment in, and application of, science and technology in pursuit of national objectives,

(b) the organization of the scientific establishment in the public service of Canada,

(c) the allocation of financial, personnel and other resources to Canadian scientific endeavours, and

(d) the extent and nature of Canada's participation in international scientific activities and the co-ordination of related domestic activities.

His Excellency in Council is further pleased to specify that the Minister of State for Science and Technology may

(a) initiate and undertake such research, analysis and policy studies as may be required to further knowledge and understanding of the impact of science and technology on society, and

(b) determine and promote the use of methods for assessing the effectiveness of scientific policies and programs.

Appendix C – MOSST Work Program as of Summer, 1973

Academic Sector:

- analysis of federal funding of university research
- analysis of federal programs to support scientific and technological training at universities
- analysis of present university contracting policies and practices
- study of the indirect costs of university research
- highly qualified manpower survey; the first phase is to survey people holding university degrees and a subsequent phase will survey graduates of community colleges

Private Sector:

- review of industrial R & D assistance programs
- study of the application of economic input-output analysis to evaluate the effectiveness of government programs in support of technological innovation
- analysis of the impact of tax and tariff policies on technological innovation
- analysis of the laws on industrial and intellectual property and their impact on technological innovation
- study of the role of Canadian Patents and Development Limited

Federal Government:

- study of federal research establishments
- analysis of the federal effort in science and technology
- study of the Science Council of Canada
- analysis of research needs related to national priorities
- review of federal government costs and expenditures on scientific activities

International Sector:

- study of international science and technology priorities
- study of international science and technology activities with developing countries
- analysis of Canadian participation in United Nations' science and technology structures and programs
- analysis of MOSST's international responsibilities
- analysis of the development of a Science Councillor network

Miscellaneous Additional Projects:

- study of the impact of science and technology through the mass media on the general public

Reprinted from *Thoughts* (August 1973), distributed by the Ministry of State for Science and Technology.

- study of science and technology information systems, networks and services
- study to establish the feasibility of an inventory of scientific activities in Canada
- articles on Canadian scientific and technological achievements
- study of future developments in petro-chemicals in Canada
- assessment of new technologies for energy production and use
- comparative study on the long-term implications for science and technology of urban transportation
- analysis of Canada's activities and needs in oceanography
- analysis of Canadian activities and needs in space technology
- study of possible applications of systems analysis to technological forecasting
- study of requirements for R & D management training

Publications of the Science Council of Canada

Annual Reports

- First Annual Report, 1966-67 (SS1 - 1967)**
- Second Annual Report, 1967-68 (SS1 - 1968)**
- Third Annual Report, 1968-69 (SS1 - 1969)**
- Fourth Annual Report, 1969-70 (SS1 - 1970)**
- Fifth Annual Report, 1970-71 (SS1 - 1971)**
- Sixth Annual Report, 1971-72 (SS1 - 1972)**
- Seventh Annual Report, 1972-73 (SS1 - 1973)**
- Eighth Annual Report, 1973-74 (SS1 - 1974)**

Reports

- Report No. 1, A Space Program for Canada, July 1967 (SS22-1967/1, \$0.75)**
- Report No. 2, The Proposal for an Intense Neutron Generator: Initial Assessment and Recommendations, December 1967 (SS22-1967/2, \$0.25)**
- Report No. 3, A Major Program of Water Resources Research in Canada, September 1968 (SS22-1968/3, \$0.75)**
- Report No. 4, Towards a National Science Policy for Canada, October 1968 (SS22-1968/4, \$0.75)**
- Report No. 5, University Research and the Federal Government, September 1969 (SS22-1969/5, \$0.75)**
- Report No. 6, A Policy for Scientific and Technical Information Dissemination, September 1969 (SS22-1969/6, \$0.75)**
- Report No. 7, Earth Sciences Serving the Nation — Recommendations, April 1970 (SS22-1970/7, \$0.75)**
- Report No. 8, Seeing the Forest and the Trees, 1970 (SS22-1970/8, \$0.75)**
- Report No. 9, This Land is Their Land . . . , 1970 (SS22-1970/9, \$0.75)**
- Report No. 10, Canada, Science and the Oceans, 1970 (SS22-1970/10, \$0.75)**
- Report No. 11, A Canadian STOL Air Transport System – A Major Program, December 1970 (SS22-1970/11, \$0.75)**
- Report No. 12, Two Blades of Grass: The Challenge Facing Agriculture, March 1971 (SS22-1970/12, \$0.75)**
- Report No. 13, A Trans-Canada Computer Communications Network: Phase I of a Major Program on Computers, August 1971 (SS22-1971/13, \$0.75)**
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- Report No. 21*, **Strategies of Development for the Canadian Computer Industry**, September 1973 (SS22-1973/21, \$1.50)
- Report No. 22*, **Science for Health Services**, October 1974 (SS22-1974/22, \$2.00)

Background Studies

- Background Study No. 1*, **Upper Atmosphere and Space Programs in Canada**, by J.H. Chapman, P.A. Forsyth, P.A. Lapp, G.N. Patterson, February 1967 (SS21-1/1, \$2.50)
- Background Study No. 2*, **Physics in Canada: Survey and Outlook**, by a Study Group of the Canadian Association of Physicists, headed by D.C. Rose, May 1967 (SS21-1/2, \$2.50)
- Background Study No. 3*, **Psychology in Canada**, by M.H. Appley and Jean Rickwood, September 1967 (SS21-1/3, \$2.50)
- Background Study No. 4*, **The Proposal for an Intense Neutron Generator: Scientific and Economic Evaluation**, by a Committee of the Science Council of Canada, December 1967 (SS21-1/4, \$2.00)
- Background Study No. 5*, **Water Resources Research in Canada**, by J.P. Bruce and D.E.L. Maasland, July 1968 (SS21-1/5, \$2.50)
- Background Study No. 6*, **Background Studies in Science Policy: Projections of R & D Manpower and Expenditure**, by R.W. Jackson, D.W. Henderson and B. Leung, 1969 (SS21-1/6, \$1.25)

- Background Study No. 7*, **The Role of the Federal Government in Support of Research in Canadian Universities**, by John E. Macdonald, L.P. Dugal, J.S. Dupré, J.B. Marshall, J.G. Parr, E. Sirluck, and E. Vogt, 1969 (SS21-1/7, \$3.00)
- Background Study No. 8*, **Scientific and Technical Information in Canada, Part I**, by J.P.I. Tyas, 1969 (SS21-1/8, \$1.00)
Part II, Chapter 1, Government Departments and Agencies (SS21-1/8-2-1, \$1.75)
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- Background Study No. 10*, **Agricultural Science in Canada**, by B.N. Smallman, D.A. Chant, D.M. Connor, J.C. Gilson, A.E. Hannah, D.N. Huntley, E. Mercier, M. Shaw, 1970 (SS21-1/10, \$2.00)
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- Background Study No. 13*, **Earth Sciences Serving the Nation**, by Roger A. Blais, Charles H. Smith, J.E. Blanchard, J.T. Cawley, D.R. Derry, Y.O. Fortier, G.G.L. Henderson; J.R. Mackay, J.S. Scott, H.O. Seigel, R.B. Toombs, H.D.B. Wilson, 1971 (SS21-1/13, \$4.50)

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- Background Study No. 15*, **Scientific Activities in Fisheries and Wildlife Resources**, by D.H. Pimlott, C.J. Kerswill and J.R. Rider, June 1971 (SS21-1/15, \$3.50)
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