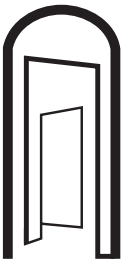

THE KILLAM TRUSTS

# 2000 KILLAM ANNUAL LECTURE

## Federal Support for Higher Education and Research in Canada: The New Paradigm

**J. Robert S. Prichard**

Prichard-Wilson Professor of Law and Public Policy
and President Emeritus, University of Toronto
and
Visiting Professor, Harvard Law School

*Published by the Trustees of the Killam Trusts*

*Izaak Walton Killam*

Born in 1885 at Yarmouth, Nova Scotia

Died in 1955 at his Quebec fishing lodge

*Dorothy Brooks Killam, née Johnston*

Born in St. Louis, Missouri in 1899

Died in 1965 at La Leopolda, her villa in France

# THE 2000 KILLAM ANNUAL LECTURE

Prof. J. Robert S. Prichard, President *Emeritus* of the University of Toronto, gave this year's Killam Annual Lecture at the St. Boniface General Hospital Research Centre in Winnipeg, Manitoba. The date was October 26, and the occasion was the Annual Conference of the Canadian Association for Graduate Studies (CAGS), attended by the Deans of Graduate Studies of all Canadian universities.

Few if any Canadians are as qualified as Rob Prichard to speak on the general theme of support for research at Canadian universities. The U of T is, after all, Canada's leading research university, and Professor Prichard has just stepped down (as of July 1, 2000) as its President after ten brilliantly successful years at its helm.

But Professor Prichard's qualifications go far beyond his mere stewardship of a great research university. As will be evident to anyone who leafs through these pages for only a few minutes, our Lecturer has immersed himself totally in the subject matter of our theme. There is no conceivable aspect of university research in Canada that Rob Prichard has failed to make his own – its history, its politics, even its place under the Canadian constitution – to say nothing of his sure grasp of its importance to Canada's intellectual and economic future.

This Lecture constitutes an elegant and sophisticated defence of what Professor Prichard calls "the new paradigm" in federal funding of Canadian universities. This phrase refers to the profound shift over the past decade – particularly in the last five years or so – in federal support from unfocused lump sum grants to the Provinces for all manner of purposes, of which higher education was but one (and not the most important at that), to closely targeted funding directly to universities and to scholars for important national purposes mostly having to do with research. These include at least five programs, from the Networks of Centres of Excellence (1989, renewed in 1994 and strengthened in 1997 and 1999); the Canadian Foundation for Innovation (1997); the Canadian Institutes for Health Research (1999); the Canadian Research Chairs Program (1999); and additional support for students through such initiatives as the expansion of the Registered Education Savings Plans (RESP's) (1997), the Millennium Scholarship Fund (1998), and increased tax exemptions for bursa-

ries and fellowships (2000). Professor Prichard argues that these new programs have at last put Canada on the road to international competitiveness in university research, replacing such worn out support regimes as Established Programs Financing (EPF) and the Canadian Health and Social Transfer (CHST), programs that had neither good policy nor good politics to ground them.

Professor Prichard does more than just present the new paradigm boldly and defend it eloquently. He takes each and every objection to the new programs and subjects them to withering intellectual analysis. In fact, so ably does Professor Prichard marshal his arguments that even those who disagree will perforce be led to the brink of concurrence!

Lest anyone think the world is now safe for Canada's research universities, however, Professor Prichard is clear that our travels down the road to international competitiveness – let alone Research Heaven (if there is such a thing) – still have a long way to go. Chief among his "six principal outstanding issues that demand urgent action" is the absence of funding for the indirect costs of federally sponsored and funded research. Increased support for graduate students, a major preoccupation of the Killam Trusts, is another.

The Killam Trustees are delighted that Professor Prichard has given to the "Killam institutions", and now through the medium of this printed version of his Lecture to the whole of Canada's university, business and governmental establishments, the benefit of his intellectually profound and extremely erudite views on our Killam Annual Lecture theme of the importance of research at Canadian universities. We know you will agree that Professor Prichard's Lecture is a "must" for all who would explore this theme.

If you would like extra copies of this or any of the five previous Lectures in this series, you can write to Christine Dickinson, Administrative Officer of the Killam Trusts, at the address on the outside back cover. You can also find the Lectures on our Killam website: http://www.dal.ca/killamtrusts

For a list of the previous lecturers and Lecture titles, see inside the back cover.

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# The Killam Trusts

The Killam Trusts were established through the generosity of one of Canada's leading business figures, Izaak Walton Killam, who died in 1955, and his wife, Dorothy Johnston Killam, who died in 1965. The gifts were made by Mrs. Killam both during her lifetime and by Will, according to a general plan conceived by the Killams during their joint lifetimes. They are held by five Canadian universities and the Canada Council for the Arts. The universities are The University of British Columbia, University of Alberta, The University of Calgary, Montreal Neurological Institute of McGill University, and Dalhousie University.

The Killam Trusts support Killam Chairs, professors' salaries, and general university purposes; but the most important part of the Killam Program is support for graduate and post-graduate work at Canadian universities through the Killam Scholarships. In each of the Killam universities and at the Canada Council, they are the most prestigious awards of their kind.

The Canada Council also presents annually the Killam Prizes in Medicine, Science and Engineering. Worth $100,000 each from 2001 forward, these are Canada's premier awards in these fields.

To date, over 4,000 Killam Scholarships have been awarded and 55 Killam Prize winners chosen. The current market value of the Killam endowments is some $400 million.

In the words of Mrs. Killam's Will:

> "My purpose in establishing the Killam Trusts is to help in the building of Canada's future by encouraging advanced study. Thereby I hope, in some measure, to increase the scientific and scholastic attainments of Canadians, to develop and expand the work of Canadian universities, and to promote sympathetic understanding between Canadians and the peoples of other countries."

John H. Matthews
W. Robert Wyman
M. Ann McCaig
George T.H. Cooper, Q.C., Managing Trustee

*Trustees of the Killam Trusts*
*November 2000*

*J. Robert S. Prichard*

# J. Robert S. Prichard

J. Robert S. Prichard is the Prichard-Wilson Professor of Law and Public Policy and President Emeritus at the University of Toronto. During the 2000-2001 academic year, he is also serving as Visiting Professor of Law at the Harvard Law School.

Professor Prichard served as the thirteenth President of the University of Toronto from 1990 to 2000. Prior to assuming the presidency, he was Dean of the Faculty of Law at the University of Toronto from 1984 to 1990. He first joined the faculty in 1976 and was subsequently promoted to associate and then full professor. He has also taught at the Yale (1982-83) and Harvard (1983-84, 2000-01) Law Schools.

Professor Prichard was born in the United Kingdom in 1949 and is a graduate of Upper Canada College in Toronto. He studied honours economics at Swarthmore College from 1967 to 1970, and attended the Graduate School of Business at the University of Chicago from which he graduated with an MBA in 1971. In 1975, he received his LL.B. with honours from the University of Toronto and was the gold medalist in his final year. He earned a LL.M. in 1976 at the Yale Law School where he held the Viscount Bennett Fellowship. He has received honorary degrees from Université de Montréal, the Law Society of Upper Canada, McGill University, McMaster University and the State University of New York and is an Honorary Professor of Law at the University of the West Indies. He was appointed an Officer of the Order of Canada in 1994 and received the Order of Ontario in 2000.

Professor Prichard's scholarship has focused on the intersection of law and economics and he has written more than forty books and articles on topics that include economic regulation, corporations, labour law, torts, medical malpractice, federalism and higher education. Along with his appointment in the Faculty of Law, Professor Prichard also holds appointments at the University of Toronto as a Professor of Higher Education at OISE/

UT and as an Associate at the Centre for Industrial Relations. He is a Fellow of Trinity and Massey Colleges.

While President, Professor Prichard served at various times as Chairman of the Council of Ontario Universities, a member of the Board of Directors of the Association of Universities and Colleges of Canada, a member of the Executive Committee of the Association of American Universities and a member of the Administrative Board of the International Association of Universities.

Professor Prichard is a director of the Ontario Innovation Trust, a $750 million fund which supports research and innovation, and Historica, a foundation dedicated to the advancement of Canadian history. He also serves as a member of the External Advisory Board of the World Bank Institute and as a director of various corporations including the Bank of Montreal, Four Seasons Hotels and Onex Corporation. He has previously served as a member of the Task Force on the Greater Toronto Area (The Golden Report) and the Ontario Law Reform Commission. From 1988-91 he chaired the Federal/Provincial/Territorial Review of Liability and Compensation Issues in Health Care.

Professor Prichard is married to Ann Elizabeth Wilson, a lawyer and graduate of Victoria College and the Faculty of Law at the University of Toronto. They have three children, Wilson, Kenneth and John.

# The 2000 Killam Lecture

# Federal Support for Higher Education and Research in Canada: The New Paradigm

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# The 2000 Killam Lecture

# Federal Support for Higher Education and Research in Canada: The New Paradigm

**J. Robert S. Prichard**

## A. Introduction

I am grateful for the Trustees' invitation to deliver the Killam Annual Lecture. The Killam name has stood for almost half a century as synonymous with both the highest aspirations of the Canadian academic community and the most remarkable acts of Canadian philanthropy. Killam Prizes, fellowships and scholarships have recognized and supported the work of outstanding scholars and graduate students from coast to coast. The legacy of Izaak and Dorothy Killam continues to command a prominent place in the pantheon of Canadian philanthropy. I am honoured by the association. And that the five previous lecturers[1] have been individuals of such distinction makes this a high honour indeed.

I also want to thank the Killam Trustees for their steadfast commitment to advancing the cause of scholarly research. Their unwavering commitment to research and scholarship at the highest levels has made a powerful difference for which all members of the Canadian academic community are very grateful.

