Introduction  After a long period of relative calm, there has been a veritable flurry of activity on the Canadian university research scene in the past five years. Developments such as the establishment of the Tri-Council code of research ethics, the metamorphosis of the Medical Research Council (MRC) into the Canadian Institutes of Health Research (CIHR), the release of the report of the Advisory Council on Science and Technology's Expert Panel on the Commercialization of University Research, the allocation of federal funding for the indirect costs of academic research, and particularly the establishment of the Canada Foundation for Innovation and the Canada Research Chairs initiative have put university research back in the public spotlight. Many politicians, bureaucrats, university administrators and academics are delighted with these measures which they assume will revitalize Canada's universities and enhance their social contribution. Others are opposed to them, believing that they will harm most members of the university community and cause considerable damage to the public interest. By and large, these competing assessments of recent university research policies stem from divergent explanations of why they have been put into place. Whereas supporters see them as timely responses to the challenges of the global knowledge-based economy, opponents see them as the latest in a long series of measures designed to advance the neoliberal agenda. Rather than inquiring into the reasons why these policies have been put into place, this paper aims to explore, in a preliminary way, what these policies will actually do or how they will actually work. Put differently, its goal is not to explain but to explicate recent university research policies, to reveal how these
policies will help reorganize and reconcert the activities of people involved in the academic research process.¹

I opt here for explication rather than explanation for a number of reasons. First, this approach provides a more solid basis on which to assess public policy than does the former. As those involved in public policymaking know, policy measures are less often the thoughtful components of a well-defined plan than the outcomes of confluences of various factors and forces, both inside and outside of government, that interact in complex and contradictory ways. As such, there is generally no single cause or reason behind one particular policy measure, let alone a series of them, that can serve as a basis to assess it. Even if one could ascertain the reason behind a particular policy or set of policies, there is seldom a direct correspondence between a policy's aims and its outcomes. Indeed, as public policies frequently produce unintended and unexpected results, one risks misjudging them if their assessment is based on underlying objectives. Rather than the products of good or bad intentions, the approach adopted here views public policies as active transformers of courses of human activity which have visible effects or effects that can be predicted. It is the actual effects of these policies, and not the motivations behind them, that can and should serve as the basis upon which they are judged.

A further advantage of explication over explanation is that it is more likely to encourage intervention in the policy process. This approach does not present public policy as the end point of a political process that is subject only to public approval or disapproval. Rather, it reveals that public policies, as active reorganizers of social relations, serve to transform the field of options and opportunities available to people to act in accordance with their interests and needs. More than simply revealing that intervention is possible, this approach may shed light on how people may effectively intervene in order to achieve their goals.² It is my hope that this analysis will be used to help renovate the public-serving nature of Canada's universities and the knowledge they produce.

The Transformation of the Social Relations of Canadian Academic Research: 1980-1996 In order to understand how recent federal initiatives are likely to transform the social relations of Canadian academic research, one must first understand how these relations have already been transformed. There is a general consensus that since the 1980s, the most dramatic changes in the relations of academic research involve university/industry interaction. Prior to the 1980s, research alliances with business were limited in number and held in relatively
low priority in most universities. Today, various forms of research alliance with industry, which are not only highly regarded but strongly promoted and rewarded, are commonplace on Canadian university campuses. There are various explanations as to why closer collaboration between academics and industry has developed. More useful for present purposes, however, is the question of how they developed.

There is a widespread misconception that the research links that developed between the academic and business communities during this period were the product of government neglect. Many people believe that inadequate federal funding of higher education provided—or was intended to provide—business with an opportunity to move in on Canadian universities which were left with no choice but to seek and accept research (and other forms of) support from the private sector. In truth, however, the federal government did not abandon our universities to the industrial wolves: it handed them over to business with its blessing. Through a series of moves, government progressively ceded control over the nature and uses of university research to the private sector while the costs of university research were (and still are) largely borne by the public.

There are three main ways in which the federal government ceded (and continues to cede) control over the nature and uses of academic research to the private sector. First, the government transformed the kinds of support that it provides for university research in ways that stimulate collaborative activity with industrial partners. Within the research granting councils, for instance, support for strategic and partnership research grew at faster rates than support for basic or researcher-initiated research. The government also produced entirely new and well-funded research support programs, such as the $47 million/year Networks of Centres of Excellence Program (which was recently made permanent with an increased budget), specifically designed to enhance industrial competitiveness. In addition, the federal government put into place a number of indirect measures to facilitate and promote industry’s involvement in academic research. These include supporting individuals, such as National Research Council (IRAP) officers, to help connect academic researchers and members of the business community; funding institutions, such as collaborative research centres and institutes, to promote and conduct collaborative research, and providing generous tax breaks for businesses that engage in collaborative research.

The federal government also ceded to business greater control over the benefits of academic research. It is quite common for research agreements between universities and businesses to stipulate that the latter get the rights to any intel-
The federal government not only condoned this privatization of knowledge whose production is still financed in large part by public funds, but it facilitated it. For example, in 1991 it changed a Treasury Board regulation so that most intellectual property produced under Crown contract would be vested with the contractee rather than the state. This move, as others, has resulted in a substantial increase in the privatization and commercialization of academic research.

