ECONOMIC COUNCIL OF CANADA

Fifth Annual Review

The Challenge of Growth and Change

September 1968

Due

ECONOMIC COUNCIL OF CANADA

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ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1968

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Unless otherwise noted, all dollar data are in current dollars.

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Symbol used in tables:

— Not significant in terms of the unit involved.

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Introduction

WE LIVE in times of dynamic change and social ferment. Not only are swift and far-reaching changes taking place in the economic fabric of our own country and the world around us, but political, social and cultural institutions are evolving rapidly into new forms.

Many of the changes we face have been conditioned and accelerated by rapid technological developments. Some of these developments are obviously beneficial; others are perhaps more questionable. The crucial point is that they will be part of our environment, and this is the environment in which we will be seeking to satisfy rising human expectations and aspirations.

Our present environment is in fact changing very rapidly as the result of international and domestic policy decisions of five, ten, and even twenty or more years ago. For example, the level of education in Canada's labour force today reflects decisions and circumstances going back many years, including the loss of momentum in Canada's educational progress in the 1920's as well as the cut-backs that occurred in the Great Depression of the 1930's. The administrative and financial structure as well as certain physical features of our cities were set in many cases during the nineteenth century. Many aspects of our policies on tariffs and competition were determined before most of us were born.

Similarly, policy decisions of this year or next will, in many cases, have their major impact over a considerable number of years in the future. Indeed, as we move into a more advanced stage of economic

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development, with increased emphasis on the value of our human resources, the lead time required for policy to operate effectively may well increase. Consequently, it is important that we move now to strengthen the basis for a continuing process of evaluation and re-evaluation of the choices or options for growth and development that may be open to Canada in a world of incessant, widespread and accelerating change. More generally, to achieve our medium- and longer-term economic goals, the need is for appropriate action now, rather than in the future, in many fields of policy.

Canada is widely regarded as one of the world's most affluent societies. Yet, the wants, demands and needs in this country, for both individual and collective purposes, continue to advance strongly in relation to our productive resources and capacities. Therefore, the problem of choice remains—that is, the problem of priorities among many needs and aspirations and the allocation of scarce resources to meet these as well and as efficiently as possible.

In its terms of reference, the Economic Council of Canada is charged with recommending policies that would "best help to realize the potentialities for growth of the Canadian economy". Both this directive and others in our terms of reference clearly indicate that the Council should be concerned with a longer view rather than immediate and short-term problems, and with the broad strategy of development rather than the preparation of detailed blueprints for growth and change.

Under today's conditions of rapid and complex change, and of great uncertainties about the future, we feel that this emphasis is more important than ever. Focusing on the immediate, short-term problems, to the neglect of the wider horizon, may easily result in missed opportunities and, in all likelihood, increased difficulty in coping eventually with problems that might be averted by timely action. We believe that if Canadians are to successfully grasp new and evolving opportunities in the future, it is now more important than ever before to bring the needs and possibilities of the future to bear on today's decisions, both in government and in the private sectors of the economy.

The essential framework for the Council's analysis and recommendations has, since its formation in 1963, been a set of basic economic and social goals—the goals of full employment, high and sustained economic growth, reasonable price stability, balance-of-payments viability and an equitable distribution of rising incomes. We have emphasized that these are goals which we should seek to achieve simultaneously and consistently in the future. We have defined and clarified

these goals in terms which would set challenging tasks for Canadians; and in our last Review we set forth some of the needs for co-ordinated longer-term planning arrangements required, both in government and in the private sectors of the economy, to achieve such goals.

Our basic concern in the earlier chapters of this Review is to describe a policy-planning framework that will help us to examine some of the options for growth open to us. This concern has been reflected in all of the Council's Reviews to date, with the analysis of growth and its sources articulated in increasing detail. We are now extending this analysis to provide a new perspective on recent developments and future possibilities. The objective, again, is to minimize the problems and maximize the opportunities of a rapidly changing environment.

Chapter 2 will discuss economic growth rates in Canada, the United States and eight European countries. On the basis of analysis developed by the American economist, Edward F. Denison, and a comparable study for Canada, many elements in the 1950-62 growth rates of these countries will be identified and measured—elements as diverse as employment increases, educational attainments, declining hours of work, the shift away from farms and other self-employment, capital investment, and the economies of larger-scale production. This framework of analysis has been largely determined by pioneering work done by others. Because of its comprehensive nature and the extent to which it has been applied to other countries, it is extremely useful in setting the stage for considering the sources of future growth. But as its developers themselves have noted, it is not the only possible framework for such analysis, nor does it answer all questions.

Some of the most perplexing of those questions arise in connection with any consideration of the possible role of science and technology in economic growth. Technological developments have enormous implications for economic growth and change, but their impact cannot easily be identified and measured. Chapter 3 is designed to offer some useful perspective on certain basic issues in this area—the importance of the process of innovation and the role of the entrepreneur, the allocation of resources to science in a way that yields a high return, methods of getting scientific and technical knowledge to potential users, and the broad strategies for using the powers of science and technology, including the social sciences, to benefit all Canadians.

Both Chapter 2 and Chapter 3 bear on the factors underlying the growth of *total* production. But as Chapter 4 points out, it is the essence of the growth process that continual changes and shifts in

structure are taking place—that growth proceeds in a highly flexible, kaleidoscopic way. Discussions of the options for growth can be significantly enhanced for policy purposes on the basis of improved knowledge and understanding about such changes. Chapter 4 provides a view of some of the major structural shifts that have taken place in the Canadian economy, particularly in the post-war years, in employment and output—notably the vastly increased importance of the service industries which now account for over half of total Canadian employment and output. In Chapter 5, we single out for special attention the one industry—agriculture—which in all the advanced nations has been most affected by the adjustment to change in recent decades.

However, there exists within this constantly shifting structure a large number of people who have not benefited from our so-called affluent society. Unfortunately, recommendations which might alleviate this problem are extremely complex, and the Council has discovered that of all its goals mentioned above, the one which is most difficult to define and to relate to other goals is that of the equitable sharing of rising incomes. This is a goal which involves an intricate mixture of social and economic issues, and has many different aspects. Moreover, efforts to achieve a broader participation in rising living standards and to bring about a more equitable sharing in the fruits of economic progress have frequently not been very successful. Indeed, perhaps in no other field have so many well-intentioned programs in Canada proved to be so disappointing over the years to the people and places they were meant to assist. For example, regional income differences—the aspect of the goal on which this Council has concentrated in earlier publications—are almost as big today as they were 40 years ago. Despite these frustrations, however, the goal itself has lost none of its national importance; if anything, it has risen in the scale of priorities.

Previous Annual Reviews have sought to identify the problem of regional imbalance in Canada more clearly by measuring the regional disparities in incomes. We have probed for the real reasons for these disparities, and on the basis of our analysis have suggested certain policy guidelines. But the Council readily concedes that the over-all problem is highly complex, and has too many facets to be solved by a simple set of policy prescriptions. This general issue continues to be a major concern of the Council.

In this Review we present the results of an examination of two further aspects of the goal of an equitable sharing of rising incomes:

—Chapter 6 will outline the nature and scope of poverty. It indicates that poverty is a large and urgent problem in Canada and concludes that a wide variety of steps are required to begin to tackle this problem effectively.

—Chapter 7 presents an assessment of the regional impact of federal government policies and programs.

It is important to recognize that if *all* Canadians are to share in rising living standards there must be strong, sustained and stable over-all growth in national output and income. Such high standards of performance can not only enlarge the access of individuals to higher incomes, but can also enlarge the resources available for social policies aimed at improving the living standards of those who have little or no income-earning potential. It is therefore important to review regularly the economy's performance in relation to the medium-term growth potentials, and to consider much more systematically than in the past the framework of both public policies and private decisions needed to keep the economy consistently close to its rising potentials.

Chapter 8 reviews the performance of the economy in relation to the basic economic and social goals. It indicates that during the past two years the economy has not consistently measured up well with all of the goals, and it considers whether these shortfalls are likely to persist. Part of the answer depends upon the evolution of international economic conditions. In this connection, the Chapter considers some recent international developments—particularly those affecting world trade and payments—that may well have a vital bearing on the achievement of the country's medium-term growth potential.

Our policy conclusions and recommendations will be found within the various chapters of this Review, rather than in a concluding policy chapter.

2

An International Perspective on Economic Growth

THE ULTIMATE purpose of our economic and social goals is to provide all Canadians with access to higher material standards of living and a higher quality of life. Economic growth—especially growth in productivity—can help to ensure such access, and therefore acceleration of such growth must be a major policy objective.

In a rapidly changing environment, economic growth involves a multitude of elements and complex interactions. A *comprehensive* approach is required to sort out these many elements and their relationships. There are many ways in which these elements may be grouped. The approach in this Chapter begins with the concept that economic growth flows from two broad groups of sources:

(1) Increases in productive resources—not only in their *quantity* (such as more manpower, buildings and equipment), but also in *quality* (such as higher levels of education and technologically more advanced capital equipment).

(2) Increases in the *efficiency* with which these resources are used and combined (for instance, through shifts of men and capital from less-productive to more-productive lines of activity, and through economies of scale and specialization).

The concept is simple enough as a basis for identifying sources of growth. But once they are identified, the real test is to measure their contribution to growth. For example, what part of the economy's

growth can be traced to rising employment, to new structures and equipment, to rising levels of education, to better organization of production, or to the general advance of knowledge?

No system of analysis has yet been devised that will provide the answers to all such questions. But promising new developments have emerged in recent years, and a major contribution has been made by the American economist, Edward F. Denison. He has developed a comprehensive system of analysis, and applied it to an exploration of the sources of growth in the United States, and more recently to a comparison of the sources of growth between the United States and a number of European countries for the period 1950-62. The Council has prepared comparable estimates for Canada.[1]

Our interest in this analysis, and the purpose of this Chapter, is to illuminate the growth process—to evaluate as many growth sources as possible and isolate those that are most relevant for the future growth of the Canadian economy. This is not easy to do. But the realistic design of effective growth policies demands a better understanding of the growth process. At the same time, it should be emphasized that the Denison approach to the assessment of the sources of economic growth is by no means the only approach, and that in the course of the work being undertaken by the Economic Council, a variety of approaches to growth analysis will be employed.

THE ANALYSIS IN BRIEF

This analysis examines the growth of incomes in 10 countries.[2] The measure used is National Income, a statistical grouping of the various

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[1] The underlying framework for the analysis in this Chapter has been taken from the Denison growth studies: *The Sources of Economic Growth in the United States and the Alternatives Before Us*, New York, Committee for Economic Development, 1962, and—with the assistance of Jean-Pierre Poullier—*Why Growth Rates Differ: Postwar Experience in Nine Western Countries*, Washington, The Brookings Institution, 1967.

On the basis of estimates developed by the staff of the Economic Council, Canada has been brought into the framework of international comparisons in the latter study. The Canadian estimates are described and analyzed in a forthcoming study by Dorothy Walters, *Canadian Income Levels and Growth: An International Perspective*, Staff Study No. 23, Economic Council of Canada, Ottawa, Queen's Printer, 1968.

Without the work that Denison and Poullier undertook in their study, no such analysis could have been made of Canadian economic growth in relation to that of various other countries. Moreover, the Council is particularly indebted to both of these men for their helpful co-operation and interest in the development of the Canadian estimates. Throughout this Chapter, the tables and charts contain selected data from *Why Growth Rates Differ* and the forthcoming Economic Council Staff Study.

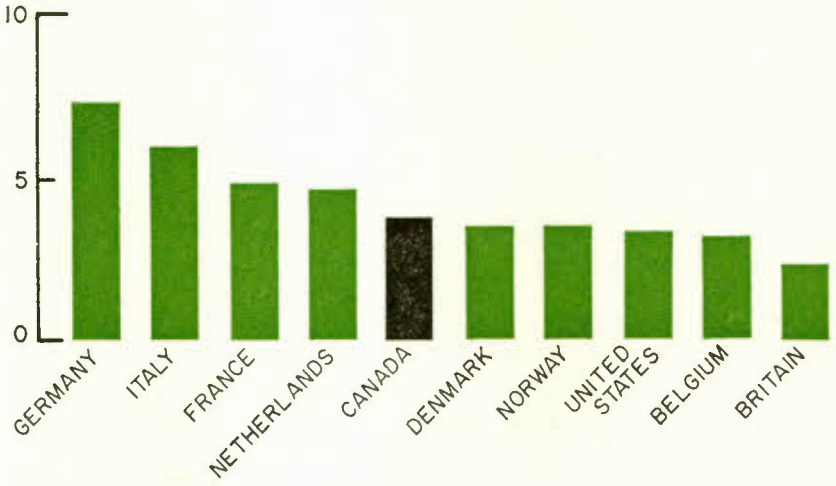
[2] Throughout this Chapter all references to growth, income or output are in real terms, i.e., the data have been adjusted to exclude price change over time.

kinds of income (wages, salaries, profits, rents, dividends, interest) which in Canada are equivalent to about three-quarters of Gross National Product. Chart 2-1 shows the average annual rates of increase of National Income in 10 countries over the 1950-62 period.

CHART 2-1

GROWTH OF REAL NATIONAL INCOME, 1950-62

(AVERAGE ANNUAL PERCENTAGE CHANGE)



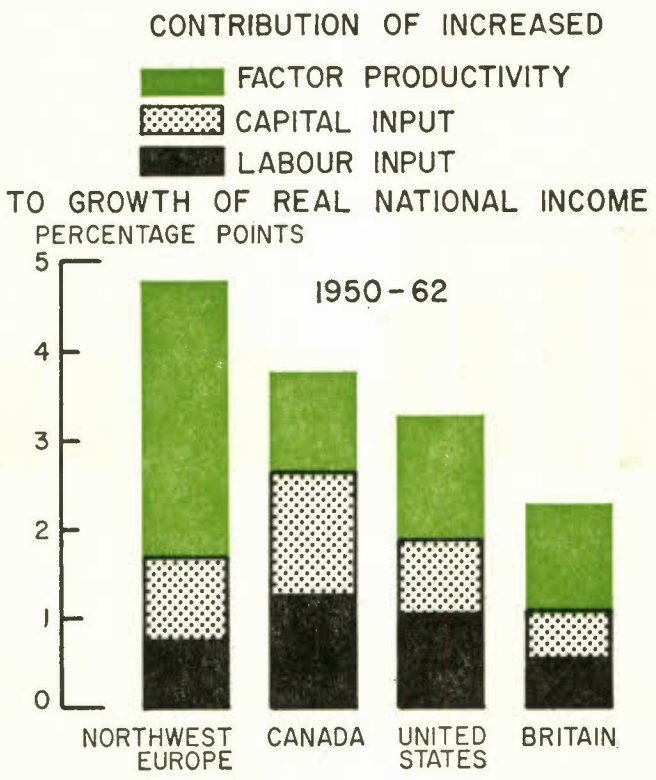
In terms of total National Income, Canada's growth performance in 1950-62 appears to have been "about average" among the 10 countries shown in Chart 2-1—lower than in some European countries, but higher than in others, and not much different than in the United States. But an examination of the underlying sources of economic growth reveals that such growth in Canada was not achieved very efficiently. Roughly two-thirds of Canada's rate of growth in total National Income from 1950 to 1962 can be attributed to massive infusions of labour and capital; only about one-third can be attributed to factor productivity—that is, to gains in the efficiency with which labour and capital were combined in production processes (Chart 2-2).

For the Northwest European countries[1] as a group, these ratios are roughly reversed. Approximately one-third of their rate of growth —which in total was higher than Canada's—can be attributed to increased inputs of labour and capital, and about two-thirds to gains

[1] Includes Belgium, Britain (United Kingdom), Denmark, France, Germany, Netherlands and Norway but not Italy.

in "factor productivity" (Chart 2-2). The United States also achieved a relatively larger share of its total growth from increasingly efficient use of labour and capital.

CHART 2-2



These disparities in rates of growth of productivity—especially the sharp contrast between Canada's relatively slow productivity gains and the rapid European advances—have frequently given rise to the notion that European experience somehow holds the promise of easy and rapid solutions to Canadian growth problems. Such tempting speculation is not supported by this analysis. What is revealed instead is that growth performance involves many elements; that these elements vary from country to country and over time in their influence on the total growth rate, due partly to different stages of economic development; and that great care must be taken not to draw *indiscriminate* implications from European experience for Canada's performance.

It is reasonable to assume that at least some of the European countries would not have achieved such rapid increases in National Income over the 1950-62 period if, at the start of that period, their levels of per capita incomes—as well as such factors as capital stocks,[1] industrial technology, and the scale of output for some products—had been closer to the U.S. or even the Canadian levels. Northwest Europe in fact began the period with an average level of output per employed person that was only three-fifths of the Canadian level.[2] By the early 1960's, European output per person employed had climbed to close to three-quarters of the Canadian level. Similarly, European output per employed person rose from about half to close to three-fifths of the U.S. level over this period. Obviously, there were some avenues of growth available to the resurgent economies of Northwest Europe that were simply not available over this period to the United States and Canada.

But even with these avenues of growth taken into account, the analysis indicates that Canada's productivity growth in this earlier period was relatively slow. The Economic Council has repeatedly emphasized the imperative requirement for strong and sustained increases in productivity. Whatever the increase in the labour force—and Canada's increase will continue to be large in the years ahead—good growth performance must be based not only on full use of our human and other resources but also on strong gains in the efficiency with which they are used and combined in the production of goods and services. A high rate of productivity growth is essential in the long run for increasing the standard of living of Canadians, and more generally for consistently and simultaneously achieving all of our economic and social goals. If some of the avenues for increasing productivity are already closed, it is necessary to explore different approaches without delay. What follows is an attempt to narrow the search for realistic possibilities for increasing Canadian productivity in the future.

COMPONENTS OF GROWTH

The various sources of growth that have been identified and measured separately are set out in Table 2-1, which provides the basic structure for this Chapter.

These growth rate components are discussed below in the order in which they appear in Table 2-1. The comparison is largely with the

[1] "Capital stock" as used here refers to a nation's total supply of buildings, machinery and equipment available for use in production, together with inventories.

[2] Based on real Gross National Product per employed person.

Northwest European countries as a group, but in some cases it will be useful to refer to developments in individual countries.

TABLE 2-1—CONTRIBUTIONS TO GROWTH OF REAL NATIONAL INCOME, 1950-62

	Canada	United States	Northwest Europe	Britain
Average Annual Percentage Increase in Real National Income	3.8	3.3	4.8	2.3
		Percentage Points		
Contribution of:				
Total Factor Input	2.7	1.9	1.7	1.1
Labour	1.4	1.1	.8	.6
Employment	1.5	.9	.7	.5
Education	.2	.5	.2	.3
Age-sex composition	− .1	− .1	—	—
Hours of work	− .2	− .2	− .1	− .2
Capital and Land	1.3	.8	.9	.5
Enterprise capital	1.0	.6	.8	.5
Residential capital	.3	.2	.1	—
Factor Productivity	1.1	1.4	3.1	1.2
Effect of Demand Pressures	− .4	—	—	− .1
Effect of Weather on Farm Ouput	.1	—	—	—
Resource Shifts	.6	.3	.7	.1
Economies of Scale	.5	.4	.9	.4
Other	.3	.7	1.5	.8

NOTE: One of the key assumptions underlying the estimates prepared by Edward F. Denison—and also used in the Canadian estimates—is that the contribution made to the growth of National Income by an increase in each factor of production (such as labour and capital) is proportional to that factor's share of National Income. A comparable assumption is used in combining the diverse elements within labour and capital inputs. A detailed description of the assumptions and methods underlying these calculations, including those related to factor productivity, will be found in Staff Study No. 23.

Labour Input

The increased input of labour accounted for 1.4 percentage points of Canada's 1950-62 growth rate of 3.8 per cent. In other words, almost two-fifths of the total growth rate can be traced through this analysis to increased labour input. The comparable figure for the United States is about one-third. In contrast, gains in labour input accounted for only about one-quarter of the growth rate in Britain and less than one-fifth in Northwest Europe as a whole.

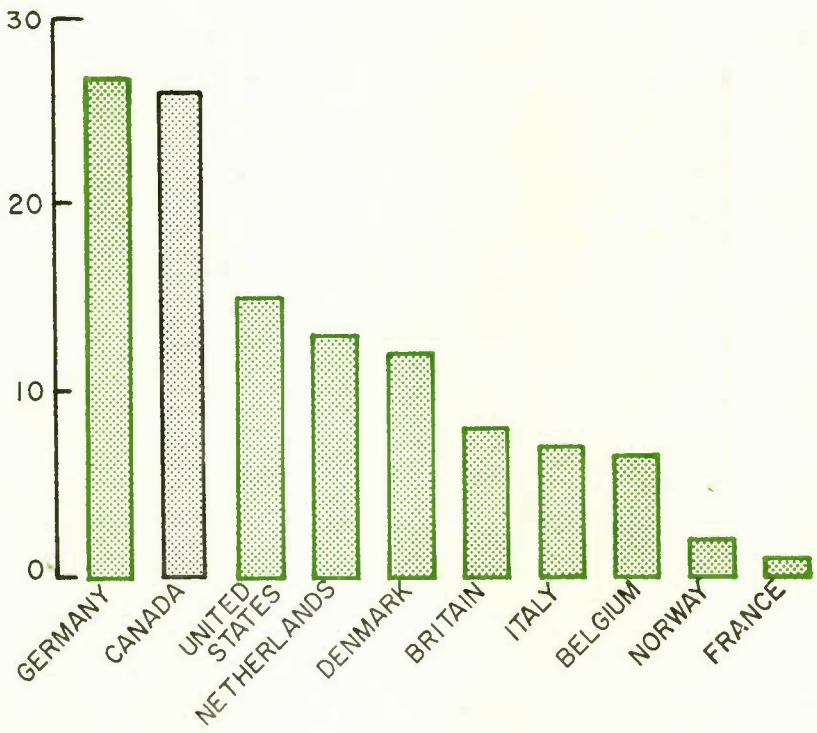
These summary figures allow for changes in both the *quantity* and *quality* of labour—changes in the number of people employed, in average hours of work, and in the educational attainments and the age-sex composition of the labour force.

Employment—As shown in Chart 2-3 the growth of employment over this period was larger in Canada than in any other country except Germany where there was a heavy influx of workers from other countries. In France and Norway employment increases contributed almost nothing to their growth in National Income.

CHART 2-3

INCREASES IN EMPLOYMENT, 1950-62

(TOTAL PERCENTAGE CHANGE)



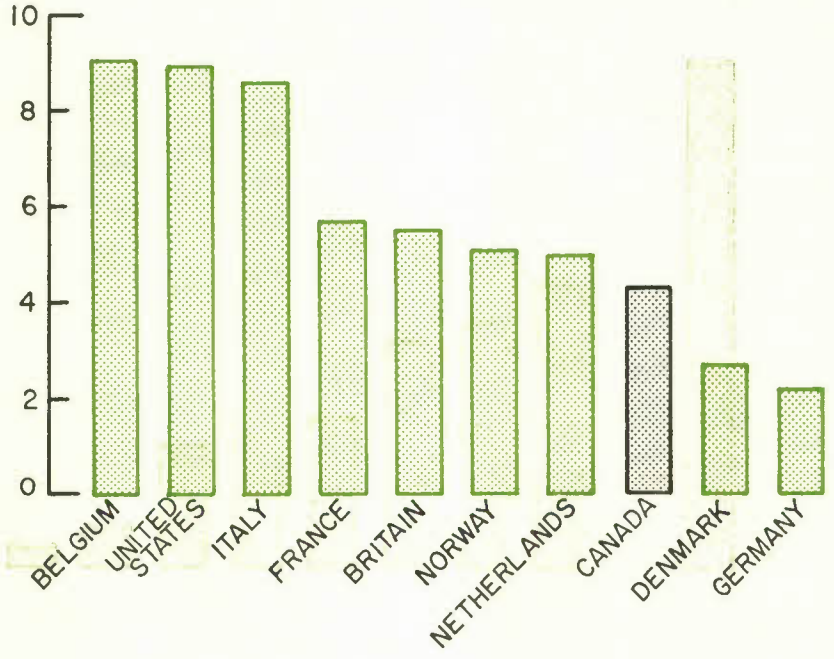
Education—Upgrading the quality of the labour force through rising levels of education also contributes to growth, since earnings tend to rise with increased education. In contrast to employment's large contribution to growth in Canada, this country had one of the smallest

gains in the quality of the labour force due to education of all the countries shown in Chart 2-4. Moreover, this advance was relatively small in spite of some "brain gain" from net immigration of skilled and professional manpower to Canada during this period, and in spite of a substantial increase in educational efforts and enrolment ratios in the latter part of the 1950's. The gains from education in Canada in 1950-62 were so small that they were offset by the effects of the changing age and sex composition of the labour force and of declining hours of work.

CHART 2-4

CHANGES IN QUALITY OF THE LABOUR FORCE DUE TO EDUCATION, 1950-62

(TOTAL PERCENTAGE CHANGE)



Note: The data in this Chart reflect both the tendency of earnings to rise with increased education, and the inceasing proportion of the labour force with higher levels of full-time, formal schooling.

Age-sex composition—In Canada, the proportion of experienced men in the labour force rose somewhat from 1950 to 1962. However, in both Canada and the United States, the change in women's participation in the labour force was far more striking: the proportion of women

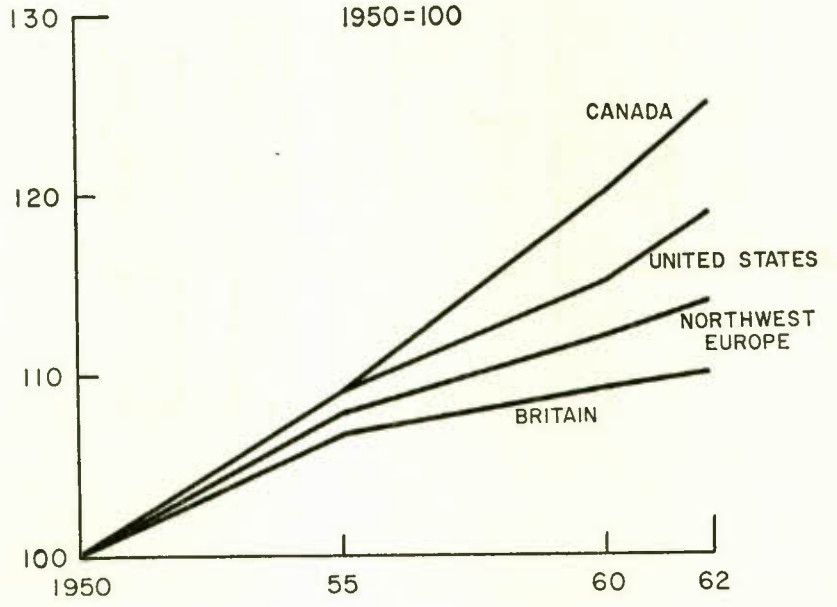
in the labour force rose much faster in North America than in Europe, where it had traditionally been higher. The increase in employment of women on this continent made a substantial contribution to the growth of total employment, output and incomes. But because of the lower average rates of female earnings, the contribution of this source of increased employment to the growth in incomes was not as great as a similar increase in male employment would have brought about.

Hours of work—The declines in average hours of work in all countries studied had little effect on the growth rates of National Income. Such declines as did occur reflect not merely shorter hours for full-time workers but also significant increases in the numbers of part-time workers, particularly women.

The combined effects of changes in all of these elements—employment, hours worked, education, and age-sex distribution—on labour input are brought together in Chart 2-5. The indexes in this Chart measure the growth of employment over the period 1950-62 *plus* changes in the quality of the labour force.

CHART 2-5

INDEXES OF LABOUR INPUT ADJUSTED FOR QUALITY, 1950-62



Capital Input

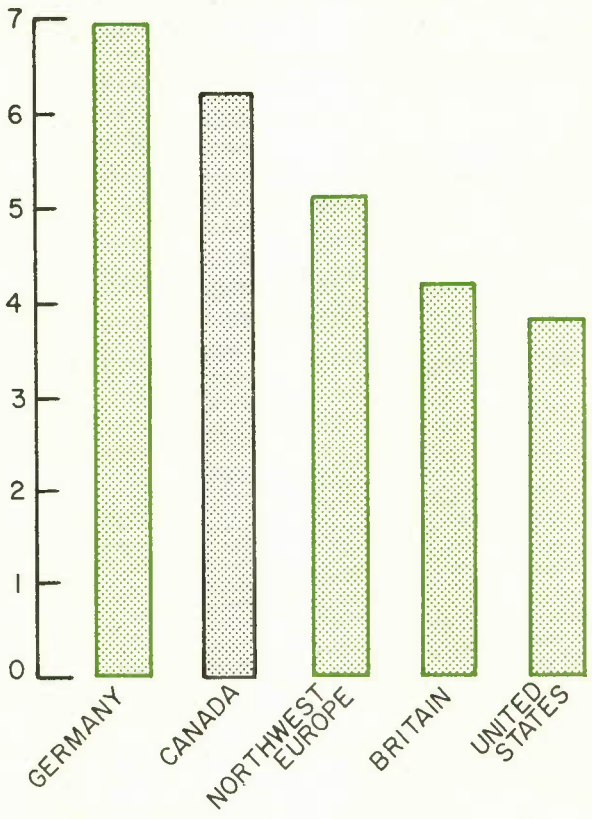
Increased inputs of capital accounted for a further 1.3 percentage points of Canada's 1950-62 growth per year in National Income (Table 2-1). In other words, some 34 per cent of this country's total growth of 3.8 per cent per year was due to this factor, compared with 25 per cent, 22 per cent, and 18 per cent for the United States, Britain and Northwest Europe, respectively. Table 2-1 distinguishes between two categories of capital—enterprise capital and residential capital.

Enterprise capital—This comprises investment by private as well as government-owned business enterprises (such as transportation enterprises and public utilities). By far the biggest element in this category

CHART 2-6

INCREASES IN CAPITAL STOCK, 1950-62

(AVERAGE ANNUAL PERCENTAGE CHANGE)



Note: Data relate to net fixed capital stock of business enterprises.

is investment in new structures and equipment. But it also takes account of inventories, non-residential land, and income payments on foreign investments. Investment by government departments and institutions is not included in the measure of capital inputs in this analysis for a variety of technical reasons. This does not, of course, imply that government investment is unproductive. Indeed, the growth of output in the business sector may be greatly dependent on public investment, such as investment in schools, roads, harbours, airports, and sewage systems.

Chart 2-6 compares the increase in net capital stock (which allows for depreciation) in Canada and other countries as a result of enterprise investment in structures and equipment.