## B. Theme, Structure and Purpose of the Lecture

I have titled my Killam Lecture: "Federal Support for Higher Education and Research in Canada: The New Paradigm." Over the past five years, we have witnessed major policy changes which have substantially transformed the federal role and which have significant implications for Canadian higher education and research. While the process of change is not yet complete, the new directions are now clear; and it is timely to describe and assess the new paradigm that has emerged.

My central thesis is that the significant changes are very much for the better. I judge the emerging new policy framework to be a major national success story worthy of study, not only for what it teaches us about research and universities, but also for what it tells us about the positive possibilities of Canadian federalism itself. However, not all observers share this positive assessment, and I will address directly the principal criticisms that have emerged.

Constructive as the new paradigm is, the policy work is far from complete. In the latter part of the Lecture, I will outline the highest priority issues for the federal policy agenda for research and higher education.

The Lecture begins with a brief history of federal and provincial support for higher education and research in order to place the changes of the past few years in context. I will then describe the principal forces that made the case for change compelling before documenting the major federal policy changes that have occurred. The basis for my positive assessment of the new policy paradigm will be followed by a catalogue and assessment of the principal criticisms which have been raised. Finally, I will propose six priority measures deserving urgent consideration by the federal government to complete and extend the new paradigm. My concluding comments will be about the future prospects for both federal support of higher education and research and Canadian federalism.

My purposes in choosing this subject are three-fold. First, the future of Canadian research and higher education should rank with the most important of our national policy preoccupations. Getting this area of policy right will make a profound difference to Canada's future. Given the virtually wholesale changes we have witnessed over the past half-decade, documentation and assessment of the changes is, itself, a worthy task.

Second, the changes of recent years are not irreversible. Critics will work to undermine or alter the new environment in the pursuit of a different future vision for Canadian higher education and research. It is incumbent on observers, like myself, who have actively worked for the changes to lay out the grounds of principle and policy which have informed the agenda of change, to answer the critics' concerns as forthrightly as possible and to establish a broader understanding of the wisdom of what has been done. If we can establish a broader consensus about the virtues of the new paradigm, the prospects for extending it will be enhanced. If the remaining

issues on the policy agenda can be understood not as isolated points on a wish-list, but rather as completing a comprehensive and coherent policy exercise, the chances for success in achieving them will be greatly improved. The logic of the paradigm can help propel further progress.

Third, higher education and research are critically important subjects of federal-provincial interaction, which can illustrate some of the broader challenges and possibilities of Canadian federalism itself. Some of the lessons gained in higher education and research may lend themselves to generalization and application to other social and economic policy fields.

Implicit in all of this is the signal importance of higher education and research. I will not dwell on this case before this audience; I assume it to be a self-evident truth. Suffice it for me to observe that our universities make an irreplaceable contribution to our nation's welfare; that our future prospects as a nation will be intimately tied to our ability to strengthen and advance our capacity for higher education and research; that the products of university-based research are essential raw materials for building both national prosperity and national identity; and that the vitality of our higher education and research will be critical to Canada's retaining a place in the first rank among nations. Many, including the five previous Killam lecturers, have written eloquently in support of these propositions. With this lecture, I want to consider how Canada can best support higher education and research and reap the abundant benefits they produce.

## C. Federal Support for Higher Education and Research: 1950-1995

At a federal-provincial first ministers' meeting in October, 1966, Prime Minister Lester Pearson stated: "Post-secondary education is a matter of provincial jurisdiction. At the same time, it's obviously a matter of profound importance to the economic and social growth of the country as a whole." This insight lies at the foundation of what has been a long and pervasive federal role in support of post-secondary education and research.

Its earliest manifestations stretch back more than a century. In the 1870s, the federal government created and funded the Royal Military College; in the 1880s, it gave a land endowment to the University of Manitoba to serve as a permanent source of revenue for the university; in 1916, it established the National Research Council; in 1918, it created an education division within the Dominion Bureau of Statistics; and in 1939, in partnership with

the provinces, the federal government first established a student aid program of loans and grants.

The modern era of federal support traces from the end of WWII. Since then federal support has taken three principal forms: support for universities, support for research and support for student financial aid.[2]

## 1. Support for Universities

Direct federal support of universities was first contemplated by the Rowell-Sirois Commission in 1940.[3] It was given clear expression with the support of Canadian troops as they returned home after WWII to attend university; and it was formally recommended by the Massey Royal Commission in 1951.[4] The Massey Commission recommended federal per capita grants based on the population of each province; and the federal government acted to implement these grants, virtually immediately. From 1951 to 1967 these grants grew steadily, but they were increasingly judged to be inadequate to meet the rapid enrollment growth associated with the baby boom. They also became increasingly embroiled in federal-provincial controversy with respect to Quebec, which objected to this direct federal involvement in provincial responsibility for education.

Following the Bladen Report[5] in 1965 and the federal-provincial conferences which followed in1966, the Federal-Provincial Fiscal Arrangements Act of 1967 established a new approach to federal funding of universities. The Act eliminated the direct federal per capita grants to universities and instead embedded federal support for post-secondary education as an integral component of the overall federal-provincial fiscal arrangements. These arrangements included both cash transfers to the provinces and the transfer of tax points to the provinces. However, the central principle was cost sharing; the federal government agreed to pay 50 per cent of the recognized operating costs of post-secondary education in each province and allowed each province to determine its own level of costs.

This arrangement prevailed for a decade and provided crucially important support for the expansion of colleges and universities across Canada. However, when the arrangements were renegotiated in 1977, the federal government abandoned the 50:50 cost sharing commitment and replaced it with an unconditional transfer to the provinces of cash and tax points to be spent at the exclusive discretion of the provinces and not necessarily

on post-secondary education. This arrangement, known as Established Programs Financing (EPF), prevailed until 1995 when it was replaced with the Canada Health and Social Transfer (CHST). The CHST is even more comprehensive and unconditional than EPF as the CHST combines both EPF and the Canada Assistance Plan (CAP) in a single block transfer for health, social services and post-secondary education.

### 2. Support for Research

The second principal source of federal support for higher education and research has been direct federal support of research.[6] The seminal moment in defining research as a federal responsibility came with the creation of the National Research Council in 1916. From the outset, NRC was both an intra-mural research institution (which in turn spawned other research-based institutions, like Atomic Energy of Canada, Ltd.) and a source of research grants for university researchers. In the decades following WWII, the federal government created the Medical Research Council (MRC), the Social Sciences and Humanities Research Council (SSHRC), the Natural Sciences and Engineering Research Council (NSERC) and the Canada Council.

Collectively these agencies came to represent a major federal commitment to research. Indeed, the councils provided the essential support for research principally through peer-reviewed research grants and graduate fellowships, without which the growth of the Canadian research and graduate enterprise would not have been possible. Furthermore, unlike the transfer arrangements and student support programs, this federal support was blessedly free of federal-provincial controversy, reflecting the widespread acknowledgment that research is a national responsibility, an acknowledgment common to most federal nations (e.g. USA, Germany, Australia). The federal support was, however, limited; it was essentially confined to the direct costs of research, leaving the substantial indirect costs of research as a provincial responsibility.

### 3. Support for Student Financial Aid

The third pillar of federal support for post-secondary education has been active support for student financial aid, principally both through the Canada Student Loans Program (CSLP) and a variety of tax preferences and incentives. The CSLP was created in 1964. The program provides

loan guarantees to eligible students to permit them to borrow from private lenders without having to provide any other security, and subsidizes the interest on the loans while the student is studying and for some time thereafter.

The CSLP permits provinces to opt-out and receive alternate payments and Quebec has done so from the beginning, preferring to operate its own student assistance program. Provinces participating in the CSLP also run their own student assistance programs, providing support over and above the CSLP provisions.

Some observers have argued for a major expansion of the federal role with respect to student assistance, proposing the introduction of a voucher system (potentially income contingent) as a full substitute for federal transfers in support of higher education.[7] Others have argued for federal withdrawal from the student assistance field, proposing that there be full devolution (with compensation) to the provincial level following the Quebec example.

## D. The Pressures for Change

This three-pillared approach to federal support for higher education and research prevailed into the 1990s but was under increasing strain. Prominent among the forces for change were: first, the increasing dysfunction of the Established Programs Financing (EPF) transfer arrangements; second, the federal fiscal crisis of the early 1990s; and third, the growing gap between Canadian research support and the support in other leading developed nations, most prominently the United States.

From 1977 to 1995, from the federal perspective, EPF became an increasingly unaffordable and unattractive program for federal support of higher education. Professor Peter Leslie has summarized the situation aptly: it was a "history of rising expenditures coupled with diminishing visibility and diminishing impact."[8] The federal government was faced with rising costs, particularly in times of high inflation; no capacity to influence provincial policy towards higher education (there was not even a federal statement of national standards equivalent to the Canada Health Act); no ability even to insist that the federal transfers be spent on higher education (as opposed to roads, schools, or other provincial priorities); no credit on campus or in the general public for the increasing transfers as provincial trea-

surers claimed these funds as *provincial* transfers by the time they reached the colleges and universities; and finally, from a political perspective, increasing blame and criticism for the inadequate financial resources available at colleges and universities even as the federal transfers continued to rise.

From the federal perspective, it was an unsustainable and unattractive program that cried out for reform. Initially the federal response was to try to limit its financial exposure; caps, limits and freezes were introduced at various times by the Mulroney government but none of these limitations went to the heart of the unstable status quo.

