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Obstacles to organizational change: the creation of the Canadian Space Agency

Abstract: This article begins with the observation that the recently established Canadian Space Agency possesses very few of the organizational attributes that its early promoters had envisioned. The agency is much less autonomous, for example, and is located much farther from the industry than was originally expected. We describe three rather distinct perspectives on organizational change and argue that each one has a contribution to make in understanding the evolution of the Canadian Space Agency away from its initial conception. As backdrop to this theoretical argument we outline the structure of the space industry, the various initiatives undertaken to guide industry development, and the circumstances surrounding the creation of the space agency. In the final section of the article, drawing on interviews with public officials and private actors, we show how, in creating the space agency, bureaucrats, politicians and industry representatives were unable to surmount several key obstacles previewed in the introductory section.

Sommaire : Cet article commence par le constat que l'Agence spatiale canadienne qui vient d'être mise sur pied ne possède que très peu des attributs organisationnels que ses premiers promoteurs avaient envisagés. Par exemple, l'agence est nettement moins autonome et elle est située beaucoup plus loin de l'industrie que ce qui avait été prévu à l'origine. Cet article présente trois perspectives distinctes sur l'évolution organisationnelle, affirmant que chacune peut contribuer à la compréhension de l'évolution de l'Agence spatiale canadienne par rapport à sa conception d'origine. Pour étayer cet argument théorique, l'article précise la structure de l'industrie spatiale, les diverses initiatives entreprises pour guider le développement du secteur, ainsi que les circonstances entourant la création de l'agence spatiale. La dernière section de l'article, s'appuyant sur des entrevues avec des fonctionnaires et des intervenants privés, montre pourquoi, lorsqu'ils ont créé l'agence spatiale, certains fonctionnaires, politiciens et représentants de l'industrie ont été incapables de surmonter plusieurs obstacles clés décrits dans l'introduction.

In the highly chequered history of Canadian manufacturing, the space industry has been something of a success story. And remarkably enough, much of the credit can be claimed by state officials. Beginning in the late 1950s, a series of federal bureaucrats and politicians nurtured the industry to the point that it could carve out a niche in satellite manufacturing and score some notable technical achievements such as the development of the Remote Manipulator System or "Canadarm."

By the early 1980s the industry was past the fledgling stage and the Canadian state was faced with a new problem: how to organize the development of a more mature, export-oriented industry. Continued success could not be taken for granted. Even with a strong technical base and a reputation for quality products, the industry continued to rely heavily on government contracts and state direction. Given the increasingly international character of the space industry, it was no longer clear that the institutional arrangements that had served both the state and industry well during the early stages of industry growth would continue to do so in the future. By the mid-1980s most state and industry actors had agreed that government oversight and support would be better delivered by a single agency responsible for coordinating the investment decisions of the government and facilitating the marketing of Canadian products abroad. Of course, this conclusion brought a new problem: what organizational form should the agency take to accomplish the diverse objectives of the various actors involved?

Throughout the rest of the 1980s and into the 1990s, officials and politicians struggled to devise an answer to this question. In the end, the concrete expression of their response, the Canadian Space Agency, has been an organizational disappointment. In the view of many, both inside and outside of the process, the government has settled on an agency that is under-funded, politically isolated, and inadequately staffed.

In this article, we seek to identify the reasons why organizational change has accomplished less than might have been expected. We begin by briefly discussing some of the theoretical platforms from which analysts have diagnosed the problems of change in public organizations. We describe three rather distinct perspectives on organizational change and argue that each one has a contribution to make in understanding the obstacles to change. Next, we outline the structure of the space industry, the various initiatives undertaken to guide industry development, and the circumstances surrounding the creation of the space agency. In the final section of the article, drawing on interviews with public officials and private actors, [1] we

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1 Interviews were conducted at periodic intervals between 1988 and 1991 with officials in line departments, central agencies, and the space agency. We also interviewed representatives of the Aerospace Industries Association of Canada (AIAC) and the CEOs of two key companies in the space sector.

show how the creation of the space agency was unable to surmount several key obstacles previewed in the introductory section. Accordingly, a proposed organizational innovation gradually succumbed to the established organizational imprints derived from the Westminster model of parliamentary government.

Perspectives on organizational change

Students of political institutions are well acquainted with the difficulties that accompany planned organizational change. Even the most optimistic of institutional designers – those rational choice theorists who believe it is possible to "get the institutions right"[2] – are well aware that many things can go wrong. It is painfully evident that ineffective or inefficient organizations are not weeded out automatically. On the contrary, they often persist in the face of concerted efforts to change them. And when change occurs, it seldom produces the kinds of outcomes that designers intended. All of this is depressingly familiar and not the subject of much serious disagreement. If analysts disagree, it is on the question of where to lay the blame for the maladaptation of organizations. In looking at the space agency, we find that three different approaches to institutions offer insight into the pitfalls of organizational change.

Rational choice: Rational choice theorists focus on the rules employed to affect change. They treat institutions as essentially contractual arrangements agreed to by rational actors. For them the challenge of organizational change is one of persuading the parties to these contracts that new institutional arrangements will organize transactions in a more efficient manner.[3] However, the shift to new institutions involves considerable uncertainty. The transaction costs – that is the costs of measuring and enforcing contractual agreements – associated with the old institutions have the virtue of being familiar. New institutions suggest new costs, costs that may be so high that they will outweigh any putative gains from a new distribution of resources and authority. In addition, the costs of the transition itself, especially the bargaining costs, must be factored in. In some kinds of transactions, these costs will be trivial, but when organizational change is involved, matters are more complicated. There is seldom an obvious solution to which all parties will gravitate. Instead, posturing, haggling and costly delays are more the norm.[4]

For rational choice theorists the problems associated with a specific

2 Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990), p. 14.
3 Oliver Williamson, *The Economic Institutions of Capitalism* (New York: Free Press, 1985), ch. 1.
4 Paul Milgrom and John Roberts, "Bargaining Costs, Influence Costs, and the Organization of Economic Activity," in James Alt and Kenneth Shepsle, eds., *Perspectives on Positive Political Economy* (Cambridge: Cambridge University Press, 1990), pp. 72–73.

organizational change are part of the general problem of collective action. Although organizational change often promises system-wide benefits, the actors involved are reluctant to cooperate unless they can also be assured of some private gains. In this context, the bargaining that typically accompanies organizational change seldom produces a Pareto optimal outcome. The parties to change are preoccupied with the prospect of being played for suckers – that is, agreeing to changes that are far less advantageous than they might have achieved had they held out for their first preference. The result may be either stalemate or a solution that leaves both parties in a worse position than they would have been had one of them conceded to the other. In short, if it goes unchallenged, strategic behaviour undermines change.