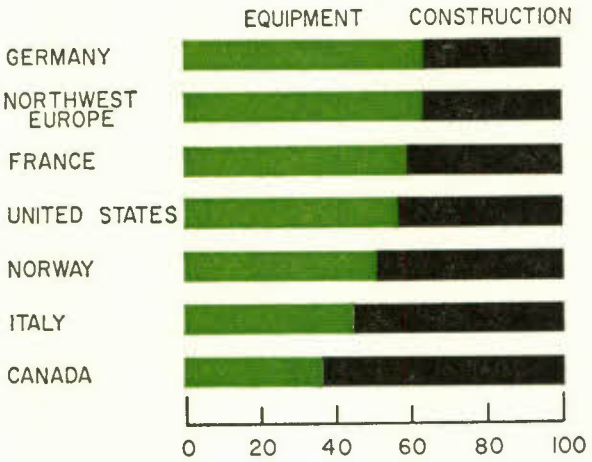
Canada's very high rate of increase—exceeded only by Germany's —may not be too surprising, considering not only that this country is one of the world's heaviest users of capital, but also that there was an investment boom in Canada in the 1950's. But why then did this massive increase in capital not result in a relatively faster rate of growth of National Income in Canada? Part of the answer may lie in the fact that in various other countries, where employment growth was less than in Canada, capital per employed person rose more rapidly. Another part of the answer may lie in what could be described as the composition of this investment, as indicated in Chart 2-7.

By comparison with the United States and European countries, Canada has an unusually construction-intensive economy. Among the factors contributing to this are climate, geography, and the somewhat greater relative importance of construction-intensive industries such as electric power and mining.[1] The analysis assumes that a dollar invested in construction has the same impact on total output as a dollar invested in machinery and equipment. However, to the extent that the latter may have a larger impact on productivity than the former, it may be that at least some of the difference in the growth performance of the Canadian economy can be attributed to this feature.

[1] On page 59 of the *Second Annual Review*, the Economic Council of Canada drew attention to a number of other factors which could contribute to the relatively heavy amount of capital per employed person in Canada. In manufacturing, for example, relatively short production runs in many product lines tend to lead to more capital overhead in relation to output and less intensive use of the facilities available. In many fields, production is subject to wider seasonal swings in Canada, with the result that more capital facilities may be needed to meet seasonal production peaks, but with lower production rates over a full year. In addition, the sparseness of population settlement outside the major urban concentrations of population clearly contribute to relatively heavier capital investment in transportation and communication facilities, as well as in various forms of social capital. Still another factor may be the build-up of large natural resource production capabilities in Canada, in anticipation of long-run future demand increases.

CHART 2-7

PERCENTAGE COMPOSITION OF TOTAL NON-RESIDENTIAL INVESTMENT



Note: Cumulative investment over the period 1948-63 based on U.S. prices in 1960.

Like the labour inputs, the contribution of capital inputs to growth can be calculated on the basis of their shares of National Income, which in this case accrue in such forms as profits, interest, dividends, and rent.

Some 80 per cent of the contribution of "enterprise capital" reflects the investment in structures and equipment, described above. The remainder captures the effect of the other items in that category—investment in inventories, and payments on foreign investments. These items will be discussed in detail in the Staff Study. Enterprise capital accounted for one percentage point or slightly more than one-quarter of Canada's annual growth in National Income from 1950 to 1962. By contrast, it accounted for only one-fifth of the British growth rate and less than one-fifth of the rates in the United States and Northwest Europe.

Residential capital—A house supplies a service over the life of its existence. In measuring National Income, a value is placed on this service which reflects the rent paid by tenants, as well as imputed rent—an estimate for the services received from owner-occupied dwell-

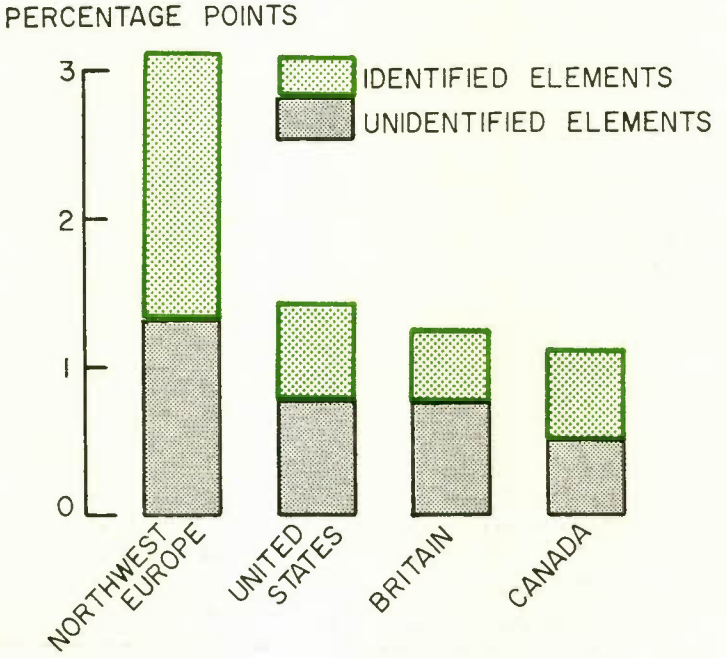
ings. Increases in the stock of dwellings contributed about one-third of a percentage point to Canada's total National Income growth (Table 2-1) over the period 1950-62. In other words, it accounted for about 8 per cent of total growth—about the same as in the United States, but considerably more than in Britain and Northwest Europe.

Land and Natural Resources

In Canada, land and natural resources are widely held to be important contributing factors in the country's economic growth and development. However, most of the economic growth and development associated with the use of land and natural resources has resulted in income payments to labour and to capital, rather than in rents, royalties and other payments to land as a factor of production. Thus in this analysis the measured contribution of land and resources to the growth of National Income is very small in all countries.

CHART 2-8

CONTRIBUTION OF FACTOR PRODUCTIVITY TO GROWTH OF REAL NATIONAL INCOME, 1950-62



Factor Productivity (Efficiency)

Factor productivity is a measure of the efficiency with which labour and capital are used in production of goods and services. Chart 2-8 shows that the contribution of factor productivity to the growth of National Income was lower in Canada in the period 1950-62 than in the United States and Britain and far lower than in the Northwest European countries as a group. Indeed, only 1.1 percentage points or less than 30 per cent of Canada's total growth rate of 3.8 per cent a year can be traced to this source. In Britain and the United States factor productivity contributed over 50 and 40 per cent respectively. The Northwest European average was 65 per cent but such countries as France, Italy and Norway derived almost three-quarters of their growth from this source.

But Chart 2-8 also brings out the fact that these startling differences are more easily cited than explained. Here this analysis comes up against its most difficult technical and conceptual problems. The elements that influence productivity growth are many and diverse, and it is still not possible at this stage to measure all of their impacts separately. Accordingly, Chart 2-8 breaks the components of factor productivity into two parts—the *identified* elements whose effects have

TABLE 2-2—CONTRIBUTION OF FACTOR PRODUCTIVITY AND ITS COMPONENTS TO GROWTH OF REAL NATIONAL INCOME, 1950-62

	Canada	United States	Northwest Europe	Britain
Average Annual Percentage Increase in Real National Income	3.8	3.3	4.8	2.3
		Percentage Points		
Contribution of:				
Total Factor Input	2.7	1.9	1.7	1.1
Factor Productivity	1.1	1.4	3.1	1.2
Effect of Demand Pressures	− .4	—	—	− .1
Effect of Weather on Farm Output	.1	—	—	—
Resource Shifts				
Out of agriculture	.5	.3	.5	.1
Out of self-employment	.1	—	.1	—
Economies of Scale				
Market size	.4	.3	.4	.2
Market concentration	.1	.1	.1	.1
Income effects	—	—	.5	.1
Other Identified Elements	− .2	− .1	.2	—
Total Identified Elements	.6	.6	1.8	.4
Unidentified Elements	.5	.8	1.3	.8

in fact been accounted for separately, and the *unidentified* elements, whose effects at present can be measured only residually as a group. These unidentified elements are in effect a measure of our ignorance.

Table 2-2 provides a more detailed presentation of the contribution to growth in real National Income made by the various components of factor productivity. As in Chart 2-8, a distinction is made between the identified components—demand pressures, the effect of weather on farm output, resource shifts and economies of scale—and the unidentified components.

Differences in Demand Pressures—It might easily be claimed that a major part of Canada's relatively poor growth performance in the 1950-62 period could be attributed to the fact that 1950 was a year of high levels of domestic business activity, while 1962 was a year of substantial economic slack. Calculations have therefore been made to assess the impact of this upon the rate of factor productivity growth over these 12 years as a whole. As shown in Table 2-2, the substantial lower level of demand in 1962 as compared to 1950 had the effect of reducing the over-all growth rate of factor productivity. It is estimated that, if 1962 had been a year of relatively high levels of domestic business activity, the average annual growth rate of factor productivity in Canada would have been 0.4 percentage points higher than actually occurred.

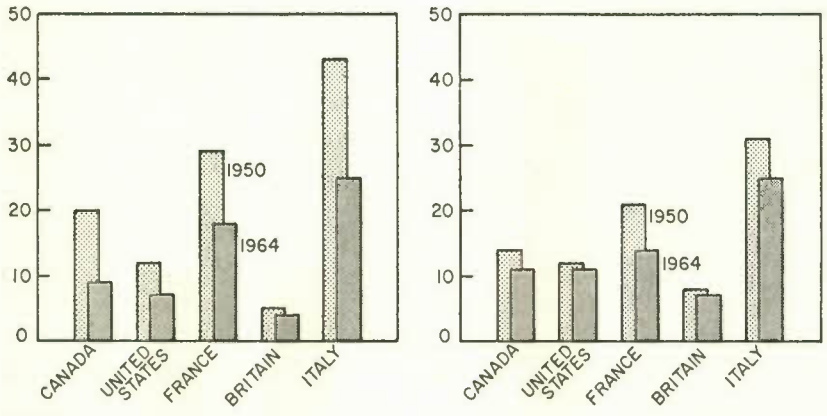
Effect of Weather on Farm Output—Variations in weather have significant effects on agricultural output and these are reflected in the measures of factor productivity. The effect of weather on crop yields was to produce yields that were somewhat below "normal" in 1950 and somewhat above "normal" in 1962. This is estimated to have raised the annual growth rate of factor productivity in Canada by 0.1 percentage points for the period 1950-62 as a whole.

Resource Shifts—As noted earlier, the analysis assumes that the addition to production made by any unit of input is reflected in its earnings. This implies, for example, a gain in efficiency when manpower shifts out of an industry of generally low earnings to one of higher earnings. Chart 2-9 illustrates two important shifts that promoted more rapid over-all productivity growth. The left side shows the substantial shift of manpower out of agriculture that occurred in Canada as well as France and Italy. The right-hand side of the Chart shows that such countries as France and Italy had a more marked shift out of self-employment—in the corner store, for example—than either Canada or the United States.

CHART 2-9

FARM EMPLOYMENT AS A PERCENTAGE OF TOTAL EMPLOYMENT

NONFARM SELF-EMPLOYMENT* AS A PERCENTAGE OF CIVILIAN NONFARM EMPLOYMENT



* Includes proprietors, self-employed professional people, and unpaid family workers.

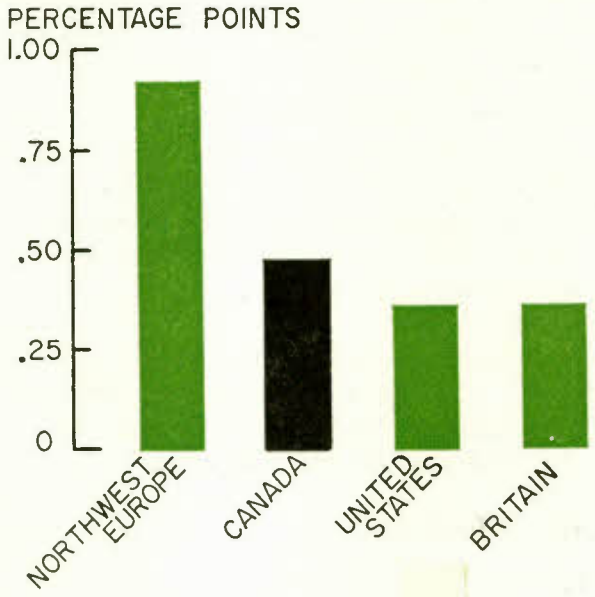
Differences between countries in the changes taking place over time in the nonagricultural structure of economies can also have effects on the differences in rates of growth of factor productivity. But such changes have not been examined in this analysis; however, they are not likely to have had substantial effects on productivity growth in a period of a dozen years.

Economies of Scale—The economies referred to here may be traced to several sources. Production may become more efficient as it expands in response to larger and wealthier markets, allowing the producer to increase the capacity of his plants and the length of his production runs. In addition, as markets become more concentrated through urbanization, certain economies may be achieved in distribution, including transportation and marketing costs.

These are the economies of scale reflected in Chart 2-10 and Table 2-2. The Northwest European countries derived a considerably greater advantage from this source than did Britain or North America. In Canada's case, the various economies of scale contributed about half of one percentage point or 13 per cent of the 3.8 per cent annual rate of growth of National Income over the 1950-62 period. The contributions of these elements were 21 per cent in Northwest Europe, 17 per cent in Britain, and 12 per cent in the United States.

CHART 2-10

CONTRIBUTION OF ECONOMIES OF SCALE TO GROWTH OF REAL NATIONAL INCOME, 1950-62



Northwest Europe's major advantage in this area can be traced to "income effects"; the very great expansion of incomes in Europe over this period, from a relatively low base, brought a corresponding increase in the purchase and production of such relatively high-priced goods as cars and appliances. This provided a basis for increasing economies of scale in certain European manufacturing industries that was not available to nearly the same extent in North America, where consumption of these goods was already at a high level.

In percentage-point terms, Canada gained the same as Northwest Europe from scale economies that can be traced to increases in the size and concentration of markets. This means of course that a higher *proportion* of Canada's total growth rate can be attributed to these two factors. In respect of market size, it would appear that this country's gains were concentrated in the domestic market, due mainly to population increase. In contrast, the expansion in European markets depended to a much larger extent on the growth of international markets, particularly as a result of the development of the Common Market and the European Free Trade Association.

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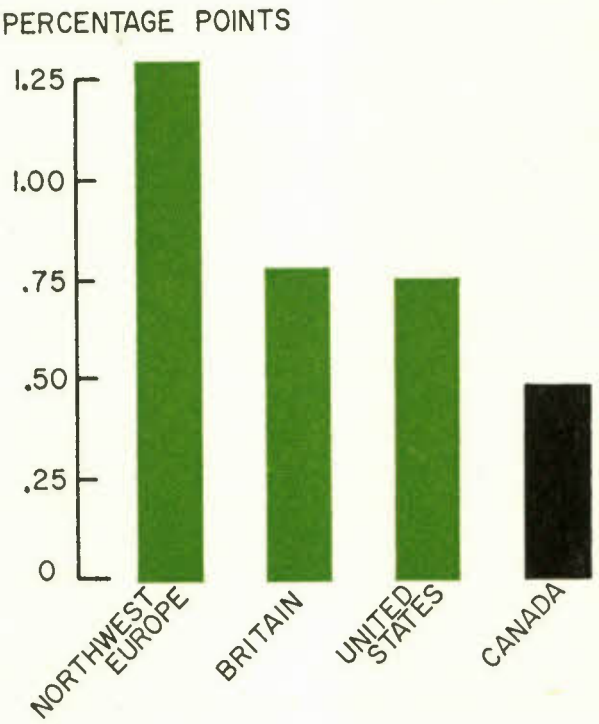
The relatively greater benefit gained in Canada from market concentration may be linked to this country's more rapid move towards practices of large-scale marketing, which had already become widespread in the United States by the early 1950's—practices illustrated by the automobile-based development of supermarkets and shopping centres. Such marketing methods can and do result in economies throughout the whole marketing system.

Unidentified Elements of Factor Productivity—The growth contribution of all those sources that have not so far been traced and measured separately is illustrated in Chart 2-11. Their combined effects can be very big. Indeed, in Northwest Europe they accounted for over one-quarter of total growth over the period 1950-62, compared with only one-eighth of Canada's growth.

CHART 2-11

CONTRIBUTION OF UNIDENTIFIED ELEMENTS OF FACTOR PRODUCTIVITY TO GROWTH OF REAL NATIONAL INCOME, 1950-62



This catch-all category includes many things that would bear on efficiency, such as some effects of lower trade barriers on scale and specialization; the impact of improved managerial skills on the organization of production; innovation, and new product and market development; the advance of knowledge and the speed with which new knowledge is effectively brought into use; the attitudes and efforts of both management and labour; and perhaps various noneconomic and institutional factors.

This residual category also includes some factors that affect the *quality* of manpower and capital—elements not yet measured separately, such as improved health, and some of the effect of more technologically advanced machinery and equipment.

Moreover, even if many of these factors could be measured separately, there would remain great difficulty in this type of analysis in accounting for all of the interactions among the many sources of growth. For example, how does the educational level of managers and employees affect the speed of applying new technology?

FUTURE PROSPECTS

By and large, an international perspective on growth source, such as this inquiry provides, is just as revealing for what it does not answer as for what it does. Most of the factors contributing to past European productivity growth are not of practical relevance for setting Canadian economic policies and planning.

The real value of this kind of analysis is that it amply demonstrates that there is no single or simple solution for improving growth performance; many elements are involved, and these have differed among countries and over time in their influence on the total growth rate—due partly to their different stages of economic development. This analysis, by illustrating these differences, directs attention towards some of the right questions for the future.

Where can Canadian economic policy be expected to operate with the greatest potential impact on economic growth and living standards? The analysis shows that in the 1950-62 period this country—in contrast to many other countries—relied for much of its growth on greatly increased *quantities* of labour and capital. It relied far less than some of the others on improvements in the *quality* of its work force. And it made only small gains in the *efficiency* with which these resources were used.

In calculating potential output in the *Fourth Annual Review*, the Council estimated that Canadian growth over the next decade would

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continue to rely very heavily on massive increases in the supply of labour, increases that will in fact exceed those in prospect for any of the other countries covered in this analysis. But this is largely a built-in increase, reflecting yesterday's birth rates.

Future changes in the *quantity* of capital inputs are not pre-determined to the same degree as labour. Policies may be altered to increase savings and investment. Canada's own experience shows, however, that even massive infusions of new capital do not by themselves have a very heavy impact on the over-all rate of economic growth. Nevertheless, it is extremely important to ensure that a large growth in non-residential investment goes hand in hand with the large growth in the labour force and that production processes be kept up to date through new investment. At the same time, Canada requires a large expansion in housing, especially in the light of the increasing rate of family formation.

The prospects for labour *quality* improvements are considerably brighter than in 1950-62. In particular, Canada can expect significant future gains in labour quality as a result of an increasing proportion of better-educated and better-trained people in the labour force. Well before the end of the period covered in this analysis, there was an accelerating expansion at the secondary school level. More recently, there has been a comparable acceleration at the post-secondary level. Both developments give Canada an important built-in element of future growth. However, the Council has previously emphasized the long "lead time" required before substantially increased *current* investment in formal education is reflected in a significant rise in the growth rate. This kind of investment, therefore, must remain high on the list of national priorities. But it also needs to be supplemented by measures to improve the quality of the existing labour force through increased assistance for on-the-job training or retraining programs.

Other factors affecting labour inputs in Canada will be far less significant in future economic growth. Although hours worked are expected to decline further in years ahead, a continuation of the post-war trend would mean that the rate of decline would be slower than in the past. The effect of prospective changes in the age and sex composition of the Canadian labour force will be largely offsetting: a higher proportion of experienced male workers will tend—on the basis of relative earnings—to counterbalance the expected increase in female participation rates.

The analysis has suggested also that certain elements of factor productivity may not contribute as much to Canadian growth in the

future as in the past. By the early 1960's, for example, Canada had achieved a redistribution of manpower resources—away from agriculture and self-employment—that gave us a pattern very close to the structure of the United States. By contrast with some of the European countries, notably France and Italy, which may still derive considerable mileage from such shifts, Canada's scope for further growth from this source is obviously more limited.

In the area of economies of scale, some of the opportunities for future gains may be smaller than in the past. For example, despite the continued rapid urbanization in prospect for Canada, further economies in the system of distribution, characterized by the supermarket and the automobile, may be more difficult and expensive to attain. The promise of electronic shopping in the so-called "cashless society" of the future is intriguing, but its impact and timing are difficult to assess in advance.

Thus there are compelling reasons to seek ways to improve growth performance in other areas. One of these is the area of the scale and specialization effects of expanding international markets, a subject discussed in the Council's *Fourth Annual Review,* and a field of potentially substantial productivity gains for many Canadian manufacturing industries. The opportunities for expanding international trade in manufactured goods have been increased by the results of the Kennedy Round of tariff negotiations. But there remain great opportunities for even further reductions in obstacles to international trade.

Other possible areas for improved performance encompass the very diverse elements whose contributions to growth have not been specifically identified in this analysis. Further research is vital to policy advances in this area—and the Council is seeking to make some contribution to the exploration of such subjects as the role of advancing science and technology, and the effects of management skills on productivity. A discussion of some important aspects of the former appears in the next Chapter, and Chapters 4 and 5 present a preliminary assessment of productivity performance within sectors of the Canadian economy. In our future work, we will also continue to develop a growing understanding about some of the reasons for the persistent disparity in productivity levels between Canada and the United States as a basis for reducing the lag in the growth of productivity and living standards in Canada.

3

Science, Technology and the Economy

SINCE THE start of the industrial revolution about 200 years ago, men have acquired a growing mastery over the techniques of producing goods and services. This process has been cumulative, it has been international in its ramifications, and in recent times it has accelerated. What it has basically involved has been the application of a growing stock of knowledge to the satisfaction of human wants. This knowledge has been of many kinds. One important part, for example, has been the economic, social and political knowledge necessary for the successful evolution of modern industrial states —knowledge of how to collect large pools of capital, organize modern banking systems, develop mass markets in which goods and services arrive when and where they are wanted, enlarge markets internationally, and provide legal and political systems that facilitate large-scale production and trade.

This Chapter, however, is mainly concerned with another highly important part of the stock of knowledge—the part we customarily define as scientific and technological.[1] The accelerating advance in this

[1] Except where there are specific references to the social sciences, the words "science" and "technology" are used in this Chapter to encompass the natural sciences and the branches of technology associated with them. For the purposes of this Chapter, also, "technology" and "science" may be considered simply as "know-*how*" and "know-*why*". A fuller discussion of the connotations of these words and of terms such as "applied research" and "development" has been included in the paper, ***Science, Technology and Innovation***, by Andrew H. Wilson, Special Study No. 8, Economic Council of Canada, Ottawa, Queen's Printer, 1968. This paper has three principal aims. The first is to present a short historical review of the growth of science and technology and their related activities. The second is to discuss some aspects of the innovation process. The third is to look ahead and to identify factors related to science, technology and innovation which will be important in the future development of Canada.

type of knowledge, incorporated into the economic process, has made a great contribution to raising living standards over the last two centuries.

It has been estimated that the stock of scientific and technological knowledge, measured in terms of scientific and technical manpower and publications, is now doubling about every 10 years and that 90 per cent of all of the scientists and engineers who have ever lived are alive today. Expenditures on research and development (R & D) in almost all western countries have been growing much faster than total national production. A wide profusion of new products, new processes, new services, and even great new industries has come into existence in the two decades since the end of the Second World War—plastics, jet aircraft, television, computers, and satellite communications, to mention only a few. About one-half of all of the items sold in department stores today were not available 20 years ago.

The discovery and transformation of knowledge into viable technologies has clearly made possible enormous gains in human welfare and living standards in the developed countries. The way in which advances in knowledge and in technology bear on the process of economic growth and on the rate of increase in productivity is becoming more widely recognized. Effects are transferred through the rising skills of the labour force, and the improvements which occur in the quality of capital equipment embodying advances in technology (increases in "quality" of the factors of production). They are also transferred through the increasingly efficient way in which the factors of production are used, combined, or organized, as discussed in Chapter 2.

The impact of scientific and technological innovation on the evolution of modern societies has generally been beneficial, contributing as it has to a growing abundance of goods and services, rising living standards, better health, increased leisure, and the elimination of many menial tasks. But to keep the record straight, and to suggest some important areas for consideration in relation to future "science policy", it is necessary to note also that scientific and technical knowledge and its application to productive processes have been achieved at a cost, some of which has been indirect and imperfectly foreseen. In addition to drawing directly on available resources, technological progress has created new socio-economic problems and enlarged the scale of old ones. Man's innovative capabilities in a technical sense have greatly outpaced his ability to make needed political, economic, social and institutional adjustments. We live in an era in which it is possible

to extinguish large sections of mankind in a single exchange of nuclear weapons. We face growing impairment and even destruction of the human environment, through air and water pollution, unplanned urban agglomerations, and the depletion of the countryside. We are confronted with a broad range of social questions reflecting the effects on human personality and behaviour of the tensions and frustrations associated with city living—especially where incomes are low, and housing is crowded and inadequate. Also, in the absence of effective policies and procedures for facilitating technological change, such change can have serious disruptive effects on the employment of individuals and groups of workers, and on the position of industries and firms whose processes or products are rendered obsolete by new developments. In short, science and technology have transformed human society in many ways—some clearly beneficial, some more equivocal in their impact, and some positively deleterious.

Science and technology can take on different aspects, depending on one's point of view. Seen from the inside—from the viewpoint of practising scientists and technologists—they may appear as an exciting adventure into the unknown, as a highly demanding intellectual discipline, as a particular sort of window on the universe, as a way of life. But from the outside, science and technology have more the aspect of something to be used—of a powerful set of tools for the solution of practical problems and the pursuit of political, economic and social goals.

Ultimately, it is up to society as a whole—in part through the market place, in part through the political process—to make its views felt regarding the nature and priority of its goals. The balance and distribution of the nation's scientific and technological effort will depend critically upon what goals are chosen and what importance society attaches to them. In this connection, modern societies have sought to use science and technology in the pursuit of a number of types of goals out of which five main classes can conveniently be distinguished: *economic* goals related to growth and competitiveness; *social* goals concerned with matters such as public health, education, and the broad range of social problems generated by technological change—goals which are closely interconnected with the goal of economic growth; *military* goals related to the nation's defence or survival, which at times have come to take precedence over all other goals, and which have sometimes served as a forcing house for scientific development; *prestige* goals, the achievement of which societies may regard as important to their political aims and objectives, but which

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may also overlap with goals of a military nature, e.g., the "space race"; and finally, the goal of knowledge for its own sake, as a *cultural* activity in which men work for the sheer joy of creation and understanding.

The economist does not have any particular competence to bring to bear on the setting of many of these goals, except perhaps in the rather negative sense of reminding society that, in a world of scarce resources, the allocation of resources to facilitate the achievement of some goals is likely to mean that fewer resources will be available for others. The main useful role of economic analysis is to do what it can to illuminate the costs and benefits, conceived in the broadest sense, of the various alternative courses that may be under consideration.

Out of a desire to improve the tools of science and technology and put them to more effective use in achieving national and international goals, much attention is now being focused on a more conscious and deliberate development of "science policy" in a number of countries. The term "science policy" does not in practice signify a monolithic problem-solving machine; rather, like the term "economic policy", it encompasses a wide range of policies which can be made more effective if their objects are clarified and their creation and use carried forward in a more co-ordinated and systematic way. To this end, new institutions have been set up and new procedures established to improve government decision-making in this area, to manage scientific and technological activities more effectively, and to develop, organize, and exploit scientific and technological knowledge in a more purposeful way. In Canada, a Science Secretariat and a Science Council have been established. Among the duties assigned to the Science Council is that of advising the Government on how best to use science in the solution of economic and social problems, and to give guidance on priorities in those areas of scientific and technological research that would contribute most effectively to the achievement of national goals.

To some extent, the attention focused on "science policy" springs from a desire for a more conscious and co-ordinated management of government operations in the "market" for scientific and technological resources. On the supply side of the market are the human and other resources necessary to the pursuit of scientific and technological activities, including teaching, research, and practical applications of technology in industry and elsewhere. On the demand side are the scientific and technological requirements of business, government, and institutions, including the educational system. By the amount and pattern of its own demands on the market, by the impact of its taxes

and expenditures on business demands, by the amount and quality of human resources which it enables the educational system to make available to the market, by its immigration policy, and generally by the way in which it influences attitudes to science and technology, government greatly affects the volume and character of scientific and technological activity carried on in the country.

The recent interest in "science policy" would seem to be a consequence of some of the new characteristics which scientific and technological development has assumed since the Second World War. Looking back over the 200 years since the beginning of the industrial revolution, one can distinguish three broad stages, not wholly separable or clear-cut, but useful for analytical purposes. In the first stage, technological development was characterized by the replacement of human and animal muscle power, and of the limited energy that was trapped from wind and falling water, with much more powerful and reliable sources of power provided by the steam engine. Steam power, and the technologies developed in the coal, iron and steel industries, laid the basis for the widespread use of machinery in factories, for the growth of urban industries, for the concentration of population in cities, for the opening up of new territories and the exploitation of new resources, and for the spread of railway and steamship lines which tied together these growing industrial complexes both at the national and international level. By the beginning of the present century, the "first" industrial revolution had become an accomplished fact in North America and the major countries of Western Europe.

Around 1900 there emerged a second phase in the technological revolution that drew upon new sources of energy and employed new technologies. This phase was marked by a rapid increase in the use of hydro-electric power, by the introduction of the internal combustion engine and associated developments in land, sea and air transportation, by the rise of the petroleum industry, the spread of communications, and the development of many new products and processes in the chemical and metallurgical industries.

But it is the third wave of technology—the wave that began at the end of the Second World War—that has created the need for a more conscious and co-ordinated "science policy". This new phase has involved the expenditure of large sums of money for research and development directed in a purposeful way to the discovery of new knowledge, and to systematically organizing and applying existing knowledge to achieve practical ends. It involves large-scale government support of science and technology, support which before the war

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was undertaken only on a very restricted scale. Compared with earlier times, it is, in the words of Lord Snow:

> ...far more deeply scientific, far quicker, and probably far more prodigious in its result. This change comes from the application of real science to industry, no longer hit and miss, no longer the ideas of odd 'inventors', but the real stuff....I believe the industrial society of electronics, atomic energy, automation, is in cardinal respects different in kind from any that has gone before, and will change the world much more. It is this transformation that, in my view, is entitled to the name of 'scientific revolution'.[1]

Science and technology have many aspects, including many economic aspects. Their contribution to economic growth has already been mentioned. In addition, influencing and managing science and technology in relation to broad national goals involves economic problems of choice and priority since resources (particularly the highly trained manpower required for science and technology) are limited. The support of science and technology competes with other claims on national resources, including some like education and training which can also contribute to economic growth and other goals. Then there are problems of choice between different areas of science and technology. Not all promising projects can be supported; there are bound to be disappointed claimants. The choice, whether in government or in a business firm, is often complicated by the difficulty of estimating long-term payoffs.