And the federal government was not alone in its dissatisfaction. From the perspective of the universities, the situation was highly unsatisfactory. Despite continued advocacy in Ottawa by AUCC[9] for increased transfers, the pleas were largely ineffective as the federal government saw no potential political gain. Furthermore, to the extent transfers were increased, there was no guarantee these funds would reach the universities, as they were frequently devoted to other provincial priorities. And when university leaders called on the provincial governments to increase transfers to universities, the provincial treasuries typically pointed to inadequate federal transfers when they failed to respond affirmatively. Throughout this period Canadian universities suffered a precipitous decline in real funding per capita, with a corresponding deterioration in faculty-student ratios and other dimensions of quality education[10]. Not surprisingly the university community increasingly expressed its dissatisfaction with the status quo.

All of this caused particularly acute problems for the research universities. As direct federal research support grew, it drew funds away from teaching and undergraduate education activities. The research universities faced a pernicious dilemma; in responding to federal research opportunities and competing for federal research grants, they were penalized for success as they were forced in the absence of federal support for the indirect costs of research to meet these costs from already inadequate provincial operating grants. And as they did so, they displaced funds from important teaching needs. As a result, the research universities were in the vanguard of voices calling for a major change in the federal approach. During this time, a number of the leading research universities (known as the Group of Ten (G10)) formed an informal association in part to draw attention to their specific needs.[11]

As universities became increasingly dependent on the provincial governments alone for their operating support, they also became more vulnerable. University autonomy depends in part on receiving funds from multiple sources so that no one source – public or private – has undue influence. As the federal role was increasingly subordinated to the decisions of provincial treasurers, and as provincial governments in most provinces continued to assert direct regulation over tuition levels, Canada's universities became uniquely dependent on their provincial sponsors, a dependency which in turn brought with it increasing provincial regulation and intervention.

The already unstable EPF arrangements were further destabilized by the federal fiscal crisis of the early 1990s. As the annual federal deficits and accumulated federal debt grew, a broad Canadian consensus emerged that federal fiscal equilibrium must be re-established. Not surprisingly, EPF, encompassing not just post-secondary education but health and social assistance, was seen by the federal government as a necessary component of federal reductions as it ranked among the largest federal expenditures.

A third force also added urgency to the case for reform. While Canadian university funding was deteriorating and direct support for research began to suffer cutbacks in the face of the federal fiscal crisis, the federal government in the United States was steadily, and on occasion dramatically, increasing its support for research, particularly in the health sciences. The gap in support for researchers and graduate students between Canada and the United States grew precipitously and strong concern about the "brain drain" and related phenomena took on greater political visibility and salience.

## E. The First Attempt at Reform: The Green Paper (1994)

The reform agenda began in earnest with the election of a new federal government in late 1993 and its determination to address the federal deficit. From the universities' perspective, the situation grew darker before the new way forward emerged. The federal budget in early 1995 was deeply discouraging as it brought restraint and cutbacks to all forms of federal support including the granting council budgets, which had hitherto been judged as immune to cuts.[12] This was arguably the lowest point in the fifty-year history of federal support for post-secondary education and re-

search. In due course, however, from this adversity came change, and from change came a new and more promising direction. But before the new approach began to emerge, there was a false start.

In 1994 the federal government had launched a policy review through the Department of Human Resources Development Canada (HRDC) which led to Mr. Axworthy's Green Paper titled "Improving Social Security in Canada". Released in October, 1994, for post-secondary education the Green Paper contemplated termination of the cash component of the federal transfers to provinces for universities and a major expansion of federal student aid based substantially on income contingent student loans. The idea was to shift resources from the first pillar of federal support – transfers – to the third pillar – student support. In the end, the Green Paper process was almost completely unsuccessful with respect to higher education. It did succeed, however, in uniting virtually all interested parties in opposition to its proposals.

While there were many reasons for the failure of this policy exercise, prominent explanations include the following points:

- The Green Paper entered deep into provincial jurisdiction as it addressed tuition fee policy and acknowledged that reducing transfers would put upward pressure on tuition fees, thus uniting most student groups against the proposed Green Paper reforms.

- The Green Paper linked income contingent student loans (ICL) to higher tuition instead of making the case for ICL independent of the level of tuition, thereby uniting most student groups against ICL as a stalking horse for higher tuition.

- The Green Paper was seriously incomplete. While it argued for a refocusing of the federal role in higher education, it was silent on the prospect of increased federal support for the second pillar of federal support - research. This narrow view, perhaps reflecting the limited mandate of HRDC, caused the Green Paper to be seen as a federal retreat from higher education and research, not a reaffirmation of a strong federal role.

- While less than forthright on the issue, the Green Paper in effect proposed a major reduction in the total federal financial commitment to post-secondary education and research, an unacceptable proposi-

tion to all interests within the post-secondary community and a proposition at odds with the growing uncompetitive position of Canadian universities compared to the United States.

The net effect was a false start; the Green Paper was shelved and the Minister and Department of Finance, supported by senior officials in Industry Canada, took charge of reshaping the policy approach. First, the government acted unilaterally to dramatically reduce transfers. EPF was abandoned and replaced with the Canada Health and Social Transfer (CHST), a term noticeable for its emphasis on health and social (assistance) and its silence on post-secondary education. The total resources devoted to the CHST were sharply reduced compared to the funds previously expected pursuant to EPF. While cutting transfers, the government did not act on the Green Paper's call for greater investments in student financial support. As a result, the relationship of the federal government to higher education became even more attenuated.

The federal retreat begun in 1977 with the abandonment of 50:50 cost sharing was now complete. There was no longer any meaningful ambiguity; the determination of university operating grants had become the exclusive responsibility of the provinces acting within their total financial capacity. While AUCC, CAUT[13], CFS[14] and others have continued to call for increased federal transfers for university operating grants, the calls have grown less compelling and their federal audience less attentive. And even as the CHST has more recently been restored and increased as the federal budget surplus emerged, the focus of attention and resources has been almost exclusively on health, not post-secondary education.

But while retreating on transfers, the federal government was coming to embrace a reaffirmation and expansion of its direct support for research, the one element of higher education clearly accepted as within federal jurisdiction and also clearly central to our nation's future. Led by the Department of Finance and Industry Canada, and strongly encouraged by AUCC and the major research universities, a new federal approach took shape. And between 1997 and the current time, a suite of new initiatives was launched which has dramatically enhanced the federal role and reinvigorated our national capacity for research. The changes are so substantial I call it a new paradigm.

## F. The New Paradigm

Reflecting its scope as a reform of social policy, the Green Paper of 1994 was principally concerned with training and education: access, skills, retraining and adjustment in the context of human resources and social assistance. The new federal approach had a different centre of gravity: research, innovation, ideas, productivity and growth. The concerns of the new global economy took centre stage: Canada's disappointing record of productivity growth compared to the United States, Canada's relative under-investment in research and development, the loss of highly skilled personnel to the United States, the growing importance of intellectual capital and intellectual property, and the growing pressures of the knowledge economy all demanded attention.

These concerns led to a new policy consensus: that the pre-eminent federal concern with respect to higher education should be research and innovation and that major new investments were required if Canada were to compete successfully in the global economy. And beginning with the federal budget in February, 1997, the government committed significant new resources to support this agenda.

The principal new federal initiatives are now four in number: creating the Canada Foundation for Innovation (CFI); expanding and securing the budget for the Networks of Centres of Excellence (NCEs); creating the Canadian Institutes for Health Research (CIHR); and launching the Canada Research Chairs program (CRC). In addition, a host of other related initiatives were taken: restoring the granting council budgets, Genome Canada, environmental research, women's health research, technology assistance for industry, strengthening the National Research Council, connectivity investments, space research and others.

The four major initiatives each warrant fuller description; each was innovative and powerful, and collectively they form the foundation of the new federal approach.

### 1. Canada Foundation for Innovation (CFI)

The Canada Foundation for Innovation was the first new federal initiative in support of research and innovation. Coming after some very lean years, it was dramatic in its scale. Initially funded in 1997 with $800 million, and since supplemented three times, the CFI was mandated to provide federal

support for major research infrastructure projects and research equipment and related support for new investigators. The CFI normally provides 40 per cent of the cost of a project (it can provide a maximum of 50 per cent) with the remainder being provided by the applicant institution which in turn depends on its own funds, provincial support or private support to complete the funding. Subsequent allocations of funds have raised the total commitment to $2.4 billion and the CFI appears to have been transformed from a one-time initiative to repair a deficit in research infrastructure to a permanent feature of federal support for research.

The CFI distributes its funds principally on the basis of research excellence as judged by peer review. The process is competitive and based on the same principles used by the granting councils. All universities which receive federal granting council support are eligible for CFI grants.

**2. Networks of Centres of Excellence (NCE)**

The Networks of Centres of Excellence (NCEs) were launched in 1989 following the success of the Ontario Centres of Excellence (OCEs) program and the research network approach of the Canadian Institute for Advanced Research (CIAR). The NCEs are a response to the particular challenges of our large geography and our relatively small population of researchers. The NCEs join researchers from different institutions, both large and small, in defined areas of research chosen on the basis of both research excellence and the importance and promise of the field including the possibility of partnerships and potential commercialization of the results of the research.

As a result of the NCEs, OCEs and CIAR, Canada has become a world leader in the development of research networks. The NCE program has given additional shape and meaning to our *national* research effort, drawing together widely distributed pockets of research excellence in common cause. Initially, the NCE program was granted only temporary five-year funding which was renewed in 1994. However, in the 1997 federal budget, the NCE program was placed among the government's base appropriations and became a permanent part of the federal research landscape. And in the 1999 federal budget the base appropriation for the NCE program was greatly increased, thus permitting an important expansion of the program.