Of course, in hierarchies organizational change is hardly ever the result of voluntary agreement; normally it is forced on participants by those in positions of authority. An authoritative intervention lowers the costs of bargaining by, in effect, dictating the conditions of a cooperative solution. Rational actors will still engage in the process of rent-seeking, that is bargaining to appropriate for themselves as much as possible of whatever surplus the change creates. But by clearly establishing the rules for change and by narrowing the range of acceptable outcomes, political authorities can lower bargaining costs and significantly reduce the scope for opportunistic behaviour. Without such an intervention, those with a stake in the original organizational design will have no incentive to contribute to the new order.

State theory: The second perspective, that of state theory, locates the problem of organizational change in the macro-design of the state and in relations between state agencies and organized interests. Change is adaptive and creative to the extent that it generates organizational capacity that can be brought to bear on social problems. Unfortunately, organizations are not especially malleable. Here they are constrained not as much by contractual relations as by their macro-design and by the entrenched interests it has fostered.

Central to this design in Canada is a form of parliamentarism that concentrates executive authority firmly in the hands of a cabinet constructed on a regional basis. Westminster parliamentarism, combined with a federal form of government and all of the governmental competition that implies, forces ministers and their advisers to pay constant attention to the territorial distribution of political goods.[5] In addition, within particular sectors, specific historical patterns of state-society interaction have become so rewarding and so routinized that they are remarkably resistant to change. An extremely wide variety of groups has succeeded in creating clientelistic relationships

5 Herman Bakvis, *Regional Ministers: Power and Influence in the Canadian Cabinet* (Toronto: University of Toronto Press, 1991).

that benefit both state agencies and the interest associations. In combination, these macro and sectoral features of the state limit the degree to which organizational change can respond to social and economic changes.

The dangers of institutional maladaptation are greatest when the state has poor lines of communication to its environment or when that environment is itself poorly organized. Improving the state's capacity to act must take some account, therefore, of the organizational development of key societal partners. Reaching the objectives envisaged in organizational change depends, in part, on the presence of networks of state-society relations capable of mobilizing societal support.[6] Without an appropriate network in place, organizational change falls victim to internal, that is political and bureaucratic, priorities.

Organizational culture: The third perspective on organizational change roots maladaptation in a series of unreflective internal processes that limit organizational options. There are a host of ways in which these processes operate, but they have in common the idea that the capacity for change is limited, first, by the inability of organizations to recognize alternatives and, second, by their deep-seated attachment to established behavioural patterns.

Many years ago Philip Selznick pointed out that successful organizations often become so value-laden that they develop distinct, change-resistant identities quite separate from the identities of the people who comprise them.[7] In recent years, organization theorists have extended that observation by noting that these organizational identities are influenced by prevailing systemwide conceptions of reality.[8] Organizations exist in broad, highly institutionalized environments where there are intense pressures to conform to established practices and procedures. Those that fail to conform lose legitimacy, while organizations that are capable of successful adaptation become increasingly isomorphic with their environments. The resulting pattern is one in which organizations come to resemble one another as they all share in the same institutional mythology.[9] Not surprisingly, as organizations become more homogeneous, so does the range of acceptable organizational models. Purposive organizational change comes face to face with

6 See Evert Lindquist, "Public Managers in Policy Communities: Learning to Meet New Challenges," CANADIAN PUBLIC ADMINISTRATION 35, no. 2 (Summer 1992), pp. 127-59.
7 Philip Selznick, "Foundations of a Theory of Organizations," *American Sociological Review* 13, no. 1 (1948), pp. 25–35.
8 See Vern Baxter, "The Process of Change in Public Organizations," *Sociological Quarterly* 30 (1983), pp. 283–304, and Paul J. DiMaggio and W. Powell, "Introduction," in DiMaggio and Powell, eds. *The New Institutionalism in Organizational Analysis* (Chicago: University of Chicago Press, 1991).
9 DiMaggio and Powell, "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review* 48 (1983), pp. 147-60; John W. Meyer and Brian Rowan, "Institutional Organizations: Formal Structure as Myth and Ceremony," ibid., 83 (1977), pp. 340–63.

a limited set of well-established, if poorly understood, notions of appropriate institutional design.

In state organizations, where resource dependency is a daily reality, officials are inclined to consider only those models that enjoy the prior approval of political authorities. Sometimes officials are forced in a particular direction by legal requirements. At other times they are limited by broader, macropolitical constraints, such as the prevailing organizational mythology. Options are narrowed as those in charge confine themselves to mimicking existing organizations. In short, there is no rich array of organizational models from which to choose.

Additional problems arise as the process of change gets underway. Reorganization is extremely hard to control.[10] Although officials may appear to be choosing from among a variety of organizational options, in fact, the process more often resembles "garbage can decision-making" in which the direction of change depends on the serendipitous combination of people, problems and solutions.[11] When these three elements are thrown together in a collage of action, then personalities, skill and timing all matter to the outcome.[12] In such circumstances, organizational change is hardly ever an instrumentally rational process. Rather, it more closely approximates a potentially conflictual search procedure that is heavily influenced by symbolism, habit and circumstance.

What is remarkable about these three perspectives on organizational change is that although they begin at very different levels of analysis and with very different assumptions about the behavioural propensities of political actors, they come to similar conclusions about the reasons for maladaptation in public organizations. Each perspective indicates that institutions impose constraints on actors by limiting their capacity to conceptualize organizational change and to cooperate in its realization. Together they provide a useful point of departure because each directs our attention to different kinds of obstacles to organizational change.

Although these three perspectives on organizational change are suggestive, they are seldom used to derive testable hypotheses on the subject. They provide, instead, alternative interpretations of how organizations manage, or fail to manage, the transition from one organizational form to another. Considering these perspectives in the context of the Canadian Space Agency does not involve choosing from among them. Our task here

10 J.G. March and J. P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics* (New York: The Free Press, 1989), ch. 4.

11 M.D. Cohen, J.G. March, and J.P. Olsen, "A Garbage Can Model of Organizational Choice," *Administrative Science Quarterly* 17 (1972), pp. 1–25.