The third and perhaps most significant way in which control over academic research was ceded to the private sector is through the policymaking process around university research. Since the 1980s, the federal government has been shifting more of the responsibility for university research policy from politicians and bureaucrats to high profile advisory bodies, such as the National Advisory Board on Science and Technology (NABST) (now replaced by the Advisory Council on Science and Technology (ACST)), that are dominated by business interests. Their considerable power has allowed industry leaders who sit on these advisory bodies to advance their particular interests over the general interest in the formulation of government policy and to institutionalize their vision of the role of university research within the Canadian government. In addition to government-wide policymaking bodies and processes, members of the business community are becoming more integrated into university research policymaking at the level of individual departments and agencies. Within the granting councils, for instance, businesspeople are playing a greater role in formulating university research policy through their increased involvement in various sorts of planning exercises and on adjudication and evaluation committees.

The above changes have worked together to transform the social relations of university research, i.e., those courses of action in and through which university research is conceived, produced, and transmitted to society. In terms of its conception, university research is increasingly shaped by concerns that emanate from outside the academy, most often from business but also from other institutions, such as government, that can afford to sponsor research. This has led, in turn, to a growth in problem-based, as opposed to discipline-based, research initiatives and to more research being conducted in the context of interdisciplinary and intersectoral research teams. The production of university research is further transformed in that it is increasingly subject to and regulated by new imperatives, particularly those of the business world, such as requirements to work in secrecy, with shorter time lines, and/or with an eye to profitability.
Finally, the distribution of academic research within the wider society is also being reorganized in significant ways. Although the taxpaying public still pays the lion’s share of the costs of university research, more and more of the knowledge produced by academics is being privatized and commercialized, and is thus available only to those who are able and willing to pay for it. The combined result of these changes is that university research is becoming increasingly oriented and responsive to business needs. This is occurring at the expense—both literal and figurative—of other social groups who are reaping diminishing rewards from university research, a point to which I return below.

It is worth emphasizing that the above account of the transformation of the social relations of Canadian academic research is not simply the product of federal government activities. The changing relations of research are both cause and consequence of other changes in the nature and operations of Canadian universities as a whole. Moreover, at the same time that changes in the relations of research have been stimulated by government actions, they have also stimulated government action in a reciprocal or mutually productive manner. The aim here is not to reduce the changing relations of research to government initiatives, but to show that federal actions have been a key part of an ongoing process of reorganization, and thereby to set the stage for an analysis of what is likely to come.

Before turning to this analysis, two final observations are in order. First, while the transformation of university research in the last twenty years has been quite dramatic, it was achieved gradually and through the investment of relatively modest amounts of additional public funds into university research. Second, the dramatic change in the relations of research took place in a largely uncoordinated fashion. Although federal initiatives stimulated increased university/industry interaction, the specific nature of this interaction was shaped, to a considerable extent, by the various efforts and initiatives of individual academics and businesspeople, as well as the particular practices and policies of individual universities. In describing this period of the changing relations of research, Janice Newson has likened it to a scattering of seeds that gave rise to a multitude of plants across the university landscape. Using the same analogy, one might say that recent federal initiatives will serve to produce more radical changes in the landscape, both in the sense of reinforcing the plants’ roots and in significantly reshaping the plants’ form.
The Transformation of the Social Relations of Canadian Academic Research: 1997 and Beyond

Assuming that they are not altered in any substantial way, recent federal initiatives are likely to produce both continuity and change in the social relations of Canadian academic research. In that they will promote more university/industry research partnerships, stimulate problem-based and team-based research, and/or increase the commercialization of the knowledge produced in the university, some initiatives, such as the transformation of the MRC into the CIHR, will reinforce earlier changes in the social relations of academic research. However, other initiatives seem likely to transform these relations in two quite novel ways. As I show below, certain initiatives seem likely to standardize processes of academic knowledge production and transmission. Others seem likely to streamline the Canadian academic research enterprise by introducing into it more specialization, differentiation, and hierarchy. Rather than attempting to reconcile these diverse effects of recent federal initiatives on the social relations of research by attributing them to some unifying cause, I focus instead on how they are likely to interact. I argue that, in the present context, recent federal initiatives will intensify the subordination of academic research to business needs, and that they will do this more effectively and rapidly than the measures that were put into place in the previous period.

Standardizing the System

The Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans (hereafter referred to as the Tri-Council code of research ethics) is a useful marker to distinguish between the previous and present phase in the transformation of the relations of university research. Put into place in 1997, this code provides guidelines to promote and monitor ethical behaviour in university research. The establishment of this code of conduct is significant for a number of reasons. First, it constituted an unprecedented incursion into university autonomy by the federal government: universities were given no say about whether the code should be produced in the first place, and they are threatened with loss of access to granting council funds if they fail to comply with it. Second, although it provoked considerable anger within certain sectors of the university community, academics were unable to mount effective resistance to the imposition of the Tri-Council code. This may be encouraging the federal government to attempt to encroach further on university autonomy. Most significant for present purposes is that since its implementation, the Tri-Council code has been reorganizing the practices of university research ethics boards and university researchers, obliging them to conduct their
work in often substantially different ways. As well as obliging them to do new things, the code both directly and indirectly leads ethics committees and academics in all Canadian universities to do these new things in similar ways. The supersession of both individual and institutional practices by procedures mandated by the code is eradicating many of the divergences between them. Over time, increasingly uniform ethical procedures and standards will be in place across the Canadian university system.