The main purpose of this Chapter is to relate science and technology to the various elements of economic growth and change, and to suggest some economic considerations likely to be helpful in the development of future Canadian "science policy". Decisions are already being made (or are in prospect) involving the commitment of very large sums of public funds, the allocation of scarce resources, and judgments respecting priorities. They should be taken in the light of the best possible assessments of all relevant costs and benefits. Although the prospective returns to particular investments in science and technology are in some cases very high, consideration must also be given to alternative uses of resources, including uses outside the field of science and technology.

Among other things, the Chapter will also describe some principal features of Canada's scientific and technological effort, and enquire whether, in the light of the accelerated rate at which scientific and technological knowledge is being accumulated, traditional methods of managing and transferring such knowledge continue to be adequate.

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[1] C. P. Snow, *The Two Cultures: And A Second Look*, Toronto, New American Library, 1967, pp. 33-34.

Only a limited number of basic issues in the field of science and technology are discussed here. This is a field in which extraordinarily rapid changes are taking place, in which much of the information required for a thoroughgoing analysis of many important questions is not yet available, and in which there lurk very difficult practical problems for decision-makers. We do not provide ready-made answers to these problems, but seek only to place them in a useful economic perspective.

One theme runs through this Chapter: the real contribution of science and technology to the economic and social goals of the modern society is to be found in the whole process of technological change. This process extends far beyond either the development and spread of knowledge or the undertaking of research and development activities, to innovation which comprises the whole range of decisions and actions required to put ideas and inventions to work. The term *innovation* is used here in a broad sense to mean not merely the first application of new technology but also the diffusion of existing technology. This basic emphasis on technological change and innovation affects the policy conclusions presented later.

SCIENCE, TECHNOLOGY AND ECONOMIC GROWTH

The Nature of Technological Change

Technology sets limits to what a country can produce at any given time with the land, labour and capital available to it. It also determines how production takes place. As the state of technology advances—either by drawing *existing knowledge* into use or by applying *new* technological knowledge—the production frontiers are extended.

Technological change, as defined here, includes not only new industrial applications and techniques for producing goods and services which flow from discoveries in the field of science, but also new applications and arrangements in the field of industrial organization and management. The central feature of technological change is that it is directed towards new and better ways of combining resources to satisfy human wants. This may involve the introduction of new processes or techniques of production which increase the amount of output in relation to resources employed (*productivity*). It may involve the introduction of a *new product* not previously available, such as television, or a *new service* not previously available, such as travel by jet aircraft or problem-solving by computers. It may involve improvements in the *quality* of existing products, such as the wearing capacity

of a tire, the performance characteristics of a radio, the output capacity of a generator, or the strength or durability of a metal alloy. It may involve the *displacement* of existing products with better or cheaper substitutes, as in the case of synthetic fibres which replace natural fibres, or plastics which replace metal, or automobiles which replace horse-drawn vehicles. Or it may simply involve a change in *design* which alters tastes and brings about a shift in the level or structure of demand. One point is clear, however. The effects of technological change are by no means confined to visible products. Its effects are more pervasive, affecting processes as well—processes which increase productivity, reduce costs, raise profitability, or improve quality.

Because of the great variety of ways in which technological change occurs, it is extraordinarily difficult to capture a precise sense of its quantitative importance. Not only does it affect the *growth* of the economy, but it is a central factor in the changing *structure* of the economy. The following section looks at certain features of technological change as it contributes to productivity growth.

Technological Advance and Growth

The preceding Chapter emphasizes three basic groups of elements in the advance in factor productivity (Table 2-2):

—resource shifts;
—economies of scale; and
—an "unidentified" category.

Technological change is intimately related to all three of these sources of growth. For example, the large shift of manpower out of agriculture and into sectors with higher levels of productivity has reflected, among other things, the effect of increased farm mechanization and improved yield technology (see Chapter 5)—a process which can be viewed as a part of total "technological advance". Similarly, increased economies of scale and specialization, which are substantially dependent on access to larger markets, are likely to depend also on the growth of technologies required to provide the efficiencies of scale production; alternatively, these technologies may already exist but only a wider market will make possible their full exploitation. In these circumstances, such a change may be viewed as a contribution to economic growth resulting from economies of scale, or it may be viewed as a contribution to economic growth resulting from the exploitation of technology. The latter view of the matter simply reflects a different approach which may, for some purposes, be more appropriate

for looking at the impact on the economy of technology-related factors. Some of the elements labeled as "unidentified" in the previous Chapter also are technology-related, including general advances in knowledge, changes in managerial and organizational systems, and some of the unmeasured quality improvements in labour and capital.

Thus technological change cuts across several elements in factor productivity. Such change is also fundamentally related to improvements in the quality of labour inputs, as reflected in the rising educational attainments of manpower. But, on the basis of existing information and analysis, precise measurements of the role of such a highly complex and interacting process have simply not been feasible. It is obviously desirable to develop and apply better information and techniques for measurement and assessment of the role of science and technology.

Technological Advance and International Trade

The contribution of technological progress to economic growth and rising productivity is reflected in recent patterns of world trade. In the *First Annual Review*, the Council noted that over the past several decades the fastest growing secondary industries in all the main industrial countries have been science-based industries, and their products have been the fastest growing element in world trade. Among the industrially advanced countries, the substantial reduction of trade barriers over the past two decades has provided a basis for rapidly expanding trade, especially in more sophisticated products. These developments have been reinforced both by the creation of regional free trade arrangements in Europe and by such special factors as the defence production-sharing and auto agreements between Canada and the United States. In particular, there has been a striking tendency for trade in certain highly research-oriented products, notably products emanating from the chemical, electronics, and transportation equipment industries, to expand faster than trade as a whole.

Recent studies suggest that the elements of comparative advantage that give a firm or a country a competitive edge in this type of trade are rather different from those that apply to trade in more traditional products. Natural resource endowments and access to heavy transport and large supplies of unskilled or moderately skilled industrial labour are in many cases relatively unimportant. Of much more significance are high-quality managerial, scientific, engineering and technical skills, and strong innovative capabilities. The United States is a prime example of a country that has developed major advantages in a num-

ber of high-skill, high-technology industries, and this has given rise to much concern among Europeans anxious that their countries should have a leading or close-to-leading position in at least some "industries of the future". Their concern looks essentially towards the future; over the recent past, as Table 3-1 suggests, the European export performance in some of the more "technological" product categories has been far from laggard.

What should be Canada's response to fast-growing world demands for high-technology products? Almost certainly it should *not* be to enter fields such as the manufacture of large jet airliners or supertankers where other countries have established major advantages. Rather, it should be, on the one hand, to support, in part by appropriate strengthening of technology, the great resource industries in which Canada already possesses substantial comparative advantages, and, on the other hand, to seize particular opportunities arising out of world demands for technological products—opportunities which happen to

TABLE 3-1—INCREASES IN COMMODITY EXPORTS, SELECTED COUNTRIES, 1952–66

(Average annual percentage change)

	From Six* Small Countries	From Five** Big Countries	From United States	From Canada
Chemicals	10.3	11.8	8.8	6.1
Transport Equipment				
Automotive	20.4	12.9	6.8	14.5
Aircraft	23.4	14.6	30.3	8.7
Other Transport	5.6	8.5	3.3	− 1.6
Machinery	12.4	11.3	15.4	10.8
Sub-total	11.6	11.6	11.7	10.5
Other Exports	6.9	8.0	2.1	4.5
Total Exports	8.1	9.5	5.0	5.5
Chemicals, Transport Equipment and Machinery as a Percentage of Total Exports:				
in 1952	19	37	20	13
in 1966	30	48	46	24

* Austria, Belgium, Denmark, Netherlands, Norway, Sweden.

**Britain, France, Germany, Italy, Japan.

SOURCE: Based on data, expressed in U.S. dollars: from United Nations and Organization for Economic Co-operation and Development.

suit reasonably well Canadian industrial capabilities. Canadian industry has established a good position in such "niches" as the world market for certain kinds of specialized aircraft. The fivefold growth in the value of exports of highly manufactured products—increasing their share from 9 per cent of total exports in 1961 to nearly 30 per cent in 1967—has been a marked feature of recent trade performance. Also, in recent years, many Canadian manufacturing industries have improved their capabilities for producing new and more advanced products in competition with imports.

To continue to play a dynamic role in rapidly expanding world trade in more sophisticated products, and to build successfully on recent achievements, close attention will be required to a number of matters, including the effective diffusion through Canadian secondary industry of the best available and relevant technology, both home-grown and imported. Increasing scale and specialization of production is also required, perhaps particularly through expanding international trade, along with continuing efforts to achieve productivity improvements.

FACTORS DETERMINING TECHNOLOGICAL ADVANCE

The importance of technological advance in economic growth, rising productivity, and international competitiveness points strongly to the need for a deeper understanding of the strategic elements that promote and contribute to technological progress and to many of the processes of change which are at the heart of economic growth. A number of these factors are examined in this section.

Research and Development

Systematic efforts to discover new knowledge and organize and exploit existing knowledge for practical ends are being greatly intensified throughout the world. Expenditures on research and development (R & D) are taking up an increasing share of the resources of the more industrially advanced countries.

Canada's total outlay for R & D in 1965 amounted to about $700 million, or 1.3 per cent of Gross National Product (Table 3-2). In 1968, such expenditures are likely to be around $1 billion. This is a relatively smaller R & D effort than that of many other advanced industrialized countries. In the United States, R & D accounted for 3.4 per cent of GNP (in 1963-64), and in Britain for 2.3 per cent of GNP (in 1964-65). It is estimated that, in 1968, the United States will spend about $26 billion (U.S. dollars) on R & D—more than twice as

TABLE 3-2—EXPENDITURE ON R & D BY SECTOR OF PERFORMANCE, SELECTED COUNTRIES

	Sector of Performance				Total, less Defence, Space and Atomic Energy	Total*
	Govt. and Private Non-profit	Industry	Higher Education	Total		
	(As a percentage of Gross National Product)					($ billion)
United States (1963–64)	0.7	2.3	0.4	3.4	1.3	22.7
Britain (1964–65)	0.6	1.5	0.2	2.3	1.4	2.3
Netherlands (1964)	0.5	1.1	0.4	1.9	1.8	0.4
France (1963)	0.6	0.8	0.2	1.6	0.9	1.4
Sweden (1964)	0.2	1.0	0.3	1.5	1.0	0.3
Japan (1963)	0.2	0.9	0.3	1.4	1.3	1.0
Germany (1964)	0.2	0.9	0.3	1.4	1.2	1.5
Canada (1965)	0.5	0.5	0.3	1.3	1.0	0.7
Belgium (1963)	0.1	0.7	0.2	1.0	1.0	0.1
Norway (1963)	0.2	0.4	0.2	0.7	0.6	—

* These crude statistical comparisons are in Canadian dollars and take no account of differences in research "costs" in the various countries.

SOURCE: Based on data from Organization for Economic Co-operation and Development; Department of Industry; and estimates by Economic Council of Canada.

much as the total combined outlays on R & D of all of the other countries shown in Table 3-2. Of the $26 billion, $17 billion will be provided by the U.S. government. The scientific and technological pre-eminence of the United States is in large part traceable to the enormous amounts of government money that have flowed into science and technology over the past 20 years. Although much of this money was channeled into defence, space and nuclear research, where there has not always been a direct commercial application, the broad effect has been to create a strong and vigorous scientific community.

Such international comparisons of R & D data need to be considered in the light of associated political, historical, social and economic factors. The comparisons, by themselves, can say little about the appropriateness of the levels and ratios, and they tell us nothing at all about the quality of the work that was actually done.[1]

In Canada, subsidiaries of large foreign companies have varying degrees of access, frequently at little or no cost, to R & D results produced by parent companies. Thus measurements of Canada's industrial R & D effort in relation to GNP are not representative of Canada's total industrial use of technology. In addition, the large

[1] For an elaboration of this point, see Andrew H. Wilson, Special Study No. 8, pp. 60-64.

proportion of R & D performed by industry in the United States partly reflects the policy of the U.S. government to contract out much of the R & D which it wants done. Canada's goods-producing industries are more heavily oriented towards primary and processing industries, handling the products of agriculture, forestry, mining and fishing, than is the case in most other industrial countries. Private research in many of these areas tends to be low in relation to research in such other industries as chemicals, electronics and aircraft. But government frequently plays a significant role in research relating to the primary industries.

Innovation

While R & D is concerned essentially with invention—with the conception of an idea, and the initial development of the idea—innovation is concerned with the crucial role of entrepreneurial decision-making and risk-taking in the "follow-through" process, which involves the coupling of the initial idea or the results of R & D with engineering, design, financing, tooling-up, production and marketing. *Thus R & D by itself may add nothing to economic growth. It is the innovation process—beginning when management decides to move from R & D into engineering, design and all of the succeeding stages —which brings new products, processes and services into use, and which contributes to growth.* A recent U.S. study sets out some "rule of thumb" figures for the distribution of costs in the successful development of certain products in that country:[1]

Research—Advanced Development—Basic Invention ..	5-10 per cent
Engineering and Designing the Product	10-20 per cent
Tooling—Manufacturing Engineering (Getting Ready for Manufacture)	40-60 per cent
Manufacturing Start-Up Expenses	5-15 per cent
Marketing Start-Up Expenses	10-25 per cent

If innovative activity is to be stimulated and encouraged, both public and private efforts must be directed over a much broader range of effort than R & D. There is danger that policy-makers will concentrate on support of R & D, leaving the rest of the process to take care of itself. As the U.S. study points out:

> We need also to bear in mind that the path between an invention (or idea) and the market place is a hazardous venture, replete with

[1] These figures are based on the personal knowledge and experience of an *ad hoc* panel on invention and innovation set up by the Secretary of Commerce of the United States. See *Technological Innovation: Its Environment and Management*, Washington, U.S. Government Printing Office, 1967, p. 9.

> obstacles and substantial risks. It is ordinarily a very costly, time-consuming, and difficult task that the innovator faces.[1]

In recent OECD work on the "technological gap" between the United States and Europe, basic scientific capabilities in Europe as measured by the capacity to make new discoveries are not considered to be inferior to the United States—although the amount of R & D undertaken is much less. Where the United States appears to have a large edge is in the ability to integrate R & D activity with the total innovative process—to effectively move beyond R & D to financing, production, marketing, sales and service. In the view of the OECD, this reflects in very large part the superiority of U.S. *management* in following through at every stage of the innovation process.

Little information is available on the process of innovation in Canada, and our knowledge of the factors or conditions that encourage and stimulate innovative activity is limited. In the United States, it has been suggested that a number of environmental factors may have greatly facilitated successful innovations and the creation of new technological enterprises. Among these have been:

—venture capital sources that are "at home" with technologically oriented innovators and have the rare business appraisal capabilities necessary to diagnose the prospects of translating a technical idea into a profitable business;

—technologically oriented universities located in an area with a business climate that encourages staff, faculty, and students to study and generate technological ventures;

—entrepreneurs who have been influenced by examples of successful entrepreneurship;

—close, frequent consultations among technical people, entrepeneurs, universities, venture capital sources, and others essential to the innovative process.[2]

In addition, innovative activity in the United States is not handicapped by the existence of a small domestic market—a situation which in Canada makes it difficult to achieve economies of scale and specialization.

Finally, innovative activity is not necessarily dependent on a country's original R & D effort for its supply of ideas, techniques, products and processes. Canada produces only a relatively small part of the R & D results actually used in Canadian industry. Successful innova-

[1] *Technological Innovation,* p. 8.
[2] *Technological Innovation,* p. 14.

tions are widely dependent on the incorporation of techniques, products, and processes developed through R & D in other countries. These results may be acquired in many ways—for example, by licensing, in some cases by copying, and particularly in Canada's case by a direct flow of R & D results as well as fully developed technologies to subsidiaries from parent companies outside the country. In most cases, however, a process of innovation is required—a process which is sometimes difficult, and frequently risky.

The Role of Management

In the context of the industrial development of the Canadian economy, the recognition of new technological opportunities, and the organization of the processes required to bring them to the market, are functions of management. So also is the adoption of "best-practice" techniques. No amount of scientific excellence or increased expenditure for R & D will improve economic performance if management is unskilled in these tasks. The management of innovation and technological change requires a willingness to assume risks, along with creative imagination, entrepreneurial drive, and organizational skills of a high order.

The formal educational attainments of people in the owner-manager group appear to be, on average, lower in Canada than in the United States, with the gap wider for this group than for almost all other categories of the Canadian labour force. Canada appears to be particularly far behind the United States in the relative scale of resources devoted to the field of university business education, and university research in this area.

At the first-degree level, U.S. universities have recently been graduating about four times the number of business administration and commerce students produced in Canada per thousand of population. For all disciplines, the number of first degrees being produced in the United States is proportionately about one-and-a-half times that in Canada. It has been estimated that at the graduate level for the Master of Business Administration degree, the ratio has been seven to one over recent years. Moreover, there have been only two doctorates granted from a Canadian university in business administration up to the fall of 1968, compared with a flow in the United States of more than 350 doctorate degrees per year over recent years.

It should of course be recognized that the gaps between the two countries in the *stock* of the more highly educated people in this field are not so wide, since many Canadians take postgraduate degrees in

the United States and return to Canada, and since there is also migration of such people from the United States and elsewhere to Canada. But we believe that the total resources devoted to university business education and related research in this field have been woefully inadequate in Canada, and that this is a field which requires considerable strengthening in a way that meets Canadian business requirements.

How close the links may be between the amount of formal education and management performance is open to question. In appraising the capabilities of management, other factors must also be considered. The Economic Council now is examining the training and development practices of Canadian management, the approach taken to management, and certain other factors that may bear on management performance. In addition, the Council is co-operating in another current study on the status of business education in Canada.[1]

The Supply of Qualified Manpower

New knowledge must exist in the minds of men before it can be embodied in new skills, new machinery, new products and new processes. In order to maintain a high potential for technological change, Canada must have an adequate supply of scientific and technical manpower to serve as a basic source of invention and innovation.

The proportion of university graduates in the labour force in Canada in 1965 was less than half that of the United States—5.4 per cent compared with 11.6 per cent. In the case of qualified scientists and engineers, Canada is also behind the United States, although precise estimates are not available. On the basis of the much more rapid rate of increase of university enrolment in Canada than in the United States through to at least the mid-1970's, Canada may now well experience a relatively more rapid rate of growth of qualified scientists and engineers over the medium-term future. Also, this development will greatly accelerate the rate of growth of such professional manpower in Canada as compared with the average rate of growth since the end of the Second World War.

There is, however, a lack of adequate data on the total available supply of qualified scientists and engineers, their distribution in R & D activity, teaching, production, and management, and the flow of qualified scientists and engineers into and out of the country. The Department of Manpower and Immigration is now filling some of these data gaps. The Science Council has recently looked into a num-

[1] This study "University Business Education in Canada" is being conducted by M. von Zur-Muehlen.

ber of aspects of Canada's manpower trends in this area, and its views are expected to be presented in a forthcoming publication.

The Management and Diffusion of Knowledge

The amount of scientific and technological knowledge is now increasing at a tremendous rate. Getting such knowledge to those who can use it has become a major problem. Are traditional methods of managing and transferring this new knowledge any longer adequate? Where new methods are being used, is adaptation taking place fast enough to cope with the vastly enlarged scale of the problem? The benefits of research undertaken in Canada and in other countries will not be fully realized, and may even be totally lost, unless means for its effective transfer are available. There is a very large economic stake in these matters, for the spread of knowledge is a diffuse process which reaches deeply into every area of economic life, affecting the skills of the labour force, the efficiency of plant and equipment, the capabilities of management, and the quality of the institutional framework which serves society.

The transfer and diffusion of technological knowledge is a complex process. It takes place through many routes and channels—parent-subsidiary relationships, licensing arrangements, scientific and technical articles published throughout the world, special technical services such as those provided by the National Research Council (e.g., the National Science Library and the Technical Information Service), publications of various government departments and agencies, efforts by industry to monitor and screen new technological developments, travel and person-to-person contact, and in other ways. There is no simple way to ensure that the "right" knowledge always arrives at the right place at the right time—that there is a perfect matching of new technological and engineering knowledge with potentially exploitable opportunities. But there would appear to be great possibilities for improving the diffusion and "matching" process.

The Science Secretariat, with the endorsement of the Science Council, has under way a major study that will examine present scientific and technical information services in Canada, assess future requirements, and appraise existing mechanisms for the international exchange of scientific and technical information. We strongly support these initiatives. We believe, in particular, that there is a need to get information to the many thousands of small business firms who are not well equipped to keep in touch with new ideas and new technological developments. Even the larger business firms—those who are much

better able to take care of their own information and technology transfer needs—are now facing situations in which it is extremely difficult to keep abreast of all of the new technological developments relevant to their particular operations. But as a Council study points out:

> The problems of communicating with so many companies, of identifying their needs and interests, of broadening their technical literacy and capacity, and of providing training in the use of public search and research facilities are formidable. One danger that pervades all information systems is that the designers may pay too much attention to the problems of disseminating larger and larger volumes of information and not enough to considering how these volumes might be reduced by effective prior appraisal.[1]

THE PROBLEM OF RESOURCE ALLOCATION

Investment in Scientific and Technological Activities

As noted above, science and technology can provide a powerful set of tools for solving practical problems and for facilitating the achievement of economic and social goals. But it must be remembered that there are many other claims on our limited productive resources —some related to growth, some not so related. This raises fundamental questions about the allocation of resources to science and technology. Moreover, simply increasing the total amount of resources going into scientific activity provides no easy or certain means for raising a country's standard of living or facilitating the achievement of other national economic and social goals.

Initial rates of return on certain lines of scientific effort may in some cases be extraordinarily high. But a point is eventually reached where the rate of return yielded by additional inputs of resources into science is no greater than that offered by other uses of resources—uses that are not primarily scientific in character. Unfortunately, because of uncertainty in estimating the longer-term benefits from science, it is not possible to say with any precision just when a nation's total scientific effort has reached its optimal point of expansion—its ideal share of the national income. (Private business firms face a similar problem in determining how much of their resources to allocate to scientific and technological activity.) But this is no reason for throwing all attempts at systematic estimation to the winds and proceeding entirely on the basis of enthusiastic guesswork. Rather, it points to the necessity for close study of past experience, both in Canada and

[1] Andrew H. Wilson, Special Study No. 8, pp. 95-96.

abroad, and the gradual development of improved information and forecasting and cost-benefit techniques to support decision-making in this highly important field.[1]

Apart from the question of what *level* of scientific effort to aim for, there is the question of how this effort is to be *structured.* Qualified scientists and engineers represent a scarce and very special type of human resource. At least to some extent, alternative employment opportunities can be developed for such people—for example, in basic research, applied research and development, production, engineering, management or teaching. Thus, the social cost of using a scientist in, say, R & D activity is the "loss" of what he might have produced in some alternative employment. And this "loss" may be greater under certain conditions—for example, where there is a great shortage of teachers—than the gain from his employment on R & D.

Equally difficult questions arise concerning the *areas* of scientific and technological activities on which a country should concentrate in order to most effectively promote its economic and social goals. Since no country can expect to fully cover—let alone be on the frontiers of—the entire spectrum of activities, there are difficult questions of choice to be made here. Again, there are few guidelines to show the way. While it is unlikely that the resources devoted to any branch of science will be totally wasted, this is not the question at issue. The real question is "Where do you assign resources to get the *maximum* payoff?".

This question of efficient resource allocation is one of the basic issues recognized by the Science Council at the outset of its work:

> ... the allocation of resources that is best for Canada may be substantially divergent from the patterns that are evolving in other countries.... Decisions will have to be made on the best information available, and we shall have to proceed by successive approximations...[2]

While many of the issues and much of the larger framework within which science policy has to be viewed are economic in nature, we are under no illusions as to the difficulties which these questions pose. It is significant that the United States, which has achieved world leadership in many branches of science and technology and which has devoted large efforts to the development of a "science of science", has yet to establish over-all guidelines and criteria to be used as a systematic basis for determining the most appropriate level and allocation of its

[1] A number of university groups in Europe and the United States have undertaken work of this kind. Similarly, attempts are being made to develop techniques designed to improve business decision-making in this complex field.

[2] *First Annual Report,* 1966-67, Science Council of Canada, Ottawa, Queen's Printer, June 1967, p. 15.

scientific resources. But more of the right questions are at least beginning to be asked, notably in Congress where the increasingly expert work of a number of committees has done much to define and clarify these issues. This also appears to be developing in Canada, not only in the work of the Science Council but also in the recent hearings of the Senate Special Committee on Science Policy. These are very promising beginnings. We urge that these questions continue to be given growing attention.

The Need to Promote an Indigenous Effort

There are many reasons why a country such as Canada should develop and maintain a capacity for indigenous effort in the field of science and technology. Some degree of scientific excellence is necessary to create the environment favourable for training, attracting and retaining highly qualified scientific and technical manpower. Indigenous effort is also needed to acquire and maintain the knowledge and experience that is essential for keeping informed of technological advances elsewhere, for assessing the value and worth of technology that may be imported, and for deriving the advantages that can flow from "learning by doing". In some fields, such effort is required for effective adaptation of science and technology from abroad to particular Canadian situations, as well as to develop new ideas and inventions relevant to special needs and problems in Canada. In addition, it has been claimed that there may be a variety of situations in which it would be cheaper, especially in the longer run, to undertake a project "in house" and from scratch rather than to seek out and adapt information which may already exist elsewhere.

Thus even though Canada must, appropriately, continue to rely very heavily on the importation and adaptation of science and technology developed throughout the world, the considerable existing indigenous effort in this field in Canada must be maintained and strengthened.

Government Support of Research and Development

The case for government support of R & D rests primarily on the belief that if the market is left to itself, less R & D activity will occur than would be socially desirable. This is because, in many cases, the social gains from investment in research and development may exceed considerably the returns that can be captured by a single person or firm. Also, certain kinds of fruitful research and development have to be undertaken on a scale too large to be contemplated by an individual economic unit. A striking example is the work of the federal

Department of Agriculture's research institutes and experimental farms which, together with government-supported work in universities, has yielded large economic benefits. The technological advances that have occurred in agriculture over a few decades were a major factor in the shift of labour out of agriculture into other sectors of the economy, a shift which has radically transformed the structure of the economy (see Chapter 4). Many factors have, of course, been involved, including more intensive use of highly efficient types of farm machinery introduced as a result of R & D and innovative efforts in the private sector. But a very important element has been better-yield technologies flowing from R & D activities of the government's Experimental Farms Service (see Chapter 5). No individual farmer could have carried out any significant part of the research and development which has gone into these programs.

There is reason to believe that in other sectors, too, the amount of R & D would fall well short of a socially desirable level if left to private initiatives. The Council of Economic Advisers in the United States has noted that:

> Several factors can be identified to account for the underinvestment in research and development on the part of private firms in such industries. The primary one is an inability of the individual firm to recover the costs of research in its prices, even though the additional value to the direct consumers of the product would greatly exceed those costs. Particularly in the case of basic research, the 'product' is new knowledge; but scientific knowledge cannot be appropriated by an individual firm. Other firms and even other industries—which have not incurred the research costs—share the benefits. As a new development moves further along the research and development spectrum toward actual production, an individual firm may be able, through the patent system, to appropriate to itself rewards sufficient to justify the costs and risks of developing and introducing the new process or new product. The clearest case for public support thus applies to the more basic forms of research. This case is reinforced by greater riskiness at this early end of the R & D spectrum. Ordinarily, at least, uncertainty decreases as a new process or product approaches specific economic application. Indeed, the research cycle can usefully be viewed as a process of progressive reduction of uncertainty as more knowledge is acquired.[1]

These arguments suggest the need for a measure of government support to some R & D activity. This support can take a number of forms, and the choice of appropriate forms is a major policy question. In some instances, government support (e.g., support in the form of major procurement contracts) may in practice extend beyond R & D to later stages of the innovative process.

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[1] *Annual Report of the Council of Economic Advisers*, Washington, U.S. Government Printing Office, January 1964, pp. 105-106.

THE STRUCTURE OF CANADA'S RESEARCH AND DEVELOPMENT EFFORT

Research and development activity may be broken down into basic research, applied research, and development. In practice, these distinctions are growing increasingly blurred, but the available figures indicate that in Canada about one-fifth of the total R & D effort is for basic research, compared with one-eighth in the United States. This difference reflects primarily the fact that in the United States a very much higher proportion of the R & D effort is concentrated in the military and space fields where the basic research component is relatively low, and where the applied research and development component is relatively high. However, in both Canada and the United States by far the greater part of R & D activity is of the applied type (including development), aimed at specific practical objectives.

Typically in Canada and the United States, much of the basic research has been carried out in the universities, although the Canadian effort is also heavily concentrated in government laboratories. Despite the relatively small share of the total R & D effort flowing into basic research in the two countries, this component is a vital part of the educational system and is crucially important for the training and education of future scientists and potential "innovators".

In terms of sources of funds, one-half of the nearly $700 million spent for R & D in Canada in 1965 was provided by government (Table 3-3) and, of this, about 70 per cent was spent by government

TABLE 3-3—EXPENDITURE ON R & D BY SECTOR OF PERFORMANCE AND BY SOURCE OF FUNDS, 1965

	Sector of Performance				
	Government	Industry	Higher Education	Private Nonprofit	Total
	(Millions of dollars)				
Source of Funds					
Government	242	50	57	3	351
Industry	1	208	3	—	213
Higher Education	—	—	71	—	71
Private Nonprofit	1	—	9	4	14
Foreign*	—	26	6	1	33
Total	244	284	146	8	682

*Foreign sources of funds include all foreign bodies outside national territory and any international organizations within national territory.

SOURCE: Based on data from Department of Industry.

itself (or its agencies) in carrying out R & D activity. Industry received $50 million in government funds in support of its R & D activities.

As was apparent in Table 3-2, only about 40 per cent of all R & D undertaken in Canada is carried out by industry, compared with about 70 per cent in the United States and Britain. Much of the R & D performed by industry in the latter two countries is for defence, space, and atomic energy applications. These applications give rise to a flow of commercial benefits, but the size and significance of that flow are difficult to judge.

TABLE 3-4—PERCENTAGE DISTRIBUTION OF R & D PERFORMED BY INDUSTRY, CANADA AND THE UNITED STATES

	Canada 1965	United States 1964
Capital Goods and Chemicals		
Machinery	3	8
Transportation equipment	20	47
Electrical products	22	20
Chemicals	14	9
Petroleum	8	2
Sub-total	67	86
Basic Materials		
Rubber	1	1
Paper	9	1
Primary metals	7	1
Metal products	1	1
Nonmetallic products	1	1
Sub-total	19	5
Consumer Goods and Miscellaneous		
Food	2	1
Wood and furniture	—	—
Other manufacturing	6	5
Sub-total	8	6
Total Manufacturing	94	97
Total Nonmanufacturing	6	3
All Industries	100	100

SOURCE: Based on data from Department of Industry.

Industrial research and development in Canada, the United States and most other industrial countries tends to be heavily concentrated in three sectors—chemicals, electrical products, and transportation (particularly aerospace) equipment. Within these broad industrial groupings there is a substantial variation in research intensity. Technology is also very often transferred from its industry of origin to other industries. For example, new chemical fibres have "invaded" textiles and transformed the nature of that industry.