### 3. Canadian Institutes for Health Research (CIHR)

From its founding in 1960, the Medical Research Council (MRC) developed an enviable record for research excellence. However, with the extraordinary increases in funding for the US National Institutes of Health in the 1990s, the MRC saw the rapid erosion of the competitive position of the Canadian medical researchers. Faced with the prospect of relatively stagnant levels of federal support for the granting councils, the MRC, under the brilliant and inspirational leadership of one of Winnipeg's most distinguished sons, Dr. Henry Friesen, embarked on a reinvention of the MRC in a form that would help reclaim our place in the first rank of nations committed to health research.

The initiative which became the Canadian Institutes for Health Research was built on three converging themes: first, the redefinition of the field as health, not medical, research, reflecting the insights of the fields of population health and health services research and acknowledging the potential contributions of many disciplines and professions to the advancement of health; second, the clear opportunity for the federal government to make a unique contribution within its jurisdictional competence to strengthening the Canadian health care system by providing a more robust foundation of health research which could inform all aspects of health and health care; and third, the critical need to narrow the gap in research support between Canada and the United States in health research to slow the exodus of outstanding scientists and to allow Canada to continue to recruit highly able scientists. The CIHR was given a funding commitment in 1999 which would, in effect, double the budget of the MRC to almost $500 million. Furthermore, the Minister of Health publicly stated the goal of doubling the budget again to $1 billion at the earliest possible opportunity following the successful launch of the CIHR.

### 4. Canada Research Chairs Program (CRC)

In the late fall of 1999, the Prime Minister announced the federal government's intention to create the Canada Research Chairs program. In the 2000 Federal Budget the CRC program was launched with the funding of 2000 research chairs (rolled out over five years) with a base annual cost of $300 million in the steady state. This was, in effect, a 33 per cent increase in the granting council budgets. The chairs, devoted in equal number to senior and junior appointments, provide for the salaries and

research support of outstanding scholars and scientists. The objectives are both to retain in Canada our most able researchers and to recruit to Canada, or back to Canada, researchers of great promise and accomplishment.

All universities which receive federal granting council support are eligible to receive chairs. Most of the chairs are allocated among universities on the basis of the relative success of each university in attracting funds in the peer-reviewed competitions for granting council funds. A small portion (6 per cent) of the chairs is reserved for small institutions on a preferential basis. The chairs are distributed among fields in approximate proportion to the total funds awarded by each of the three councils: NSERC 45 per cent, CIHR 35 per cent and SSHRC 20 per cent[15]. Appointment to the chairs requires both nomination by the host university and peer reviewed approval based on high standards of research excellence.

### 5. Additional Support for Students

In addition to these dramatic initiatives to support research, the federal government also increased its commitment to student financial support. The federal government has acted to strengthen its delivery of financial benefits directly to students through changes in student aid, the provision of scholarships and the adjustment of the tax system. Between 1995 and 2000, the catalogue of initiatives has included:

- the Millennium Scholarship Fund with initial funding of $2.5 billion (1998)
- expansion of the Registered Education Saving Plans (RESPs) (1997)
- introduction of the Canada Education Savings Grants to supplement individual contributions to RESPs (1998)
- providing a tax credit for interest payments on student loans (1998)
- increased tax exemptions for bursaries and fellowships (2000)
- increased granting council support to permit an increase in graduate fellowships (1998)
- provision of debt relief for graduates experiencing extended financial difficulty (1998)

- expansion of the education tax credit for students and those supporting them (1997, 2000)
- provision of Canada Study Grants for students with dependents (1998)

In total, these initiatives constitute a major additional commitment of resources to students to help them meet the cost of higher education. While the changes have fallen short of the fundamental reform contemplated by the Green Paper's proposal for income contingent loans, they have strengthened the overall federal presence in the field of student aid and made a meaningful difference to students. At the same time, however, it must be recognized that the cost of being a student has risen sharply in some provinces and the burden on students remains substantial. It must also be acknowledged that the centerpiece of these initiatives – the Canada Millennium Scholarships initiative – was resisted in Quebec on federal-provincial grounds and has generally had a more modest impact than was once hoped[16].

## G. The Provincial Reaction

The shift in federal emphasis from support for transfers to support for direct federal initiatives to support research and students has been accompanied by a shift in provincial policies and approaches to higher education and research as well. Without attempting to detail all that has happened or make an unduly strong claim of cause and effect, the following provincial pattern can be seen:

- On the issue of transfers, health, not post-secondary education, has been the dominant theme of federal-provincial political discourse. While not abandoning claims for higher cash transfers for post-secondary education, the provinces have devoted little political capital to obtaining them. In contrast, demands to increase the CHST to strengthen provincial capacity and expenditures in health have dominated federal-provincial negotiations.
- Individual provincial governments have been very active in developing policy approaches for post-secondary education; funding policies, enrollment growth, tuition fees, system rationalization, private universities and distance education have each been the subject of extensive consideration.

- More recently, various provinces (e.g. Alberta, Quebec) have committed significant new resources to higher education after some very lean years. These increases appear to be largely independent of changes in the level of the CHST although in some provinces (e.g. British Columbia) there appears to be at least a tenuous connection.

- A considerable diversity of policy approaches has emerged at the provincial level. For example, Quebec and British Columbia have adopted policies of low and/or frozen tuition fees while other provinces, most prominently Ontario, have permitted significant tuition fee increases.

- With respect to research, numerous provinces have elaborated significant policies and programs to support university-based research.[17] In total, the initiatives are substantial and diverse. In each case, the initiatives reflect the particular needs and traditions of the province and they frequently reflect the particular economic strengths and strategies of that province.

- Ontario is a good example. Over the past four years, despite harsh cutbacks in basic university operating grants in 1995, the provincial government has launched a suite of new programs: the Ontario Research and Development Challenge Fund (ORDCF), the Premier's Research Excellence Awards (PREA), the Ontario Innovation Trust (OIT), the Research Performance Fund (RPF) and the Ontario Science and Technology Graduate Scholarships (OSTGS). Some of these programs directly complement federal initiatives (e.g. the OIT provides matching grants for successful CFI applications), while others are distinctively provincial in orientation (e.g. the RPF is strictly limited to reimbursement of the indirect costs of *provincially* funded research).

These provincial initiatives with respect to post-secondary education and research have been a clear exercise of primary provincial jurisdiction in this area and the resulting diversity is consistent with provincial responsibility and the innovation and experimentation it invites. There are genuinely different possible strategies for supporting post-secondary education and the provinces are exploring them. With respect to research, the provincial record makes clear that despite federal leadership in the field reflecting national priorities, there is still important room for provincial

action aimed at advancing provincial priorities through research and innovation. Indeed, the increased federal support appears to have increased provincial engagement, not diminished it.

## H. Assessment and Criticisms of the New Paradigm

### 1. Assessment

The policy changes I have described represent a major shift in approach for federal support of higher education and research: the end of the era of the Federal-Provincial Fiscal Arrangement Act and EPF; the emergence of the CHST; major new federal initiatives to support research including the CFI, CRCs and CIHR; and significant new direct and indirect contributions to helping students meet the costs of higher education. The centre of gravity of the federal role has shifted from its historic focus on federal-provincial transfers to the assertion of a federal leadership role focused on research, innovation, ideas and student support.

While neither the shift nor the new paradigm are complete, the direction is clear. The federal role in research support has been expanded while the primary provincial responsibility for post-secondary education has been clarified and exercised. With respect to student financial aid, the federal government has remained actively involved in the field but, with the exception of the Millennium Scholarship Program, its emphasis has been on tax measures - RESPs, CESG, tax credits, etc. - while primary responsibility for student financial aid remains in the hands of the provinces. Furthermore, all the evidence suggests this new paradigm will become more, not less, pronounced. The current federal government appears committed to further investments in research and innovation and has shown little interest in returning to the prospect of increasing post-secondary transfers.

The normative challenge is to assess this new paradigm. Does it hold more promise than the previous approach? Is it more likely to achieve our goals? Does it better respond to the dual realities cited by Prime Minister Pearson, that post-secondary education is a matter of provincial jurisdiction but also a matter of profound importance to the economic and social status of the nation as a whole?

My answer to each of these questions is clearly in the affirmative. The essence of my reasoning is as follows:

- The old EPF arrangements were unsustainable. They represented neither good politics nor good policy. Politically, the federal government received virtually no credit for its financial contributions to post-secondary education and a good deal of blame for the inadequacy of funding received by the universities through the filter of provincial treasuries. As funding per student deteriorated for twenty years, the federal government had essentially no influence but was seen as complicit in the results. From a policy perspective, the growing divorce of financial obligation and policy influence, whereby the federal government was faced with growing financial liabilities and decreasing policy influence, was a failure of accountability and breached reasonable standards of public administration. A reassessment was both inevitable and desirable.

- The federal focus on research and innovation makes good constitutional, policy and political sense. There is no doubt that this is a legitimate role for the federal government; for over a century of federal-provincial relations, it has been widely accepted as an appropriate federal area of intervention and has been remarkably free of constitutional controversy (although Quebec has found some cause for concern in the CFI and CRCs). It also builds on a strong record of achievement as Canada's granting councils are widely admired internationally for their independence, peer review, administrative effectiveness and commitment to quality. Politically, research is a field which permits the federal government a direct role extending into all parts of the nation for which it can claim credit and seek support.

- The very nature of research, the breadth of its benefits, and its importance to growth, productivity and innovation all support assigning primary responsibility for financial support to the national government. Indeed, in the knowledge-based global economy, investments in research and innovation should rank at the very top of a national government's efforts to create international competitive advantage. They represent one of only a very few efficient and effective instruments of economic (as opposed to social and cultural) intervention. Furthermore, the benefits of research, wherever it is

done in Canada, accrue substantially to the national and not just local advantage.