12 See Graham Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971), pp. 145ff, and Patrick Dunleavy, "Reinterpreting the Westland Affair: Theories of the State and Executive Decisionmaking," *Public Administration* 68 (Spring 1990), pp. 29–60.

is to wring out of these perpectives some insights into the difficulties of recognizing and confronting the obstacles to change. As the introduction indicated, our general conclusion is that in the creation of the Canadian Space Agency, these obstacles were neither recognized nor confronted particularly well.

The space industry and the Canadian state

Relative to many others, the Canadian economy is not especially large. Yet, despite this small size, Canada has developed and maintained a significant place in the manufacture of space equipment, including satellites – a sector that is highly demanding in terms of technological innovation, inter-company cooperation, and scientific expertise. The demand for a significant communications capability is generated by a combination of the country's geographic expanse and its harsh climate. Responding to this demand is a federal government bureaucracy that had its origins in the Defence Research Telecommunications Establishment (DRTE), later renamed the Communications Research Centre. This agency housed considerable expertise and a human determination to innovate and thus address communications difficulties. Accordingly, the Canadian space industry grew up under the auspices of a special kind of policy network,[13] a state-directed network. As the industry matured and the state's resources evolved, this network foundered. Participants groped toward a new arrangement, part of which was to involve the creation of a Canadian space agency. This section of the paper examines briefly the creation of a state-directed network in space and the crisis this network experienced in the mid-1980s.

Production in the space sector involves three distinct activities: the development and manufacture of satellites and related space facilities including space stations, the manufacture and launching of vehicles that place the satellites in orbit, and the manufacture of earth stations that relay and interpret signals received from the satellites. Historically, Canadian firms have specialized in the first and third of these areas, while relying on American or European facilities for the launching of spacecraft. Along with its counterparts in the United States, Europe and Japan, the Canadian industry experienced a rapid expansion beginning in the 1970s. In 1990 there were approximately 2,500 transponders in orbit, compared to 1,400 in 1985, 350 in 1980, and 180 in 1975. Of this total, 40 per cent were American, 30 per cent were part of international consortia, 6 per cent were European

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13 The term policy network refers to the structure of relationships that obtain among public and private actors within a policy community. See M.M. Atkinson and W.D. Coleman, "Policy Networks, Policy Communities and the Problems of Governance," *Governance* 5, no. 2 (1992), p. 158.

or Japanese, and 4.5 per cent were Canadian.[14] In spite of this impressive record of expansion, the rate of growth for in-orbit telecommunications capacity began to slow down in Canada and the United States by the late 1980s. Accordingly, pressures for penetration of foreign markets increased as did competition among the key players – the United States, Canada, Europe and Japan. Several new markets have been targeted, with perhaps the most important being communications between mobile units, whether automobiles, ships or aircraft. Other possible new markets include decentralized digital business connections and remote sensing.

The Canadian industry is small, but highly competitive internationally with the key companies tending to be Canadian-owned. The largest of these is Spar Aerospace, which, with the nurturing of the federal communications bureaucracy, has grown to become a prime contractor for communications satellites and a world leader in remote manipulator systems. Cambridge, Ontario, is the site of Comdev, a specialist in communications multiplexers that go into satellites. Canadian Astronautics Limited in Ottawa and SED Systems in Saskatoon are active in the earth stations market, while MacDonald Detwiler in Richmond, British Columbia, concentrates its efforts in the area of remote sensing. Several foreign-owned companies – Bristol Aerospace in Winnipeg, Oerlikon in Quebec, and Raytheon Canada in Ontario – also have a place in the Canadian sector.

Yet it is crucial to note that this sector developed with very specific nurturing and direction from the Canadian state. Canada's expertise in space started out by being concentrated in the Defence Research Telecommunications Establishment. Scientific leadership from the DRTE was provided by Dr. John Chapman, who had an ambitious vision for Canada in space and who believed strongly in close cooperation between the government and the private sector. In the early 1970s it was Chapman who devised the strategy in the newly formed Department of Communications to develop gradually Spar Aerospace as a prime contractor for Canadian communications satellites. The subsequent success of Spar, both domestically and abroad, created conditions favourable to the growth of other smaller companies in the space field. In short, by the mid-1980s the Canadian state had carefully shared its evident expertise in the space and telecommunications field to promote an industry that was competitively placed in both domestic and foreign markets.

During the 1980s this state-directed arrangement came under increasing stress for several reasons. First, the space firms themselves were growing, their future was becoming more promising, and they were gradually devel-

oping an interest in shaping the policy under which they operated. These companies eventually congregated within the Air (later Aerospace) Industries Association of Canada (AIAC), but soon found themselves dwarfed by the larger, multinational air frame manufacturers who comprised the bulk of the association's membership. In response, the space companies formed a Space Committee within the AIAC, hoping to play a larger role in influencing the direction of government policy.

Secondly, the Department of Communications (DOC) began to lose its dominant position in the network. The Interdepartmental Committee on Space (ICS), which had been given responsibility for coordinating government space programs, had its chair shifted from DOC to the Ministry of State for Science and Technology (MOSST). Other agencies represented on the committee, Energy, Mines and Resources and the National Research Council in particular, became more interested in, and committed to, space activities. Reaching a common position within the ICS evolved into a difficult and time-consuming process. These problems came into sharp focus in the mid-1980s as the departments involved sought to devise a new five-year space plan. Instead of facilitating agreement, ICS had begun to get in the way. In the words of an official closely involved, "In my mind, it has always been a funny committee. It is advisory in a sense and a coordinating body in a sense, and it can't really take decisions ... it wasn't a forum that could rank or rate projects. It was too large and cumbersome for that. It really couldn't focus and get agreement." In the end, the plan was negotiated outside the committee, between MOSST and the relevant line departments.

Finally, as the Canadian space sector expanded, future growth came to depend on alliances and cooperation with other countries. Ties with NASA in the United States and with the European Space Agency were established and several joint projects were considered. The ICS was not a useful vehicle for managing such contacts. Instead, these agreements were pursued and signed by the individual departments. Yet these departmental efforts were not always well coordinated and some feared that they gave the impression internationally that Canada did not have its own house in order.