Table 3-4 provides a view of the structure of R & D performed by industry in Canada and the United States. The dominance of chemicals, electrical products, and transportation equipment in both countries is readily apparent. The significant difference between the two countries, however, is the much larger Canadian proportion of R & D in resource-based industries.

Industrial R & D is a heavily concentrated activity; only about 800 Canadian companies reported R & D expenditures for 1965, and it would appear that fewer than 20 companies performed half of the work done in industry. The history of invention suggests that, despite this concentration in a few companies with large programs, many small firms as well as individuals produce important creative ideas and new inventions. The major commercial exploitations of these ideas, however, are often undertaken by larger firms. Among the reasons for this are the frequent necessity to have access to large amounts of capital, the possible need for an organizational structure in which several scientific disciplines can be brought together in a single group project, and the need for a management system able to deal with production, marketing, sales and servicing requirements.

THE SOCIAL SCIENCES

Social problems now constitute an increasing challenge to our society, in large part because advancing science and technology are greatly outpacing our efforts and abilities to make the necessary adjustments in attitudes, values, and social institutions. In other words, it has become unmistakably clear that our social and political mechanisms are not adjusting effectively to the rapidly changing conditions of life in the modern technological society. We are not developing adequate efforts and knowledge to cope satisfactorily with a broad range of social, political, economic and cultural problems—for example, problems such as growing urbanization, pollution of our environment, housing, and the conditions of life in the big city. The results are reflected in institutional structures that resist or cannot adapt to

change—in some tendencies towards the impoverishment of life and social maladjustment, including the creation of tensions and frustrations which contribute to the incidence of crime, violence, delinquency, mental disorder, and family breakdown.

The ways in which science and technology interact with the processes of social change are not well understood. Many of these processes require much deeper study by social scientists (including sociologists, economists, psychologists, political scientists, demographers and social anthropologists).

Yet the social sciences—that body of knowledge concerned with the behaviour of man in society and the structure and mechanisms of social institutions—remain relatively underdeveloped in Canada. The support given to research in the social sciences in Canada has been totally inadequate. It represents only a small fraction of the support for the natural sciences; it is smaller in relation to population and total income in Canada than in the United States and various other modern societies; and it is miniscule in relation to the social problems that now confront us.

We therefore recommend that there should be a substantial strengthening of social science research capabilities in Canada, including an enlargement and broadening of the support available for such research.

Moreover, a great many of our society's most perplexing problems require extensive co-operation between the social sciences and the natural sciences—and indeed the humanities as well—if appropriate and effective solutions are to be found. We therefore hope that in the future, social and natural scientists will work increasingly together so that "there may grow alongside innovation and change the ability to anticipate and to plan ahead the resolution of the human problems associated with it".[1] And in this context, we believe it is essential that any "policy for science" in Canada should be broadly enough conceived that it can encompass an appropriate development of the social sciences and humanities along with the natural sciences.

POLICY CONCLUSIONS

A blend of many different efforts and policies will be required to develop and harness the resources of science and technology to the fullest possible extent. There is no simple policy prescription; it will

[1] Lord Jackson of Burnley, "Science, Technology and Society", *New Scientist*, London, England, August 31, 1967, p. 429.

be necessary to move forward simultaneously on a variety of fronts, both private and public.

What is required is the development of a coherent strategy which co-ordinates and blends the scientific, technological and innovative capabilities of government, the scientific community, the business sector, and the universities. This strategy should be designed to improve the country's technological and innovative capacity with a view to raising productivity, improving competitiveness, increasing the standards of living of the Canadian people, and generating growing resources for enhancing the human environment and raising the quality of life.

In the light of the various considerations examined in the Chapter, we suggest that increased attention is required to the following needs.

Strengthening Management

In our view, no task may be more important for improving Canada's innovative performance than to strengthen the capabilities of Canadian management to understand and manage technological change and the innovative process.

There are many routes to this end. One of the most rewarding is likely to be improvement in management education and training, both through strengthening university business education in Canada, and through facilitating Canadian management training on a continuing basis. Along with this there should be an expansion of university-based business research, as well as greater attention to improved systems of management development in Canadian corporations, governments and institutions.

Greater efforts are needed in Canada towards improving our knowledge and understanding of the innovative process—how technological innovation is "spawned, nurtured, financed, and managed into new technological businesses that grow, provide jobs, and satisfy people".[1] Various government programs, including national conferences and seminars, can make an important contribution in this field. Activities such as those of the Senate Special Committee on Science Policy can also have a stimulating impact and broad educational effect.

We also emphasize that the maintenance of strong competitive conditions encourages the development of strong management capabilities; indeed, under such conditions, no industry can afford not to have high quality management.

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[1] *Technological Innovation: Its Environment and Management*, p. 56.

Harnessing the Flow of Scientific and Technical Information

Canada has historically been heavily dependent upon technologies originating abroad. Given the size of the country's resources, we will continue to obtain a large part of our technology from outside the country. To keep Canada on the forefront of expanding technological possibilities, and to facilitate quick and effective absorption and applications of new technical developments, it is essential to seek to maintain efficient arrangements for monitoring and screening new scientific and technical developments taking place in other countries, and to ensure that means are available for disseminating information to those sections of our society in which it can be effectively used. As we have already noted, there is a wide variety of channels and means through which the dissemination of information can be achieved. Some of these need to be strengthened. In addition, other potentially useful avenues should be explored. For example, Canada's foreign trade service, which has done outstanding work in keeping Canadian businessmen informed of potential export opportunities abroad, might also keep businessmen informed of innovations that may have a potential application in Canadian industry.

We emphasize that new technologies have provided large new potentials for the "management" of knowledge—for the organization, storage, retrieval, and manipulation of information. In particular, electronic computers are now assuming a large and rapidly expanding role in information-handling. However, our concern here is not with the specifics of designing a more effective technology transfer system. The Science Secretariat has for the past year been studying the state of scientific and technical information services in Canada, and its conclusions and recommendations are expected to be available shortly. Our concern is rather to lend support to these initiatives. Major economic benefits could flow from improvements in the speed and effectiveness with which technological knowledge is transferred, diffused, and embodied throughout the economy. There is a particular need to provide such information more effectively to small- and medium-sized business enterprises. We emphasize again, however, that improvements in information transfer must be coupled with a stronger capability on the part of Canadian management to understand, interpret, and apply such information. Economic benefits are measured, not in terms of information flows, but in terms of practical results achieved in production.

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Strengthening the Country's Indigenous Effort

Canada cannot rely entirely on imported technology; there must be a strengthening of the country's own capabilities. Without a strong indigenous effort, a country cannot attract and hold the scientific and technical manpower which permits it to adapt and exploit technologies originating abroad, or which it needs to train its future supply of scientists and engineers.

In our view, the expansion in Canada's own scientific and technological effort must be structured in a way that raises particularly the scientific and technical capabilities within Canadian industry and universities. At present, an exceptionally large share of R & D work in Canada is carried out directly by governments or their agencies. The view that the balance of R & D effort should be shifted towards the performance of a proportionately larger share of R & D activity in industry and in the universities was expressed in our *First Annual Review*, and is shared by leading Canadian experts in this field. It is especially important that industry itself take more vigorous initiatives, and that attitudes, efforts and motivations become more strongly oriented towards technological advance and innovation. But effective government incentive and other programs will be required to help to bring about this result. In particular, government support may be required especially for the more fundamental types of research because the returns here are often far in the future and the elements of risk may be very high. Similarly, government support is essential for adequate research into social problems—for example, in the fields of health, education, pollution control, and the social sciences.

Canada must maintain a high potential for technological change by ensuring that there is an adequate supply of scientific and technical manpower to serve as a basic source of invention and innovation. In this connection, we need much better manpower information in this field. Over the next decade, the supply of professionally trained engineers and scientists coming out of Canadian universities is likely to be very large, and will provide a basis for a sharply accelerated growth in the country's scientific and technological efforts. However, it is important to emphasize that if such efforts are to be stepped up, existing facilities, apparatus and equipment to accommodate expanding R & D activity will need to be greatly increased.

Improving the Environment for Innovation

Institutional factors can provide powerful impediments to the effective use of technology. This is a conclusion that is emerging clearly

from the examination of Europe's so-called "technology gap" with the United States. Among these impediments, it is claimed, are rigidities and inflexibilities of many kinds—in capital markets, management attitudes, organizational systems, government policies, educational institutions, labour union practices, and so forth. Such institutional conditions may largely determine a country's "social capacity to innovate". We have not attempted to study any of these factors in detail. But we believe that it will be highly important, as a basis for good future innovative performance in Canada, to seek to maintain the essential conditions of flexibility and adaptability required for such a performance.

The environment for innovation can also be improved by encouraging the interchange of ideas and scientific and technical information between industry and the universities. New science-based industries are proliferating all around certain centres of advanced education in the United States. It has been claimed that the opportunities for close, frequent consultations among technical people, entrepreneurs, and the universities have been one of the most important elements in this process. The particular relevance of such U.S. experience for Canada may be open to question, but increased contact and exchange of ideas among professional people can help to stimulate and promote new ideas and more effective innovative activity. The Department of Industry has recently launched a new program that will help establish Industrial Research Institutes at a number of Canadian universities for the purpose of providing research services to industry on a fee basis, and encouraging more frequent consultations and interchanges between the universities and the business community through specialized training and seminars. In addition, research communities such as Sheridan Park, near Toronto, where industrial research laboratories of industry and governments are set up in one location and share certain common services, can facilitate a more rapid diffusion of technological knowledge.

Technological change can also be encouraged and promoted by measures to assist displaced workers to obtain retraining and reemployment, and by helping industries reorganize and adapt their operations to changing requirements. The Economic Council of Canada, recognizing that change is a fundamental characteristic of economic growth, and that technological development is a necessary condition for achieving Canada's basic economic goals, has recommended a range of adjustment methods and procedures to ensure that the hardships of technological and other change on individuals or groups of

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workers through job dislocation are minimized. These procedures are set out in "A Declaration on Manpower Adjustments to Technological and Other Change", published by the Council in November 1966.

A number of programs in the area of manpower adjustment are now being operated by the Department of Manpower and Immigration, while the Department of Industry administers three major programs aimed at assisting industry to reorganize or update its operations—the Automotive Adjustment Assistance Program, the Adjustment Assistance Program related to the Kennedy Round, and the more general Machinery Tariff Program.

Industrial research and technology can be stimulated in various ways—for example, by financial incentives for R & D in Canadian industry, government sharing of development costs, and in certain instances through government contracts. All of these devices are in fact now being employed under programs administered by various federal government departments and agencies.[1]

Finally, the environment for innovation can also be improved by maintaining highly competitive conditions, which frequently act as a spur to technological change.

Supporting Excellence

No country, not even the United States, and still less a country with Canada's population and resources, can expect to show a uniformly high level of achievement across the whole spectrum of science and technology. In some areas, which for one reason or another happen to have attracted one or more truly first-class people, work of great excellence—work able to hold its own or better with what is being done anywhere in the world—may be achieved, and indeed is being achieved in Canada. In other areas, the standard attained may be much less exciting.

Both types of work, the excellent and the humdrum, can play a valuable role. Scientific and technological work need not always or even most of the time be brilliantly original in order to make a useful contribution to the economy. At the same time, it is desirable to have a number of areas of scientific and technological work where the standard achieved is well above the ordinary. First-class people doing first-class work tend to attract and hold others of the same kind, to improve the general intellectual climate, and to inspire students and co-workers to greater and more productive efforts. This is something

[1] For a description of some of these programs, see Andrew H. Wilson, Special Study No. 8, Appendix III.

very difficult to evaluate in purely economic terms, although it does on occasion hold out the enticing possibility that world leadership at the research and development stage can be effectively converted into world leadership at the stage of large-scale production and marketing. If this is not possible, there may still be the option, if development has proceeded to a patentable invention, of exchanging or selling the new technology abroad for a good return.

True excellence is unfortunately not something which can be readily created, in some pre-designated area, by government decree. The creative spirit bloweth where it listeth, and its manifestations often occur in surprising places. The most effective ways in which governments can promote excellence are to bring about educational and other conditions broadly conducive to its appearance, to recognize it when it does appear, and then to back it financially, to the extent that the good of the Canadian economy and of the Canadian intellectual community appears to justify.

Education and Urbanization

We would not presume to set forth here a full priority list of areas where additional applications of science and technology would bring the Canadian people especially large returns. We merely wish to note two specific areas which, on the basis of the work that the Council has done in them, would seem to us to merit attention as favourable fields for the application of more scientific and technological resources.

The first is education. Given the large economic, social and cultural values of education, we would urge that studies and experiments already under way to determine the applicability of new technologies to education at all levels be greatly augmented. We have in mind particularly the technologies associated with the computer, new types of communications, and audio-visual devices. The "best" teachers can now reach a wider audience, in a technical sense, than ever before. The possibility appears to exist of achieving simultaneously a major qualitative upgrading of education in Canada and a significant improvement in educational "productivity". But more than "hardware" is involved. A deeper knowledge of the psychology of learning —what takes place when teacher and student confront one another in the classroom—is an essential component of any strategy designed to raise performance levels in education. Indeed, without a better knowledge of this process, an attempt to introduce new technological systems could have a de-humanizing effect on education.

Secondly, we urge that programs be undertaken to apply first-class scientific minds and advanced technologies to resolving the growing

problems of rapid urbanization. Much more could usefully be done along these lines with respect to such matters as transportation, housing, air and water pollution, noise, recreation, and the human environment generally.

In the case of housing, the housing industry has long been plagued by a multiplicity of building codes and regulations that have contributed to inefficiencies and lack of standardization. Similarly, there exist major institutional barriers to the control of air and water pollution. Such barriers must be broken down, and Canadian institutions reshaped to serve more effectively the goals of society in a technological age.

The Allocation of Resources to Science and Technology

We do not underestimate the difficulty of the many complex and evolving decisions that effectively make up "science policy" in the real world. From the point of view of society as a whole, science and technology (like economics) are not goals in themselves, but tools for the study and pursuit of goals. One of the things that makes the decision process—the problem of choice—so difficult is the very abundance of scientific and technological knowledge, which has brought an enormous variety of specific goals within reach, given time and a willingness to allot appropriate resources. To take an extreme example, it is not inconceivable that Canada could perhaps, even within a decade or so, surpass both the United States and Russia in space flight capabilities, provided the desire to do so were so great that Canadians were prepared to curtail their real standard of living substantially and devote enough resources—perhaps the equivalent of one-fifth of GNP—to this single goal. Obviously, such a desire does not exist, but the example is illustrative of the less extreme problems with which decision-makers in this area are continually faced.

As emphasized near the outset of this Chapter, it is ultimately the responsibility of society as a whole to make its views felt regarding the priority of goals, including those goals whose achievement calls for large applications of science and technology. As also emphasized earlier, the main useful role of economic analysis in this context is to try to help to illuminate the likely costs and benefits of various alternative courses and—at least as far as available information and the best available techniques of analysis will permit—what the likely net return would be from these courses as compared with other possible uses of resources.

It would be idle to pretend that either the availability of relevant information or economic techniques of analysis and measurement for making this sort of contribution are in a highly advanced state of development, or that for a long time to come the formulation of major decisions affecting science and technology in Canada will not often involve, in certain ways, daring judgmental leaps in the dark. But it should be an important objective to develop new and better techniques of evaluation, as well as to gradually improve existing techniques with practice. Moreover, even when such techniques may furnish shaky or partial answers—or even no really worthwhile answers at all—they do at least provide a useful discipline for ensuring that some of the right questions are asked, and that a framework is set forth within which the pure art of judgment can more effectively operate.

Science and technology have been of tremendous importance in Canada's economic growth and development, and the potential exists for them to play an even more effective role in the future. We therefore welcome and encourage the various significant efforts now under way to achieve both a better understanding and a better management of this major force in modern society.

In summary, on the basis of the foregoing discussion, we recommend:

(1) that *innovation*—the crucial stages beyond R & D—be given greater recognition in "science policy";

(2) that the capacity for Canadian business management to undertake successful innovation be strengthened;

(3) that new and more effective means be developed to harness information on science, technology and innovation, both from abroad and from Canadian sources, in both the public and private sectors;

(4) that Canada's indigenous scientific and technological effort be strengthened, particularly in industry;

(5) that support for the social sciences be greatly increased, and that "science policy" should have regard to the need for more interrelated activities across the whole spectrum of research, including the natural sciences, the social sciences and the humanities.

4

The Changing Structure of the Economy

MUCH OF our previous analysis of economic growth in Canada has been cast in highly aggregative terms. We have looked at over-all growth of output and of inputs such as labour and capital and have treated these general sources of growth, in so far as they can be discerned, in the broad scope of economy-wide advances. Such aggregate analysis is of considerable value for:

—setting out a comprehensive framework for viewing the economy;
—providing over-all dimensions of potential and actual growth performance;
—identifying the general sources of growth;
—establishing a basis for general policy approaches for stimulating and promoting good growth performance; and
—looking at the goal of growth in relation to other basic economic and social goals.

But studies of the patterns and sources of growth of *individual sectors* of the economy can provide significant additional knowledge about productivity growth and help to lay the basis for more carefully attuned economic policies.

The fact is that an economy does not grow simply by the production of growing volumes of the same kinds of goods and services, or by using expanding inputs of labour and capital in every sector and industry. Indeed, the essence of economic growth is change—continual change in patterns of output and in combinations of inputs. Many of

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the types of goods being produced half a century ago, along with many of the occupations and technologies—and even some of the industries—have disappeared. Moreover, it is a well-known historical fact that the faster the pace of economic growth, the faster are the changes and shifts in patterns of production and distribution, and in the industrial, locational, occupational and other basic characteristics of a nation's economy. Thus growth proceeds in a highly flexible, kaleidoscopic way—with patterns of change that often follow quite different routes than may be readily seen or anticipated.

In this sense, economic growth is not dissimilar to many forms of growth studied in other social sciences and in the natural sciences:

> Finally we have what might be called *structural* growth, in which the aggregate which "grows" consists of a complex structure of interrelated parts and in which the growth process involves change in the relation of the parts. Thus in the growth of a living organism, or of an organization, as the "whole" grows, the form and the parts change: new organs develop, old organs decline, and there is frequently growth in complexity as well as in some over-all magnitudes. Problems of structural growth seem to merge almost imperceptibly into the problems of structural *change* or development, so that frequently "what grows" is not the over-all size of the structure but the complexity or systematic nature of its parts. Thus the "growth" of a butterfly out of the chrysalis involves an actual decline in over-all magnitudes such as weight or volume, but certainly seems to come under the general heading of phenomena of growth or development.[1]

In its earlier Reviews, the Council has explored some of the changes in characteristics that have been associated with economic growth in Canada, including both regional growth and development and the implications of rapid urban growth. This Review describes the patterns and sources of growth in major groups of industries.

The structure changes discussed in this Chapter refer to patterns of production activities. Generally, industries are defined on the basis of principal activities. Such a definition, however, is not clear-cut, since a given industry may also perform certain activities that are usually within the scope of another. For example, manufacturing establishments, besides their principal processing functions, also do some transporting, selling and servicing. It is impossible to separate all activities statistically in a precise way. Nevertheless, these classification problems are relatively small, and many of the differences would tend to cancel out. The major conclusions about the shifts in industrial structure are not likely to be affected very much by these considerations.

[1] K. E. Boulding, "Toward a General Theory of Growth", *Canadian Journal of Economics and Political Science*, August 1953, p. 326.

Changes in the relative importance of various industries, particularly over the post-war period, are presented here mainly in terms of employment, although limited reference is also made to output changes. These changes have major implications for the growth and performance of the economy, especially when they have been as rapid and extensive as in the past two decades. The aim here is to look beyond the changes that have occurred in individual industries in isolation, to the more comprehensive pattern of different changes taking place among various industries.

In the past, economic analysis and policies have been largely centred on the performance of goods-producing industries even though the service-producing industries have expanded to a point where they employ well over half of the labour force. The performance of the service industries now vitally affects the progress of the whole economy. In the education and health fields and personal services, such as laundries, hotels and restaurants, there are important direct effects on the final consumer. In addition, many service-producing industries affect the performance of the goods industries and thus have significant indirect effects on the provision of products to consumers.

LONGER-TERM TRENDS

Broad changes in the structure of the Canadian economy since the latter part of the nineteenth century are illustrated in Chart 4-1 which shows the changing shares of total production and employment among major groups of industries.

The striking fact is that although Canada is becoming an increasingly industrialized nation—with an enormous expansion and diversification in industrial activity—the *share* of the industrial sector of the Canadian economy (comprising manufacturing, construction and utilities) has not grown in terms of employment, and not a great deal in terms of the value of production. This experience is similar to that of other industrial countries, including the United States.

The dominating shift in structure has been the decline in the share of what are frequently called the primary industries (agriculture, fishing, forestry and mining), in terms of both employment and production, and an almost corresponding expansion in the share of services. Most of the relative decline in the primary industries has occurred in agriculture.

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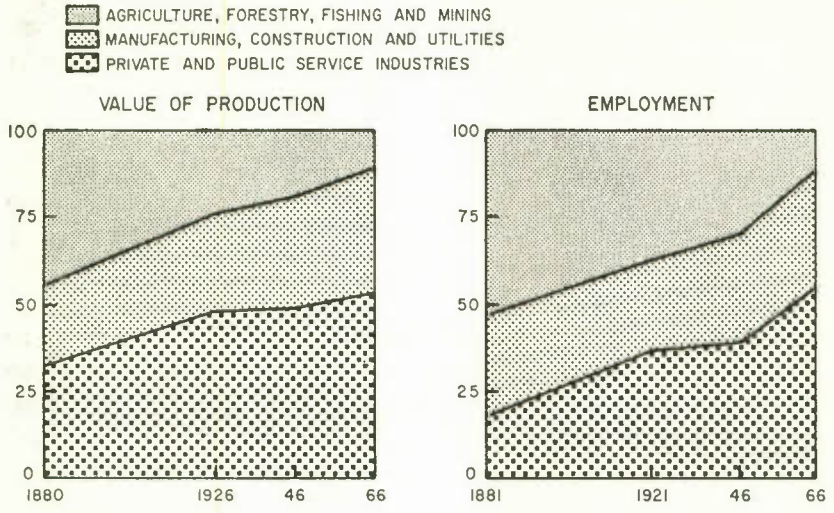
CHART 4-1

LONG-TERM CHANGES IN THE STRUCTURE OF THE ECONOMY

PERCENTAGE DISTRIBUTION OF PRODUCTION AND EMPLOYMENT



Source: Based on data from *Historical Statistics of Canada*, M. C. Urquhart and K. A. H. Buckley, eds., Toronto, Macmillan, 1965; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

Although there has been great diversity of performance among industries within the basic sectors, and although some of the earlier data represent rougher estimates than more recent data, this Chart portrays reasonably well the trend towards a declining share in the value of total goods production and employment in the economy in relation to production and employment in services.

POST-WAR TRENDS

Changes in Employment

At the end of the Second World War 60 per cent of the labour force was employed in goods-producing industries and 40 per cent in service-producing industries (Table 4-1). During the past 20 years the Canadian economy has been transformed to the point where nearly 60 per cent of the labour force is now employed in the service industries and little more than 40 per cent in the production of goods. Employment in agriculture has shown a marked decline and by 1966 it

accounted for only about 7 per cent of total employment, compared with 25 per cent in 1946. The share of employment in manufacturing remained stable at 25 per cent. In construction and utilities, employment increased rapidly in the early post-war years but at a much slower rate during the 1950's and 1960's.

TABLE 4-1—PERCENTAGE DISTRIBUTION OF EMPLOYMENT BY INDUSTRY

	1946	1956	1966
Agriculture	24.8	13.6	7.4
Forestry and fishing	2.3	2.4	1.4
Mining, quarrying and oil wells	1.5	2.1	1.7
Manufacturing	25.3	25.1	24.8
Construction	4.7	7.2	7.5
Electric power, gas and water utilities	0.7	1.2	1.2
Goods industries	59.3	51.6	44.0
Transportation, storage and communication	7.2	7.6	6.5
Trade	12.0	15.5	15.6
Finance, insurance and real estate	2.6	3.4	4.2
Public, business and personal service industries*	18.9	21.9	29.7
Service industries	40.7	48.4	56.0
All industries	100.0	100.0	100.0

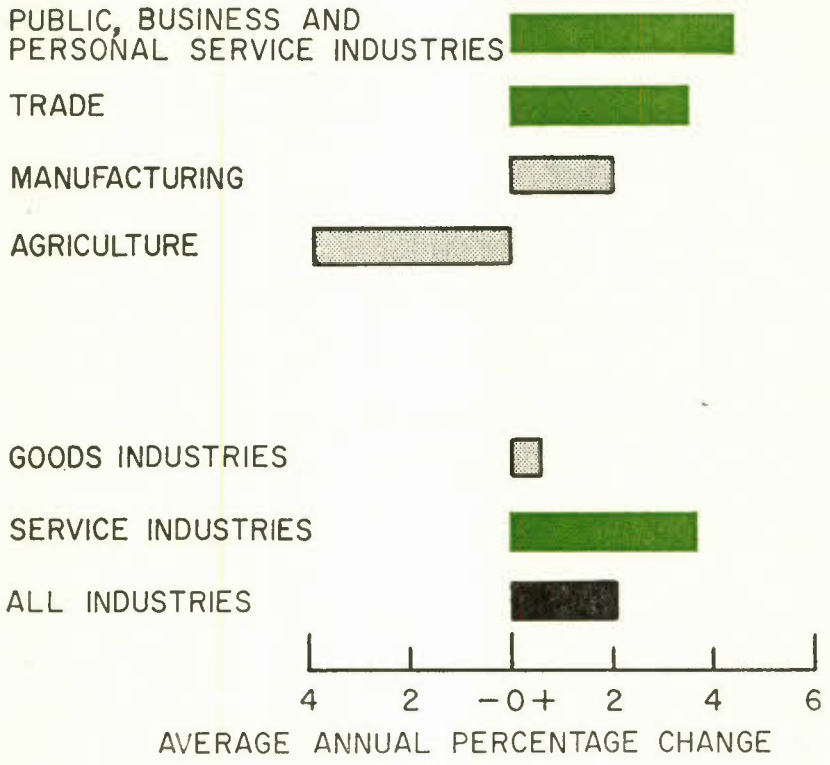
*Includes public administration, defence, community, recreation, business and personal service industries.

SOURCE: Based on data from Dominion Bureau of Statistics.

In contrast to the relatively slow rates of growth or declines in most of the goods industries, employment has increased more rapidly than average in all of the service industries except transportation, storage and communication, which are not only linked to many activities in the goods-producing industries but also share some of their characteristics. The most rapid rates of increase have taken place in finance, insurance and real estate, and a group of industries that includes community, business and personal service, public administration and defence. The growth of employment in trade has also been very rapid. The post-war average annual rates of change in employment for the goods and services sectors and for four of the major industry groups, which together represent about four-fifths of total employment, are shown in Chart 4-2.

CHART 4-2

CHANGES IN EMPLOYMENT BY INDUSTRY, 1946-66



Source: Based on data from Dominion Bureau of Statistics.

The expansion of employment in the group of industries that includes community, recreation, business and personal services, public administration and defence, has raised the share of this group from 19 per cent of total employment in 1946 to 30 per cent in 1966. The largest part of the increase was in community services, including education and health services, which now employ about four times the number employed in these activities in 1946. Another substantial part of the increase was in business services, and in personal services; total employment in business and personal services combined has doubled. In public administration and defence, employment has increased but at a slower rate than for most other activities in this over-all group; the increase between 1946 and 1966 was 50 per cent—the same rate as for the economy as a whole.

The decline in employment in agriculture and the more rapid rise in employment in service industries than in manufacturing are features that have been evident in the post-war economic growth of other industrialized countries. However, the shifts in employment towards the service industries have generally been occurring at a somewhat more rapid rate in Canada. The Canadian service industries now account for close to 60 per cent of total employment, a proportion similar to that of the United States and considerably above that of European countries.

In Canada, the rapidity of these interindustry shifts is all the more significant for the process of economic growth and adjustment because the labour force has been growing more rapidly than that of other countries, and this is expected to continue for some time in the future. Total employment in Canada increased from 4.8 million in 1946 to nearly 7.3 million in 1966. Of the increase, 2.1 million were in the service industries and only 400,000 in the goods industries.

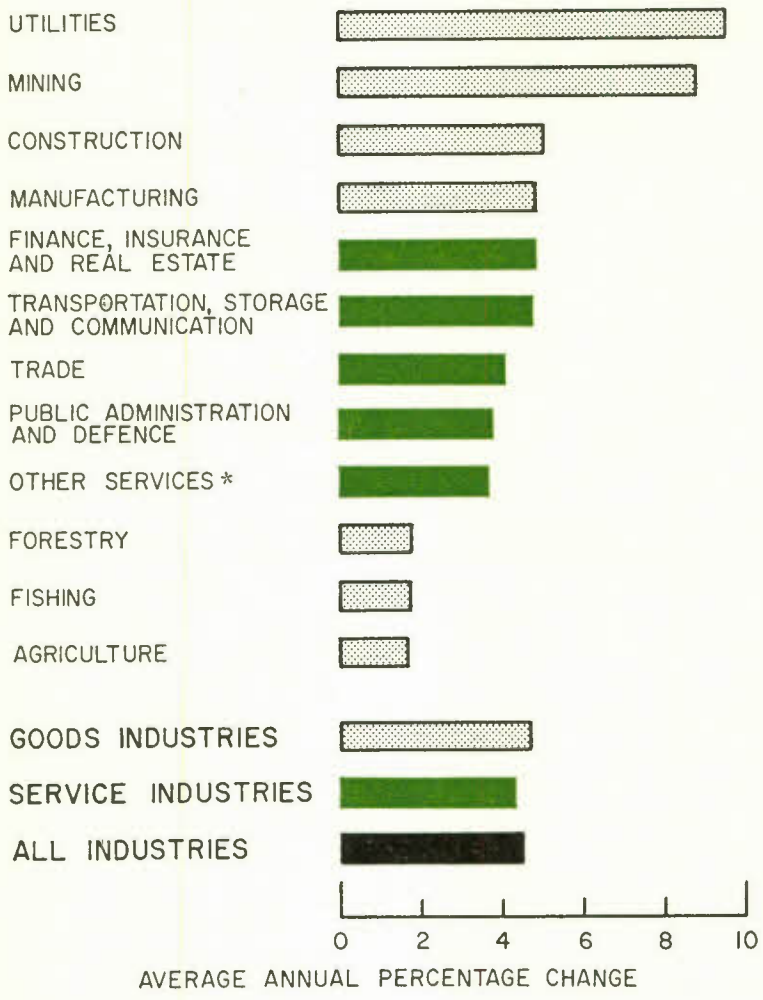
Increases in Output

Changes in employment are only one element in the changing industrial structure. They tend to be closely associated with changes in the industrial distribution of output. But the changing patterns of industrial output are also influenced by other elements, including differing changes in the characteristics of the labour force among industries and in capital per worker, as well as by a host of other factors.