- A strong, vibrant and properly funded national research enterprise is an indispensable element of a strong and vibrant university system for Canada. Universities are defined by their commitment to integrating teaching and research in a single enterprise, with every faculty member committed to a life of both scholarship and teaching. By focusing on research support, the federal government can thereby immeasurably strengthen post-secondary education while respecting the ultimate provincial jurisdiction. It can provide more vital and competitive research capacity, which will in turn make possible better post-secondary education opportunities.

- Federal withdrawal from any pretence of controlling or determining the level of base operating funding received by universities makes sense given the constitutional assignment of responsibility to the provinces. Virtually from the beginning of direct federal support for universities following the Massey Commission recommendation, the arrangements have been plagued with federal-provincial difficulties. Led by (but not limited to) Quebec, there has been a persistent unwillingness to cede control over universities and their funding to Ottawa. Following the abandonment in 1977 of the shared cost principles embedded in the Federal-Provincial Fiscal Arrangements Act, the provincial perspective has increasingly prevailed. The dismal record of federal inaction and provincial jurisdictional jealousy gave us twenty years of declining support for universities. Shared responsibility in practice came to mean inadequate responsibility and commitment.

- Overlapping jurisdiction for university funding was counterproductive, as it undermined accountability and reduced transparency. For more than twenty years, provincial operating funding per student has deteriorated with neither level of government assuming responsibility for the problem nor being held accountable for it. Federal withdrawal has increased provincial accountability, helped to focus political pressure at the provincial level and led to creative provincial experimentation and innovation in the post-secondary field. While all provinces embrace the importance of post-secondary education to their future, there are very considerable differences of policy among

provinces with regard to how best to structure, fund and regulate the post-secondary systems in each province. This is both understandable and desirable. It is the essence of federalism to encourage, not suppress, innovation and experimentation, and in the post-secondary field we are seeing this process at work.[18] It will almost certainly produce a richer array of outcomes than the earlier approach. While some of these outcomes may well be disappointing to some critics, the totality of outcomes is certain to enrich the opportunities for students.

- The separation of federal and provincial funding roles will increase university autonomy by making them less dependent on a single level of government. This is particularly true for research universities. The separation of roles allows research universities to diversify their support, reducing the risk of improper political influence or intervention that is inherent in dependence on a single source of support, no matter how benign it might appear to be. It is essential that universities remain free of undue external influence regardless of source. As universities are seen as more central to the nation's future, the risk of improper intervention grows correspondingly.

- The shift in emphasis from transfer grants to research support entails a shift in emphasis from entitlements to an emphasis on performance, quality and competition among both researchers and institutions. While transfers are typically governed by enrollment or population, research support is governed by competition, peer review and quality. Furthermore, new federal initiatives like the Canada Research Chairs program and the proposed support of indirect costs will reinforce this emphasis on excellence and performance as their allocative algorithms track institutional performance in national competitions. This emphasis on competition and performance is highly desirable; it forces universities to be strategic and focused and to attend to issues of faculty performance. A failure to address inadequate performance has significant financial repercussions for institutions. The competitive environment forces scholars to strive for excellence and to earn and re-earn their support while giving them the confidence that their performance will be judged by their peers and their success will depend on their performance. We have seen the power of this paradigm in other nations and have experienced it ourselves on a lesser scale. The added emphasis inherent in the new federal approach is a welcome development.

- The new paradigm has also harnessed the positive forces of competitive federalism as the provinces have been drawn into a competitive struggle for shares of federal expenditures on research, thus complementing the positive forces of competition among researchers and institutions. As a province's share of federal funds now depends substantially on the success of the province's researchers and institutions, various provinces have developed strategic policies and expenditure programs to increase their shares. For example, some provinces have developed matching arrangements for their universities to increase their success rate in CFI competitions. Others are directly increasing their support for research with provincial research councils, direct provincial research support programs, R&D tax credits and provincial R&D policies. Furthermore, there is a growing realization that adequate base operating support is also an essential element of research competitiveness. While the particulars vary from province to province, the overall effect is clear: greater total expenditures on university-based research, more creative policy innovation, and greater emphasis on performance-based funding arrangements, all ingredients of stronger national performance and international competitiveness and of stronger universities and research.

- Finally, with respect to student financial support, the continuing federal presence has been constructive and positive. The cumulative impact of the various federal initiatives over the past five years has mitigated the burden of rising costs for students and their families while keeping the federal government out of areas of clear provincial jurisdiction like tuition fee regulation. The federal presence has not and should not undermine the primary provincial accountability for access and the intersection of tuition fees and other costs with student financial aid policies. However, the federal role should reflect a continuing concern for opportunity, access and mobility while leaving considerable space for provincial diversity. The numerous tax preferences have done exactly this. And the federal-provincial wrangling that accompanied the launch of the Millennium Scholarship Program appears to have been resolved satisfactorily in most provinces (Ontario being a large and regrettable exception) and there is clearly room for further additional investments in this area. Devoting more funds to students through grants, scholarships, loans, debt relief and tax preferences is an investment in opportunity that will

always be rewarded. Few federal commitments can do as much to create opportunity for all Canadians.

In summary, I judge that the new paradigm for federal support of higher education and research dominates the old from a normative perspective. This is not to ignore the substantial unfinished agenda of change or the need for increased investment, which I address in the next section. Nor is it to be insensitive to the extremely difficult financial transition that all universities have experienced and the continuing underfunding of provincial operating grants. But it is to argue that we have arrived at a more sustainable, more vital and more productive allocation of federal and provincial responsibilities which holds greater promise than the previous arrangements and which is more likely to advance Canadian national interests with respect to research and higher education.

## 2. The Principal Criticisms

Others, however, have come to considerably less positive judgments about the new paradigm as it has taken shape, objecting to both the directions chosen and the consequences of these choices. While the critics' concerns are numerous, the principal ones are as follows: *first,* that the new approach will cause a separation of teaching and research, thereby threatening to strip some institutions of their essential character as universities;[19] *second*, that the approach will lead to both greater differentiation among Canada's universities based on their differential success in attracting federal research funds[20] and an unwelcome increasing concentration of resources in the research-intensive universities; *third*, that universities in certain regions of the country (e.g. the Atlantic provinces) will be disadvantaged in the national competitions by the failure or inability of their provincial governments to respond effectively to the dictates of competitive federalism[21]; *fourth*, that the competition among institutions induced by the new competitive and performance-based paradigm will be destructive, not constructive, as it threatens to undermine the efforts of less strong institutions to build their research capacity[22]; *fifth*, that the new federal approach invites inappropriate private sector influence in university research through partnerships, commercialization and matching requirements in programs like the NCEs and CFI[23]; and finally, *sixth*, that whatever the merits of this approach for research in health, science and engineering, it is ill-suited to the needs of the humanities and social sciences[24].

Let us consider each of the criticisms in turn.

*(i) Separating Teaching and Research*

This is the most common and provocative criticism. If it were true, it would be genuine cause for concern. But the criticism is without merit or foundation. Nothing in the federal approach suggests that any university, or indeed any individual faculty member, should abandon a commitment to research. All Canadian universities accept that the integration of teaching and research is central to their missions and must remain so. And every faculty member must accept and welcome this obligation. But the basic operating funds provided to universities pursuant to provincial funding formulas provide the core resources necessary to support this activity. The teaching loads at all universities are lighter than those at schools and colleges for exactly this reason: to provide the necessary time for faculty members not only to teach but to be active in research. The fact that there are important differences both within and among institutions in the extent to which this privilege is exercised and this obligation is discharged is a comment about performance, not principle, and about inadequate university management, not inappropriate federal policy.

The provision of supplementary research funds through peer reviewed, performance-based competitions enhances the opportunities for research through additional support, equipment, materials, research associates and other ingredients. But lack of success in these competitions is no excuse for abandoning a core commitment to research and scholarship by every faculty member at every university in the nation. To fail to meet this commitment is to dishonour the essence of our calling. Rather the new paradigm should be an invitation to improve performance at the individual level and to focus strategically at the institutional level to build on the distinctive strengths and mission of each university.

It is sometimes argued that certain universities face different costs which should be recognized in the allocative process. For example, smaller institutions may not gain the same economies of scale and scope available to larger universities, and universities maintaining research resources like a major regional or national research library used by researchers from numerous institutions may claim special financial recognition. However, these particular needs can and must be met within the competitive paradigm. No matter how vigorous, organized or regionally concentrated the

special claims may be, they are no reason to retreat from the commitment to allocation based on demonstrated performance and excellence. And in insisting on this paradigm there is certainly no evidence of a malevolent federal intent to strip any university of its essential character as an institution which integrates teaching and research[25].

*(ii) Greater Differentiation*

The claim that the new paradigm will increase differentiation is true. But this is a strength, not a criticism, of the new approach.

In the age of mass higher education, substantial differentiation is an essential characteristic of any successful national university system. Students' needs are best met by a wide spectrum of choices of types of post-secondary institutions reflecting different missions and approaches. And that spectrum must include one or more research universities competitive with the leading research universities in the world. Furthermore no nation, no matter how wealthy, can afford to build and support all of its universities in the image of the internationally competitive research university. To attempt to do so would be to guarantee the mediocrity of all and deprive the nation of the remarkable and diverse benefits of the research university, the undergraduate liberal arts college, the polytechnic university, the university-college, the open university and all other types of university-level institutions which have unique strengths embedded in their particular institutional characteristics. Diversity and differentiation increase choice and opportunity.

For too long Canada, in the name of equal opportunity, has had policies unduly favouring homogeneity, not differentiation, with the perverse result of limiting, not expanding student opportunity. That the new federal paradigm will hasten the arrival of greater opportunity through more rapid differentiation is cause for celebration, not concern. And that the new paradigm will allow some universities to emerge as research universities competitive with the best in the world will be evidence not of failure, but of the virtues of the new federal approach.