The mandate and report of the Advisory Council on Science and Technology's Expert Panel on the Commercialization of University Research also has the potential to standardize aspects of academic research. Struck in 1998, the panel assessed Canadian universities' performance in commercializing research and put forth a vision and implementation strategy to improve it. Perhaps the most significant recommendation of the report is the proposed requirement that, to be eligible for federal research funding, universities (and researchers) must adopt policies consistent with a set of principles laid out by the expert panel. The report also recommends that the federal government invest substantial resources to strengthen the commercialization capacity of universities, and that universities be obliged to submit annual innovation reviews and strategies in order to obtain and to keep these funds. If the recommendations of the report of the expert panel are adopted (and ongoing work on a national innovation strategy suggests that this is likely to happen in some form or other), they will affect the relations of research in ways similar to the Tri-Council code: academics will be obliged to alter some of their knowledge-production practices, and a uniform set of procedures will displace the variety of processes through which Canadian universities currently commercialize academic research. Further, although the scope of individual and institutional practices that are standardized may initially be quite limited, there is potential for it to expand. For example, if government adopts the report's recommendation to develop the commercialization infrastructure of Canada's universities, system-wide practices and standards for issues more tangentially related to commercialization, such as criteria for performance review, may also be developed if not imposed.

Regardless of intention, the effect of the above changes will be to render academic research more useful to industry. In that academic knowledge production is governed by clear and uniform standards of ethical conduct, universities will provide business with more reliable knowledge products (whose intellectual property rights are thus less vulnerable to challenge). And in that other
processes of knowledge production and transfer will be more uniform across the system, collaboration between business and individual universities—particularly between business and groups of universities—will become less complex and contentious than it has been in the past. As academic knowledge production and transmission practices are standardized, university/industry interaction may be progressively routinized, thus freeing up resources in both academic and business institutions. In the current context, these funds are likely to be invested in additional research alliances (which will generate pressure for further standardization), thereby intensifying both individual universities’ and the entire university research system’s service to the business community.

**Streamlining the System** The second likely effect of recent federal initiatives is to streamline the Canadian academic research enterprise by introducing more specialization, differentiation, and hierarchy into the university system. The two prime vehicles of this transformation are the Canada Foundation for Innovation (CFI) and the Canada Research Chairs (CRC) initiative. The CFI was established in 1997 to award funds to help universities and other research institutions modernize their research infrastructure and equip themselves for state-of-the-art research. The foundation, which has received $3.15 billion in federal funds to support continued awards until 2010, is an independent corporation whose Board of Directors is ultimately responsible for the design of programs and setting of policies to achieve foundation objectives. In general, the CFI pays for 40 percent of universities’ infrastructure costs: universities and their partners must cover the other 60 percent of the costs. As well, the amount of funding for which universities may apply under some CFI programs is related to their track records in obtaining granting council funding. Funding applications are assessed by peer review panels in relation to university strategic plans (that are made available on the Internet) and on the basis of three criteria that reflect the CFI mandate: quality of the research and need for infrastructure, contribution to strengthening the capacity for innovation, and potential benefits to Canada.

The CRC program, announced in 1999, will provide $900 million over five years to establish and sustain 2,000 research chairs in Canadian universities. The program is intended to build and develop research excellence in Canada by supporting the work of both emerging and established “stars” in all fields of research. Universities’ overall share of research chairs is related to their past success in granting council competitions. Universities’ applications for individ-
irtual chairs are also evaluated by peer review panels who take each institution's strategic plan into account in their decisionmaking.

Although the CFI and CRC initiative operate independently, there are some existing and anticipated areas of overlap between them. For instance, in their nominations for research chairs, universities have the opportunity to include a request for infrastructure support from the CFI.25 It has also been suggested that in the future, universities will submit the same institutional plan with applications to both the CFI and CRC initiative.26 One additional commonality between the CFI and CRC initiative is that their futures are somewhat uncertain: it remains to be seen whether the federal government will provide financial support to them on an ongoing basis.

The official objective of the CFI and the CRC initiative is to build and sustain research excellence in Canada's universities; however, a likely effect of these initiatives is an increase in the specialization and differentiation both within and between academic institutions. The most obvious way in which the CFI and CRC initiative promote specialization and differentiation within individual universities is by requiring them to produce strategic plans as a condition of applying for program funds.27 By definition, the selection of priority areas for strategic investment promotes specialization. Less obvious are the ways in which these initiatives may lead to the erosion—in absolute and/or relative terms—of some kinds of university research capacity, further advancing institutional specialization and differentiation.28

The CFI and CRC initiative may erode some kinds of university research capacity by producing new and substantial institutional costs. For example, although CFI programs provide significant funds for research infrastructure, they do not provide full support for the staff or the upgrades inevitably needed to keep that infrastructure running smoothly. And while the CRC initiative allows universities to offer quite handsome salaries to recruit and retain excellent researchers, it is anticipated that these funds will be, or will have to be, topped up in order to attract some of the most desirable research "stars."29 In addition to such short term costs, these programs may produce even more significant long-term costs for universities. As noted, the futures of both the CFI and CRC initiative have yet to be determined. If and when their programs wind down, universities will have to pick up the government's share of the tab or risk losing much of their previous investment in research infrastructure and personnel. In this context, universities will have to be strategic not only in terms
of where they invest institutional resources, but also where they withdraw funds in order to pay the new bills. Research and other areas deemed less central or valuable to the university are the likely choice.