The net result of these various influences is that there has been a less striking shift in output than in employment over the post-war period. A comparison of measured increases in real output reveals a slightly slower rate of growth in the service than in the goods industries (Chart 4-3). There are, however, problems in the measurement of output in a number of industries, particularly among the service industries. The output of service industries, such as public administration and defence, and community, recreation, business and personal services, is measured largely in terms of the labour used rather than in terms of some direct measure of output. Increases in their output probably are, therefore, underestimated. One is left with the impression that the total volume of output of the service sector has grown at roughly the same rate as that of the goods sector over the post-war period—not more rapidly as the employment data would suggest, nor less rapidly as the real output data would suggest. Thus the shifts in output that have occurred have been mainly within the goods sector, with a relative decline in primary production (except in the case of mining) and relative increases in the other goods industries.

CHART 4-3

GROWTH IN REAL OUTPUT BY INDUSTRY, 1946-66



*Includes community, recreation, business and personal services.
Source: Based on data from Dominion Bureau of Statistics.

Low Rates of Increase in Output per Person Employed in the Service Industries

Even if account could be taken of the underestimation of growth in a number of the service industries, one would find that increases in *output per employed person* have been slower in most of these indus-

tries than in goods-producing industries. Estimates for commercial service industries indicate an average annual rate of growth over the 1946-66 period of only 1.1 per cent compared with 4.8 per cent for the goods sector. This comparison excludes public administration and defence and the noncommercial part of community, recreation, business and personal services. The different rates of increase in output per employed person in the two sectors can be partly explained by the greater increase in the proportion of part-time workers employed in the service sector.

Certain differences in the characteristics of employment in the various industries also have significant effects on productivity—effects such as those discussed in Chapter 2. Changes in the characteristics of the labour force in different industries are shown in Charts 4-4, 4-5 and 4-6. In the service industries there were greater increases in the proportion of women employed, but increases in experience and schooling were proportionately smaller than in the goods industries. Sharp contrasts emerge, for example, between manufacturing and retail and wholesale trade. Changes in the characteristics of the average employed person in *manufacturing* were more conducive to the growth of productivity. The proportion of female employment remained low; the proportion in the 25-64 age group rose faster than in any other industry; and the improvement in the level of schooling was substantially higher than in the service industries, especially for men, who constitute 80 per cent of manufacturing employment. In contrast, the proportion of female employment in *retail and wholesale trade* continues to be significantly higher than in manufacturing; the proportion of more experienced persons rose less; and the rate of improvement of schooling was lower than in the goods industries. Contrasts such as these are even more striking between manufacturing and the group that includes health, education and other public services.

Increases in capital per worker also have an important influence on rates of increase in the output of individual industries. Available data for individual goods industries and for two service industries (trade, and transportation, storage and communication) show that from 1949 to 1959 the increases in capital per worker were higher in most of the goods industries—higher in agriculture, forestry and fishing, in which employment was declining and capital was being substituted for labour; higher in mining (including oil and gas production), which was already relatively capital-intensive in the early post-war years and has become even more so; and higher in construction, in which there has been a marked increase in mechanization.

CHART 4-4

MALE AND FEMALE EMPLOYMENT AS A PERCENTAGE OF TOTAL CIVILIAN EMPLOYMENT, BY INDUSTRY

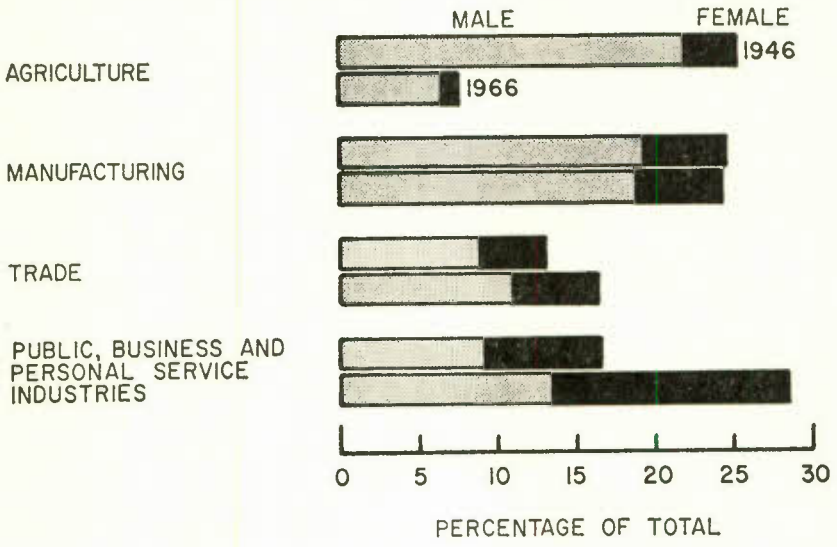


CHART 4-5

INCREASES IN THE 25-64 AGE GROUP AS A PERCENTAGE OF TOTAL EMPLOYMENT, BY INDUSTRY, 1951-61

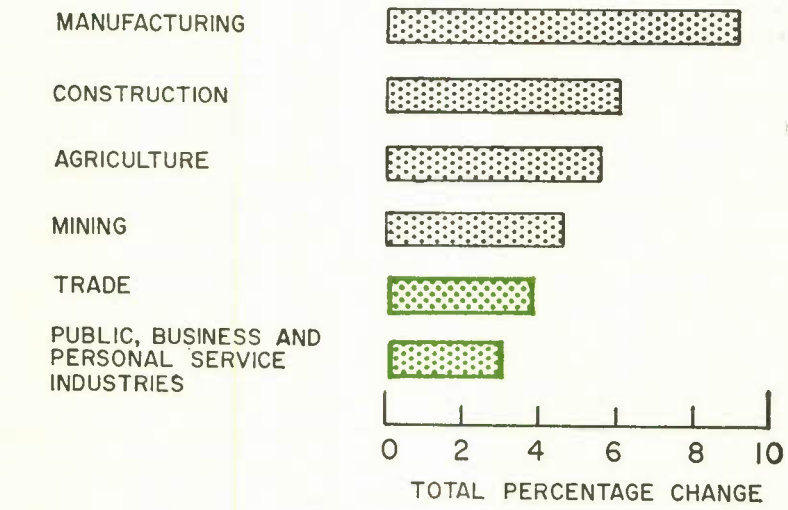
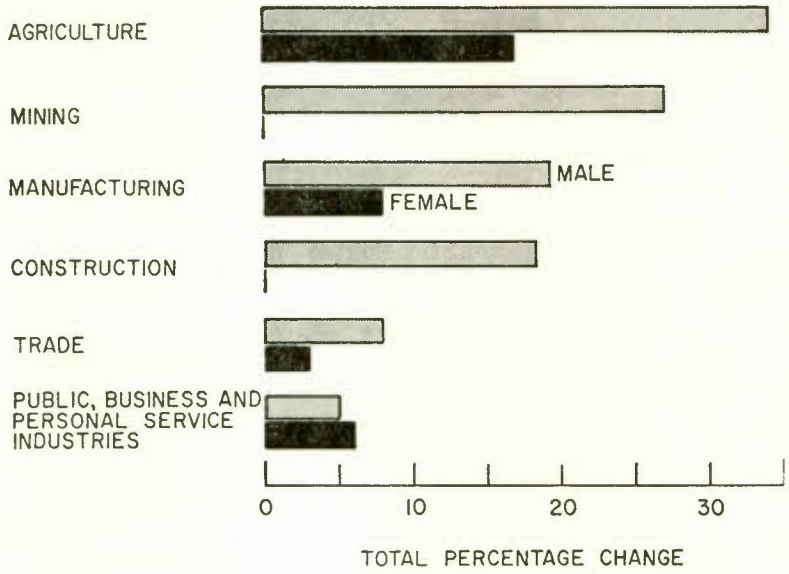


CHART 4-6

INCREASES IN EMPLOYED PERSONS WITH NINE OR MORE YEARS OF SCHOOLING AS A PERCENTAGE OF TOTAL EMPLOYMENT, BY INDUSTRY, 1951-61



Source: Based on data from Dominion Bureau of Statistics.

SOME IMPLICATIONS

This brief examination of the changing structure of the Canadian economy has touched on a number of aspects of a subject that is of substantial importance in assessing the possibilities for future growth. Both increases in productivity within industries and shifts of resources between industries are important elements in the over-all rate of growth of the economy. For example, the shift of resources out of agriculture was shown in Chapter 2 to have been a significant factor in post-war Canadian increases in over-all productivity. Furthermore, the relative contribution of such shifts to productivity growth has been much greater in Canada over this period than in many other countries, including the United States.

Despite the data limitations discussed below, the material contained in this Chapter enables us to indicate the inadequacy of certain overly simple views of Canada's long-term historical development. For example, one view that has been held by many, both in Canada and abroad, is that the potential for Canada's growth is mainly to be found in its

rich natural resources and that this would result in great relative growth of the primary resource industries in terms of production and in use of labour and capital. Another view that has appeared at one time or another in countries such as Canada is that industrialization brings an enormous relative growth in manufacturing, including the processing of raw materials, again with great relative growth in employment, capital use and production. The facts do not support such views. Economic growth in the more industrially advanced nations of the world today—whether they are rich in natural resources (such as Canada, the United States, Australia and Sweden), or resource-poor (such as Britain, Japan and the Netherlands)—is not proceeding along these lines. In fact, in most of these countries, whether or not they are rich in natural resources, it is the service industries that appear to be growing most rapidly.

While the material in this Chapter improves our understanding of the nature and extent of changes in the structure of the Canadian economy, it does not permit conclusions on the causes of these changes. Such conclusions would require a more intensive examination of a wider range of factors, including changes in the demand for the output of industries, changes in the ways in which industries have used productive resources, and changes in the structure of prices and costs.

Just as it is important to improve our understanding of the causes of the changing structure of the Canadian economy, it is also clear that it is important to know more about the gains in efficiency in individual sectors. This is of special significance in the rapidly growing service sector which now employs nearly 60 per cent of the labour force and a large amount of other resources, and in which much of the employment is in industries exposed neither to international competition nor to strong elements of domestic competition. In Canada, as elsewhere, some of these industries are owned and controlled by governments, some are regulated by governments, and some are private. Where there is little external or domestic competitive pressure, the question of ensuring efficient production takes on added significance.

This preliminary analysis of the changing structure of the economy has encountered many problems in the measurement of both the output of industries and the inputs associated with that production. Some consideration was given to changes in the quantity and quality of labour inputs and to differential changes in capital inputs over part of the post-war period. The examination of the role of inputs will have to proceed much further. To make this possible it will be necessary to have up-to-date capital stock estimates as well as other information

on the utilization of capital. Even more important, however, is the need to improve output measures in a number of industries.

Many of the difficulties in output measurement stem from the fact that there is no clearly definable or measurable product in the provision of public administration, defence, education, health and certain other noncommercial services. Measurement of output in certain of the commercial industries, particularly in the service sector, is also inadequate. Without a better understanding of output trends in this sector, it is becoming more and more difficult to assess the significance of aggregate productivity changes and to reach conclusions on the general performance of the economy.

Several steps could be taken to improve the measurement of output. In particular, surveys of the commercial service-producing industries should be made to fill gaps in the present measurement of output and to clarify some of the ambiguities. Obviously, important conceptual problems need to be solved—for example, in industries such as finance, insurance and real estate, as well as in the noncommercial service-producing areas, in which the nature of output is particularly difficult to define and measure.

There is much to be done before a really accurate assessment of the nature and sources of growth in particular industries can be made. Plans have in fact been developed by the Dominion Bureau of Statistics to strengthen output and productivity measurements. We recommend that steps be taken to proceed with this work as quickly as possible. Improved information would increase our understanding of productivity performance and permit more intensive analysis of the nature and sources of growth of industries. This would help to lay the basis for more effective policies for the growth and development of individual industries and of the economy in general. The improvement of data in some of the areas we have discussed will not, however, be easy. The United States and other countries have similar difficulties. Still, it is important to be aware that some erosion is taking place in the estimates of total economic output, and that this will continue if there is a further shift towards industries where output is inadequately measured.

5

Productivity in Agriculture

MAJOR AND rapid adjustments have been taking place in Canadian agriculture in recent decades. Some aspects of these adjustments have been discussed in previous Annual Reviews and Council Studies.[1]

This Chapter examines changes in the volume of production and in the resources and technology used in agriculture, and assesses their impact on the productivity of the agricultural labour force. Some longer-term information on early settlement, export expansion, and subsequent labour and resource adjustments will be provided as background to an evaluation of the significance of more recent trends. Also, to provide a clearer perspective, some international comparisons —especially Canadian-U.S. comparisons—are used as a background to the discussion of various issues. In brief, the following analysis adjusts the value of total agricultural output over the period 1947 to 1965 for changes in prices, and for variations in weather, to derive a trend in the volume of agricultural production. Combining these data with the number of persons employed in agriculture, an estimated trend in the volume of production per worker is developed.[2] The analysis then proceeds to estimate the relative importance of the contribu-

[1] J. Dawson, *Changes in Agriculture to 1970*, Staff Study No. 11, Economic Council of Canada, Ottawa, Queen's Printer, 1964; and Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment: A study of the Economic Impact of ARDA, PFRA, and MMRA*, Special Study No. 7, Economic Council of Canada, Ottawa, Queen's Printer, 1967.

[2] Workers here include all farm operators, paid workers and unpaid family labour.

tions made by various factors to the growth of labour productivity so as to reveal opportunities for improvements in Canadian agriculture.[1]

The Chapter focuses on productivity improvements rather than farm income problems. But it is clear that such improvements are a necessary, even if not a sufficient, condition for the long-run future growth in real incomes and living standards of Canada's farm population.

Agricultural production in Canada takes place under widely different conditions across the country. Among regions there are marked differences in climatic conditions, soil fertility, production potentials, marketing potentials, and resource use. During the years 1961-65, for example, about 60 per cent of Canada's farm cash income in livestock has come from the Eastern provinces and 70 per cent of Canada's cash income in crop production has come from the Prairie provinces. At the national level, the composition of farm cash income has changed little over the past two decades. During the post-war years about 20 to 25 per cent of farm cash income has come from wheat sales, 15 to 20 per cent from other crops, about 30 per cent from livestock sales, 15 per cent from dairy products, and 10 per cent from sales of poultry and poultry products.

HISTORICAL BACKGROUND

Only a hundred years ago Canada's society was predominantly agricultural. More than three-quarters of its working force was engaged in farming. Today, Canada is predominantly urban, and more than 90 per cent of total employment is in nonfarm activities. In this long-term transition from rural to urban society and the development towards a modern, high-income, high-consumption economy, total domestic demand for food has grown only slightly more rapidly than Canada's population. By contrast, the growth of overseas demand for Canada's agricultural products has been stronger—although with erratic movements from year to year. Most of this export growth has come from expansion of wheat exports; much less has come from livestock exports (Chart 5-1). The gradual slowdown in the growth of domestic demand for food, instabilities in export markets[2] and—since over 90 per cent of Canada's wheat originates in the Prairie provinces—the uneven regional distribution of the benefits from greater wheat ex-

[1] A more detailed analysis of these matters will be included in a forthcoming Staff Study, which will also set forth the underlying assumptions and techniques of analysis (L. Auer, *Canadian Agricultural Productivity*, Staff Study No. 24, Economic Council of Canada, Ottawa, Queen's Printer, 1968).

[2] Recent experience illustrates such instabilities—for example, the large expansion in wheat exports over the first half of the 1960's and the significant decline in such exports during the past year.

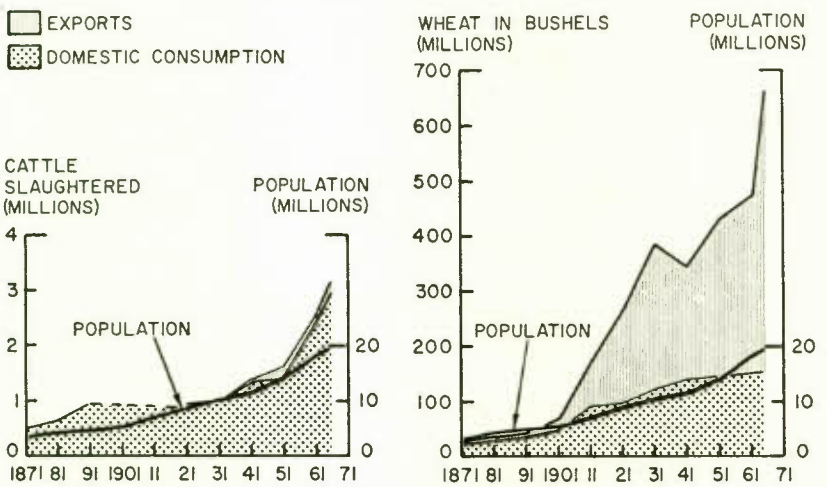
ports have entailed extensive adjustments in the agricultural sector, especially during the post-war period.

Historically, the development of Canada's agriculture has proceeded in three distinct periods: early development, rapid expansion and land settlement, and a prolonged and still continuing period of adjustment. During the early period, essentially from the time of Confederation to 1900, settlement and cultivation of land proceeded at a moderate pace in spite of high rates of capital investment in the construction of railways. There were formidable obstacles and many impinged upon the daily life of settlers: the lack of roads, the harsh winters, and the shortage of funds made settlement a struggle for bare existence. At a time when other countries offered free passage, a grant of land, agricultural implements, and loans for building homesteads, much of Canada's best farming land was held by speculators and the Canadian government offered only limited financial assistance to immigrants. As a result, many immigrants to Canada only settled temporarily and, over the whole period from 1861 to 1901, the number of emigrants leaving Canada exceeded the number of new arrivals.

After 1900, following four decades of net emigration, there was a sudden and prolonged surge of net immigration and land settlement.

CHART 5-1

POPULATION, DOMESTIC CONSUMPTION AND EXPORTS OF BEEF AND WHEAT

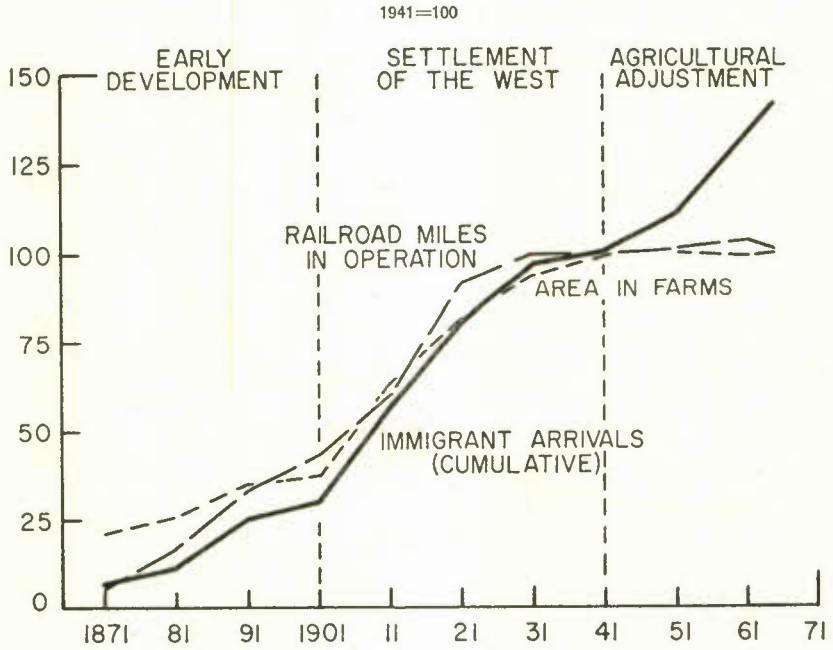


Source: Based on data from *Historical Statistics of Canada*, M. C. Urquhart and K. A. H. Buckley, eds., Toronto, Macmillan, 1965; and Dominion Bureau of Statistics.

Many factors contributed to this change. By the end of the nineteenth century, much of the farm land in the United States had been occupied but sweeping stretches of excellent prairie land were still unsettled in Canada. Other factors included policy favouring large-scale immigration, better prices for agricultural products, and a vast expansion in Canada's transportation system. Moreover, the desire of many Europeans to leave their war-torn countries helped carry the momentum of land settlement past the First World War through the 1920's. From 1901 to 1931, there was an expansion of 100 million acres in the area in farms in Canada—from 63 to 163 million acres. During the Depression of the 1930's, however, the rate of land settlement slowed down and only 10 million acres of land were added. Since 1941 there has been little change. Some additional land has been brought into farm production in the West but, with the growth in the area of cities and the abandonment of some farm land in the East, the total area in farms today is no larger than it was prior to the Second World War (Chart 5-2).

CHART 5-2

INDEXES OF IMMIGRANT ARRIVALS, RAILROAD MILEAGE, AND AREA IN FARMS



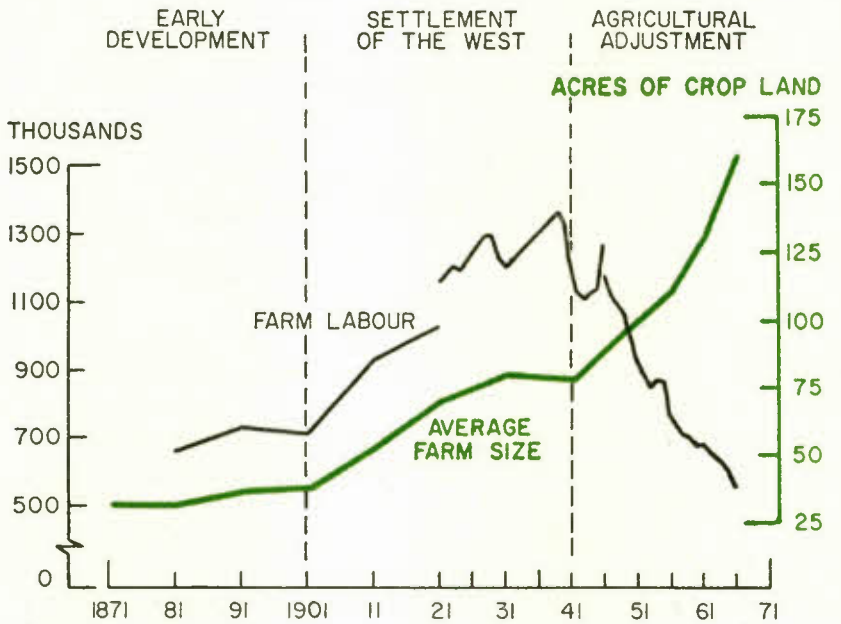
Source: As in Chart 5-1.

The Second World War had a decisive impact on the structure of the Canadian economy. Within five years, from 1939 to 1944, Canada's armed forces expanded from less than 10,000 to almost 780,000. Employment in manufacturing and transportation nearly doubled, and unemployment dropped from over half a million persons to less than 65,000. In contrast with the very large increase in employment in the rest of the economy, agricultural employment dropped from 1.4 to less than 1.2 million. This was the beginning of a prolonged period of labour and resource adjustment. By the end of the Second World War, every sixth person in agriculture had left for nonfarm occupations. After a short-lived rise in the immediate post-war period, this downward trend continued and, in 1967, Canada's agricultural employment was 559,000—only half as large as two decades earlier. Largely as a result of these adjustments, the size of farms has expanded significantly. (Chart 5-3).

Despite this massive reduction of agricultural employment, the volume of agricultural production has

CHART 5-3

FARM LABOUR AND FARM SIZE

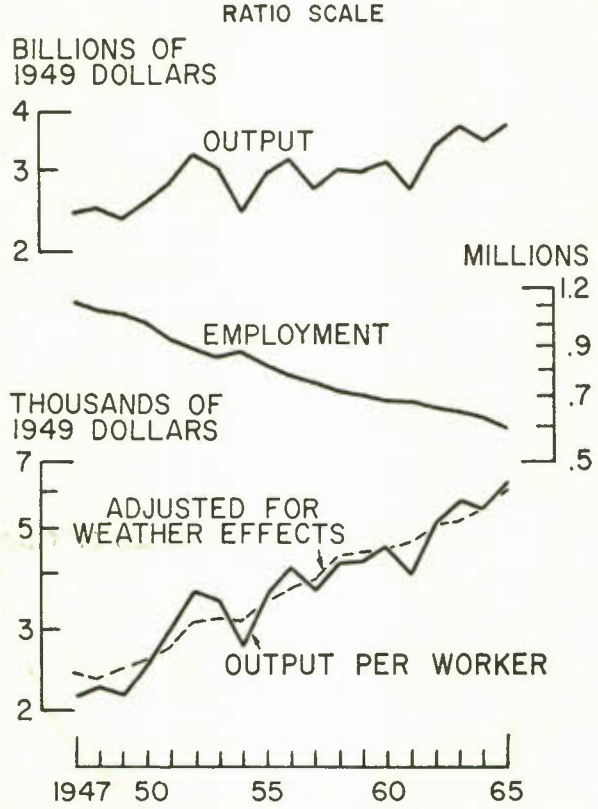


Source: As in Chart 5-1.
Note: There are discontinuities in the farm labour series in 1921 and 1946.

increased by roughly 50 per cent. This increase, combined with the reduction in manpower, has resulted in a tripling of output per worker in the agricultural sector (Chart 5-4).

CHART 5-4

GROSS VOLUME OF OUTPUT, EMPLOYMENT AND OUTPUT PER WORKER IN AGRICULTURE



Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

This rate of increase of labour productivity in agriculture over the past two decades has been considerably greater than in other sectors of the economy. However, average farm incomes have remained significantly lower than average nonfarm incomes. There are two basic reasons for this persistent disparity. First, given the initial wide gap between the levels of average farm incomes and average nonfarm incomes in the early post-war period, a substantially faster rate of income-generating productivity growth is required in agriculture,

merely to prevent a widening of this disparity. For example, on the assumption that the average level of productivity in agriculture is only half of that in the rest of the economy (an assumption which, on the basis of available information, is roughly in line with the actual situation), it would require a rate of productivity growth of $4\frac{1}{4}$ per cent per year in agriculture to prevent, over a 20-year period, a widening absolute disparity, with the rest of the economy growing at a rate of only $2\frac{1}{2}$ per cent per year. The second reason is the "price-cost squeeze" affecting farmers. With slow growth in demand for farm products, prices of farm products have increased much less than prices of other goods and services over the past two decades. This has meant that the prices of the goods sold by farmers have, on average, increased less rapidly than the prices of goods purchased by farmers. And this has meant, in turn, that part of the income-generating benefits arising from the rapid rate of growth of agricultural productivity have been shifted from the farm sector to other sectors of the economy.

The analysis of this Chapter is focused on agricultural productivity increases, rather than on issues relating to farm incomes and price and cost developments. The relevance of high productivity gains in agriculture is that they are essential in the longer run to the achievement of increased levels of income. They are therefore a needed, but not necessarily adequate, condition for improved farm incomes. Thus it is a matter of great importance to seek out and evaluate all possible avenues for potential further improvements in agricultural productivity, and especially those that contribute to gains in net farm income.

SOURCES OF GROWTH IN LABOUR PRODUCTIVITY

The magnitude of the over-all growth rate in agriculture and the general pattern of contributing factors are very similar in Canada and the United States. In both countries the over-all growth rates of output per worker in agriculture are close to 6 per cent per year (Table 5-1).

Certain important assumptions underlie this analysis of growth in agricultural productivity. For example, it is assumed that farmers attempt to allocate their farm expenditures rationally by investing their money so that each extra dollar yields the highest return. This assumption—combined with data on farmers' operating expenditures, investment in real estate, machinery, and labour use—provides the basis for computing the contribution these resource inputs have made to over-all growth in labour productivity. In essence *growth in output per worker* is attributed to *growth in expenditures* on inputs per

TABLE 5-1—COMPONENTS OF GROWTH IN AGRICULTURAL LABOUR PRODUCTIVITY, CANADA AND THE UNITED STATES, 1947-65

	Canada		United States	
	Average Annual Per-centage Change	Per Cent	Average Annual Per-centage Change	Per Cent
Growth in agricultural labour productivity....	5.5	100	6.0	100
Components:				
Labour input (effect of out-migration).....	2.0	36	2.6	43
Capital and material inputs.....	1.7*	31	1.8*	30
Land and buildings.....	0.1		0.2	
Machinery.....	0.9		0.6	
Inputs affecting crop yields.....	0.3		0.2	
Fertilizer and lime.....	0.2		0.2	
Seed.....	0.1		—	
Inputs affecting livestock yields.....	0.1		0.6	
Livestock**.....	0.1		0.2	
Purchased feed.....	—		0.4	
All other changes.....	1.8	33	1.6	27

*Sub-totals do not add up because this total includes some miscellaneous items not separately shown.

**Includes livestock purchases and breeding stock.

NOTE: Growth in labour productivity is measured here in terms of growth rates of the gross volume of production (adjusted for variations in weather) per person employed in agriculture. Estimation procedures are described in greater detail in Staff Study No. 24.

SOURCE: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

worker.[1] For changes in labour inputs, however, a reduction makes a positive contribution to growth in output per worker. Although the analysis seeks to identify all sources of growth in labour productivity, it does not provide explicit estimates of the contribution to growth of such indirect inputs as increased education and skills of the agricultural labour force or government-sponsored research. Instead their contribution is estimated summarily in a residual of "all other changes". Also, as a basis for the analysis, adjustments have been made to remove annual variations in output attributable to weather conditions, and all productivity estimates are in 1949 constant dollar values. By removing these effects the analysis is restricted to growth in labour

[1] Although the conceptual framework used in this analysis generally conforms to that in Chapter 2, individual factor inputs are defined and grouped together differently. They relate to gross measures of output, and output per unit of labour input. Thus we attempt to measure growth in labour productivity rather than growth in the total volume of production.

productivity measured in terms of growth in volume of production per worker.

Labour—The most significant contribution to growth in labour productivity has come through adjustments in agricultural employment. Today, compared with two decades ago, a substantially greater output is produced by substantially fewer farmers. As older farmers have retired and many of the younger farm people have found employment in the nonagricultural sector, some of the marginal farm land has been abandoned or has reverted to forest land and some of the better farm land has been purchased and absorbed into larger farm units. Through further mechanization, the enlarged farm units could often be operated without additional farm labour. Consequently, there has been a gain in labour productivity which has come partly from out-migration and partly from increased mechanization. Rates of out-migration from farming have been very similar in both Canada and the United States —a 55 per cent drop in the agricultural labour force of Canada and a 52 per cent drop in the United States from 1947 to 1965. Although the estimates indicate that in both countries the reduction of labour contributed more than other input factors to the over-all growth of agricultural productivity, they also suggest that the relative contribution of out-migration to growth was somewhat larger in the United States than in Canada (Table 5-1). The greater gain in labour productivity from this source arises, not from a more rapid rate of out-migration, but because U.S. farm labour is on average higher-priced than Canadian farm labour. Thus the United States has derived greater productivity gains from a similar rate of out-migration.