The Canadian Space Agency

By the mid-1980s the space sector had developed a clear interest in replacing the state-directed network with a different kind of arrangement. The firms were seeking a framework for policy-making in a sector where state expertise would remain crucial, where government purchases would continue to occupy an important position, but where close coordination between government and industry would provide real advantages for the development of domestic industrial capacity and export growth.

In January 1985 the AIAC drew up an extensive proposal for the creation of a "National Space Organization" and submitted it to the Canadian gov-

ernment.[15] The association sought this change for several reasons. First, it was concerned about the dispersal of the government's space-related activities around a number of departments and agencies. It noted the difficulties of coordinating these activities and the problems the industry faced in having to deal with a number of sponsoring agencies. Secondly, the association lamented the inflexibility in budgeting that came with the ICS process. If a project in one department was short of funds and a project in another department had a surplus, it was difficult to arrange a temporary transfer from one to the other. Finally, space companies felt that a single agency would facilitate the development of growing international contacts.

The industry's proposal met with a highly favourable response from perhaps the most important source, the prime minister. The prime minister and the PMO saw the creation of a Canadian Space Agency (CSA) as important for raising the profile of what had become a very successful, high technology Canadian industry and for developing international contacts. Later in 1985 the government used the throne speech to announce its intention to create a space agency. The response from the line departments was one of interest but caution. The idea contained some promise for resolving the problems that had developed with the ICS. But the AIAC proposal was not very specific on key organizational details, the throne speech contained only the announcement, and the Prime Minister's Office remained terse on the subject. In short, the two actors with the least knowledge of government operations in the space sector, the PMO and the industry, were the most enthusiastic proponents of the agency concept.

If the agency was to fulfill its promise as the key to the establishment of a network where business and the state could collaborate effectively, several conditions needed to be met. First, the agency would have to collect under its aegis the vast majority of the government's existing expertise in space policy and space technology. Coordination had to become an in-house matter. Secondly, the agency had to have considerable autonomy from existing government departments, preferably with a flexible personnel policy that would allow it to employ an influential executive head. Whatever the weaknesses of the ICS concept, it did have one strength: its space plan normally went to cabinet with several powerful ministers committed to it. And that political muscle had brought success. As one central agency official observed about the ICS, "we were dealing with a kind of loose confederacy that had, in fact, produced superb results at very reasonable cost. Whatever Canada had done in space, whether by good management or good luck, was top-notch." Thus any new agency had to have the clout in Ottawa to allow it to deal as effectively with central agencies and cabinet

15 Aerospace Industries Association of Canada, *Space – An Opportunity for Canada* (Ottawa: AIAC, 1985).

as its multi-headed predecessor. Finally, the agency had to receive sufficient financial resources to establish a solid operating budget and to move beyond the project-driven character of the ICS operation.

Meeting these conditions required the right answers to several organizational questions:

1. How much expertise and capacity was to be subtracted from existing space-oriented departments and then placed in the new agency?
2. What would be the organizational form of the new agency: a standard government department, an autonomous crown corporation, or something different again?
3. Would there be a net additional allotment of resources to the government's space budget(s) to facilitate the development of organizational autonomy?
4. Where would the agency be located, near the government's expertise or nearer the industry (for example, in Montreal)?

These questions are interrelated. Departments might be expected to contribute more to a new agency if they thought it would be strong and autonomous, if it had net additional resources, and if it were located in Ottawa where the government's expertise was concentrated. Conversely, departments might be more grudging with their contributions if they thought that the agency would be a weaker program manager than individual departments, if they perceived that no new resources for space would be forthcoming, and if the agency's creation were to involve a wholesale transfer of personnel and expertise to a new site.

Following the throne speech announcement, the agency idea entered a kind of limbo. The departments most affected, Communications, Energy, Mines and Resources, the National Research Council and MOSST, looked to their own resources with an eye to what might be contributed to the new organization. But this initial planning was done against a cloudy background; departments did not know what organizational form the agency would take and how strong it might be. Accordingly, they gradually became more cautious and sought to retain as much of their space activities as they could.

The Department of Communications reacted with the most caution. In anticipation of the creation of the agency, the department reorganized its activities to play down the idea of "space" and to play up its communications mandate. For example, in 1984 the department's research sector had a director general, Space Technology and Applications, and four directors for Space Electronics, Space Mechanics, Space Systems, and Space Applications respectively. The Technology and Industry Sector had a director for M-SAT and a director for the David Florida Laboratories (DFL). In 1986, after the announcement of the space agency, the previous director general's

mandate was retitled Space Technologies Research and this official now supervised only two directors: the director, Space Mechanics, and the director of the DFL. Two years later, the director general's title was again changed, this time to director general, Communications Technologies Research. The word "space" had disappeared from the department's organization chart completely.

The department ended up trying to protect as many of its space activities as possible. One official rationalized DOC's thinking in the following way: "DOC would happily transfer to the CSA any resources or facilities that would relate to *all* space programs. We have done that. But we would retain any related activities, facilities and resources that pertain only to communications satellites." By late 1987 the department was prepared to contribute only its David Florida testing laboratory and its Space Mechanics group. Referring to the latter, the same official added: "That particular group is an orphan at DOC, it has always been subservient to the communications group. So it has had a limited role to play." A space company executive was more blunt, suggesting (in an interview) that DOC dumped on the agency the one division that had contributed the least to space policy.

Meanwhile in 1987 the government finally moved to begin planning for the agency. The Privy Council Office conducted a wide and expensive search for a high-profile person with significant personal stature to head the agency. In the meantime the government appointed Art Collin, a senior public servant with substantial experience in the space area, to head up a transition team that would negotiate with the departments and refine the agency concept. Both Collin and the leading candidate for the agency's presidency envisaged a strong, highly autonomous organization with some kind of crown corporation status. Collin wanted an agency that could "stand alone," that would report to Parliament through a minister but not necessarily be under the control of the minister. The agency had to have the capability to be the voice of Canada internationally, and not simply the voice of a department of the Canadian government. Collin resigned from the transition team in February 1988, having provided a framework for such an agency complete with a draft statute.