Further, because universities will have to invest so heavily in strategic areas of research, they will acquire a special interest in these areas’ success. This is all the more likely given that future access to CFI and CRC funds are contingent upon success in granting council competitions, and areas of strategic excellence will generally be considered the “best bets” in terms of competing for council awards. These areas are thus likely to be further prioritized when it comes to the allocation of institutional resources such as discretionary research funds, research space, etc.

The decisions of individual academics may further erode some institutional research capacity in relative and/or absolute terms. As more resources are diverted to strategic areas in their universities, academics may be inclined (if not obliged) to only hire new colleagues whose work is related to these areas. Academics may also shift their own research foci in order to position themselves to link into strategic programs and avoid having their access to research resources reduced. This will further skew the allocation of institutional resources, putting the futures of those who cannot or will not adopt this strategy at even greater risk. Efforts to avoid marginalization (or to enhance career opportunities) may even prompt academics to attempt to transfer to universities where their research better fits into strategic research plans. Again, specialization and differentiation within universities, as well as between them, are likely to result.

Finally, the CFI and CRC initiative may promote specialization and differentiation within universities by reorganizing the funding programs of the research granting councils (and possibly those of other government departments and agencies as well). While council programs certainly shape the kinds of research in which academics engage, these programs are also continually reshaped in relation to changes in academics’ applications for funds. As universities’ resources and researchers are increasingly invested in strategic areas of specialization, it stands to reason that council funding programs will be skewed in similar directions. This will increase the pressure on academics to shift their research toward strategic priorities and raise the costs of their failing to do so.

As well as increased specialization and differentiation, the programs of the CFI and CRC initiative are likely to introduce more hierarchy into Canadian universities than has previously existed. The designation, through the CRC initiative, of selected academics as “research stars” is the clearest expression of
this hierarchy. However, hierarchy will also emerge as the value of university researchers and research areas become more differentiated, as do the degrees of power and privilege they enjoy. Over time, this hierarchy may become institutionalized, resulting in the establishment of additional distinct classes of academics with differential pay structures, conditions of work, standing, and security in their institutions.

When one moves from the level of individual universities to the level of the Canadian university system, the CFI and CRC initiative again seem likely to promote specialization, differentiation, and hierarchy. Just as institutional resources will be concentrated in strategic areas most likely to produce research excellence, so systemic resources will be concentrated in those universities most able to build and sustain research excellence. With some exceptions, these are likely to be Canada's largest and most research intensive universities. One contributor to this skewing of system-wide research resources is the method of distributing CFI and CRC funds which ties future funding to that obtained in the past. As Canada's larger, research intensive universities have received the bulk of granting council funds, they have (thus far) received the bulk of CFI and CRC funds. In the competition to build and sustain research excellence, Canada's smaller, less research intensive universities are thus disadvantaged from the start.

The initial advantage of larger, research-intensive universities will be reinforced by their greater ability to support and develop state-sponsored strategic research initiatives. Due to their generally larger endowments, richer alumni, greater "donation appeal," and/or more valuable stock of intellectual capital, these universities have more resources than smaller, less research-intensive universities to invest in their strategic research initiatives. Their greater resources also put these universities in a better position to recruit and retain excellent researchers, as well as to lure any potential and actual "research stars" from smaller institutions which cannot afford to offer as generous packages of resources and rewards. As their relative ability to build and develop research excellence grows, Canada's larger, research intensive universities will attract even larger shares of granting council (and other) funds. This will result in their receiving even greater shares of CRC and CFI funding, producing a benevolent cycle for them and a vicious spiral for the rest, particularly universities in more remote and/or economically disadvantaged parts of the country.

Developments in systemic research funding are likely to produce a paradoxical response within smaller universities. Although they will be unable to compete with the larger universities, they will redouble their efforts to develop strate-
gic areas of research specialization, if only to stem the outward flow of research resources and personnel. The increased importance of specialization to the survival of smaller universities will intensify the institutional dynamics discussed above. It is unlikely, however, to prevent the progressive differentiation within the Canadian university system or the intensification of the hierarchy among Canada's universities.

These projected changes in the social relations of Canadian academic research are also likely to render academic research more useful for, and oriented to, business needs. For example, although neither CFI nor CRC programs specify the research areas that individual universities are to target for strategic investment, universities' choices will be constrained by a variety of factors which will lead them to prioritize areas of commercial interest or potential. The obligation to find partners to match CFI funding at a ratio of 60:40 will clearly pressure universities to specialize in areas of industrial relevance. This is not only because corporations are better able than most organizations to support academic research, but because provincial governments (another important funding source) are also prioritizing industrially relevant university research in the hopes of promoting economic competitiveness. CFI and CRC decisionmakers and decisionmaking may also skew universities' choices in the direction of industrially relevant research. For example, the CFI Board, which has ultimate authority for funding decisions, is dominated by advocates of closer university/industry research ties. Universities hoping to maximize their chances of being awarded CFI funds are likely to take this into account when selecting institutional priorities. The Steering Committee of the CRC initiative, also dominated by proponents of university/industry collaboration, has an effective veto over university nominations for Chair holders which it has publicly stated that it is willing to use. Not only may this encourage universities to prioritize particular research areas, but it may also dissuade, even prevent, them from specializing in others. Universities' concerns about the lifespans of CFI and CRC programs may further encourage them to prioritize industrially relevant areas, as business is more likely to help keep leading edge initiatives alive if they are relevant to their particular needs. Program mandates to produce benefit to Canada are likely to have similar effect, as economic benefits are generally easier to identify and to measure than are other kinds of benefits that may stem from academic research.

