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SPONSORSHIP OF BUILDING RESEARCH - A CANADIAN VIEW

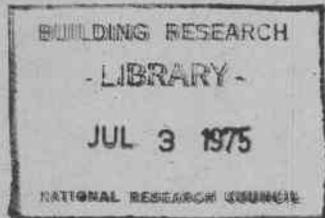
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BY

N. B. HUTCHEON AND A. G. WILSON

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LES SUBVENTIONS A LA RECHERCHE SUR LE
BATIMENT - UN POINT DE VUE CANADIEN

Les auteurs étudient le problème de fournir des ressources financières adéquates à un organisme de recherche national sur le bâtiment appuyé par des fonds publics dans le cadre économique de la liberté d'entreprise, compte tenu de l'expérience de la Division des recherches en bâtiment du Conseil national de recherches du Canada. Les auteurs font observer que la façon dont un organisme de recherche obtient ses fonds exerce une forte influence sur les critères de ses priorités de recherche. Dans la plupart des organismes du gouvernement canadien, les subventions accordées doivent couvrir toutes les dépenses et les revenus ne peuvent pas s'ajouter aux fonds disponibles. Cela favorise le choix de programmes d'un intérêt plus large, ceux qui servent un seul ministère ou une seule société étant souvent accordés moins d'importance malgré leur mérite. Une situation prolongée de subventions constantes soulève de sérieuses difficultés de gestion dans le cas d'un organisme bien établi dont les engagements ne cessent d'augmenter. Cela entraîne un examen d'autres modes de financement qui offrent une plus grande flexibilité en réponse à de nombreux besoins.

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Sponsorship of building research — a Canadian view

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International Council for Building
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Summary

Consideration is given to the problem of providing appropriate financial resources for a publicly-supported national building research agency in a free-enterprise economy, based on the experience of the Division of Building Research, a part of the National Research Council of Canada. It is noted that the method through which a research agency obtains its funds has a strong influence on its criteria for research priorities. In most Canadian government agencies, the funds provided are intended to cover all expenditures and income cannot be used to augment resources. This encourages the selection of projects that serve a large community of interest; those that serve a single department or company usually rate a lower priority even though deserving of attention. A condition of constant resource allocations over an extended period presents serious management problems to a mature organization with ever-increasing commitments. This leads to consideration of alternate forms of financing, providing more flexibility in responding to a variety of needs.

The Division of Building Research has operated for the twenty-six years of its existence as a publicly-supported agency receiving all of its funds from a Parliamentary vote. This arrangement, which is typical of many building research agencies, may be thought to provide too limited an experience to be able to make a useful contribution to a discussion of research sponsorship. Yet in retrospect there have been many variations in practice that have had substantial influences upon the conduct of research and the management of the Division. The opportunity to work closely with other agencies has also provided some insight into other arrangements, which can usefully be related to the direct experiences of the Division.

Organized building research in Canada has been carried out since 1947 when the Division of Building Research (DBR) was set up under the National Research Council of Canada. The Council is an agency of the Canadian government established in 1916 by Act of Parliament to promote scientific and industrial research and is empowered to undertake, assist, or

promote research. It is a body corporate having power to hold real and personal property and to expend any money appropriated by Parliament for the work of the Council.

Further freedom thought to be necessary for the conduct of research was provided by designating that the Council report to a Minister, not by virtue of his normal departmental responsibilities, but as the member of the Privy Council designated to act for the National Research Council. The Council is further empowered, subject to the approval of the Minister, to appoint its own staff.

The National Research Council consists of the President, who is the chief executive officer, three Vice-Presidents, who with the President constitute the salaried executive, and seventeen members appointed by the Government and serving without remuneration. The National Research Council Laboratories, of which DBR is one, are responsible to the Council for administrative and policy purposes, reporting to it through the executive officers. Close control is exercised over detailed administrative matters which are in general carried out in conformity with government procedures.

The broad direction of research is determined partly through the influence of the executive and Council, and by budgeting procedures based on the principles of management by objectives. In practice, the budget of the National Research Council in terms of programs and activities for the Council as a whole is presented for consideration to Treasury Board, which is responsible for the administration of all federal government department and agency spending programs. The various parts of Divisional budgets are included but are not necessarily separately identified. The NRC executive determine the distribution of operating funds to the Divisions, the budget for salaries being handled by the executive for the Council as a whole. The Divisions receive "target" figures for staff numbers and operating budgets, which are later con-

firmed or amended if necessary once final budget approval is received from Parliament.