But the idea of a large, autonomous agency was problematic from the start. First, and most important, the location of the agency became a political issue. Most of the space companies as well as the Ottawa space bureaucrats and scientists had assumed that the agency would be located in Ottawa, the base of the government's expertise. The Prime Minister's Office did not make the same assumption. The city of Montreal, backed by a strong lobby from the Quebec government and the Progressive Conservatives' Quebec caucus, mounted an intensive campaign in favour of having the agency in the Montreal area. The city of Ottawa countered angrily with the somewhat belated support of the Ontario government. The location question took the AIAC somewhat by surprise. Members worried that locating the agency

outside Ottawa might weaken its clout and inhibit its retention of capable personnel. Yet they were not sufficiently united or well-prepared to intervene strongly on the issue. After a long, internal and fractious debate, the location issue was resolved in favour of Montreal. But the damage had been done. The location fiasco lengthened the decision process, allowing new jealousies to emerge and old deals to unravel.

Secondly, the PCO did not like the direction of the Collin report. It feared that a strong, autonomous agency would be too difficult to control politically, becoming a thorn in the government's side on spending matters and on technology policy. Accordingly, it recommended that the agency take on the form of a government department, reporting to a minister, who would, in turn, be responsible to Parliament for space policy. Internal discussion of the PCO proposals, in combination with the long location debate, postponed final conclusions on the shape of the agency until well into 1990, almost five years after the throne speech announcement.

It is evident that the agency that has finally emerged does not satisfy the objectives of either state or industry actors as articulated in the mid-1980s. First, it has not gathered under its umbrella most of the government's space expertise and activities. It does have the David Florida laboratory from DOC but does not have responsibility for the department's key mobile satellite program (MSAT), or for other communication satellite activities (arguably the largest component of government space activities). It has responsibility for the RADARSAT program, but the Canada Centre for Remote Sensing, which was the proponent of RADARSAT, remains part of the Department of Energy, Mines and Resources. The agency inherits the space science and astronaut programs from the National Research Council and does have responsibility for Canadian participation in the US space station. Significant in this regard is the managerial philosophy that has emerged at the core of the agency. Instead of establishing its own independent links, the agency proposes to deal with "user communities" of space technology indirectly, that is, through the departments such as DOC and EMR that have had a history of contacts with those communities.

Secondly, the agency does not appear to have the political clout originally hoped for by space companies and space bureaucrats alike. The agency has the organizational form of a government department, with some symbolic window-dressing. Its head is called a president rather than a deputy minister, its assistant deputy ministers are vice-presidents and so on. In practice, however, the agency is part of a government department (currently Industry, Science and Technology Canada [ISTC]), and reports to the ISTC minister and not directly to Parliament. Whether space policy has the political impact it had with the ICS is, indeed, an open question.

Finally, the agency does not have additional financial resources. It does have the budgets for the projects transferred to it. It has a small budget inherited from the space science program at NRC. Some might argue that,

in fact, the net resources to space programs are likely to decrease. The move to Montreal is going to be very costly and the agency still needs to set up much of the infrastructure for a government department – financial, personnel and administrative services. It is unclear whether these costs might detract in the medium-term from possible monies allocated to space projects.

To conclude, if the state-directed network of the 1970s were to evolve to become more of a partnership with industry, the state had to be able to coordinate effectively its expertise and planning in the space sector. This condition has not been met; in fact, the state may have weakened its coordinating capacity. A senior public servant close to the agency commented: "If you were to go around and talk to industry now, my guess is that they would say that one of the things that has not happened – they're probably quite disappointed – is rather than consolidate our industry relations and interfaces, we have fragmented them further. Spar, in addition to having to deal with EMR and DOC and NRC and ISTC, now also has to deal with the space agency. So rather than consolidate those contacts, they made more."

What went wrong?

It is possible to attribute the difficulties experienced in creating the space agency to a band of confused and misguided bunglers who happened to be on the scene at the time. On this reading, another group of bureaucrats, politicians and industry representatives might have created a different kind of agency, one more closely resembling the original model. Unfortunately, this analysis is both too simplistic and too optimistic. The integrity and intelligence of the vast majority of critical actors in this drama has never been called into question. On the contrary, the space agency venture drew together some of the most sophisticated managerial talent, and some of the most accomplished technical experts, in the public service.

The problem does not lie with the people involved, but with the nature of the constraints, many of them institutional, imposed on the process of organizational change. Borrowing from each of the perspectives discussed in the first section, we will identify the obstacles to change that confronted officials and politicians in the creation of the space agency.[16] Some of these obstacles were avoidable, others were not. Although proponents of an independent agency were doubtless distressed that these obstacles were not overcome, it is even more troubling that so many participants seemed unaware that they even existed.

16 There is no one-to-one match between the perspectives outlined in the first section, and the more precise problems identified here, although clearly the rational choice perspective has greater relevance for the first two points, state theory for the final point, and organizational culture for points three and four. As we indicated at the outset, our purpose is not to test theories but to obtain insights. All of the factors we identify, from the very precise ones to the broad structural ones, had a role to play in the ultimate outcome. There is no single story.

1. *High bargaining costs*. At the bureaucratic level, all participants realized that the space agency could only be created by piecing together programs that were already under way in the various departments and agencies. The more generous these bureaus might be in surrendering their space-related activities, the stronger the space agency. Unfortunately, none of the participants had any special reason to be generous. Even though most bureaucrats supported the idea of an agency, it still made sense, from a departmental point of view, to hunker down and defend turf so that others would be called upon to make the biggest sacrifices. This attitude, which is entirely consistent with the maxims of rational choice theory, lays the groundwork for the playing of non-cooperative games. In these games, the most famous of which is the prisoner's dilemma, participants decline to cooperate because the payoffs from defection are either larger or more certain than those from cooperation.

Throughout the process of interagency bargaining, departments put their own interests first in assessing the shape of the space agency. In fact, the strategy of non-cooperation deepened as participants came to recognize that on the various points of disagreement, whether they involved financial or personnel resources, no one else was prepared to sacrifice if they could avoid it. If this kind of opportunistic behaviour persists over the longer term, the resultant agency ends up inadequately staffed, poorly resourced, and bereft of key programs.