Capital and materials—The contribution of total capital and material inputs in agriculture accounts for one-third of over-all growth and—in aggregate—is practically identical in both countries. However, an examination of individual input categories shows some significant differences in the contributions made by particular categories.

Mechanization—Increased expenditures on capital and material inputs related to mechanization contributed more significantly to over-all growth than increased inputs in land and buildings. They represent greater use of tractors, grain harvesters, trucks, pick-up balers, electric motors and all other equipment on farms, as well as greater expenditures on machinery repairs and maintenance, diesel fuel, gasoline and lubricants. Over the period under consideration these inputs contributed more to growth in Canada than in the United States.

Crop yields—Inputs related to crop yields include purchases of fertilizer, lime and seed. They too have contributed more to growth in

Canada than in the United States. This is largely because Canadian farmers now buy more seed for planting than in earlier years—a development which reflects a catching-up process, since U.S. farmers traditionally have spent more on seed purchases than Canadian farmers.

Livestock—Inputs related to livestock yields measure purchases of livestock, breeding stock on farms, and feed. Evidently, U.S. farmers have increased inputs in this area much more rapidly than Canadian farmers and, to the extent that these purchases have improved the quality of feeds and livestock, Canadian farmers have not kept pace with U.S. farmers.

Other—Aside from these capital and material inputs, "all other changes" that cannot be readily quantified have also contributed significantly to growth in both countries. They show up in productivity gains that result from research conducted at universities, experimental stations, federal research institutes, and private firms. They also come from better farm organization, increasing farm size, regional and product specialization, scale of operation, increased knowledge, skills and education of farmers, and numerous other factors. In total, they are not directly related to expenditures on the farm and cannot be readily measured, but they contributed to growth as much as all capital and material inputs combined.

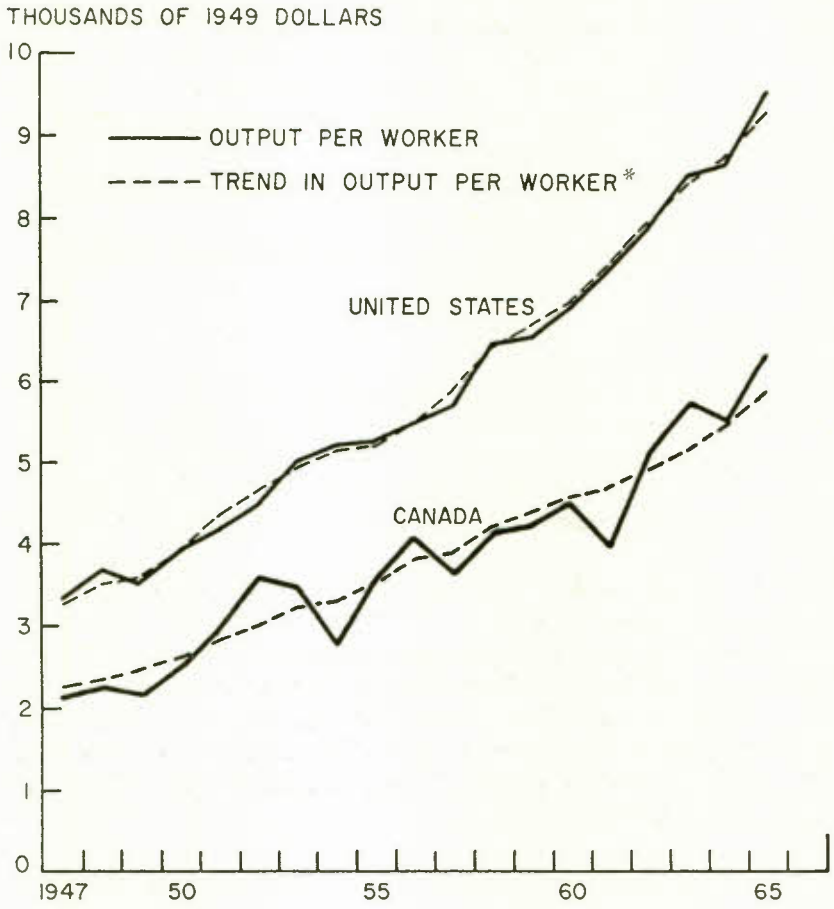
LEVELS OF LABOUR PRODUCTIVITY AND RESOURCE INPUTS

While *growth rates* in agricultural labour productivity have been similar in Canada and the United States, *levels* of labour productivity differ significantly. Over the past two decades, output per farm worker has been consistently lower in Canada than in the United States (Chart 5-5). In percentage terms, this relationship has changed little over the years. In terms of net value of production per worker, Canadian farmers produce on the average 25 per cent less than U.S. farmers. In terms of gross value of production, the disparity is about 35 per cent.[1]

[1] This wider disparity for gross value of production is mainly the result of the relatively much higher purchase of inputs in the United States from other sectors of the economy. Gross value of production is defined here as total cash receipts derived from marketings of crop and livestock production plus an allowance for farm products consumed directly in farm households. Net value of production is this gross value of production minus operating expenses and depreciation of buildings and machinery. It excludes all direct payments made under government assistance programs. No adjustments have been made in Canadian-U.S. comparisons for price differences between the two countries.

CHART 5-5

GROSS VOLUME OF OUTPUT PER WORKER IN AGRICULTURE, CANADA AND THE UNITED STATES



*The derivation of the trend is discussed in Staff Study No. 24.
Source: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

If future growth rates in labour productivity in agriculture were to remain the same in both countries as in the past two decades, it would be impossible for Canada to catch up with U.S. levels of productivity. Indeed, the levels would continuously diverge. Actually, there has been a significant widening in the *levels* of productivity between the two countries over the post-war period. Two decades ago, the gap in output per worker was in the neighbourhood of $1,000; today it is over $3,000

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(Chart 5-5). Thus, any significant narrowing in this gap would require a sharp acceleration in productivity growth in agriculture in Canada relative to the United States. For example, assuming that U.S. agricultural productivity growth over the next two decades were to approximate that achieved over the past two decades, Canadian farmers would need to step up their productivity growth by more than half—from 5½ per cent to over 8 per cent per year—to catch up to U.S. productivity levels by 1990.[1]

Part of the productivity gap between Canada and the United States can be explained by the fact that U.S. agriculture is more highly mechanized than Canadian agriculture. In the United States machinery input per farm worker has been about 30 per cent higher than in Canada.

Probably a much more important part of the productivity gap between the two countries arises, however, from differences in yield technology in both crop and livestock production—that is, from much higher expenditures per worker in the United States on various resources that contribute to higher yields in crop production per acre and in livestock production per animal. As shown in Table 5-2, such expenditures were more than twice as high as in Canada over the period 1961-65.

Correspondingly, the *proportions* of farm expenditures on mechanization and yield technology differ between the two countries; whereas U.S. farmers spent nearly twice as much on yield technology as on mechanization, Canadian farmers spent more on mechanization than on yield technology. This suggests that labour productivity in the United States has gained more and reached a higher level as a result of more intensive application of yield technology rather than more rapid advances in mechanization.

ECONOMIC INCENTIVES IN AGRICULTURAL PRODUCTION

In assessing the potential for further improvements in the productivity of Canadian agriculture, it is useful to identify and attempt to measure the strength of economic forces that stimulated growth in the past. Although such an assessment raises difficult conceptual problems, it can provide some indication of promising directions for shifts in expenditures on agricultural inputs.

[1] Differences in gross real output cannot be used directly as a measure of differences in the efficiency of resource use in agriculture although it is of course a very significant indicator. This is because different climatic conditions, farm programs and farm prices affect optimal use of farm land as well as use of other resource inputs, e.g., fertilizer, machinery and equipment.

TABLE 5-2—INPUTS PER WORKER IN AGRICULTURE, CANADA AND THE UNITED STATES, 1961-65

	Annual Averages		United States as Percentage of Canada
	Canada	United States	
	(1949 $ Can.)	(1949 $ U.S.)	
Total capital and material inputs..	3,011	5,308	176
Selected inputs:			
Land and buildings.....	568	1,031	182
Machinery.....	960	1,230	128
Inputs related to yields.....	931	2,421	260
Crops.....	198	445	225
Livestock.....	733	1,976	270

NOTE: Sub-totals do not add because of miscellaneous items not shown separately. For more detailed estimates, see Staff Study No. 24.

SOURCE: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

In the primarily market-based system that exists in Canada, market prices and resource productivities should generally tend to serve as relevant indicators for efficient allocation of resources. We can, therefore, expect that expenditures in the most productive areas should depend largely on the economic incentives provided by the returns from such expenditures (that is, how much would be yielded by each extra dollar spent on a particular input in agriculture—say, on fertilizer or machinery). A rough classification of the strength of these returns is shown for various categories of inputs in Table 5-3. "Weak" returns are classified as a yield of 10 per cent or less, "intermediate" returns as 11-20 per cent, and "strong" returns as over 20 per cent. The analysis suggests, for example, that during the years 1947 to 1951, the incentives for expenditures on agricultural inputs were strong for mechanization and crop-yield technology but weak for additional labour. Over the years, as annual investments and purchases of the more productive inputs increased, these incentives declined but are still strong in inputs related to crop-yield technology (Table 5-3).

A comparison of this ranking of economic incentives with the earlier estimates of the growth pattern of Canadian labour productivity in agriculture reveals a general similarity. Mechanization and crop-yield technology contributed more to the over-all rate of growth than inputs related to livestock production, and land and buildings. An equivalent analysis of U.S. data does not show such close parallels. There, returns on additional investments ranked highest for inputs in farm mechani-

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TABLE 5-3—ECONOMIC INCENTIVES FOR RESOURCES IN AGRICULTURE

	Economic Incentive to Increase Input	
	1947–51	1961–65
Labour	weak	weak
Capital and material inputs		
Land and buildings	weak	weak
Machinery	strong	intermediate
Inputs affecting crop yields		
Fertilizer	strong	strong
Seed	strong	strong
Inputs affecting livestock yields		
Livestock on farms	weak	weak
Livestock purchases	intermediate	weak
Feed purchases	weak	weak

NOTE: For estimation procedures, see Staff Study No. 24.

zation but the contribution to growth was greater in yield technology. Evidently, dollar returns on investments are not the only economic incentive for greater productivity gains. Other important factors are involved.

At this point we might surmise that government policies have had a decisive influence. Faced by excess production in the late 1950's, the U.S. government paid farmers to take land out of grain production. This in turn is likely to have induced farmers to increase crop yields on the remaining acreage and to feed more grain to livestock. In addition, there was provision to sell surplus grain directly to the government. The Canadian government, on the other hand, utilized a system of grain delivery quotas essentially based on grain acreage. This in turn may have induced farmers to enlarge their farm acreage and invest more heavily in mechanization. In contrast with the substantial decline in farm acreage in principal crops in the United States over the past two decades, there has been a small expansion in Canadian acreage in principal crops.[1] Shifts among crops apparently have contributed little to the over-all gain in the volume of crop production in either country (Table 5-4). But changes in crop yields have contributed very significantly. In Canada, higher crop yields accounted for 70 per cent of the estimated expansion in crop produc-

[1] For principal crops accounting for about four-fifths of all crop production in Canada and the United States, the acreage in the United States declined from 308 million to 266 million acres between 1947 and 1965; in contrast, in Canada, there was a slight increase in such acreage from 60 to 62 million acres.

TABLE 5-4—CONTRIBUTION OF CHANGES IN ACREAGE, CROPS AND YIELDS TO CHANGES IN VOLUME OF PRODUCTION OF PRINCIPAL CROPS, CANADA AND THE UNITED STATES

	Canada	United States
	(Millions $ Canadian)	(Millions $ U.S.)
1965 Production	2,274	15,085
1947 Production	1,815	11,854
Change 1947–65	459 (100%)	3,231 (100%)
Attributable to:		
Changes in acreage	134 (+29%)	− 2,070 (− 64%)
Shifts in crops	6 (+ 1%)	− 223 (− 7%)
Changes in yields	319 (+70%)	+ 5,524 (+171%)

SOURCE: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

tion; in the United States, they accounted for over 170 per cent and more than compensated for the negative effects of acreage reduction and shifts among crops.

CROP YIELD TECHNOLOGY

It would be unrealistic to attribute these different patterns of growth in the two countries to government policy alone. Differences in climatic conditions have played an important role. Canada's crop production is centred in the Prairie provinces where the growing season is short, precipitation sparse, and farmers specialize in the production of hard red spring wheat and other small grains. In the United States, agricultural production is centred in the Corn Belt where climatic conditions are favourable for production of coarse feed grains, especially corn. In 1965, for example, the yield of corn in the United States was 68 bushels per acre; this compares to a yield of 22 bushels per acre of wheat in Canada.[1] On the basis of post-war trends, corn yields in the United States have been increasing at an annual rate of about 2.0 bushels per acre, whereas wheat yields in Canada have been increasing at a rate of only 0.2 bushels per acre. Canada's corn yields compare favourably to the U.S. corn yields but climatic conditions in Canada do not favour substantial and widespread production of this crop. Corn acreage (mainly in Southern Ontario) accounts for less than 2 per cent of Canadian cropland, compared with more than 20 per cent in the United States. Very few Canadian farmers have been able to benefit from advances in corn-yield technology. Moreover, the

[1] These yield figures have been adjusted for abnormal weather conditions on the basis of longer-term trend analysis.

United States has succeeded in the hybridization of sorghum grain. Since 1947, acreage of this feed grain has expanded from five to thirteen million acres, and yields have more than tripled.

A comparison of Canadian and U.S. crop yields quickly reveals that Canada has made remarkable gains in corn and soybean yields but appears to have no substitute for sorghum grain. Canada continues to rely heavily on the lower-yielding small grains for feed production and appears to lag behind in yield improvements of wheat and barley, and potatoes. Although Canada compares very favourably in flaxseed and soybean yields, unlike Canadian farmers, U.S. farmers have been able to shift from flax to soybeans, an oilseed crop more widely adapted to U.S. climatic conditions with greater yield and yield-gains than flax. Consequently, in terms of over-all improvement Canada has fallen behind the United States in crop production per acre (Chart 5-6).

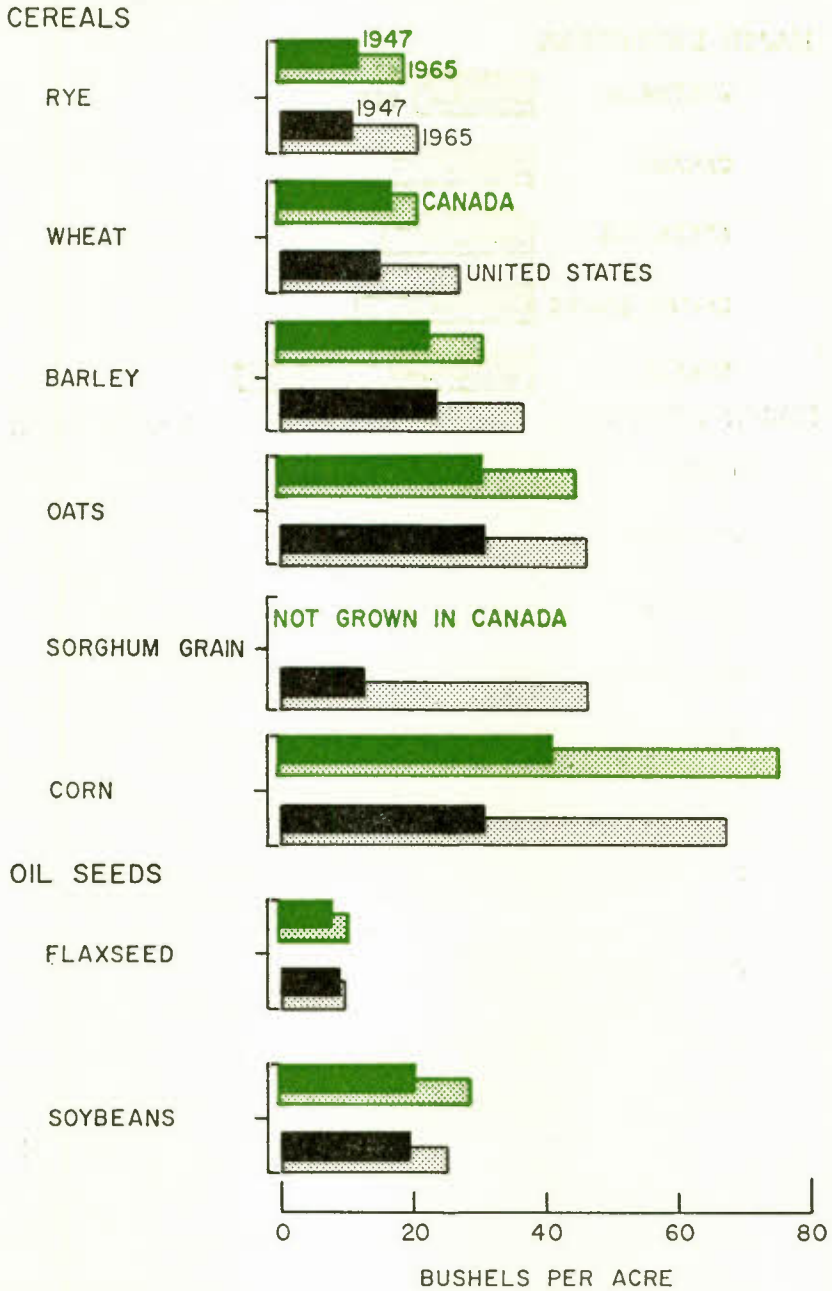
In Canada the most important crop is wheat, which has traditionally accounted for the largest portion of Canada's agricultural exports. In international comparisons of wheat *yields per acre,* not wheat *quality,* Canada ranks low and appears to be falling further behind. After the Second World War, Canada ranked about twentieth in wheat yields per acre among major producing countries; today Canada ranks about twenty-eighth. Wheat yields of most West European countries today are two to three times higher than Canadian yields (Chart 5-7). Prior to the Second World War, wheat yields of major exporting countries, with the exception of France, tended to be lower than Canadian yields. Now, except for Australia, they have either caught up to, or surpassed, Canada. Compared with the major importing countries of Western Europe, the differences are even more striking. From 1947 to 1965, these countries have increased their wheat yields at a rate of 0.5 to 1.4 bushels per year, which is from two to five times the Canadian rate of gain.[1] Indeed, in some of these countries the *increase* in wheat yields during the post-war period exceeds the average *level* of wheat yields in Canada during recent years.

Generally, the highest rates of gain have been in countries where climatic conditions favour high yields of cereal crops and where yields resulting from more intensive cultivation traditionally have been higher than in Canada. They could not have been attained, however, without drastic improvements in production techniques—that is, increased mechanization, greater fertilizer application, better disease and weed control, variety improvements, and greatly improved farm-

[1] Although these estimates of yields and yield improvements refer to the post-war period, the relationships are not basically altered for comparisons covering the period 1939 to 1965.

CHART 5-6

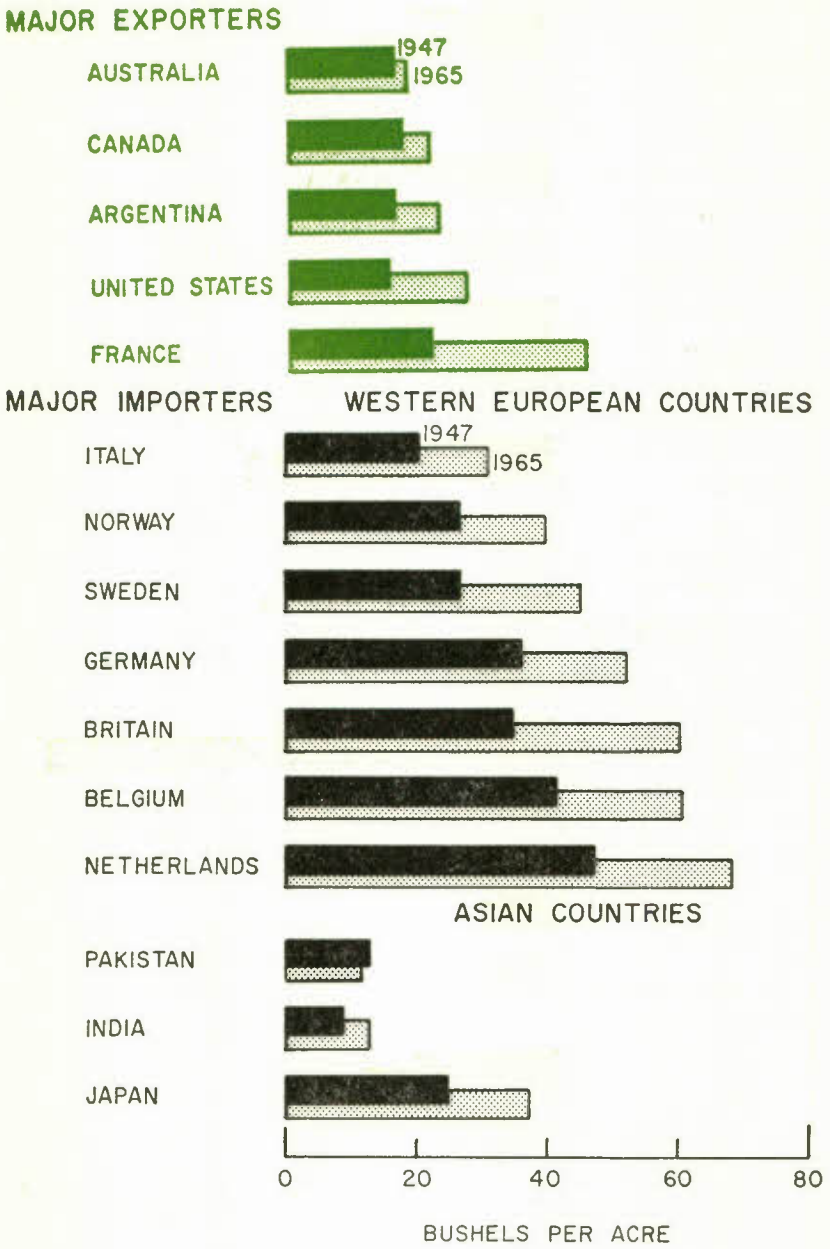
CROP YIELDS, CANADA AND THE UNITED STATES



Note: Estimates for 1947 and 1965 derived from underlying trend yields.
Source: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

CHART 5-7

WHEAT YIELDS, SELECTED COUNTRIES



Note: Estimates for 1947 and 1965 derived from underlying trend yields.
Source: Based on data from U.S. Department of Agriculture; Dominion Bureau of Statistics; and estimates by Economic Council of Canada.

ing practices. Also, a good part of these gains has come from research, where costs are small compared with returns. It has been estimated, for example, that even in the United States, where climatic conditions for wheat production are not as favourable as in Europe, wheat variety improvements since 1939 account for one-quarter of all wheat-yield gains, and that this alone now adds annually well over $125 million to U.S. Gross National Product. These gains are extremely large in the light of the fact that governments in the United States—federal and state—engaged the services of only a small number of research scientists to provide the basic research in wheat, the benefits of which accrue to farmers and consumers at very low costs.

Canada's wheat acreage is about one-half the size of U.S. wheat acreage, but the size of the wheat research staff is only one-third as large; in rough terms the U.S. government allocates two research workers, while Canada allocates only one research worker, per million acres of wheat. Although it does not follow that allocation of more research funds leads to a proportionately greater rate of advance in yield technology, a closer examination of priorities in allocation of research funds in Canada appears to be warranted. For example, in 1966, the research resources in the field of cereal crops appear to have been unduly small in relation to those in horticultural crops—that is, fruits and vegetables. Federal and provincial governments and universities invested 219 professional man-years in horticultural crops, but only 113 professional man-years to all cereal crops combined (wheat, oats, barley, corn and rye).[1] Considering that over the past decade cash income derived from the production and sale of fruits and vegetables in Canada accounted for less than 10 per cent, while cash income derived from sale of cereal crops accounted for more than 25 per cent, of Canada's total farm cash income, there appears to be some potential for adjustment. In particular, we suggest that there is need to examine whether the amount of resources currently allocated to research in cereal crops is adequate. More generally, there is need to examine whether priorities currently being given, implicitly or explicitly, to various areas of research in agriculture are appropriate.

LIVESTOCK YIELD TECHNOLOGY

Canadian farmers have expanded the scale of their livestock enterprises very rapidly and have achieved significant improvements in

[1] Department of Agriculture, "1966 Inventory of Agricultural Research Projects", prepared for the Canadian Agricultural Services Co-ordinating Committee, Ottawa, February 1967.

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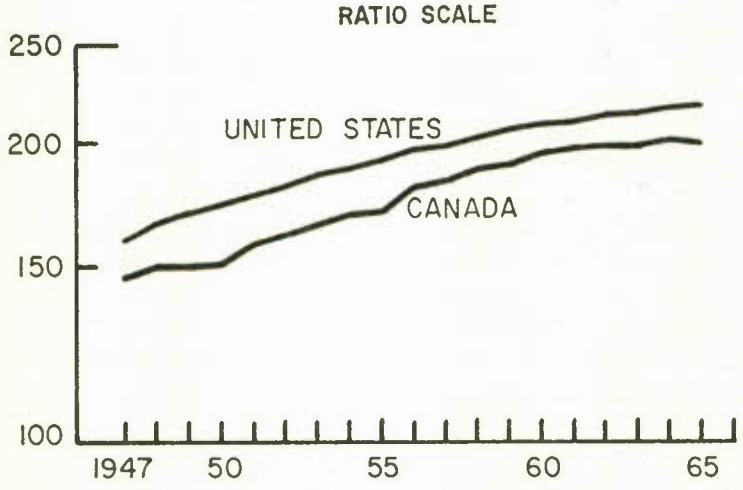
production techniques. For example, over the past 15 years the average size of cattle herds has more than doubled, the average size of hog herds has nearly tripled, and the average size of turkey flocks has increased almost tenfold. These trends towards scale and specialization have been accompanied by higher yields per animal. Annual egg production has risen from 150 eggs per hen in 1947 to 200 in 1965, milk production per cow from 4,600 pounds to 6,560, and cattle production from 40 to 60 animals marketed for every 100 cows kept on farms. In terms of production per animal, these increases range from 30 to 50 per cent.

In spite of these gains, yield levels in Canadian livestock production are still well below U.S. levels. In 1965, for example, hens on Canadian farms laid fewer eggs per laying hen than those on U.S. farms. Over the years the performance has improved in both countries and there is some indication that there is some narrowing of the gap. In earlier years, the percentage difference was as much as 20 per cent; in 1965 it was close to 10 per cent (Chart 5-8).

CHART 5-8

EGG PRODUCTION PER HEN,
CANADA AND THE UNITED STATES



Source: Based on data from U.S. Department of Agriculture and Dominion Bureau of Statistics.

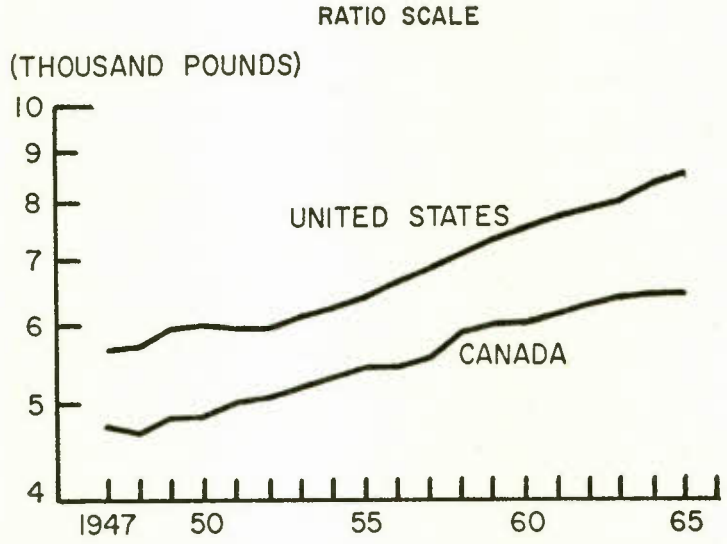
In the dairy field, the developments are less favourable for Canada. In the early post-war years, milk production per cow in Canada was about 15 per cent below the U.S. level, but in more recent years it

has been closer to 25 per cent below the U.S. level. In 1965, for example, the figure in the United States was about 8,400 pounds of milk per cow; in Canada it was only 6,500 pounds (Chart 5-9). One of the reasons for this gap is that Canadian dairy producers are often located in the more remote areas and therefore do not ship all of their milk but only the cream. This is not fully reflected in official marketing estimates and has the effect of marginally widening the above productivity disparity. While the proportion of cream shipments varies among provinces, in all provinces except British Columbia milk production per cow is lower than the national average of the United States.

CHART 5-9

MILK PRODUCTION PER DAIRY COW, CANADA AND THE UNITED STATES

(THOUSAND POUNDS)



Source: Based on data from U.S. Department of Agriculture and Dominion Bureau of Statistics.

Also, some of the shipments come from dual-purpose herds where production of milk is merely a by-product of beef production and often used in raising beef calves. While this lowers estimates of dairy production per cow, there is no evidence that beef cattle in Canada are more productive than in the United States. Using cattle marketings per 100 cows kept on farms as an indicator of beef production per

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animal, in 1965 the yield in beef production was about 25 per cent lower in Canada than in the United States. These Canada-U.S. yield ratios were nearly equal in the early post-war years.

From these comparisons, it would appear that, as in crop production, yields in livestock production are below U.S. levels, and that in some areas—for example, dairy and cattle production—the gap is widening. These diverging trends probably reflect many factors, including lags in the adoption of efficient farm practices, and gaps in research and development in the livestock sector. Animal research efforts in Canadian universities and in federal and provincial research institutions are proportionately smaller than in the United States. Also, a relatively much smaller volume of research in Canada is conducted by private industry than in the United States and it is not known to what extent this lack of private research puts Canadian yield technology at a disadvantage. If this gap in yield technology is to be reduced, its causes must be more carefully identified.

POLICY IMPLICATIONS

Labour productivity in Canadian agriculture has advanced over the past two decades at nearly 6 per cent per year. The preceding analysis shows that over one-third of this gain has been associated with the movement of workers out of agriculture. Another third is attributable to increased capital and materials inputs, and the balance to other productivity improvements.

Canada has achieved a *rate* of growth of labour productivity in agriculture well above that recorded in other sectors of the economy, and of roughly comparable dimensions to the rate of growth of agricultural labour productivity in the United States. However, the substantial disparity between the two countries in the absolute *level* of agricultural labour productivity has widened significantly. Mechanization and yield technology have contributed in nearly equal proportions to growth in the United States. In contrast, Canada has advanced in the area of mechanization but not kept pace in yield technology.