Several important aspects of DBR's work are determined by NRC policies and practices. The Division's program and disposition of staff and operating funds are a prime responsibility of the Director of the Division, who responds to national needs as far as he can with the resources available, basing his decisions on the advice of his colleagues. He is influenced by many and varied considerations arising out of an awareness of research activities at home and abroad, the needs of public and private agencies as reflected in inquiries, requests and contacts of all kinds, work on behalf of codes and standards, and the advisory service to many agencies, to private industry, and to the design professions. He receives advice and over-all guidance from the Building Research Advisory Board of 14 appointed members which also reports annually to Council.

Science policy and coordination of research and research funding have been under extensive and prolonged discussion in Canada for the past five years. The relatively large proportion of Canadian government research carried out in-house, as pointed out by the OECD and others, has become a matter for widespread criticism, and it is now government policy to adopt measures known as "make or buy" intended to promote the use of research capabilities outside of government on a "buy" basis for as large a proportion of government-sponsored research as is appropriate. This is, however, a very recent development.

The Division has traditionally, and for a variety of reasons, expended almost all of its budget on its in-house activities. There has not been, in principle, any reason why Divisional budget funds should not have been used to "buy" research and services from others. A number of factors have, however, discouraged this practice. In the early years of the Division there was, with some notable exceptions, little by way of building research interest or capability in universities or the private sector. Although Divisional efforts and funds were directed primarily toward the development of a national institute providing a multidisciplinary team capable of fulfilling a broad research, advisory, and information role, attempts were made to encourage an interest in building science activity at universities through the diversion of limited operating funds for the support of small projects. The growth of the very extensive university grants system administered by the National Research Council, which in the last decade has had budgets provided by a separate Parliamentary vote in excess of the total budgets of the NRC Laboratories, along with other schemes to support in-

dustry research, made it increasingly difficult to justify the diversion of Divisional funds to projects which could not qualify in competition with others for support under these schemes. Consequently, only a few subject areas which were considered to be worth-while, but which were not covered by established schemes, were supported by modest "contracts." Other pressures to direct budgets to in-house activities came from the increasing demands made upon the Division which, for many years, have greatly exceeded the capacity which could be maintained with the resources made available.

The position of DBR as one of several Divisions sharing in the NRC block vote from Parliament, and subject to general government financial administrative procedures has inevitably had an important influence on the choice of research activities. Since the budget provided is intended to cover all expenditures, the Division is in a position to select projects which, in its judgement, will make the greatest contribution to the country as a whole, and is not under any compulsion for budget reasons to choose projects which, although not of the highest priority, would provide necessary earned income.

This position has some limitations in another direction, however, since, in accord with general government practice, all income other than budgetary appropriations must be placed in a consolidated fund which is then available to the government for reallocation.

The basic position thus created is that the Divisional budget defines a limiting block of resources. Anything the Division undertakes must be supported out of this block. Even when income is involved, there is, in the first instance, no way in which the costs to the Division can be met out of the income produced. In particular, the income cannot be used to increase Divisional staff beyond the established control figures, although it can be used in certain situations to pay for the services of consultants, or to contract work to other agencies. In the case of activities undertaken for others, there is the possibility of recovering unusual costs over and above those associated with the normal Divisional contribution to the project. The net Divisional contribution must always be met out of the resources allocated to the Division.

Under these conditions the main advantage of carrying on work which is to be repaid partly or largely by others lies in the possibility that the Divisional Contribution will result in an increased total effort. Because of this, it may be justified to divert resources from other projects which normally might be considered of higher priority. There is thus a possibility of

pooling resources, such as a critical core expertise, for the planning and direction of a project from the Division and funds needed for costly expendable equipment, travel, and field work which may be available from one or more co-sponsors.

The results of any work funded from the Division's allocated resources are usually made freely available for public use. This is not always to the liking of the sponsoring agency in government or in industry which is sharing in the cost of the project and may want results withheld, particularly if they are unfavourable, or they may want to ensure exclusive use for at least a limited period. The effect of such restriction on the over-all benefit to the country must be weighed at the time of evaluating the project.

As a consequence mainly of these various considerations arising from the way in which the Division's resources are allocated, a number of practices have been established. Although, in principle, the Division is free to do work for individual firms or agencies and to be paid for by them, few projects of this kind have ever been undertaken. With so much urgent work waiting to be done, only high priority proposals can be entertained; usually the criterion is their value to a wide community of interest. In this case, they can properly be supported out of the Divisional budget. The practice of charging, therefore, has been used largely as a means of counteracting strong pressures to accept projects of limited interest and of ensuring that, in cases where such projects are undertaken, costs are borne equitably. On the other hand, much work has been done for industry without charge when the results contributed to a Divisional project of more general interest and the client was willing to have the results used in this way. Testing in accord with standard test methods has been undertaken on a commercial basis when the Division has the equipment and expertise and they are not available on a commercial basis elsewhere in the country.