These situations are more tractable when there is some scope for lowering the costs of bargaining. Actors have something to exchange, exchanges continue for some time, and participants demonstrate considerable indifference across a range of possible outcomes. Under these conditions, a non-cooperative game might be transformed into a cooperative one. Departments would engage in mutually beneficial exchanges, build up a store of trust and a reputation for honesty, and end up taking turns compromising.

But the creation of the space agency had none of these situational qualities. In the first place, instead of facing a series of decision points of roughly equal importance, departments confronted a lumpy, "once-only", decision. Officials focused on the short-term consequences of their actions, which were relatively clear and certain, because the long-term benefits of cooperation were much harder to visualize. Thus, when DOC officials quarrelled with MOSST officials about which DOC programs were to be transferred to the new agency, both parties insisted on their first preference. They were aware that the outcome would have a significant effect on their own relative strength in the next round of negotiation. DOC officials wanted to retain everything but the David Florida Laboratories and the Space Mechanics group; MOSST wanted to transfer all of DOC's operations associated with space. If DOC succeeded, the agency would lack a critical mass of space programs. If MOSST succeeded, DOC would have lost a major set of programs crucial to its legislated communications mandate. Though both departments

were committed to the agency, neither party could afford to compromise because of the unassailable advantage that compromise would have bestowed on the other. In addition, the key actors did not express the kind of indifference that is crucial to log-rolling. For example, although they were officially agnostic on the topic of location, none of the operating departments favoured the Montreal site. On the matter of the structure of the agency, there were few firm views, but then the departments (including, in the final analysis, MOSST) were not in a position to bargain on that issue anyway. It was clearly one in which politicians and central agents were the principal participants.

Of course, these obstacles to a bargaining solution to organizational change are not unique to the space agency. Moreover, they would have been much less important had the process of creating the agency not been entrusted to bureaucrats. But the transition team was entirely bureaucratic in its makeup and the initial negotiations among departments were conducted at the bureaucratic level. It was only when this process began to unravel that the space agency issue was elevated to the political level. This brings us to the second obstacle.

2. *The absence of structuring decisions.* Recall that for rational choice theorists the most important ingredient in successful institutional adaptation is the rules of engagement. Somehow the parties to organizational change must get the rules right. In the context of cabinet government, the most important decision rules are the ones devised by the political executive. These rules structure decisions that, in turn, set the parameters within which the details of the space agency could be worked out. The structuring decisions would then address the purpose of organizational change, the authority to be exercised by the agency, the resources committed to its creation, and the implications of the new organization for existing policy. They supply, in short, a framework for bargaining.

Cabinet has considerable experience in devising just this kind of framework. Indeed, it is sometimes argued that one of the reasons unrestrained competition among agencies – the "bureaucratic politics" phenomenon – is less likely to occur in parliamentary systems is that cabinet is in a position to bind the bureaucracy in advance to a restricted range of possible outcomes.[17] Had cabinet made some clear decisions about the size, structure and purpose of the agency, subsequent decision-making might have followed a different path.[18] Rather than adopting a bargaining style, where

17 M.M. Atkinson and K.R. Nossal, "Bureaucratic Politics and the New Fighter Aircraft Decisions," CANADIAN PUBLIC ADMINISTRATION 24, no. 4 (Winter 1981), pp. 531–62.
18 In drawing conclusions in his study of government organization, Gordon Osbaldeston adopts as one of his rules: "If you must reorganize, think through the design and implementation before launching the change." *Organizing to Govern*, vol. 1 (Toronto: McGraw-Hill Ryerson, 1992), p. 145.

bureaucrats are preoccupied with the distributive implications of a design, they might have employed a problem-solving style in which the focus is on the quality of collective outcomes.[19] Bureaucratic conflict could then have been confined to technical problems of staffing and budgeting.

But the only rationale for the agency that had been worked out carefully was a political one. Cabinet provided no structuring decisions on any of the other critical questions, nor did it provide any incentive for bureaucrats with experience in the space sector to join the agency. The importance of forestalling bureaucratic bickering and nurturing an identification with the new agency seems to have escaped attention. Instead of resolving conflict by invoking an agreed upon blueprint for the agency, ministers seized on departmental mandates and defended their bureaucratic colleagues in what became a high-level political turf battle. The minister of energy, mines and resources, Patricia Carney, and the minister of communications, Marcel Masse, donned the mantle of departmental defenders and fought side by side to retain major space-related projects within their respective departments. This was not a fight that proponents of the agency – chiefly MOSST officials – could win. They did not have the ministerial or the managerial clout to resist a down-scaling of the agency's mandate. Besides, by this time, ministers were preoccupied with the location question, not with what the agency was actually supposed to do.

3. *A lack of monitoring and follow-through.* At the outset the agency idea had support at the highest level, that of the prime minister and, in Canada, organizational change at the federal level is understood to be a prime ministerial prerogative. It is the prime minister who decides how to allocate functions among ministers, and with this prerogative comes the authority to reorganize government. The dangers of concentrating organizational power in this one office are mitigated when the prime minister's organizational designs have the support of strong ministers. Unfortunately, in the creation of the space agency, there was no driving force other than the prime minister himself. And the prime minister evaluated the space agency largely in terms of its public relations impact, both domestically and internationally, and only marginally in terms of its bureaucratic and policy impact. Domestically, the agency had to be big enough to be noticeable. Internationally, it had to be prominent enough to persuade the Americans and others that Canada was serious about participating in space-related endeavours. Senior officials could then work out the bureaucratic implications. The problem, of course, was that not all the implications of the decision were purely bureaucratic. Putting the agency idea into practice involved a host of decisions, three of which ended up being particularly

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19 Fritz W. Scharpf, "Decision Rules, Decision Styles, and Policy Choices," *Journal of Theoretical Politics* 1, no. 2 (1989), p. 166.

crucial and (to varying degrees) political. What legal form should the agency take? Who should lead the agency? Where should the agency be situated? Rather than considering these questions simultaneously, they were dealt with independently of one another with input from different bureaucratic actors.[20]

The transition team was asked to devise an organizational framework for the agency, and began with the presumption that the prime minister had in mind a stand-alone entity, a crown corporation that would report to Parliament through a minister. The agency was, after all, a prime ministerial initiative and to house it in one of the existing departments of government would have made it, in the end, a creature of that department. The transition team envisioned an agency that would be an instrument of the government of Canada. As such, it would be in a position to speak directly to parallel agencies in the United States, Europe and Japan without having to filter its positions through departmental priorities. This organizational issue soon had to compete for attention with a second problem, that of where the agency should be located. The location question emerged at the same time that PCO officials were trying to solve a third problem, that of who was to lead the agency. All of these problems had solutions, but they were not necessarily compatible. Nor were they considered in a comprehensive manner, thereby opening the door to garbage-can decision-making.