The implications of recent federal initiatives for the Canadian university research system will also intensify universities' research service to business. As implied above, CFI and CRC programs are likely to transform our broadly based
and widely distributed university research enterprise into one in which fewer areas of research are each investigated more intensively within a more limited number of increasingly specialized academic institutions and/or units. The production of a more rationalized university research system may benefit industry in the sense of producing critical masses of researchers in the same location who are thus more potentially productive and more easily accessed and/or directed by business leaders. At the same time, those universities and units within universities that are under-resourced by the redistribution of systemic and institutional resources will be more needy than ever of alternative sources of funds. This may increase their willingness and/or efforts to remake themselves in ways that more closely conform to business needs.

It is worth noting that new federal initiatives will not only render academic research increasingly subordinate to business needs, but will produce this change more quickly and effectively than did previous initiatives. The pace of change will accelerate due in part to the momentum produced by previous government initiatives. However, it will be due mostly to two key differences in the government’s current approach to university research. First, in contrast to the previous period, the federal government is injecting huge amounts of new funding (over $4 billion announced since 1997) into academic research over a relatively short period of time. These funds will not only facilitate but will require more substantial and rapid transformations within individual universities and the whole university system.36 Second, recent initiatives are targeted at a more general level than were previous ones: CFI and CRC funds are applied for and provided to universities rather than individual academics, and the Tri-Council code and proposals of the Expert Panel are aimed at the entire system, rather than particular institutions. Because they are directed at a higher order of organization, federal initiatives will have a more immediate and more weighty impact upon the relations of academic research.

Implications of Recent Federal Initiatives Thus far we have seen how recent federal policies are likely to transform the social relations of Canadian academic research. In this section, I turn to an assessment of these policies. Given that the prime justification for them is that they will enhance the university’s contribution to the well-being of Canadians, these policies are evaluated in relation to their implications for the university’s public service mission. I define this mission as the obligation to serve a wide variety of social needs and interests through a diversity of means.
As some recent federal initiatives will reinforce previous changes in the social relations of Canadian academic research, one can begin to assess the former by considering the implications for the public interest of the latter. There is growing evidence that, although earlier changes in the relations of research produced some benefits for selected academics, academic units, and businesses, they have had, overall, a negative impact on Canadian universities' ability and willingness to serve the public interest.37 One way that previous federal initiatives have harmed the public interest is by inhibiting the kinds of research that may be undertaken by Canadian academics. As external funding of university research has shifted away from researcher-initiated projects and toward strategic and partnership projects, it is increasingly difficult for academics to pursue research questions that respond to the needs of particular social groups, such as disadvantaged groups that cannot afford to sponsor academic research. This difficulty is further exacerbated by shifts in the internal allocation of university resources toward industrially oriented research and research support (i.e., infrastructure, industrial liaison offices and officers, lawyers, etc.), which have also led to a decline in the resources available to support other kinds of research. It is worth noting that some research is not simply limited in the short term but also, perhaps more so, in the long term. For instance, as universities become more involved with corporate partners, they may become less likely to support researchers or research that are unsupportive of, or that threaten, the latters' interests.38 Further, as more research funds flow to academics engaged in industrially oriented research, fewer academics who are engaged in other kinds of research have the resources to support and to train graduate students who can carry on this research in the future.

Federal initiatives have also contributed to changes in academic knowledge production practices that are detrimental to the public interest. Although research collaboration with industry has increased some academics' access to leading edge knowledge and equipment, it has also thrown up new obstacles to research, such as secrecy requirements, that slow the pace of knowledge production and cause unnecessary duplication and waste. Academic involvement in the privatization and commodification of knowledge is also resulting in researchers being denied easy access to data and other materials they need to conduct their research. This has obliged many either to exchange for these materials exclusive access to research results, to produce these materials for themselves, or to forgo using them altogether—each with serious consequences for the pace and/or costs of knowledge production.39 Alliances with business may also compromise the quality and integrity of academic research. This is due, among
other things, to the incorporation into the research process of some practices and expectations of the business world (such as working with tight deadlines in search of economically valuable “deliverables”) and the pressures and temptations to skew, fudge, or fabricate results so that desirable research outcomes materialize.\textsuperscript{40}

Finally, changes in the ways that academic research is transmitted to the wider society also have harmful implications for the public interest. As more and more of the knowledge produced in universities becomes the private property of business, academics, and/or universities, the public gets little return on its investment in academic research. Not only are citizens frequently forced to pay for the knowledge or products that their tax dollars helped to produce, but these may even be inaccessible to them due to exclusive licensing agreements and/or prohibitively high prices for monopoly goods.\textsuperscript{41} Further, as the case of Nancy Olivieri of the Hospital For Sick Children illustrated, academics’ involvement in the privatization of knowledge may prevent them from disclosing information that is valuable if not vital to the public interest.\textsuperscript{42} Various scandals in North America also suggest that this involvement has allowed and encouraged academics and/or their universities to betray the public interest in favour of their own interests or those of corporate partners.\textsuperscript{43}

It seems clear that recent federal initiatives will reinforce and exacerbate many of the harms to the public interest discussed above. As these initiatives further skew both external and internal funding toward strategic and partnership research, the university’s ability and willingness to respond to a variety of research needs will be more limited. Similarly, as these initiatives promote more privatization and commercialization of knowledge, the production of academic research will be further inhibited, and public access to and benefit from this knowledge will be further reduced. What is perhaps most distressing about recent initiatives, however, is not their particular effects, but their more general effect, on the public interest. Over time, these initiatives and the dynamics they set into motion will make it increasingly difficult for academics and universities to practice and preserve a broad conception of public service, even if they are so inclined.