Over the years, the Division has developed strong information and advisory roles as well as a research one, believing that these are proper responsibilities for national research institutes serving the construction industry. Thus the work of the Division can no longer be defined in terms of research projects alone, although these do account for about 65 per cent of the effort. When these activities involve escalating costs and staff commitments, their maintenance becomes an increasing burden on the Divisional resources as, for example, with a successful publication series in which recoveries from their sale are not returned to the Division. Indeed, the inability of the Division to control these in-

creased demands upon resources attendant upon success poses some difficult management decisions. Unless special relief can be provided, it becomes necessary eventually to consider curtailing a successful service even though it may be revenue producing.

There can also be difficulties, particularly in years of rigid limitations on resource allocations in promoting increased financial support in aid of new and continued research needs. Although there is opportunity provided for making such proposals, they are screened by senior management and, to the extent that they are found acceptable, are put forward to higher authority as part of a broader presentation of behalf of the agency as a whole. Regardless of the merits of otherwise of the system, the recent situation has been that DBR, among others, had had to make its program choices within essentially fixed budgets.

The difficulties and degree of constraint implicit in the DBR position are in direct proportion to the rigidity of the budget situation. Under conditions of a young and growing organization, with an increasing budget and staff, no great difficulties may be encountered. In a more mature situation with substantial and ever-increasing commitments, a growing demand for service and a relatively constant annual budget and establishment, the inability to grow to meet the new opportunities which are the mark of success, promotes consideration of other forms of sponsorship.

The Division is well aware of the basic uncertainties in other forms of sponsorship involving earned income, in which variations of income lead to equal variations in expenditures unless some carryover or reserve mechanism or other means of matching income and expenditure are provided. The usual public service tenure conditions are not well suited to a variable income situation. The high proportion of costs represented by salaries, usually 70 per cent or more, makes it necessary to have the possibility of short-term appointments, or alternatively very substantial reserves, or both. Neither of these possibilities exist in government service as a rule and the only obvious alternative is the possibility of obtaining a supplementary budget at times when serious reductions in earned income occur, an approach which works well when governments are sympathetic to it.

When an agency is put in the position of having to earn income, it is unavoidably predisposed to doing the kind of work, and thus of developing the kinds of expertise, that will pay off. It cannot be expected to provide comprehensive services which are unproductive of income, while at the same time being compelled to pay its own way, although in research funding as in

commerce, there is always the possibility, in principle, of making enough on some projects to be able to support others. The Provincial research councils in Canada have been provided with varying degrees of budget support from their respective governments. The requirement to earn income means that each council must develop particular kinds of expertise which can then be exploited on a research contract basis throughout the province and occasionally beyond.

There need be no doubt of the general influence of source and method of procuring income upon the criteria for the research to be undertaken. If direct support of private industry interests is what is wanted, there may be good reason to require an agency to earn its income from industry. Equally, if the intention is that the agency should demonstrate its relevance and usefulness to government deeds, it may well be appropriate that the agency find some or all of its income as a contractor to other departments and agencies. When the kind of research that is wanted is potentially useful in support of several different sectors and kinds of roles, it may well be entirely equitable to finance the research wholly out of the public treasury. In this event, the research can well be directed toward matters of importance that might not be done if left to be supported by particular interests.

A financial assessment levied against industry or segments of it is another way of distributing cost but it is questionable whether it resolves any of the basic difficulties. Levies on production or construction volume do have the feature of providing increasing sums as growth takes place.

If one accepts the proposition that those who benefit should pay, and recognizing that the source of the support is likely to influence the kind of work

which is undertaken, it might be argued that building research institutes should receive their income from several sources. These could include: direct government contributions to meet the general service aspects as well as the multiple interest contribution; negotiated retainers from government and similar agencies receiving continuing advisory and information services plus contract research with income added to the research institute budget to cover major projects; and contract research with agencies other than government, the income in all cases being retained. There should then be some form of reserve fund, as already outlined, to provide for income and expenditure balance. At the very least, the revenue from services should be available as a source of funds to meet the costs of providing such services in order to promote those that are self-supporting.

A variety of arrangements for transferring resources to a national research institute from operating agencies of government (as well as from private industry) and for their deployment in providing the desired scientific services can be envisaged. All require, however, an acceptance of the philosophy that the operating agencies should look to the national institute for appropriate scientific support and should have funds in their budgets to pay for these services. A commitment and ability to respond effectively on the part of the institute is a further requirement. Any tendency for inappropriate growth could be avoided by strict adherence to established guidelines. In this way it should be possible to avoid unnecessary duplication, avoid competition with private firms capable of providing specialized consulting, testing and research services, or with public research agencies serving recognized specialized areas, and to restrict activities to those that are not likely to be done, or done well, by other organizations.

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