A variation of this criticism is that allocating research resources based on performance in peer-reviewed federal competitions will lead to an undue concentration of resources in the major research universities. For example, the initial distribution of Canada Research Chairs allocates a significant fraction of the chairs to the leading research universities. Again, however,

the concern is misguided. At present, Canada suffers from an undue diffusion, not concentration, of research resources and the related graduate programs. As Professor Peter Leslie observed in his landmark study for the AUCC, twenty years ago: "If financial resources are modest, as they are in Canada, dispersion of these resources is especially wasteful."[26] Relative to jurisdictions such as the USA and the UK, Canada has a far greater diffusion of research and graduate studies and this diffusion has undermined our ability to build and sustain research universities competitive with the best in the world. To the extent the new federal approach will mitigate this national disadvantage we should celebrate the possibility, not decry it, confident that the benefits will accrue to all Canadians.

In rejecting criticism of the new federal paradigm on the grounds that it will contribute to differentiation I am *not* advocating research intensity as the only relevant dimension of differentiation. The opposite is true. Provincial post-secondary education policy should provide incentives to differentiate along multiple dimensions and differentiation grants should recognize and endorse differences in mission, strategy and pedagogy. But these considerations fall squarely within provincial post-secondary policy, not federal research policy, and they offer no principled rationale for distorting a national research policy based on research excellence alone.

*(iii) Regional Disadvantage Arising from Provincial Inaction*

It is certainly the case that some provinces have been more active and creative than others in developing provincial policies which will help universities in securing federal research grants and thereby increase the province's share of federal research expenditures. Furthermore, the frustration that arises for university leaders in those provinces that have been slow to act is completely understandable. Where Alberta, Quebec, Saskatchewan, British Columbia and Ontario have all been active, Manitoba and Nova Scotia have been noticeable for their inactivity. But the fault lies not in the federal approach but in the provincial priorities. And the proper remedy lies not in distorting good federal policy but rather in changing provincial priorities. It is open to each province to choose a post-secondary policy that will best meet that province's needs while taking account of many factors, including the federal research support framework, and it is incumbent on university leaders in every province to work closely with their provincial governments in devising appropriate strategies. However, the temporary failure of this effort in any particular prov-

ince is no reason to abandon or distort a principled and productive federal paradigm.

Differences in provincial approaches, policies and outcomes are inherent to federalism and a source of strength, not weakness. To decry this reality is to deny our federal character. Time and energy are better spent on the affirmative agenda of developing uniquely effective provincial policies that take the fullest possible advantage of the federal framework.

A more subtle version of this critique accepts in principle the advantages of competitive federalism but argues that in practice its advantages are negated by the substantial disparities in wealth and resources among provinces. This argument has some merit but the appropriate response lies not in abandoning or modifying the new federal approach but rather in greater attention to two related federal policy areas: fiscal equalization and regional economic development. Fiscal equalization is a far superior policy instrument for addressing disparities of economic resources than distorting federal research support, undermining peer review or detracting from a focus of excellence. Equalization addresses the heart of the issue and does so in a manner least likely to cause unintentional negative secondary consequences.

Regional economic development policy can also be used to redress regional imbalances in economic resources and create greater opportunity for less advantaged regions to compete for national resources. The recent federal announcement of a new approach to economic development in the Atlantic region based more on research, innovation and the infrastructure of the new economy is highly complementary to the national policy framework for research support. To the extent it allows universities in the Atlantic region to build capacity that in turn allows them greater success in national competition, no objection should be raised from the perspective of the new paradigm.[27] Indeed, this new approach to economic development should accelerate the realization of the full benefits of the new paradigm and I applaud the direction.

*(iv) Destructive Competition*

The desire to be immunized from the pressures of competition has a long if not noble history. It can be found in virtually all fields of human activity and universities are no exception. The rhetoric of opposing competition usually invokes some claim of destructive competition. Such is the

case for those who oppose the new federal paradigm on the grounds that the competition it induces should be dampened, regulated or eliminated instead of welcomed.

This resistance to competition and preference for regulation is ill-placed in the growing global competition for intellectual talent. We cannot insulate ourselves from the global forces of competition. Instead, we must organize ourselves to compete as effectively as possible. Arbitrary limits and regulations, adopted in the name of avoiding the alleged destructive aspects of competition (e.g. eliminating the losers in a process for which winners and losers are inherent) will do nothing but constrain our effectiveness and undermine our commitment to performance and excellence. We must remember that the relevant competition is not Canadian but global. Attempts to mitigate competition within Canada will simply weaken our capacity to prevail in the face of international competition.

The academic world widely accepts the virtues of peer-reviewed competition, knowing it is a superior form of resource allocation for research than any other we can imagine. We should welcome, not resist or frustrate, the embrace of this principle by the new federal paradigm and take comfort from the extent to which this embrace is not tempered by other less worthy considerations. Over the long run we will all be better for it.

*(v) Undue Private Sector Influence*

An important theme of the new federal support for research has been a concern to ensure that research and ideas resulting from the new support are put to commercial application whenever possible. This theme has led to a number of explicit policy implications: the criteria for selecting NCEs include "knowledge exchange and technology exploitation"; the CFI requires matching contributions and welcomes private sector matches; the ACST's Expert Panel on Commercialization made a number of interventionist (and in some cases ill-considered)[28] recommendations designed to increase the commercialization of research results; and the recently announced new support for SSHRC[29] is heavily biased toward economic concerns.

Concern and worry about the possibility of undue private sector influence in university-based research is both understandable and appropriate. It speaks to the very nature of our institutions.

In my view, it is clearly preferable not to require private sector participation. It should be left to the judgment of the researchers and their institutions as to whether or not to involve a private sector partner in a particular research endeavor. As a result, the CRC program which has no matching requirement, and the CFI which makes matching mandatory but private sector participation optional, are preferable to the NCE program for which private sector involvement is mandatory. Furthermore, where private sector involvement is present, the approach must involve strict scrutiny of the arrangements to ensure they are consistent with academic freedom and institutional autonomy.

I must hasten to add two caveats. First, there is nothing inherent in the new federal paradigm that leads to undue private sector influence. That question turns on the details of the particular policy initiatives, not the paradigm itself. Second, while I am wary of undue or mandated private sector influence, that concern should not disguise nor detract from the tremendous benefits of research for economic growth and productivity nor the many advantages of private sector collaboration in many areas of research. The point is simply that direct private sector involvement should not be mandated and, when the private sector is involved, the involvement must be structured to meet high standards of academic freedom, ethical integrity, and institutional autonomy.

*(vi) Social Sciences and Humanities*

It is clear that humanities and social sciences research has been far less well supported by the federal government than research in health, science and engineering. By virtually every measure, new investment in the fields covered by SSHRC and the Canada Council has grown markedly less than in the NSERC and MRC/CIHR fields. Furthermore the CRC program has been specifically structured to assign the SSHRC fields a considerably smaller share of the chairs than the share of the university faculty working in these fields. This will perpetuate the asymmetric federal expenditures and accentuate the disproportionate responsibility of the provinces (through base operating grants) for the strength of the social sciences and humanities, a not entirely comforting consequence given the propensity of some provincial governments (including Ontario) to focus on perceived immediate labour market considerations instead of our capacity to provide a rigorous liberal education.

This relative federal under-investment in the SSHRC fields is regrettable and should be corrected. Virtually all voices in the university community share this view, and share the hope that the federal government's commitment in the mini-budget of October, 2000, of new funds to SSHRC is a first small step in redressing the imbalance. But this imbalance is in no way inherent in the new federal paradigm; it simply reflects the particular political choices that have been made to date and the belief (misguided in my view) that science, engineering and health are more central to our national welfare than other fields of inquiry. This under-valuation of the SSHRC fields in research support is neither unique to Canada (for example, the same pattern occurs in the United States but arguably in even more pronounced form) nor inevitable. Within the new paradigm, it is incumbent on all of us who believe a more prominent role is warranted for the SSHRC fields to work to obtain it.

## I. The Unfinished Agenda

The embrace over the past five years of the new paradigm of federal support of higher education and research represents a very substantial overhaul and refocusing of the federal presence in the field. It constitutes a strong reaffirmation of federal responsibility and commitment and it has begun to make a powerful positive difference. The dismal prospects we faced only five years ago have been replaced by new resources, energy, optimism and possibilities. We can now see a better future and make plans to realize it.

The task, however, is not yet done; the work of change is not yet complete. To be a full success, a number of additional steps need to be taken to complete construction of the new federal paradigm. Without them our success will be severely limited.

There are six principal issues outstanding that demand urgent action. I will address them in order of priority, the most important first.

### 1. Indirect Costs of Research

The most critical gap in the new federal paradigm is the absence of funding for the indirect costs of federally sponsored and funded research. Without indirect cost support, the new federal approach will not succeed; with indirect cost support, the basic architecture of the paradigm will be

complete. Without indirect cost support, the refocusing of the federal role will be neither coherent nor fully effective. With full indirect cost support, the intellectual and policy foundations of the new paradigm will be squarely in place and its full promise can be realized.

The case for federal provision of the indirect costs of research was made persuasively and comprehensively over thirty years ago in the Macdonald Report.[30] Since then, the case has been advanced repeatedly and the need has grown more acute.

In the United States full indirect cost support has been a crucially important instrument in building and advancing the extraordinarily strong university-based research enterprise. Without it, US research universities would have been plagued by the same perverse incentive we face in Canada: institutional success in research competitions would have been penalized in the form of additional uncompensated costs; students would have been hurt by the displacement of resources from teaching to subsidizing research; and researchers would have been constrained by the absence of adequate infrastructure and support. Instead, the American indirect cost recovery scheme, while burdened on occasion by accounting complexities and disputes, has been a remarkable force for over a century[31] in advancing the American international pre-eminence in research, recognizing and reinforcing institutional excellence, protecting the learning experiences of students at research universities from the effects of displacement, and providing researchers with the support they need to succeed.