While previous federal initiatives have already limited many universities’ and academics’ practice of, and thinking about, public service, recent federal initiatives will substantially reduce the potential for these changes to be challenged and for academics’ practice and thinking of public service to be renovated or expanded. For example, recent changes will constrain researchers’ abilities to respond
to a variety of social needs in more powerful ways than did earlier changes. Not only will individual academics' research choices be limited by previous changes in granting council programs and their repercussions inside universities, but they will now also be restricted by the strategic plans (which, as noted, are likely to be highly industrially oriented) that universities are compelled to produce for the CRC and CFI programs and the various resource implications occasioned by these. Each university's plan will be constrained, in turn, by the research plans of all other universities that are made publicly available and taken into consideration by those assessing universities' applications for program funds.

Academics' ability to freely use and conduct their research in the public interest will also be curtailed by recent government initiatives. Whereas previous initiatives may have encouraged, even pressured, some academics to commercialize their research, should the recommendations of the Expert Panel on the Commercialization of University Research be adopted, many academics will be compelled to do this and impeded from sharing their work with the public in ways they might deem more beneficial. There are indications that the Tri-Council code of ethics has already transformed or constrained some academics' ability to more broadly conceive and serve the public interest. For instance, the medical model of research inherent in the code has led to more questioning and challenging of research approaches frequently adopted by public interest researchers (such as qualitative research approaches) and has reduced the latitude for academics to conduct public interest research whose results may cause distress or harm to individuals or organizations such as corporations. Particular demands of research ethics boards (REBs), such as that researchers warn subjects about stressful questions or oblige them to sign consent forms prior to speaking with them, have also limited academics' ability to conduct public serving research by introducing a new measure of concern if not distrust into the research situation which diminishes participants' willingness (and in some cases ability) to share valuable information. As researchers face growing obstacles from REBs, some may opt to self-censor potentially controversial research questions or projects or to preempt REB interference by withholding or concealing information from them. Both of these options have the potential to further erode researchers' service to the public.

Academics' space to assert and/or defend broad conceptions of public service will also be constrained by recent federal initiatives. As universities are brought into more intense competition with one another for new federal program funding, administrators and academics will be compelled to prioritize institutional
interests over the public interest in decisions regarding research priorities and specialization. Indeed, many universities already seem to be basing their strategic decisions on their relative research strengths and/or the likely preferences of adjudication committees rather than the needs and desires of surrounding communities, thereby diminishing the importance and room accorded to public interest considerations in institutional deliberations and debate. For example, although there is a huge need and demand for research and development in the area of sustainable agriculture (as opposed to agri-business) in Saskatchewan, neither of the province’s universities have explicitly targeted this area for strategic investment.

Finally, the nature and requirements of new government programs further reduce the space within universities to assert and defend the public interest. As these programs have been presented to faculty as “faits accomplis,” most university debate about them has focused on the technicalities of compliance as opposed to the implicit assumptions or likely consequences of the programs. In the process, the conception of public service built into these programs, which largely equates it with the enhancement of economic competitiveness, has been quietly imported into the university. Those who would challenge this conception are finding themselves frustrated by various program requirements and exigencies. For instance, the CRC initiative motivated universities to quickly finalize strategic plans so as to get an early pick of the crop of available “research stars.” Academics who attempted to delay the process by challenging the implicit assumptions and goals of the program were regarded by administrators and some peers as indulgent, if not irresponsible, and were thus accorded little opportunity to air their concerns.

To be sure, recent federal initiatives do not completely eliminate academics’ and universities’ ability to practice and preserve a broad conception of public service. However, the new dynamics within and between universities, government, and the private sector that they set into motion dramatically increase the difficulties and costs of doing so, particularly in the long term. Ultimately, one can anticipate that federal initiatives will advance not only structural changes but also functional and normative changes in the nature of Canada’s university research system. We may see the transformation of a collection of diverse and autonomous institutions that meet the needs of a variety of local, national, and international communities into a more integrated system of universities with more standardized research practices and particular research niches that cater primarily to the needs of national and international business. While they can-
not be calculated, the costs of this curtailment of the university's conception and practice of public service will be significant. Indeed, as I have suggested elsewhere, they may ultimately jeopardize citizen support for Canada's universities, placing their very future at risk.\textsuperscript{46}

**Resistance** The above discussion is predicated on the assumption that recent federal initiatives and the dynamics they set into motion will not be contested by members of the university (or any other) community. While relatively muted response to earlier government initiatives might justify this assumption, growing concern among faculty, academic organizations,\textsuperscript{47} and members of the general public about changes in higher education and university research suggests that this may not remain the case. Paradoxically, various aspects of recent federal initiatives may in themselves produce various tensions or conflicts that can generate, or be used to generate, resistance to these initiatives. In closing, I point to three of the ways in which these initiatives may produce opposition from within the academy.