We do not wish to give the impression that substantial improvements in yield technology will necessarily or automatically solve the problems of Canadian agriculture under any circumstances. Indeed, our analysis implies that unless developments in yield technology go hand in hand with other appropriate developments—such as increased mechanization, increased average farm size, expansion of markets for agricultural products, better market organization, and continued out-migration from agriculture—the severity of Can-

ada's farm income problems might well be aggravated by major new break-throughs in yield technology.

As indicated at the outset of this Chapter, the expansion of Canada's domestic demand for agricultural products is essentially limited to population growth. Under these conditions, reductions in food prices would not stimulate significant increases in domestic food consumption, and would result in reductions in farm income. On the other hand, there may be a potential for expanding agricultural exports, and careful and continuing consideration should be given to all possible means for achieving significant increases in such exports. For wheat, Canada's major agricultural product, a thorough examination of all aspects of production and marketing is needed at the present time, especially in view of greater uncertainty about future export possibilities and changing conditions and policies in various countries affecting wheat. In the long run, continuing research in production and marketing of all grain crops is needed to anticipate problems, and find potential solutions, before they become acute.

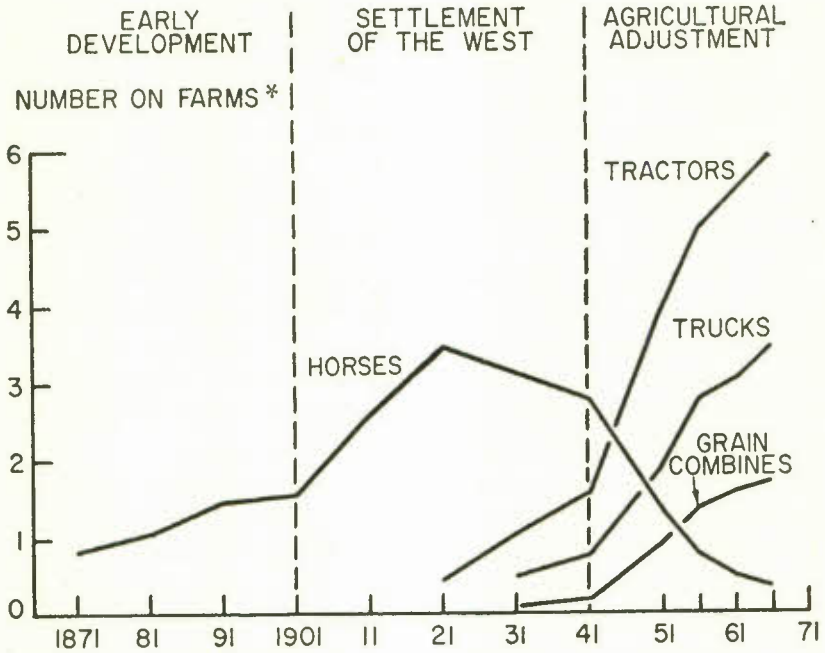
Adoption of machine technology has been very rapid during the post-war period and judging by the estimates of returns on such investments, as well as current rates of progress (Chart 5-10), there is still room for improvement. In future, this process will probably require fewer additions to machinery inputs but there will undoubtedly be a continuing, and perhaps accelerating, trend towards the use of machinery and equipment of growing performance and capacity. Already, in both Canada and the United States, the rate of increase in the number of trucks is diminishing and in the United States the number of farm tractors has actually declined over the past five years. This apparent trend is closely related to the continuing consolidation of smaller farm units, the reduction in the agricultural labour force, and the concomitant need for larger and more powerful units of machinery and equipment.

Such farm size adjustments are highly desirable for improving the performance of the economy as a whole and the agricultural sector in particular. But they involve social costs as well as social benefits and may impose heavy burdens on individuals. A range of government policies is required to ease the burdens of adjustment and to facilitate changes of a widely beneficial nature. Among policies to serve these purposes are:

—*Education:* Although considerable improvements have been made over the post-war period, education levels of farm youth are still below the levels of nonfarm youth. Higher levels of education are

CHART 5-10

ADOPTION OF NEW MACHINE TECHNOLOGY IN AGRICULTURE



*Horses in millions; tractors, trucks, and grain combines in hundreds of thousands.
Source: Based on data from Dominion Bureau of Statistics.

essential for those who wish to leave farming to compete in nonfarm occupations.

Better education is equally essential for those who wish to stay in farming and who need to adopt modern and efficient production techniques, manage larger farm units, and use the productive resources at their disposal to yield the maximum payoff.

—*Financial assistance for mobility:* Many farmers whose experience and savings are invested in agriculture are reluctant or unable to leave their farms. Effective policies for adjustment—particularly in the form of financial assistance for retraining and out-movement—should take account of the age, previous schooling, and the financial obligations of those whom these programs are designed to assist.

—*Financial assistance for both retirement and farm consolidation:* When older farmers retire on farms because of lack of alterna-

tives, whole farm units, at one time operated very efficiently, often become less efficient or even deteriorate. It frequently takes years for the farmer's son to rebuild the family farm to its former level of productivity, and even longer before he can enlarge it. There is therefore a need to help bridge this gap in the "family cycle". Financial assistance for retirement should enable older farmers to retire without undue hardship. At the same time, selective financial assistance should enable the younger farmers to continue in farming and to expand their farms towards the achievement of more efficient operations through farm consolidation.

—*Farm management assistance:* As capital requirements on farms are rapidly increasing, it is essential that funds should not be tied up in unproductive investments. It is now possible to bring the benefits of farm management assistance by monthly computer analysis of farm business accounts to every farmer at a very reasonable cost per farm.[1] More intensive research and development in this area could be extremely helpful to farmers in making better use of their limited operating capital and at the same time would enable credit institutions to provide additional funds for farmers in a way which could facilitate more efficient performance. Such management aid and more readily available credit could greatly help to put farm management on a sounder business footing.

All these policies could help the commercial family farms to become more efficient and to increase their incomes. It has not been our purpose to consider the whole problem of low farm incomes.[2] Rather, we have presented a long-run assessment of productivity gains in the past and of potential improvements in the future. We believe that a high rate of future productivity growth in agriculture is necessary for the long-term growth of farm incomes in Canada. But there is also a need for more clearly defined short-run policies. Policies are required to deal with marketing problems arising from seasonality of production, production cycles and price instability. Others are required to avert inequitable costs and burdens on individuals in the process of facilitating continuing agricultural adjustment towards greater efficiency in agriculture.

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[1] Some promising initial steps in this direction have been taken by the federal Department of Agriculture and co-operating agencies.

[2] For an evaluation of the impact of certain policies on the problem of low farm incomes, see Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment.*

6

The Problem of Poverty

POVERTY IN Canada is real. Its numbers are not in the thousands, but the millions. There is more of it than our society can tolerate, more than our economy can afford, and far more than existing measures and efforts can cope with. Its persistence, at a time when the bulk of Canadians enjoy one of the highest standards of living in the world, is a disgrace.

What is poverty in Canada? Those who have seen it, felt it, experienced it—whether as its victims or as those trying to do something about it—can supply some telling descriptions. But one of the notable characteristics of poverty in modern times is that it is so located in both city and country, and often so disguised (it does not, for example, invariably go about in rags), that it can pass largely unnoticed by those in happier circumstances. An occasional glimpse from a car window; a television show or Saturday supplement article—these may be the only manifestations of it which touch many a middle-class consciousness. Yet the figures—even the conservative, rather tentative estimates in this Chapter—show indisputably that it is there, almost everywhere in Canada, on a larger scale than most Canadians probably suspect.

One reason for poverty's partial invisibility is that the poor tend to be collectively inarticulate. Many of them lack the education and the organization to make themselves heard. For example, most of them are outside the ambit of the trade union movement. They have few spokesmen and groups to represent them and give voice to their needs.

Another difficulty is that it is all too easy, in Canada, to file poverty away under the heading of certain other long-standing national

problems, and in this way to lose sight of it as a major problem in its own right. Thus many Canadians may assume that the problem of poverty is close to identical with the problem of low average incomes in the Atlantic Provinces and Eastern Quebec (especially their rural areas) and among the Indian and Eskimo populations. But this is an inaccurate impression. The *incidence* of poverty—the chance of a given person being poor—is certainly much higher in the areas and among the groups just mentioned. But in terms of absolute numbers, between a third and a half of the total poverty in Canada is to be found among the white population of cities and towns west of Three Rivers. The resident of Montreal or Toronto need not travel far to see poverty first-hand; a subway fare will suffice. Much rural poverty, too, is to be found dispersed through areas where *average* income, by rural standards, is relatively high.[1]

There are two major problems in defining poverty. First, it is a *relative* concept. Second, while the availability of relevant statistics compels it to be discussed here largely in terms of low incomes, it means something more than simple income deficiency.

Let us deal first with the problem of relativity. It is of course true that generally-agreed-upon concepts of poverty alter through space and time. Thus, the situation of those Canadians whom the majority of their fellow citizens would deem to be suffering from poverty is hardly to be compared with that of the street-sleepers of Calcutta. And if a typical 1968 "poverty line", defined in terms of real income, were extended back through time, most Canadians during the Depression of the 1930's, and perhaps even most Canadians of the 1920's, would be found to have been living below that line.

But neither of these facts makes poverty in Canada in 1968 any less real or painful. To feel poverty is, among other things, to feel oneself an unwilling outsider—a virtual nonparticipant in the society in which one lives. The problem of poverty in developed industrial societies is increasingly viewed not as a sheer lack of essentials to sustain life, but as an insufficient access to certain goods, services, and condi-

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[1] "...the problem of low rural incomes can be associated to a degree with the problem of poor regions, but if this association is overemphasized, attention may be unduly diverted from the dispersed, but in absolute numbers still very substantial, poverty problem in prosperous regions. Although one third of the 'poor' farms in Canada were located in areas where their proportion was so high that the areas themselves could be classified as poor, almost another third of the poor farms were located in areas where the opposite was true." Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment.* A Study of the Economic Impact of ARDA, PFRA, and MMRA, Special Study No. 7, Economic Council of Canada, Ottawa, Queen's Printer, 1967.

tions of life which are available to everyone else and have come to be accepted as basic to a decent, minimum standard of living.

Poverty, thus defined, is not quite the same thing as low income. A statistician would say there is a very strong association between the two, to the extent that one can often be used as a rough-and-ready substitute for the other. They are not, however, identical. For example, the low-income population of Canada includes a small proportion of people such as the university student who gets by on $1,500 a year, but does not feel himself irrevocably poverty-stricken, first, because he has a family to fall back on if necessary, and second, because much better income prospects lie a short distance ahead of him. Much more serious and more widespread is the kind of low-income situation that carries with it a sense of entrapment and hopelessness. Even the best statistics can only hint at this. They cannot capture the sour atmosphere of poor health and bad housing—the accumulated defeat, alienation and despair which often so tragically are inherited by the next and succeeding generations.

We believe that serious poverty should be eliminated in Canada, and that this should be designated as a major national goal. We believe this for two reasons. The first is that one of the wealthiest societies in world history, if it also aspires to be a just society, cannot avoid setting itself such a goal. Secondly, poverty is costly. Its most grievous costs are those felt directly by the poor themselves, but it also imposes very large costs on the rest of society. These include the costs of crime, disease, and poor education. They include the costs of low productivity and lost output, of controlling the social tensions and unrest associated with gross inequality, and of that part of total welfare expenditure which is essentially a palliative made necessary by the failure to find more fundamental solutions. It has been estimated in the United States that one poor man can cost the public purse as much as $140,000 between the ages of 17 and 57.

It should also be noted that in recent years there has been a burst of improvement in the available weaponry against poverty. Not only have new weapons been devised or proposed; but there has also been a development of techniques of evaluation by which the effectiveness of both old and new weapons can be assessed and enhanced. Much of this improvement has occurred since the U.S. Government declared formal war on poverty with its Economic Opportunity Act of 1964. (The term "war on poverty" is appropriate in more than one sense, for, ironically enough, some of the techniques of policy planning and evaluation now being applied in the field of poverty originated within the military and

defence planning establishments.) There have also been some extremely promising developments in Canada and some overseas countries. We would not wish to paint an overoptimistic picture, nor to suggest that much further experimentation and improvement are not required. But it is undoubtedly the case that the prospects for mounting a powerfully renewed offensive against poverty, with clear performance criteria and appropriate feedbacks of information on actual results obtained, and with a greater sense of involvement on the part of the poor themselves, are considerably better today than they would have been ten years ago.

In the remainder of this Chapter, some income statistics are first presented in order to give the reader some sense of the over-all magnitude of the problem of poverty in Canada. Some broad characteristics of low-income families and individuals are also examined—characteristics significant for the planning of anti-poverty programs. A brief reference is made to the special characteristics of poverty among Canada's Indian and Eskimo populations. This is followed by a sketch of the U.S. war on poverty and some useful lessons from that experience. There is also some reference to the highly interesting techniques of anti-poverty planning recently used in the Gaspé and Lower St. Lawrence areas of Quebec. Finally, the concluding section of the Chapter puts forward some proposals that would help to lay the basis for a well co-ordinated and effective Canadian war on poverty.

THE EXTENT OF LOW INCOMES IN CANADA

In popular discussion of the problem of poverty, a traditional opening question has been, "Are the rich getting richer while the poor get poorer?". In other words, poverty has been viewed in terms of trends in the distribution of income through society as a whole. This is not a particularly useful way of coming to grips with poverty as it is defined here. Nevertheless, recent trends in the distribution of income are taken as a starting point in order to clear the ground for what we regard as a more fruitful approach.

As may be seen from Table 6-1, there has been relatively little change in the distribution of family income in Canada over the last 15 years. In particular the share of total income received by the bottom fifth of families has altered only fractionally. Breaks in the statistics make it difficult to extend these comparisons further back in time, but it appears that there may have been a trend towards greater income equality between 1931 and 1951, with the share received by the bottom fifth showing an appreciable increase. Between 1951 and 1965,

however—a period over which average family income increased very rapidly—little shift in percentage shares was apparent. (It should be noted that the distribution of family income in Table 6-1 is *before tax*; exactly corresponding figures of income *after tax* are not available, but Table 6-2 gives some idea of the effective rates of income tax applying to various income groups in 1961.)

TABLE 6-1—DISTRIBUTION OF NONFARM FAMILY INCOME BEFORE TAX

	Distribution of Total Income			Average Income per Family
	1951	1961	1965	1965
	(Percentage)			(Dollars)
Lowest-income fifth of families	6.1	6.6	6.7	2,263
Second fifth	12.9	13.4	13.4	4,542
Third fifth	17.4	18.2	18.0	6,102
Fourth fifth	22.5	23.4	23.5	7,942
Top fifth	41.1	38.4	38.4	13,016
All families	100.0	100.0	100.0	6,669

SOURCE: Based on data from Dominion Bureau of Statistics.

TABLE 6-2—CLASSIFICATION OF NONFARM FAMILIES AND PERSONS NOT IN FAMILIES, BY INCOME GROUP, 1961

Income Group	Number of Families	Number of Persons Not Living in Families	Average Income Tax as a Percentage of Income*
	(000)	(000)	
Under $1,000	137	306	—
$1,000—$1,999	275	192	1.5
$2,000—$2,999	356	157	3.2
$3,000—$3,999	524	150	4.6
$4,000—$4,999	583	71	6.0
$5,000—$5,999	500	35	6.5
$6,000—$6,999	365	17	7.1
$7,000—$7,999	260	9	7.4
$8,000—$9,999	296	8	8.5
$10,000 and over	331	10	16.5
Total	3,627	955	8.1

*Applies to families and persons not living in families.
SOURCE: Based on data from Dominion Bureau of Statistics.

The lower fifth, or lower third, or any other fraction of an income distribution, makes a poor statistical substitute for poverty as we have defined it. It bears no necessary relation to the needs of the poor—to their degree of access to certain goods and services regarded as basic to a decent standard of life at any point in time. The proper object of an attack on poverty should be the careful identification and aiding of those whose circumstances do not permit them to achieve such a standard. Ultimately, the object should be the elimination of poverty.

In a later section of this Chapter, we shall recommend thoroughgoing procedures for the setting of minimum living standards and the estimation of the amount of poverty in Canada. Here, operating without the benefit of such procedures, we nevertheless feel it necessary to give the reader some general notion of the size and character of the poverty problem which proper estimates would be likely to reveal. The tentative and broadly illustrative character of the figures should be strongly emphasized. It would be most distressing to see them taken up as fixed, precise and authoritative measures of poverty in Canada: rather, they should be superseded as soon as possible by better and more informative figures. To underline this point, two alternative estimates of "total poverty" are presented.

The two estimates are derived from a special study of the low-income population of Canada, carried out by the Dominion Bureau of Statistics on the basis of the 1961 Census.[1] Low-income families were defined as families with incomes insufficient to purchase much more than the basic essentials of food, clothing and shelter. An examination of data on family expenditures, collected from a sample of about 2,000 families living in urban centres with populations of 15,000 or more, showed that, on average, families allocated about half of their income to these needs. It might therefore be concluded that where a family was using up a good deal more than half its income on essentials, that family was likely to be in straitened circumstances, having little money left over for such things as drugs, medical care, education of children, recreation, savings, etc.

For purposes of the first estimate, low-income families and individuals were defined as those using 70 per cent or more of their incomes for food, clothing and shelter. On this basis, low-income families and individuals would include single persons with incomes below $1,500, families of two with less than $2,500, and families of three, four, and

[1] J. R. Podoluk, *Incomes of Canadians*, Dominion Bureau of Statistics Census Monograph, 1968.

five or more with incomes of less than $3,000, $3,500, and $4,000 respectively.

As of 1961, some 916,000 nonfarm families plus 416,000 individuals were living below these levels.[1] The total number of persons involved was about 4.2 million, including 1.7 million children under 16 years of age. In all, they accounted for some 27 per cent of the total nonfarm population of Canada.

There are a number of special difficulties in defining and estimating the incomes of farm families, and the figures in this area are not much more than educated guesses. It would appear that, in 1961, roughly 150,000 farm families,[2] comprising perhaps 550,000 persons, may have been living below the income levels set forth above. The addition of these people to the nonfarm group would have brought the low-income percentage for all of Canada, including farms, to just under 29 per cent on the basis of the definition employed.

The Canadian economy has of course undergone a vigorous expansion since 1961, sufficient to lift the incomes of a good many families and individuals above the low-income lines we have specified. No comparative figures are available for farm families or for nonfarm individuals, but it would appear that by 1965 the percentage of nonfarm families living below the specified levels (their incomes being expressed in 1961 dollars) had declined from 25 per cent to 20 per cent. This probably gives an exaggerated impression of the longer-term trend of improvement, inasmuch as in 1961 the economy was at a low point of the business cycle, with the ranks of the poor temporarily swollen by unusually large numbers of unemployed.

The above estimate is the more conservative of the two presented. Most readers who care to reflect on the income cut-offs on which the estimate is based, and to compare these cut-offs with their own personal income situations, will agree that living standards at or just above the cut-offs are likely to be modest indeed.

In the second estimate, the cut-offs are raised somewhat by the device of assuming that the expenditures of 60 per cent or more (instead of 70 per cent or more) of income on food, clothing and

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[1] Average incomes of low-income families in 1961 were:

Two persons in family	$1,427
Three persons in family	$1,851
Four persons in family	$2,347
Five or more persons	$2,707

[2] The *total* number of families primarily dependent on farming for a livelihood in 1961 was in the order of 275,000. Thus more than half these families were below the income levels used here.

shelter by an individual or family indicates straitened circumstances. This brings the cut-offs up to $2,000 for a single person, $3,500 for a family of two, $4,000 for families of three and four, and $5,000 for families of five or more. Applied to the 1961 nonfarm population, these changes raise the low-income percentage from 27 per cent to 41 per cent.

At the beginning of this series of estimates, their "tentative and broadly illustrative character" was emphasized. They are not fully adequate measures of poverty. Such measures require among other things a thorough-going analysis of the needs and expenditure patterns of different types of families, and a consideration of assets, borrowing power, and income in kind as well as money income. It is useful also to distinguish between temporary and long-term poverty, and to allow for differences in living costs between different cities, towns, and rural areas.

But for all their shortcomings, the estimates presented here—particularly the first, more conservative set—suggest very strongly the existence of a major poverty problem in Canada. The statement that at least one Canadian in every five suffers from poverty does not appear to be a wild exaggeration. It is almost certainly close enough to the truth to be taken as one of the most serious challenges facing economic and social policy over the next few years.

SOME STATISTICAL CHARACTERISTICS OF LOW INCOME FAMILIES AND INDIVIDUALS

Statistics cannot adequately describe poverty. But used with care they are capable of furnishing important clues to types of policies likely to be effective against poverty. With this end in view, some further information is set forth here concerning the nonfarm low-income families and individuals included in the *first* of our estimates of the extent of poverty in Canada.

Two important warnings must be issued at the outset. Statistically, low-income families and individuals differ noticeably from the total Canadian population in respect of a number of things besides income. Certain characteristics of age, family size, place of residence, education, relationship to the labour force, and occupation, are more commonly found among them than among the population at large. Put another way, where these characteristics are present, the chance of a family or individual having a low income (the *incidence* of low income) is high. These high rates of incidence are often significant as policy guides to particular kinds of poverty problems.

TABLE 6-3—SELECTED CHARACTERISTICS OF ALL NONFARM FAMILIES AND LOW-INCOME NONFARM FAMILIES
YEAR ENDING MAY 31, 1961

	(1) Number of Nonfarm Families	(2) Number of Nonfarm Families	(3) Incidence of Low Income
	All Families	Low-Income Families	(2) as a percentage of (1)
	(000)	(000)	
Nonfarm Families	3,627	916	25
Place of Residence:			
Metropolitan	1,901	314	17
Other Urban	959	250	26
Rural	767	352	46
Region:			
Atlantic	349	158	45
Quebec	988	276	28
Ontario	1,363	254	19
Prairies	556	150	27
British Columbia	368	78	21
Sex of Head:			
Male	3,344	795	24
Female	283	121	43
Age of Head:			
Under 25	149	43	29
25-54	2,509	554	22
55-64	491	109	22
65 or over	478	210	44
Size of Family:			
Two	960	280	29
Three	734	148	20
Four	758	157	21
Five or more	1,175	331	28
Number of Children under 16:			
None	1,383	330	24
One	699	143	21
Two	679	156	23
Three or more	866	287	33

	(1) Number of Nonfarm Families	(2) Number of Nonfarm Families	(3) Incidence of Low Income
	All Families	Low-Income Families	(2) as a percentage of (1)
	(000)	(000)	
Nonfarm Families	3,627	916	25
Labour Force Status of Head:			
In current labour force	2,996	573	19
Not in current labour force but worked during year	100	49	49
Did not work	531	294	55
Education of Head:			
No schooling or elementary only	1,681	625	37
Secondary, 1–3 years	1,068	208	20
Secondary, 4–5 years	551	62	11
Some university	137	13	9
University degree	190	8	4
Number of Earners in Family:			
No earners	268	217	81
One earner	1,870	529	28
Two earners	1,114	142	13
Three or more earners	375	28	7
Major Source of Income:			
Wages and salaries	2,909	533	18
Self-employment	306	76	25
Transfer payments	271	245	90
Investment income	75	26	35
Other income	55	25	45
No income*	11	11	100

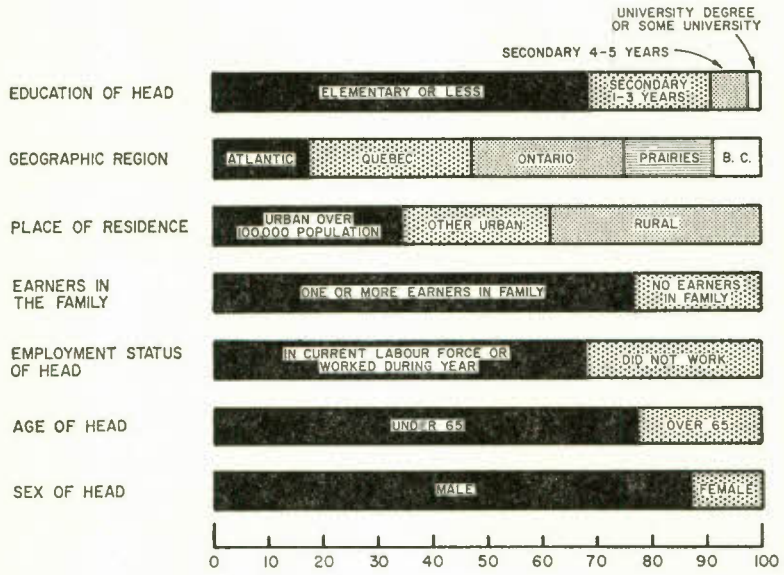
* This relatively small group includes such people as recent immigrants and recently widowed women who had received no income in Canada over the period covered. SOURCE: Based on data from Dominion Bureau of Statistics.

This can be demonstrated in terms of some of the characteristics covered in Table 6-3. It is evident from the incidence figures that income is more likely to be low when one or more of the following characteristics are present:

(1) The head of the family had no formal education beyond elementary school.
(2) The family lives in a rural area.
(3) The family lives in the Atlantic Provinces.
(4) The head of the family is not a member of the labour force.
(5) No member of the family worked during the year.
(6) The head of the family is 65 years of age or over.
(7) The head of the family is a woman.

CHART 6-1

PERCENTAGE DISTRIBUTION OF LOW INCOME NONFARM FAMILIES, 1961



Source: Based on data from Dominion Bureau of Statistics.

From this list, it is all too easy to form a picture of poverty in Canada that consists of a relatively few stereotyped categories, most of them involving high dependence on government pensions and welfare payments. There are indeed many people in such situations, but a more balanced picture of the total low-income population of Canada is

necessary. It is vital, in framing policy, not to be overinfluenced by rates of incidence, and in this way to form too simple and stereotyped a picture of poverty. Chart 6-1 points out the following facts:

(1) 62 per cent of low-income nonfarm families in 1961 lived in urban areas, and of this group more than half lived in metropolitan areas. (If the rough estimate of 150,000 low-income *farm* families in 1961 were included in the Charts, the proportion of all low-income families living in urban areas would still have been more than 50 per cent.)

(2) 83 per cent of low-income nonfarm families lived elsewhere than in the Atlantic Provinces. 53 per cent of them lived in Ontario and the Western Provinces.

(3) 68 per cent of the same group of families had heads who were in the labour force for at least part of the year.

(4) 76 per cent of the group had one or more earners in the family, and (see Table 6-3) 66 per cent of families obtained most of their income from wage, salary and self-employment earnings.

(5) 77 per cent of family heads in the group were under 65 years of age.

(6) 87 per cent of families in the group were headed by men.

It can thus be seen that a set of anti-poverty policies directed towards major groups or geographical areas showing a very high *incidence* of low incomes would almost certainly fail to deal adequately with poverty. It would, for example, have a tendency to neglect unduly the very considerable group whose poverty problems are associated not with an absence of earnings, but with an insufficiency of earnings. It would tend to miss the many pockets of poverty that are scattered through relatively high-income regions—pockets which, in the aggregate, account for a large proportion of total poverty in Canada.

So much for the first warning concerning the interpretation of these statistics. The second warning is to avoid confusing characteristics with causes, and to bear in mind constantly how the total amount of poverty can be affected by broad, economy-wide forces such as the rate of economic growth in relation to potential. If the economy falls well below its potential, the incomes of many people will drop because they become unemployed. It is highly likely under these circumstances that unemployment will tend to strike hardest at those with least education; but to say simply that these persons' low incomes are *caused* by lack of education is not an adequate analysis of the situation.

With these two important cautions stated, we may now proceed to look at some further policy implications suggested by the low-income statistics.

Sources of Income

The principal source of income for most families, including low-income families, is earnings in the form of wages, salaries and income from self-employment. Any factors that adversely affect the market value of labour services, or which prevent the services from being offered, may result in income falling below poverty lines. Among the more notable factors of this kind are lack of job skills (often associated with low levels of formal education), old age, disablement, ill health, and participation in low-paying occupations. The necessity of caring for young children may also prevent labour services from being offered. A small percentage of families are able to offset deficient labour income with returns from wealth holdings. But most must rely on some form of government transfer payment, such as pensions, unemployment insurance, or family allowances; hence the higher degree of reliance on such payments among low-income families, who, as a group, received 27 per cent of their income from this source in 1961, compared with a figure of 8 per cent for all families.

Where a low-income family is for one reason or another incapable of offering labour services, and is therefore largely dependent on government payments, the policy problem of how to aid that family is in one sense relatively simple: the major issue is the size of the income to be provided. But where there are earnings, but on an insufficient scale, or where there is an unexploited potential for earnings, the policy choices are less simple. Other things being equal, it is far better to help people to help themselves—to put them in a position to upgrade their earnings permanently through such measures as training and manpower mobility programs, and to exploit unused earnings potential (provided this does not involve a sacrifice of future to present earnings, as in the case of the youth who drops out of high school to augment family income). But self-help takes time, and meanwhile income support in the form of government payments may be needed. It seems a fair generalization that in the past Canadian social policy has tended to emphasize various forms of income maintenance, and has only recently moved strongly into the more difficult area of promoting self-help among low-income people.

Low Income Occupations

Where the head of a family is in the labour force, his chances of having a low income are very much greater in certain occupations than in others. This statement is a well-worn commonplace, but the extent of the differences revealed in Table 6-4 is nevertheless striking. The incidence of low incomes in 1961 was more than twice the over-all average in four occupational groups: farm workers; loggers and related workers; fishermen, trappers and hunters; and labourers.

TABLE 6-4—OCCUPATIONAL DISTRIBUTION OF MALE NONFARM FAMILY HEADS, 1961

	(1)	(2)	(3)
	Number of Nonfarm Family Heads		Incidence of Low Income
	Total	Low Income	(2) as a percentage of (1)
	(000)	(000)	
Managerial*	419	42	10
Professional and technical	256	12	5
Clerical	200	21	11
Sales	182	24	13
Service and recreation	246	50	20
Transport and communications	256	61	24
Farm workers**	34	19	56
Loggers and related workers	35	20	57
Fishermen, trappers, hunters	20	14	70
Miners, quarrymen, related workers	44	8	18
Craftsmen, production process and related workers	991	183	19
Labourers	149	60	40
Not stated	39	10	26
Total of male nonfarm family heads in current labour force	2,871	524	18

*Includes self-employed, as do other occupational classifications.
**Includes farm *workers* not living on farms.
SOURCE: Based on data from Dominion Bureau of Statistics.

Once again, it is necessary to draw a careful distinction between incidence and total numbers, and to note that the four occupations named accounted for only 22 per cent of all the low-income family heads in the Table. Nevertheless, it is worth remarking that the four occupations tend to be characterized by much seasonality and other

irregularity of employment and earnings. This cross-checks with other information suggesting that, across the whole occupational spectrum, insufficiency of wage and salary earnings is often associated with intermittent and part-time work.

Education, Location and Occupation

The association between low income and lack of education beyond the elementary level is particularly strong. Not only did families whose heads had less than secondary education show a high incidence of low income in 1961 (37 per cent), they also accounted for more than two-thirds of all low-income families.