So long as the Federal-Provincial Fiscal Arrangements and EPF existed, there was at least an argument (although a poor one) that the federal transfer was intended to include compensation for indirect costs. But the elimination of EPF has removed any possible force in this argument and the case for full federal support of indirect costs is now unanswerable.

There are a number of encouraging developments. The AUCC has placed indirect cost recovery first on its agenda of advocacy this year; the Prime Minister's Advisory Council on Science and Technology has seized the issue and fully appreciates its importance; the federal mini-budget of October 20, 2000 has recognized the principle by providing new indirect cost support for CFI projects; the CRC program explicitly recognizes federal responsibility for the full range of research costs, direct and indirect; and there is wide agreement that the appropriate level of indirect cost

recovery is approximately 40 per cent with perhaps a somewhat higher rate for smaller institutions given their difficulty in realizing economies of scale.

Furthermore, there is an excellent fit with provincial policy. For example, in May, 2000 Ontario's Minister of Finance announced that Ontario would meet the full indirect costs of all provincially funded and sponsored research and called upon the federal government to do the same for federally funded and sponsored research. Similarly, Quebec has released a policy paper calling for federal reimbursement of the indirect costs of federally funded and sponsored research.[32] What once might have been a complex federal-provincial dilemma has now been clarified and all that remains is for the federal government to act on the logic of the new paradigm. It would make an extraordinary difference.

## 2. Absolute Levels of Research Support

Putting in place the full architecture of the new paradigm for federal support of higher education and research is crucial. No less crucial is establishing appropriate absolute levels of support for research in Canada that will keep us in the first rank of nations[33]. Our goal must be international competitiveness. In this regard, we have a long way to go.

Despite the progress of recent years the resource gap for Canadian research is growing, not shrinking. Our greatest challenge lies in the comparison with the United States. As the AUCC has carefully documented,[34] the resource gap is widening as the US federal government has continued to increase its commitment to research support at levels and rates well ahead of Canada. American researchers receive grants that are three times larger than equivalent Canadian grants and the institutions which house these researchers receive full indirect cost recovery, which in turn permits them to provide appropriate infrastructure and support.

The impact of this differential support is well known. The late Professor Michael Smith, Canada's distinguished Nobel Laureate (and an earlier Killam Lecturer) put it succinctly a year ago in *Lancet*: "This discrepancy in research funding has had the predictable effect: an inability to compete, a loss of morale, particularly in young research trainees; and a loss of the brightest and most ambitious researchers to the USA".[35] American preeminence in research is a reality for all nations. But it represents a disproportionate threat to Canada given our geographical adjacency and the ease with which researchers can choose between careers in the US and Canada.

We simply must address this gap. All evidence indicates that our researchers are highly productive and their work is of high international quality. If we provide the necessary resources, there is every reason to be confident that we can compete effectively. But if we fail to create opportunities comparable to the USA, we are certain to lose much of our most critical talent and capacity.

### 3. Increased Support for Graduate Students

The resource gap for researchers is replicated in the gap between Canada and the United States in financial support for graduate students, and the consequences are equally serious. This is a critical point of vulnerability for the future of Canadian research and higher education that must be addressed on an urgent basis. In recent policy debates, despite some modest progress, graduate student support has not received the same attention as support for research. But it is equally important. As the Killam Trusts have so fully recognized, our graduate students are our future researchers, colleagues and innovators. It is terribly shortsighted not to offer them competitive levels of support at the moment they are making potentially permanent decisions about whether or not to pursue their research careers in Canada. It is simply not reasonable to expect our most promising graduate students to cast their lot with Canada if the personal financial consequences of doing so are highly disadvantageous.

We need an urgent effort by the three granting councils, the universities and the federal and provincial governments to increase dramatically the commitment of resources to graduate students. We have the necessary mechanisms and programs already in place. We simply need the determination to fund them at adequate levels. There is no investment we could make that would more directly influence Canada's current imbalance of trade in the intellectual capital of tomorrow.

### 4. International Collaboration

In addition to strengthening our national capacity for research, we must strengthen our capacity for international collaboration. The world of ideas pays little heed to national boundaries. For smaller nations like Canada it is crucially important that we be full and active partners in the global research enterprise. The benefits to Canada in the form of access to the

cutting edge of research around the world dwarf the cost of more substantial engagement with the global research community.

There are encouraging first steps. The recent report of the Expert Panel on Canada's Role in International Science and Technology[36] argued for an increased commitment to this area; the Canada Foundation for Innovation has allocated $100 million dollars to supporting Canadian collaboration in international research infrastructure projects; and the October 2000 federal mini-budget has added a further $100 million to this effort.

The goal must be to make Canada an attractive and vital partner in international collaboration, able to bring not just expertise and ideas to the partnerships but resources as well. We have already become world leaders in building research networks through the pioneering efforts of the NCEs, OCEs and CIAR; we must now apply this expertise to the international stage and back our efforts with the necessary capital and operating resources. If we do so, we will claim a more secure position at the frontiers of the global research effort and gain extensive benefits for Canada.

### 5. Competitive Compensation

The competitive global research enterprise has greatly increased competition for the finest academic talent. This in turn is increasing compensation levels, particularly for high performers. As their talents in many cases are sought by both universities and the private sector, and knowledge and ideas are ever more highly valued, the marketplace is responding with significantly higher compensation. And again, American dominance is particularly threatening to our ability to compete.

Canadian universities have historically maintained reasonably strong levels of compensation. However, we now face the need to be able to recognize and reward internationally competitive levels of quality by high performing faculty members who increasingly face very attractive offers to go elsewhere. We also need to be able to respond to particular shortages of talent in fields (such as computer science) where demand substantially exceeds supply.

In addressing this issue we are limited by both the high degree of unionization and collectivization of most Canadian university faculties and the absence of non-university sources of supplementary income to reward

excellent performance. The former has led to a principal focus on the needs of the median performer, not the most excellent; the latter has put Canadian faculty members at a systematic disadvantage, generally unable to access summer supplements and other salary support common in the United States for recognizing outstanding performance[37]. This also makes our faculty more vulnerable to financial inducements from the private sector, which might distort their research priorities. Furthermore, the absence of recognition from public sources of outstanding performance regardless of field runs the risk of devaluing those fields which do not attract private sector support, a highly regrettable consequence of inaction.

The Canada Research Chair program indirectly addresses this issue of internationally competitive compensation by providing the resources necessary to attract and retain outstanding candidates and recognizing that competitive compensation can be an important part of the offer. However, the CRC program, by design, reaches only 2000 researchers. Furthermore, in many universities the terms and conditions of the appointments will be governed by collective bargaining agreements applicable to all faculty members. We need to extend our capacity to recognize and reward exceptional performance independent of the CRC program. I believe there are promising opportunities to adapt to the Canadian context the best of the American tradition of summer supplements, and to fund them on a competitive basis through the granting councils. The details are less important, however, than a determination to address the problem; in the absence of a determination to do so, the new architecture of federal support for research is likely to be undermined with respect to its most important input: outstanding faculty members.

### 6. Support for Student Mobility

The federal government has distinctive constitutional responsibility for inter-provincial mobility and international relations. Additional federal support for students could play an important role in discharging these responsibilities. Additional federal support could and should be aimed at increasing inter-provincial mobility among post-secondary students. Helping them meet the added costs of travel and accommodation involved and encouraging them to come to know their nation and its diversity better at a very formative period in their lives is certain to help bind Canadians together and build a stronger nation[38].

Similarly, additional federal support should be dedicated to helping Canadian students study abroad and attracting international students to Canada. With respect to the latter, it is difficult to imagine an investment in foreign assistance that will pay larger dividends than providing opportunities for study at our universities for outstanding students from developing nations. It would represent a national adaptation of our distinguished record of foreign assistance to the needs of the knowledge-based economy.

## J. Concluding Comments

In claiming that this transformation of the federal role has been a major success I mean to ignore neither the very difficult period endured by post-secondary institutions in the early 1990s nor the magnitude of the agenda that still lies ahead. We lost significant ground in the early 1990s and we are only now beginning to regain it. I claim only that the new course is a more promising one than the one it replaced; that it is a more principled, vital and sustainable course than the earlier approach; that it is a course better suited to meeting the global competitive challenge in research and human capital; and that it has created hope and possibility where previously discouragement and shrinking aspirations were the dominant themes.

For the research university and the research community, the future appears increasingly positive with the prospect of indirect cost recovery almost within our grasp. Canada is on the verge of having all the critical elements of a new policy framework in place that will support and reward excellence and allow our leading research universities to aspire to full membership in the ranks of the leading public research universities of the world. Their aspirations need no longer be limited by the perverse constraints and disincentives of the past, and their achievements can now more fully reflect the talent and efforts of their members.

The significant magnitude of the agenda ahead certainly leaves no room for complacency or relaxation of advocacy and effort in Ottawa. But there is cause for optimism: optimism borne of the place of research and innovation on the national agenda; optimism that the new federal paradigm will give our scholars and universities new strength; and optimism that our universities can more fully discharge their vital roles. Indeed, to return to the hopes of our benefactors, the Killams, we can claim that their hopes are again being embraced by the nation to which they gave so much.

I will close with a few words about federalism as there is a broader lesson to be learned not just about higher education and research but about federalism and Canada as a whole. For half a century, post-secondary education has been an important part of the broader enterprise of nation building. Our modern post-secondary system is one of the principal achievements of the post-WWII expansion of Canada's social, cultural and economic institutions. Our participation rates in post-secondary education rank with the highest in the world and our scholars and researchers are highly respected for their outstanding work. The federal government played a crucially important role in these accomplishments.