For the PCO officials charged with addressing the leadership problem, the solution was to recruit a Canadian with world-class credentials in science and technology for whom the agency would be a natural career move. Their preferred candidate for the job insisted on full corporate status for the agency and demanded a role in drafting the enabling legislation. With the agency headed for crown corporation status, the solution to the leadership problem was consistent with the emerging organizational design. Neither, however, fit with the solution to the locational problem. When it became clear to bureaucrats and the industry that, for political reasons, the agency might not be located in Ottawa, the process of orderly organizational change ground to a halt and a parallel political process began. The city of Montreal, the Montreal business community, and the political elite in Quebec began pressing for a Montreal location. Scientists, bureaucrats and members of the Conservative caucus from Ontario argued the contrary case. The resulting stalemate put the entire process of organizational change on hold. In the two years that it took to settle the locational issue, the financial situation of the government deteriorated and PCO lost its number one candidate. With him went much of the pressure for an independent corporate body.

20 Gordon Osbaldeston notes that there is a strong tendency in Canada "to launch organizations without a great deal of administrative or operational planning." See *Organizing to Govern*, p. 132.

4. *Commitment to established organizational imprints.* Even at this point in the process, the conventional solution – an agency housed within a department – was not necessarily the only possible outcome. But when the problem was placed firmly in the hands of central agency officials, experts in government organization, other organizational possibilities became less probable. Within central agencies there was little enthusiasm for a completely independent entity. In fact, had it been up to them, the whole idea of a space agency would have been permanently shelved. The creation of the agency meant that programs and people would have to be ripped away from departments and put back together. Worse, it meant confronting the old chestnuts of political and financial accountability. Regardless of its legal status, a new agency would have to establish lines of responsibility and acquire a budget for administration, neither of which had been necessary under the old interdepartmental committee.

In Canada, the dominant mythology emphasizes the need for close ministerial supervision of major government agencies. With reduced financial flexibility (aggravated by the need to put up a building in St. Hubert), and growing intransigence among the departments involved in space, circumstances came to favour the option of situating the agency within an established government department. The space agency would have a separate deputy minister – the president – and its own administrative infrastructure. However, it would not report to Parliament directly, but through the minister of industry, science and technology. A bureaucratic entity would be born without threatening the conventional norms of ministerial responsibility. PCO officials took steps precisely in this direction. Their attitudes on the subject are neatly summarized by a senior official: "It is worth noting, just as a general comment, that the organizational experts within government who were called upon to advise on organizational structure, inevitably argued for the departmental form of organization. This is their starting point. They argue that because of the convention of ministerial responsibility, anything that in any way detracts from ministerial authority over the organizational entity to be created is bad in principle."

As long as the leadership problem was driving the organizational design, central agency officials could not insist on their own preferences. But once the prime minister appointed an internal candidate to head the agency, someone who was already an order-in-council appointee and who therefore had limited bargaining power, "the people handling the organization in the PCO said okay, now we start by making it a department, with a few extra little bells and whistles."

The evident desire to have the agency conform to the norms of public sector organization might be interpreted simply as an attempt to control its development. But organization theorists note that those in charge of organizational change, unless pressed by higher authorities or by outside experts, will naturally be drawn toward forms that are normatively sanctioned. In

Canada departmental hierarchies have much more legitimacy than independent agencies and questions of technical efficiency and organizational innovation do not weigh very heavily in the equation. Here is the assessment of one senior official:

There is something fundamentally wrong with the way the federal government handles major organizational change. I think they tend to be too secretive, too limited in their view. They seldom look around the world and examine how similar functions are being managed elsewhere and if they do, they do it in a superficial way. They don't use highly qualified outsiders ... They should really marshal some intellectual resources, bring in advisers who have done it in other countries, look at different models and, if necessary, have some public ventilation of all of this. But we are on a different track.

In the creation of the space agency, the different track took Canada to a familiar destination.

5. *Rudimentary business-state relations.* An additional obstacle to change arose from the fact that the purposes of the space agency as understood by officials were quite different from the purposes as understood by business. This miscommunication was hardly surprising. Apart from the sporadic contacts made by the Space Committee of the AIAC, there had been no routine, high-level contact between the state and the space industry in the 1970s and early 1980s. Instead, business-state relations were characterized primarily by a set of bilateral arrangements established between particular firms and particular departments. These arrangements typically took the form of procurement contracts and assistance in negotiating with foreign governments. Policy was an entirely state-centred affair, with key developmental and financial decisions being taken in the ICS.

The state's dominance of the policy agenda is a key characteristic of what we have called a state-directed policy network, one in which state actors dominate the formulation and implementation of policy. Private actors are uninvolved or relegated to the role of weak policy advocates. Comparative public policy research during the past decade indicates that state-directed networks are exceptional in capitalist states.[21] But state-directed networks do develop, especially where private actors have very little organizational capacity, where firms and associations are dependent on the state for

21 Particularly revealing here have been several studies of France and Japan. See Alan Cawson et al., *Hostile Brothers: Competition and Closure in the European Electronics Industry* (Oxford: Clarendon Press, 1991); Peter A. Hall, *Governing the Economy: The Politics of State Intervention in Britain and France* (Oxford: Oxford University Press, 1986); Richard J. Samuels, *The Business of the Japanese State: Energy Markets in Comparative and Historical Perspective* (Ithaca: Cornell University Press, 1987); and Richard Boyd, "Government-Industry Relations in Japan: Access, Communication, and Competitive Collaboration," in Stephen Wilks and Maurice Wright, eds., *Comparative Government-Industry Relations* (Oxford: Clarendon Press, 1987), pp. 61–90.

political or financial support, or where special sensitivities, in areas such as national security or monetary policy, dictate restricted contact with private actors. To some degree, the first two of these conditions applied to the space sector in Canada, at least during the first fifteen years of its existence. The state had produced some stunning achievements during that period, not least of which was the development of a prime contractor capacity in the form of Spar Aerospace. But when the time came for organizational change within the state, private sector actors were unable to make a significant contribution to the transition.