Perhaps the most significant feature of recent federal initiatives around university research is the huge amount of money that is being put into them. Although these funds have been welcomed by many people in the university community, they have much potential to generate resistance to federal initiatives and to the new relations of research. The rapid injection of very substantial funds into the university system promises to accelerate the differentiation and hierarchy that has been developing within and between Canadian universities. This means that many academics are likely to experience significant and rapid declines in their relative professional standing.\textsuperscript{48} This intensification and institutionalization of stratification within their profession has the potential to mobilize some academics against federal initiatives, given the risks it poses to the success, if not the future, of their careers. Some university administrators may be similarly moved to resist, given the implications of greater differentiation and hierarchy for their own career prospects.

The ways in which new federal initiatives affect university autonomy may also produce concern and resistance within the academic community. As noted above, the Government of Canada showed far more respect for academic autonomy prior to 1997 than it has subsequently done. Although the government did promote certain kinds of university activity, it did not impose uniform standards or practices on Canadian universities that directly interfered with their autonomy. Since the introduction of the Tri-Council code, the federal government has
taken actions and endorsed suggestions that pose considerable threats to university autonomy. And while the academic community has not yet stopped any of these, it has become increasingly sensitive and resistant to them.\textsuperscript{49} It is possible that, as federal incursions into university autonomy persist or even escalate, academics will become more willing to challenge federal initiatives and the new relations of research to which they contribute and respond. University administrators may also be more willing to resist incursions on university autonomy as the benefits of new federal initiatives become increasingly concentrated in fewer academic institutions.

Finally, if the government's apparent disrespect for academic autonomy has the potential to generate resistance, so too do the ways in which it seems to be respecting it. One key feature of the impending specialization within and between Canadian universities is that it is officially to be the product of academic choice. Whereas granting universities “free choice” seems to be a more democratic approach to institutional specialization than alternatives that have been adopted in other countries at other times,\textsuperscript{50} it is also a potentially more problematic one. As attempts to produce, implement, and/or modify strategic plans intensify university politics, bringing various internal tensions and conflicts into sharper relief, academics may be unable—or unwilling—to make the decisions delegated to them. Faced with the inability to apply or successfully compete for CFI, CRC, or other funds, frustrated administrations may decide to impose on their universities specialization plans or related policies and programs of their own making. This may further antagonize academics, whose sensitivity to the erosion of their autonomy has already been heightened, and increase their willingness to challenge both government initiatives and their own administrations. While this response may reinforce university administrators' support for federal initiatives, it may just as easily have the opposite effect. This is particularly the case when one considers the many other ways in which these initiatives can undermine administrative effectiveness and legitimacy (such as by increasing the unpredictability of federal funding and decreasing administrators' flexibility and ability to engage in long-term planning).

While opponents of the changing relations of academic research may be heartened by the actual or potential resistance generated by recent federal initiatives, it is worth emphasizing that this resistance will not necessarily stem from progressive concerns nor translate into progressive practice. In the present context, some resistance will spring from narrow personal or professional concerns and may thus be defused by measures (such as changing formulae for the dis-
tribution of resources within new federal programs) that will not challenge the new relations of research in any fundamental way. It is thus vital that opponents of the new relations of research strive to deepen their colleagues’ concerns about federal initiatives at the same time that they attempt to mobilize their resistance to them. Devising strategies or campaigns that not only stave off the new relations of research but that, in the process, renew the academic solidarity and commitment to public service that have been eroded by them, will be an important means to this end.51

Notes

I would like to thank Janice Newson, Caroline Andrew, and the reviewers of this paper for their valuable comments and advice. I also gratefully acknowledge the support of the Social Sciences and Humanities Research Council of Canada.

1. My approach is inspired by the work of Dorothy E. Smith (The Conceptual Practices of Power, Writing the Social, etc.) which aims to reveal the subtending social relations that produce and order human experience. My work differs from hers, however, in a number of respects, such as in the incorporation of temporality (or a dynamic element) as well as prediction into the analysis.

2. While explanations may also suggest strategies for intervention, these strategies (such as calls to oppose the neoliberal agenda) are frequently too general to be of use, or inadequate because underlying social relations are not clearly understood. For an elaboration of this argument, see C. Polster, “From Public Resource to Industry’s Instrument: Redefining and Reshaping the Production of Knowledge in Canada’s Universities,” Canadian Journal of Communication 23/1 (1998), pp. 91-106.


10. The recent growth in problem-based and collaborative research is not solely the product of increased university/industry research partnerships. However, much of the impetus for these developments stems from the business sector’s perceived and real interests and needs.

12. For example, the displacement of collegialism by managerialism in the running of university affairs that is required by some university/industry alliances has facilitated the formation of additional alliances.

13. As reviewers of this article rightly noted, the reorganization of the more general relationships between the state, the private sector, and Canadian universities is more complex than has been presented here. For a more thorough discussion of the ways in which these relationships have been transformed, see Polster, Compromising Positions, particularly chapter six. The work of other Canadian academics cited in this article also makes a valuable contribution to our understanding of this issue.

14. Although federal support for university research increased over this period, the amount of new money invested in academic research pales in comparison to the over $4 billion injected into the system since 1997.