Not surprisingly, however, the federal role in post-secondary education was implicated in the progressive decentralization and disengagement that marked federal-provincial relations in the 1970s and 1980s, a process that became progressively more strained by persistent federal deficits and increased national debt. The 1990s saw these pressures come to a financial head and this triggered a reassessment of the federal role in a variety of policy areas.

This reassessment has led in multiple directions: both greater centralization and greater decentralization have emerged, depending on the policy area, and ambiguity, not clarity, has often prevailed. The new federal budgetary surpluses are now posing a new dilemma: should they be used by the federal government to re-enter fields abandoned in more difficult times.

The example of higher education and research I have described offers a possible guide for the federal role more generally: not abandonment, but focus; not retreat, but reassertion; not repeat of an old paradigm, but invention of a new one, better shaped to the demands of both federalism and the inexorable forces of the new global economy. This approach offers the promise of a fuller realization of the full possibilities of federalism: the federal government focused on raising Canadian performance to internationally competitive levels within its jurisdictional competence – research – while deferring to provincial jurisdictional pre-eminence in post-secondary education, and both levels of government investing in support for students through tax preferences, loans and grants.

This is not a diminished federal role. Indeed, if the federal government were to embrace the unfinished agenda I have set out, it would require a commitment of resources well beyond anything previously contemplated by federal expenditures. But it is a more effective and appropriate role, which can make a powerful difference not just to our cause but to the nation as a whole.

NOTES:

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1 Since 1995, Principal David L. Johnston, Dr. Richard A. Murphy, Hon. Peter Lougheed, Prof. Michael Smith and Mr. Björn Svedberg.

2 In this Lecture, I have not considered two other important areas of federal support which directly or indirectly affect post-secondary education: training and aboriginal students. Federal support for training includes both direct expenditures and indirect transfers. Among post-secondary institutions, the vast bulk of training funds has been spent at non-degree granting colleges, not universities. Most recently, the federal government has been moving to devolve responsibility in this area to the provinces pursuant to bilateral federal-provincial agreements, a development broadly consistent with the principal thesis of this Lecture. Federal support of aboriginal students has been an element of the federal government's overall aboriginal strategy, assisting aboriginal students in attending post-secondary educational institutions and thereby increasing access and equity. This support is completely consistent with the thesis advanced in this Lecture.

3 Royal Commission on Dominion-Provincial Relations, *Report* (Ottawa: King's Printer, 1940) Book II, p. 52.

4 Royal Commission on National Development in the Arts, Letters and Sciences, *Report* (Ottawa: King's Printer, 1951) p. 141.

5 *Financing Higher Education in Canada*, Association of Universities and Colleges of Canada, 1965.

6 For a history of federal support of research, see *The Role of the Federal Government in Support of Research in Canadian Universities*, (Macdonald Report) (Ottawa: Queen's Printer, 1969), p.63 ff.

7 See, for example, Kent, *Getting Ready for 1999*, (IRPP, 1989) pp. 130-132.

[8] P. Leslie, *Canadian Universities: 1980 and Beyond*, Association of Universities and Colleges of Canada, 1980.

[9] Association of Universities and Colleges of Canada, representing all degree-granting institutions in Canada.

[10] Since 1980 real funding per capita has decreased by over 25 per cent.

[11] The Group of Ten was formed in October, 1991. The current members are: UBC, Alberta, UWO, Waterloo, McMaster, Toronto, Queen's, McGill, Montreal and Laval. The membership criteria are comparable to the Association of American Universities which includes the leading research universities in the USA and McGill and Toronto from Canada.

[12] The granting council's budgets were reduced in the 1995 Federal Budget and restored in the 1997 Federal Budget. However, the scheduled increases for 1997-2000 were very modest and clearly inadequate to meeting the international competitive challenge.

[13] Canadian Association of University Teachers representing faculty members at virtually all universities and some colleges.

[14] Canadian Federation of Students, the largest organized student voice at the national level.

[15] The allocation of SSHRC is overweighted compared to its budget. Strict proportionality would have left SSHRC with less than 15 per cent of the chairs.

[16] Regrettably some provinces, most notably Ontario, have resisted allowing the full impact of the federal initiative to flow through to the direct benefit of students, preferring to divert some of the new resources to offset existing provincial commitments to student aid.

[17] For a survey of these initiatives, see Munroe-Blum, *Growing Ontario's Innovation System: The Strategic Role of University Research (1999)*, Appendix D: Case Studies, pp. 1-37.

[18] The federal withdrawal to its appropriate sphere of responsibility is not complete as, on occasion, the federal government continues to entangle itself in post-secondary issues best left to provincial responsibility. For example, the recent federal grant to assist a New Brunswick-based company start an electronic "university" offering MBAs in almost total disregard of provincial post-secondary policy seems inappropriate. Similarly, the recent federal grant to Sudbury and Thunder Bay in Ontario to assist them and their local universities (Laurentian and Lakehead respectively) in seeking a provincially-funded medical school for Northern Ontario would appear to be an unwelcome intrusion into provincial post-secondary planning rather than an appropriate expression of federal responsibility for either health or northern economic development.

[19] See, for example, interviews with President Jayne Hodder of Bishop's University and President Sean Riley of Saint Francis Xavier University, *Policy Options*, September, 2000 at pp. 19-31.

[20] See, for example, Hodder and Riley interviews, *supra* n. 19.

[21] See, for example, public statement by the presidents of New Brunswick's four universities commenting on the CRC program, November 17, 1999.

[22] See, for example, the open memorandum from Dr. Fred Lowy, Rector, Concordia University addressed to Canadian University Presidents dated June 6, 2000 and reproduced in *Policy Options*, September, 2000 at pp. 32-33.

[23] See, for example, CAUT Bulletin, May, 2000.

[24] See Hodder, *supra* n. 19 at p. 21: "There is currently a push in this country to intensify research in the science and technology field. But there is a risk with that strategy of inadequately supporting important and high-quality research in the humanities and social sciences."

[25] It should also be noted that in both the Canada Research Chair program and the Canada Foundation for Innovation special advantage has been introduced for smaller and less research intensive universities in the form of special set-asides (6 per cent for CRC and 5 per cent for CFI). These are difficult to justify as a matter of principle but understandable as a matter of political compromise. Fortunately, however, within the set-asides, the core commitment to peer review and excellence has been maintained.

[26] Leslie, *supra* n. 8 at p. 63.

[27] I recognize some critics resist virtually any form of regional economic assistance preferring less intervention in the marketplace. Assessing this debate lies beyond the scope of this Lecture. My point is limited to pointing out the potential complementary nature of such interventions.

[28] See public letter dated July 22, 1999 from Acting Vice-President S. Halperin to Dr. T. Bruztowski, President, NSERC, setting out the reservations of the University of Toronto, which I endorse.

[29] The October 18, 2000 federal "mini-budget" included a commitment of an additional "100 million dollars over five years to SSHRC for a new initiative on economic growth, innovation and management."

[30] See Macdonald Report, *supra* n. 6.

[31] The United States has provided for federal indirect cost recovery since the 1890s, a commitment reflected in the Hatch Act and the second Land Grant Act.

[32] See "Vue d'ensemble pour une Politique scientifique du Quebec " (June, 2000). For a translation see " For a Quebec Science Policy: An Overview " at page 27.

[33] Some argue that the issue of indirect costs is more properly subsumed under this general concern for the absolute level of research support. However, I disagree on grounds of both principle and practice. As a matter of principle, sorting out the relevant federal responsibilities for costs is more than just cost accounting; it goes to the core issue of jurisdiction. As a matter of practice, it makes a large difference to internal university dynamics whether the funds are awarded to individual researchers for direct costs alone or to the university to meet the indirect costs of maintaining the necessary research environment. The United States provides ample evidence of the importance of the two-pronged approach.

[34] See Robitaille and Gingras, "The Level of Funding for University Research in Canada and the United States: Comparative Study" (May, 1999).

[35] See *Lancet,* vol. 353, p. 216 (1999).

[36] See "Canada, International Science and Technology, and the Knowledge-based Economy" (2000).

[37] In the United States faculty salaries are usually characterized as covering only the nine months of the year that faculty normally teach thus providing a rationale for faculty to seek summer supplements (often calculated as two-ninths of the annual salary) to compensate them for dedicating their summers to research. In Canada faculty salaries are normally characterized as covering the full twelve month year, thus making the summer supplement concept a foreign notion. The net effect is to make Canadian faculty salaries considerably less competitive for faculty members who are active and successful researchers.

[38] For background information on student mobility in Canada, see Day & Grafton, "Interprovincial Student Mobility in Canada: Patterns and determinants" in Lazar & McIntosh, Canada: The State of the Federation ( 1998/99 ).

## The Killam Annual Lectures

1995 **Dr. David L. Johnston**
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Former Principal, McGill University
*"Research at Canadian Universities and the Knowledge Based Society"*
University of Toronto

1996 **Dr. Richard A. Murphy, Ph.D.**
Director, Montreal Neurological Institute,
McGill University
*"Government Policy and University Science: Starving the Golden Goose"*
University of Calgary

1997 **Hon. Peter Lougheed, P.C., C.C., Q.C.**
Partner, Bennett Jones Verchere; Corporate Director;
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*"The Economic and Employment Impact of Research in Canada"*
Reading Room, Houses Of Parliament, Ottawa

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University Killam Professor, University of British Columbia;
Director, Genome Sequence Centre, British Columbia Cancer Research Centre;
Nobel Prize Laureate in Chemistry, 1993;
Career Investigator, Medical Research Council of Canada
*"Science and Society in the Forthcoming Millennium"*
Hyatt Regency Hotel,Vancouver

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