It is striking that, having proposed the agency idea in 1985, the industry had virtually no further role in its development. Once the idea had been seized upon at the highest political levels, and a transition team appointed to oversee the change from the ICS to an agency, the AIAC and member space companies were left outside the process. They lacked the organizational strength to demand a place at the table. As a result, they stood in stunned silence as the concept for the agency evolved from their preferred option of an agency with a significant measure of independence, like a Schedule C, parent crown corporation (such as Atomic Energy of Canada Limited [AECL]), to a Schedule B, departmental crown corporation (such as the National Research Council [NRC]), to an agency housed within a department. As outsiders, the industry was also taken by surprise by the dispute over where the agency would be located. Although Spar officials claimed to be indifferent about the location issue, the rest of the industry, including AIAC, was flabbergasted that the government would locate the agency near Montreal rather than in the national capital region. The industry's reaction is summed up by one senior executive:

We thought in our naïveté that by creating a space agency and showing that we were creating valued jobs and all these sorts of things that that would matter to politicians ... When I say naïveté, one of the problems with the space industry is that it is run primarily by persons whose training has been in engineering. Engineers are notoriously naïve. They believe that if this is logical, then you, as a reasonable human being, are going to see this is logical. We thought our vision of the universe was reasonable and that the politicians would have to see that too. But they didn't. We opposed in every way we could moving the agency to Montreal. You won't find any of the space companies that ever spoke in favour of it.

Perhaps the institutional legacy of a state-directed network could simply not be overcome. In a state-directed network, organizational change is defined in terms of the internal bureaucratic and political requirements of the state. Organizational options are assessed against these requirements, without much concern expressed for the needs of the clientele. State officials assume, usually correctly, that the industry has little or no appreciation of the political and bureaucratic realities associated with organizational change.

Firms are not considered strong enough to offer policy advice; paternalism begets clients, not partners.

The one exception to this characterization was Spar. Spar officials have a reputation for accommodating their company to political realities, as evidenced by their willingness to adhere, in 1989, to the new requirements for a regional dispersion of space-related contracts. Spar saw the space agency as a means of dealing more effectively with foreign governments in what are usually government-to-government deals. But its enthusiasm was tempered by a realistic assessment of the dangers involved in lumping space programs together. Not only might the agency be under-funded financially, but it might have some serious political weaknesses as well. The creation of a single agency would entail replacing several effective cabinet ministers, all of whom had a partial interest in space, with a single minister who would have primary responsibility. From Spar's perspective, the combination of a weak agency and a weak minister would be far less appealing than the status quo.

Spar's willingness, and indeed its need, to go it alone was a further reflection of the rudimentary business-state relations that characterize the space sector. This low level of sectoral mobilization left state officials a relatively free hand in organizational design, a design thus unlikely to respond to industry's needs. During the 1970s and 1980s Ottawa had shown itself more than willing to reorganize government departments in search of the best division of labour. The penchant for solving problems by reorganizing responsibilities was well established and, without some pressure from the private sector, it remained the natural political response to changes in the policy environment.

Conclusion

The creation of a space agency in the 1980s was a crucial development for the industry. Both the state and the firms in the space sector had reached a stage where existing organizational practices and the old policy network had become something of a strait-jacket. Continued success no longer seemed to come easily and organizational problems in the state were identified as a contributor to the uneasiness and growing lack of confidence in policy development.

Both state and industry recognized these problems and agreed initially on the outlines of a solution. Most of the officials with direct experience in the space sector and most of the firms in that sector envisioned a strong, rather independent agency that would gather together Canada's expert personnel and on-going programs and collaborate with business to realize policy objectives. The degree of independence implied in this model is by no means unknown in Canada, but it does require a modification to the principles of departmental organization and direct ministerial responsibility that are at the heart of the Westminster form of parliamentary government. Both

sides believed that such a modification was worthwhile. An independent agency would spur the further growth of the sector and facilitate the achievement of the broad communication goals long held dear by the Canadian government. Neither side paid much heed at the outset to the obstacles likely to block this type of organizational innovation.

Looking at the organizational genesis of the Canadian Space Agency, we find that insufficient care was devoted to preparing for the decision. Stakeholders soon began to wonder just how they would benefit from the planned changes, particularly given that they were about to lose programs that they had worked hard to develop. In addition, central agencies and politicians never defined clearly a set of parameters within which bargaining might take place. None of the parties to the decisions tried to build on the previous history of strong state direction to create a collaborative network in which problem-solving rather than bargaining is the dominant style. Consequently, the process of creating the agency degenerated into the self-serving bureaucratic turf battle that organization theorists have long warned about.

When organizational change finally got under way, it soon became the victim of processes that limited structural innovation. The state showed an inability to monitor and follow through on change. Consequently, the vision of a large, rather autonomous agency succumbed gradually to the inexorable logic of established organizational imprints. The resulting definition of the agency, a separate entity within a large department, was far removed from the earlier ideas and models.

Finally, the ambitious order of political change envisioned by both state and business in the early 1980s was bound to be demanding, whether of government resources and will or of industry and its associations. In creating the space agency, no attention was paid to the rudimentary level of organizational development of industry associations. Certainly, state officials never appear to have asked themselves whether the space sector was adequately organized for the next stage of policy development, or whether they would have to intervene to promote changes in that level of organization.[22]

The space agency episode underlines the need for conscious planning informed by theories of organizational change, if governments wish to pursue structural innovations. Unfortunately, neither politicians, public officials, nor space firms themselves seem to have fully appreciated the

22 Intervention of this kind is far from unprecedented. The industrial policy planning exercise carried out in Britain in the 1970s involved fairly systematic attention to sector working parties in the overall design. The reorganization of the French banking sector by the French state aimed at taking full advantage of the Single Market involved systematic attention by officials to the structure of industry associations. Changes were made in those associations, some with the carrot, others with the stick, as part of a new anticipatory approach to banking policy.

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myriad obstacles to organizational change. Although an agency was finally created, it takes its place in a fragmented and uncoordinated state structure and faces a pluralistic, advocacy-oriented set of interests. It remains an open question whether the policy objectives that inspired its creation are any closer to being realized.

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