15. Newson made this comment on CBC radio's Morningside in 1997.


18. It is worth noting that the granting councils did hold consultations with the academic community on the code and that some changes proposed by academics were incorporated into it. This does not, however, change the fact that this external code, and its accompanying penalties, were imposed on the university community.

19. For example, whereas prior to the establishment of the code, research ethics boards (REBs) had only to review sponsored academic research, they must now review all academic as well as graduate and undergraduate research in accordance with procedures laid out in the code. The work of individual academics is also being transformed as REB members impose new obligations upon them, such as the requirement to submit interview schedules for open-ended interviews or to highlight potentially sensitive survey questions for research subjects.

20. The code directly encourages uniformity by mandating and requiring proof of compliance with a detailed set of procedures for REBs (and the academics they oversee) to follow. Formal and informal discussions among academics and university and government administrators involved in ethics review may encourage and produce further standardization of research practices. In addition to a number of particular research practices, the Tri-Council code may ultimately serve to standardize approaches to academic research (particularly in the human sciences) by constraining academics to adopt research models that are more quantitative than qualitative or open-ended in nature. For a more detailed discussion of this issue, see J. Newson, “Codes of Ethics Frameworks and the Commercialisation of University-based Research,” Paper presented at the World Council of Comparative Education (Chonbuk, Korea, 2001).


22. Ibid., p. vii.


27. The fact that universities' research plans are made publicly available may promote further specialization as each university may be reluctant to duplicate the strategic plans of other universities, particularly those universities whose strengths in strategic areas are superior to their own.

28. The following comments apply whether total institutional research capacity declines, remains constant or increases.

30. The various ways in which, and places from which, universities may reallocate resources in order to pay the costs of strategic research initiatives are too numerous to discuss here. Suffice it to say that many of these, such as reducing departmental budgets or taking funds from areas such as university teaching or basic infrastructure, have the potential to either directly or indirectly reduce some kinds of institutional research capacity.


32. To be sure, some forms of specialization, differentiation, and hierarchy have always existed within the Canadian university system. My emphasis here is on the ways in which these will be reinforced and transformed by recent federal initiatives.

33. The proposal at the University of Regina to create a number of University Research Chairs to further develop specialized research capacity in the institution and to support potential "research stars" is a clear illustration of this.

34. See, for example, the list of recent university research programs launched by the government of Ontario in J. R. Pritchard, "Federal Support for Higher Education and Research in Canada: The New Paradigm," 2000 Killam Annual Lecture (Trustees of the Killam Trusts, 2000), p. 5.


36. For instance, the increase in university partnerships that will be created through CFI programs will both necessitate and legitimize changes in the nature and operations of university research administrations.

37. This evidence appears in the work of Canadian researchers such as Janice Newson, Neil Tudor, Erika Shaker and Denise Doherty-Delorme, and others, as well as in the growing number of articles and exposés on university/industry collaboration appearing in both the academic and mainstream media in Canada. Even more evidence of the harms of university/industry links can be found in the writing of academics and journalists in the United States where forms of collaboration have a longer and more controversial history (see, for example, E. Press and J. Washburn, "The Kept University," Atlantic Monthly March (2000), pp. 39-54.


41. Some would argue that these harms are offset by other benefits of commercializing academic research such as its potential to create jobs and generate tax revenues. Others would argue, however, that these benefits are minimal given the generous R&D tax breaks offered to businesses in Canada, the limited number of jobs generated by spin-off companies, and the ease and frequency with which intellectual property, the companies that own it, and/or the individuals that produce it are either bought by foreign corporations or relocated to other countries.


43. E. Press and J. Washburn, "The Kept University."
44. The following comments are based on informal discussions with selected academics, university administrators involved in implementing the code, and representatives of academic organizations such as faculty associations. They are also supported by certain findings of a recent study of the impact of the Tri-Council code on researchers in the humanities and fine arts (M. Owen et al, Report to the Social Sciences and Humanities Research Council of Canada on Implementation of the TCPS (Ottawa: Humanities and Social Sciences Federation of Canada, 2001) and an article on the impact of ethics codes on social science research in the United States (C. Shea, "Don't Talk to the Humans: The Crackdown on Social Science Research," Lingua Franca (September 2000), pp. 27-34.


47. This concern is reflected in the growing number of academic conferences and publications addressing the erosion of the public-serving university which include the Manitoba Organization of Faculty Association's "Food For Thought" conference in 2000 and the CAUT's ongoing series of publications in association with James Lorimer and Company.

48. While academics in some areas, such as the social sciences and humanities, may be most likely to experience such declines, academics in many if not all other areas, including those in the basic and even applied sciences, are at risk, given the limited numbers of "star" researchers and "world-class" research institutions that can be supported.

49. This is evident, for example, in the large number of academics who signed the Canadian Association of University Teachers' (CAUT) letter to the federal government objecting to the report of the Expert Panel on the Commercialization of University Research (CAUT Bulletin, March 2000).

50. C. Barrow, "The Strategy of Selective Excellence."

51. Limitations of space preclude a discussion of such strategies that might include boycotting CFI and/or CRC programs (and insisting that federal funds be put into the universities in more helpful and less harmful ways), opposing the commercialization of academic research (see C. Polster, "The Future of the Liberal University, ...”), and renovating the conception and practice of academic autonomy (see J. Newson and C. Polster, "Reclaiming Our Centre Towards a Robust Defence of Academic Autonomy," Science Studies 14/1 (2001), pp. 55-75).