However, in addition to education there are other factors such as occupation, region, and place of residence (urban or rural).[1] In addition, there is some interaction between education and income, rather than a purely one-way causal connection. Thus the education levels of family heads were very likely influenced by the income and related circumstances of *their* parents; and their circumstances in turn are likely to influence the education levels achieved by their children.

In the cross-classifications of Charts 6-2, 6-3, and 6-4, low educational achievement continues to exhibit a strong association with low income, but does not wipe out the influence of other factors. Thus, even where there is education beyond the elementary level, the incidence of low income continues to be notably higher in the Atlantic Provinces than elsewhere, higher in rural than in urban areas, and considerably higher in some occupations than in others.

It seems clear that provision of adequate education generally, plus deliberate special efforts to help those whose family circumstances tend to discourage persistence in education, must form a highly important part of policy against poverty. As some of the other work of the Council has shown, the performance of the educational system has very long-range effects. To the extent that it fails to perform well in helping the children of low-income parents to break out of the poverty cycle, there are likely to be distressing social and economic costs for one and perhaps more generations.

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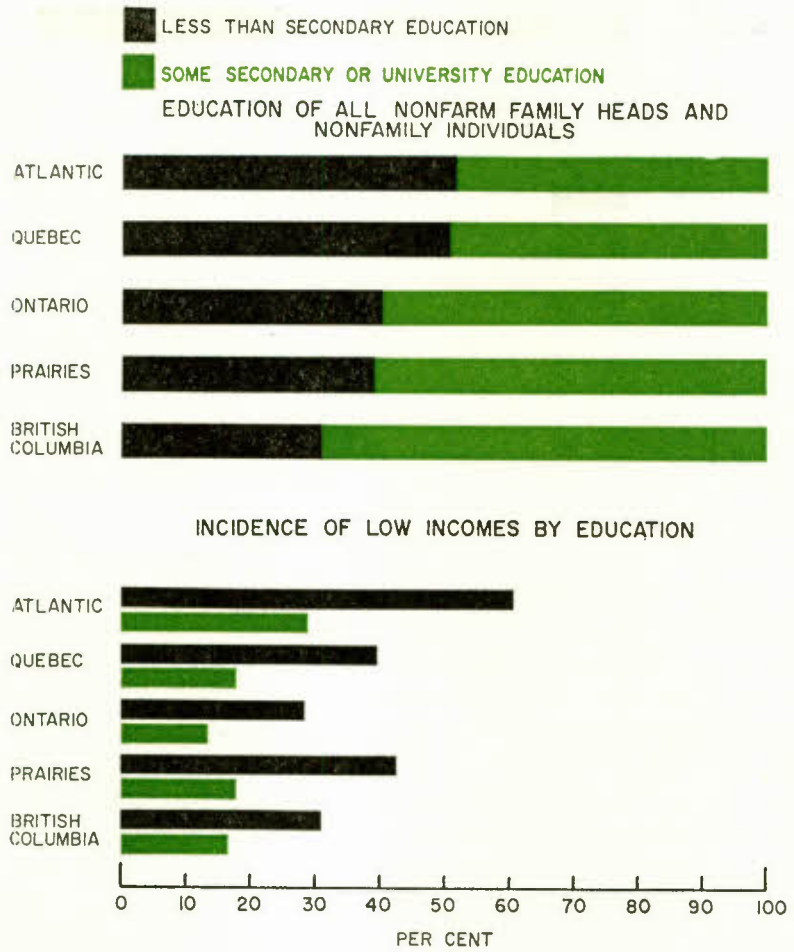
[1] A regression analysis of the low-income data has suggested that many of the factors associated with a high incidence of low income tend to occur together. The explanatory variables used in the analysis were education, place of residence (urban or rural), age, region and occupation. As a general rule, the partial effect of each variable was smaller than the corresponding incidences given in Table 6-3.

It is also clear, however, that the upgrading of human resources involved in combatting poverty calls for a good deal more than strong improvement in the formal educational system. There must also be many other elements, such as adult retraining and manpower mobility programs, to help families and individuals escape from the low-income circumstances which entrap them.

CHART 6-2

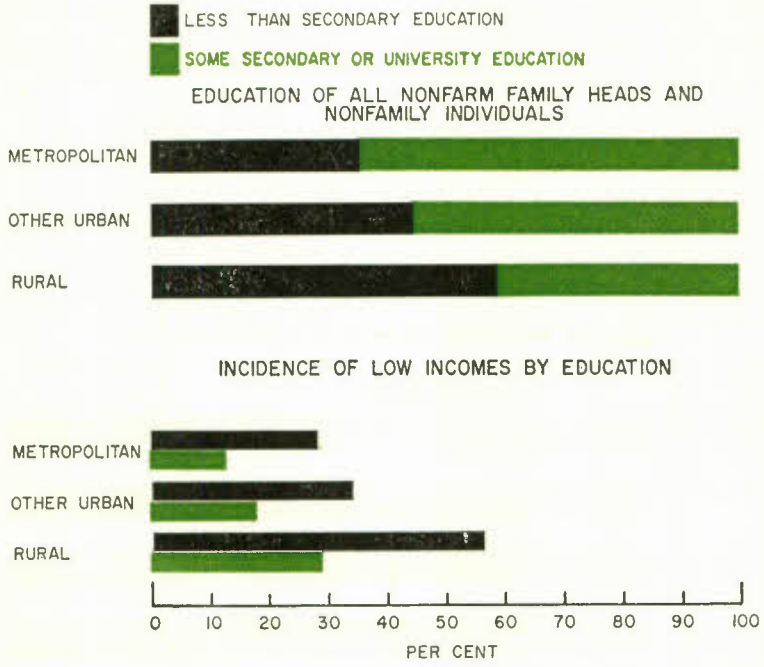
EDUCATION AND LOW INCOMES BY REGION, 1961



Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

CHART 6-3

EDUCATION AND LOW INCOMES BY PLACE OF RESIDENCE, 1961



Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

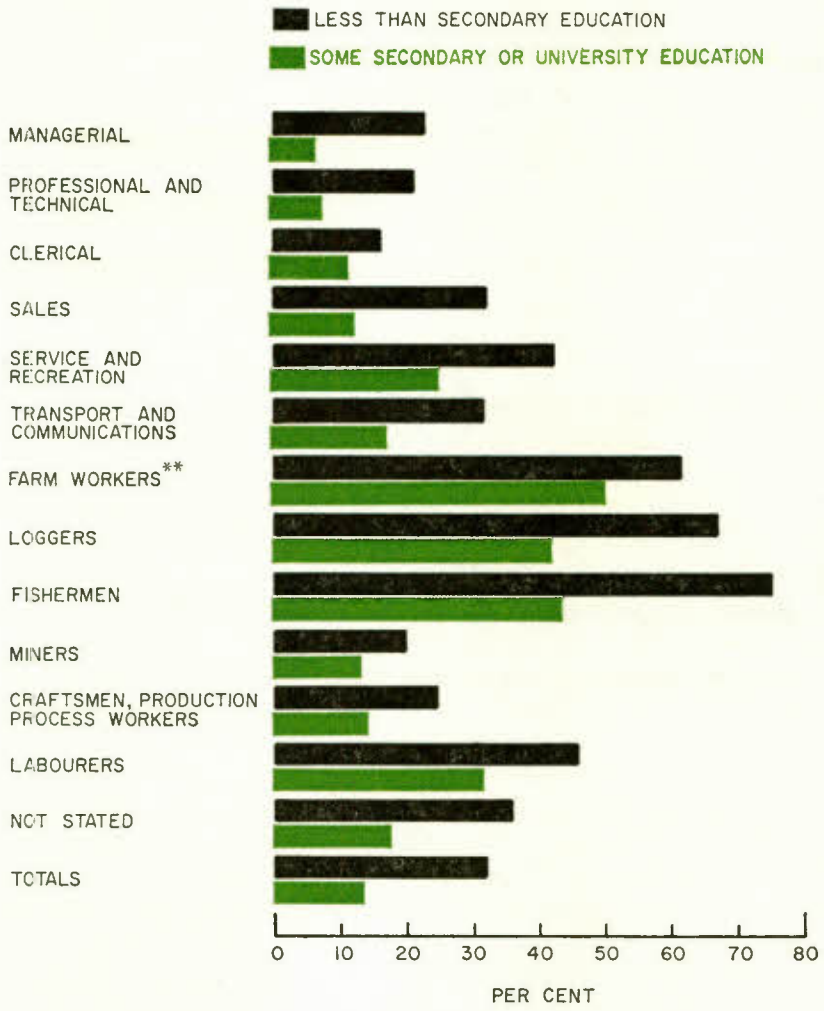
Families Headed by Women

The high incidence of low income among families headed by women is strongly related to the presence of dependent children. Most low-income families headed by women under 65 are families where there are two or more children under 16. For all such families, the incidence of low income is close to 50 per cent.

The presence of dependent children often prevents a woman who is head of a family from entering the labour market, or restricts her to low-paid, part-time jobs. While transfer payments such as mothers' allowances will probably always play an important role in relieving this type of situation, it is evident that much improved day-care facilities for young children could also make a major contribution. Such facilities would also improve the situation of low-income families headed by men whose wives would be glad to seek paid work if given the opportunity.

CHART 6-4

OCCUPATIONAL GROUPS AND INCIDENCE OF LOW INCOMES BY EDUCATION, 1961*



*Includes all nonfarm family heads and nonfamily individuals under 65 years of age.
**See notes to Table 6-4.
Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

Some Family Income Trends

The concept of low incomes changes with time. What may have been regarded in an earlier period as an adequate family income comes

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to be regarded later as inadequate, even after taking account of price changes. It is, nevertheless, useful to examine income trends to see what changes have taken place in the proportion of Canadian families in certain income brackets over a period of time. Consistent statistical data on family incomes go back to 1951. It is, therefore, possible to get some idea of how the distribution of family income evolved over the period from 1951 to 1965. With a substantial rise in the real income of the nation as a whole, it is only to be expected that there would have been a decline in the proportion of families in low-income brackets. For example, in 1951, nearly two-fifths of all nonfarm families received incomes of $3,000 or less. After making the necessary adjustments for changes in the value of the dollar, this proportion had dropped to slightly more than one-fifth in 1961, and by 1965 it had declined still further to less than one-fifth.

However, the growth in real incomes over this period was not shared equally by all family groups. The sharpest decline in the proportion of low-income families was among those whose major source of income was earnings. On the other hand, there was only a modest decline in the proportion of low-income families who were dependent upon income from sources other than earnings, or among families whose heads were not in the labour force.

Whether the head of the family was a man or a woman made a considerable difference in terms of income improvement over this 15-year period. The proportion of families with incomes under $3,000 and headed by women declined by only 24 per cent. This contrasted with a drop of 58 per cent in the case of families headed by men.

Another important characteristic associated with income improvements was age. The younger the age of the family head, the greater was the increase in income. For example, while average family income in real terms was 55 per cent higher in 1965 than in 1951, families whose heads were under 35 had real incomes about 63 per cent higher. On the other hand, the average family whose head was 65 and over had real income averaging only 34 per cent higher. The obvious conclusion is that the young benefited more from economic growth over this period than the middle-aged and elderly.

Above-average increases in the incomes of families with younger heads probably reflect a number of factors. Younger age groups have higher levels of education and are thus generally more mobile, both occupationally and geographically. Their incomes are more likely to rise as a result of their own increasing productivity as well as productivity increases in the economy as a whole.

While family heads aged 55 to 64 are still employed, their earnings usually level off or start to decline relative to younger age groups. Furthermore, this age group is more vulnerable to unemployment than workers between the ages of 25 and 54. The contraction of employment opportunities, especially for older workers with limited education and training, often results in a withdrawal from the labour force. Employment statistics show that on the average the less educated is the worker, the earlier is his departure from the labour force.

Age is also an important characteristic of low-income individuals who are not living in families. For example, 60 per cent of such low-income individuals in 1961 were 55 or older, and nearly one-third of these were over the age of 70. On the other hand, less than 25 per cent of low-income individuals were between 25 and 55. To a large extent older persons who are not part of a family are outside the labour force and thus primarily dependent upon government payments for income maintenance.

There is much further statistical material available concerning the characteristics of low-income Canadians.[1] Some of this material confirms tendencies already fairly well-known—e.g., the poorer health of low-income people, and the crowded and otherwise substandard housing conditions which many of them face. No attempt is made here to give a well-filled-out picture of the low-income population; the object has been only to identify a limited number of characteristics which will begin to suggest the range of policies required to mount a truly comprehensive and effective attack on poverty.

INDIANS, ESKIMOS AND MÉTIS

No discussion of poverty in Canada can avoid making special reference to the Indian, Eskimo, and Métis members of our society.[2] A few simple statistics tell a brutal story. One is that the average life expectancy of an Indian woman in Canada is 25 years. Another is that

[1] Much of this material is to be found in the series of 1961 *Census Monographs* being issued by the Dominion Bureau of Statistics. A useful general compendium of statistics relating to the low-income population is to be found in the document, *Profile of Poverty in Canada*, issued by the Special Planning Secretariat of the Privy Council, Ottawa.

[2] In 1961, there were 192,000 Indians in Canada and 28,000 Eskimos. Métis were not separately identified in the 1961 Census, but if their rates of population increase over the preceding 20 years had been the same as those of the Indians and Eskimos, they might have numbered about 60,000 in 1961. By 1965, the total number of Indians was 218,000. A special survey by the Indian Affairs Branch in that year estimated that 78.5 per cent of Indian households had incomes of less than $3,000 a year, 54.5 per cent less than $2,000, and 28.2 per cent less than $1,000.

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the infant mortality rate among Eskimos is about 293 deaths per thousand live births, more than 10 times the infant death rate for the population as a whole.

In Canada, partly because of constitutional practice and partly out of custom, Eskimos and Indians on reserves have been regarded as special groups of people requiring special policies. The Métis have tended, on the other hand, to be regarded as neither Indian nor white, and have therefore been largely excluded from both societies. For "registered" Indians and Eskimos, however, the applications of public policy have tended to make these peoples "wards of the state", or "citizens minus". To quote a recent study,[1] Indians, Eskimos, and Métis ought, as charter groups of Canadians, to be "citizens plus" rather than "citizens minus" as is now all too often the case.

The problems facing the Indian, Eskimo and Métis peoples are very grave and are accentuated by a number of special factors:

(1) rapid increase of population, in fact the most rapid of any ethnic group in Canada;
(2) the rapidly declining opportunities for making a livelihood by the traditional occupations of hunting and trapping;
(3) the low economic potential of Canada's 2,200 reserves, less than a third of which could possibly provide sufficient resources to support their present populations; and
(4) the continuing difficulties faced by Indian, Eskimo and Métis people in coping with, and adapting to, the problems of the major society, both because of present attitudes within the white community and because of strong cultural differences.

Such a listing is obviously incomplete, but there are additional limitations to any generalizations. The primary one is that we are referring to not one group, or even three, but to some hundreds of Indian bands, Eskimo settlements, and Métis communities scattered across the country. While all the Eskimos have a basically similar language, the Indians are fragmented both linguistically and culturally. The Métis, for their part, are the most forgotten people of the three.

Many excellent surveys, studies, and reports dealing with the circumstances and problems of Canada's "citizens minus" have recently appeared. While the competence of the Economic Council to appraise various findings in detail is obviously limited, we would like to stress some common conclusions.

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[1] *A Survey of the Contemporary Indians of Canada*, H. B. Hawthorn, ed., Ottawa, Queen's Printer, 1967. This Report is in two volumes, the second of which, dealing with education and with the internal organization of Reserves, is still in press.

(1) Indians and Eskimos are treated too much as a special group in ways which exclude them from many of the ordinary provisions of public policy. This difficulty arises partly because Indians and Eskimos fall traditionally under federal jurisdiction, while many health and other public services as well as education are within provincial jurisdiction. The result has often been that Indians and Eskimos receive either inadequate services or special services which further segregate them from the larger society.

(2) Particular efforts will be required to help those Indians, Eskimos, and Métis who are striving to integrate themselves into the larger society. Such integration does not mean the total assimilation and homogenization of these groups, but it does mean the increasing provision of opportunities for these peoples to take part in the main stream of Canadian life. The future economic life of most of these populations will undoubtedly lie within the larger industrial society.

(3) A third major area of consensus is the need for a "community development" approach to the problems of education, individual development, adaptation to the larger environment, and community organization. In part, this work of community development has to do with the encouragement of new initiatives and economically viable enterprises within the band or settlement, and indigenous workers should be trained to work in the communities wherever feasible. In part also, the process will involve a better understanding between local groups seeking to develop local initiatives and the administrators of public policies, who tend to be too remote to be responsive to current needs. One promising development is the New Start Program currently being initiated by the Department of Manpower and Immigration in three northern areas of the Prairie Provinces. To the extent that the program proves successful in these test areas, it may generate techniques applicable in other communities with substantial Indian and Métis populations.

(4) It is clear that however much can be done to develop economic activity on reservations and in other places where significant groups of native peoples live, a continuing substantial migration to urban areas must be expected, notably in Western Canada. This process must be facilitated from both ends to a greater extent than hitherto. Those who move to the cities must be better prepared, educationally and in other ways, for a very

different life. At the city end, more must be done to help these citizens to feel at home in their new environment, and to become responsible and contributing members of the community.

(5) It would also appear useful to initiate an immediate study of federal and provincial legislation and administrative practices affecting native peoples. Two main objects of such a study would be to avoid allowing compelling needs to remain unmet because they fall between jurisdictions, and to identify instances where existing aid programs are not well-adapted to meeting the particular problems of Indian reservations and similar areas.

SOME LESSONS OF THE U.S. WAR ON POVERTY

In his State of the Union Message for 1964, the President of the United States declared "all-out war—unconditional war" on poverty in America. The aim of this war was not to alleviate poverty but to eliminate it. Following this Message and the *Economic Report of the President,* the Administration sent a special message to Congress requesting passage of what became the Economic Opportunity Act of 1964.

This new effort was begun against the background of the system of social security which had grown up since the 1930's. The basis of this system is the Social Security Act of 1935, which provided a program of contributory old-age and disability pensions, along with state-administered programs of aid to families with dependent children. These were enlarged and extended in 1964 and 1965 with the addition of a "medicare" program for people over 65 years of age and further extensions of dependents' and survivors' benefits. In addition, there exists a complicated array of federal, state and local welfare assistance programs, food supplement programs, school lunch programs, etc., which vary widely in impact from state to state.

Supplementing the social security structure, the Economic Opportunity Act of 1964 established an Office of Economic Opportunity within the Office of the President, bearing responsibility for the operation of a number of programs. Initially these programs were:

(1) a Job Corps for young men and women aged 16 to 21, providing education, work experience, and vocational training;

(2) a program for Volunteers in Service to America (VISTA) to serve in a variety of federal, state and community anti-poverty programs;
(3) a Community Action Program designed to provide services (legal assistance, health services, etc.), to co-ordinate all programs established at the community level and mainly by the community, and to encourage institutional development and change within communities; and
(4) special programs for migrant workers.

In addition, the Office of Economic Opportunity (OEO) was to distribute funds to existing departments and agencies to operate other programs authorized by the Act. These included work training programs operated by the Labor Department, work study programs and adult education programs administered by the Department of Health, Education and Welfare; special rural anti-poverty programs operated by the Department of Agriculture; small business loans through the Small Business Administration; and community work and training projects for welfare recipients operated by the Department of Health, Education and Welfare.

The primary emphasis in all of these programs has been on self-help, self-development, and maximum participation and involvement of the poor themselves. This emphasis has been most marked in the youth programs with an educational purpose, and in the various Community Action Programs.

The programs of the war on poverty fall into four major categories: (1) manpower development, training and mobility programs; (2) individual improvement and/or educational programs; (3) community action and community change programs; and (4) income maintenance programs.

The main manpower programs under the Economic Opportunity Act are the Job Corps, the Neighborhood Youth Corps, the work experience program, and the new JOBS program. The Job Corps is a high-cost program, requiring about $7,500 per trainee-year. In terms of cost-benefit analysis, however, the Job Corps appears to be successful even if educational benefits alone are taken into account, and there are noneducational benefits as well. The Neighborhood Youth Corps, which does not provide for residential training centres, is a less costly program and apparently somewhat less successful. The work experience program is financed through the Department of Health, Education and Welfare and administered by the state welfare agencies. Its

object is to provide maintenance grants, adult basic education, vocational instruction and other forms of training to adults with dependent children who are either actual or potential welfare recipients. The program appears to have been relatively unsuccessful, mainly because of low rates of course completions and job placements. The new JOBS program will provide federally subsidized job training programs to be administered by private businesses.

The chief educational programs are Head Start, for pre-school children; and Upward Bound, a pre-college program for secondary school students. There are also a number of additional programs administered under the Elementary and Secondary Education and Higher Education Acts of 1965 by the Department of Health, Education and Welfare. The Upward Bound program provides a full-time summer program together with other programs during the school year to high school students with college potential but who would otherwise not likely reach university. Tutoring, summer educational courses, and medical and dental care are supplemented by weekly stipends during the summer phase of the program.

The Community Action Programs have been evaluated as successful in the delivery of services, relatively unsuccessful in the co-ordination of programs, and fairly successful—though assessment is difficult—in bringing about institutional development and change. Direct services, such as the Legal Services Program, have been highly successful in defending the poor before the courts, bringing suits on behalf of poor clients, and providing educational programs to acquaint the poor with their rights.

As co-ordinating bodies, the community action agencies which have been set up under the auspices of the Community Action Program have been relatively unsuccessful, partially because of the intensely complicated array of federal, state, and local programs which already exist. As instruments of institutional development, however, the community action agencies appear to be more successful in bringing together the people of poor communities to plan and implement measures at the community level. These centres are also experiencing considerable success in influencing the institutional environment—social welfare agencies, courts, police—in poor communities.

What are some of the lessons to be learned by Canada from recent U.S. experience in warring on poverty? Care must obviously be exercised in transferring these lessons, inasmuch as the U.S. poverty problem has certain characteristics not found to anything like the

same extent in Canada—e.g., that part of the problem represented by large nonwhite populations living in urban ghettos. But the following principles, gleaned from the work of a number of American experts, would seem to have relevance for Canada:

(1) High aggregate demand and strong labour markets are a highly necessary condition for achieving substantial reductions in poverty.

(2) A full-scale war on poverty should embrace all of the four basic categories of anti-poverty programs mentioned earlier: manpower programs, individual improvement programs, community betterment programs, and income maintenance programs. Experience has shown that these categories are interrelated and mutually supporting.

(3) The exercise of drawing statistical poverty lines, while bound to be somewhat arbitrary, is necessary for good social planning, because without it there is great danger that policy will take the easy way out and beam much of its program emphasis towards the moderately well-off.

(4) Another danger is the political popularity of "trickle-down" approaches to poverty. Analysis has shown that spending money (e.g., on some kinds of economic development) in the general vicinity of poverty groups by no means guarantees that a substantial proportion of the benefits will in fact flow to the poor.

(5) Individual anti-poverty programs should start with realistic expectations and the best possible built-in evaluation mechanisms, including notably mechanisms for data collection. Programs should normally be held unchanged long enough for effective evaluation to take place, but beyond this there should be a frank willingness to experiment.

(6) So-called "family structure effects" are an important consideration. The likelihood of success in programs for teen-agers is increased by success in programs for adults. For example, if one of the parents, previously unemployed, can be placed in employment, this will improve the prospect of lifting the children permanently out of poverty.

(7) Education has certain limitations and difficulties as a specific anti-poverty weapon. The initial gains achieved in some educational programs for young children such as Head Start have shown a tendency to fade out later. High investment appears to be needed to overcome basic educational deficiencies. At the

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same time, educational programs have yielded valuable side-effects, such things as bringing children into contact with organized medical care for the first time in their lives. It has been observed that the over-all payoff from educational programs is increased if parents can be actively involved.

(8) Substantial benefits have been noted from programs to improve family planning, the nutrition of expectant mothers, and the nutrition of infants up to three years of age.

(9) There must be adequate recognition of the social adaptation involved in the absorption of the so-called "hard-core" poor into employment. Without such adaptation, there tends to be a high rate of drop-out from even good jobs. More needs to be known about the characteristics of the "hard-core" poor, and more done to elicit the co-operation of business in absorbing these people into productive employment. Partly, what is often involved is a process of job creation: not outright "make-work" schemes, but examination of growing labour requirements to see if these can be subdivided in ways that permit the absorption of trainees from among the "hard-core" poor.

ANTI-POVERTY PLANNING IN THE GASPÉ AND LOWER ST. LAWRENCE REGION

As noted earlier, poverty in Canada is widely distributed geographically, with a considerable proportion of it taking the form of relatively small poverty pockets in otherwise well-off areas. There are, however, certain extensive areas or subregions where poverty is so widespread that its elimination can be treated in many ways as an area problem. In the United States, considerable attention has been focused on one such area, the Appalachian Region. In Canada, large parts of Eastern Quebec and the Atlantic Provinces could be looked at in the same way.

A comprehensive program now under way to deal with the poverty and developmental problems of the Gaspé and Lower St. Lawrence Region of Quebec, including the Magdalen Islands, has involved the use of some highly interesting and to some extent original techniques of socio-economic planning. With suitable modifications, some of these techniques may well prove of value in dealing with poverty problems in other parts of Canada, perhaps even in some urban areas. The program has been regarded from the first as a large-scale pilot project.

The region in question is mainly rural, with an average income per person only a little over half the average for the Province of Quebec as

a whole. The economy is based largely on agriculture, fishing and forestry. In 1963, a regional planning agency, the "Bureau d'Aménagement de l'Est du Québec", was established as a nonprofit private corporation by two existing local economic councils. In the same year, the Bureau was provided with financing under the terms of the ARDA agreement between the Province of Quebec and the Federal Government, and given the task of preparing within three years a master development plan for the region. Two basic specifications for the work were an intensive program of research and full participation by the local population in the preparation of the plan. Co-ordination and liaison with the provincial government were to be provided by way of relationships with a committee of ministers, a permanent committee of senior officials, and the Quebec Economic Council.

The research program undertaken by the Bureau was broad and interdisciplinary, involving the use of agronomists, ecologists, engineers, economists, sociologists, geographers, cartographers and many other specialists. As the research work proceeded, it became evident that a solution to the problems of the region would require far-reaching structural changes in patterns of resource and land use and in political and social organization. This made it all the more important to ensure a continuing dialogue between the research workers and the people of the region, whose daily lives were in many cases likely to be profoundly affected by the changes in prospect. Such a dialogue was brought about by means of a network of local committees and through the efforts of a specialized team of 20 "social animators". Basically, social animation is a technique of stimulating and motivating people to define their existing environment and their wishes for a changed environment, and to organize and plan processes of social change. In this instance, use was made of all major means of communication, including group discussions, radio, television and special newspapers and films. A circular flow of ideas and suggestions from research workers to the population and back again to the research workers was thus assured.

The result of these endeavours was a development plan to 1982, submitted for public appraisal in 1966. The plan was subsequently modified somewhat and, on this basis, an agreement covering the five-year period to March 31, 1973, was signed by the provincial and federal governments in May 1968.[1] Total expenditure under the plan

[1] *An Agreement Covering the Implementation of a Comprehensive Rural Development Plan for the Lower St. Lawrence, Gaspé and Îles-de-la-Madeleine,* Ottawa, 1968.

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is projected as $258.8 million, of which $46.6 million will come from provincial revenues and $212.3 million from federal revenues. The principal objectives of the plan are as follows:

(1) Modernization of the "traditional" economic sectors of agriculture, fishing and forestry.
(2) Creation of new activities in manufacturing, mining and tourism—activities capable of absorbing at least part of the manpower flowing out of the "traditional" sectors.
(3) Major improvements in the occupational and geographical mobility of the labour force.
(4) Accelerated urbanization and regrouping of population in a few well-equipped urban centres.
(5) Provision of infrastructure and other investment necessary for the success of the plan.
(6) Establishment of a sound institutional structure, well adapted to the demands of a broad-based development policy for the region.

The agreement provides for the appointment of a provincial planning co-ordinator, a federal planning administrator, a management committee composed of these two officials, a federal-provincial liaison committee, and a provincial regional administrative conference made up of representatives of the various departments of the Quebec government involved in the plan. The previous emphasis on participation by the local population continues with the designation of the Eastern Quebec Regional Development Council, Inc., as the "privileged regional interlocutor".

CONCLUSIONS AND RECOMMENDATIONS

A more concerted and purposeful attack on poverty in Canada now is urgently required. Such an attack would not only benefit those low-income families whose needs now are inadequately met, but would also bring substantial benefits to all Canadians. The challenge, in the short run, is to alleviate the conditions which today thrust many Canadian families and individuals into involuntary poverty and hold them there. In the long run, the challenge is to prevent the development of these conditions. The aim must be to identify those measures that will meet this challenge effectively and economically, but also compassionately, taking care to preserve the human dignity and freedoms which our society cherishes.

The attack we envisage should be well prepared and conceived on a comprehensive scale. It should be presented to the public with a strong sense of commitment, but also realistically. False hopes of easy, short-run triumphs should be avoided, as should that brand of sentimentality which is satisfied to make gestures in the general direction of the poor, without enquiring closely into what such gestures actually accomplish. Compassion there must certainly be, but also a very hard-headed and up-to-date preoccupation with the measurement and evaluation of results. Far from being inconsistent, the two are indispensable elements of a sense of commitment that means to get somewhere.

There now are some important gaps in the information and analysis required to conduct a truly comprehensive attack on poverty in Canada. Filling some of these gaps will call for extensive research work by experts drawn from all the social sciences, and to some extent from the natural sciences as well. There are, however, many highly useful actions which need not wait upon time-consuming programs of data collection and research. An attack on poverty can be built up in stages, starting with the attainment of some obvious, short-run objectives, then gradually expanding to a broader advance as the more significant gaps in available knowledge and understanding are filled.

In both the short-run and the longer-run stages, the following general principles should play an important role:

(1) The maintenance of high employment and strong and stable economic growth is crucial. No policies are more effective in helping to move families and individuals out of poverty than the combination of demand and supply policies required to sustain new job creation and the increasingly efficient use of manpower, capital and other productive resources. Without success on this front, other anti-poverty policies are unlikely to be of much avail.

(2) No effort should be spared to generate a widespread sense of public commitment to and involvement in the elimination of poverty. This is especially necessary in Canada, where responsibility for social policy is divided among three levels of government and a multitude of private agencies. A large proportion of the actual day-to-day work of fighting poverty has to be done at the local level, where policies conceived further up the line can often come to grief against various sorts of institutional barriers. A clear definition of goals and a strong sense of com-

mitment and involvement are necessary to break down such barriers and engender the requisite spirit of intelligent co-operation between governments, private agencies, and the general public. It is of course particularly necessary to involve the poor themselves in the development of programs designed to help them. Their comments, when analyzed, may provide the most rapid available indications of gaps and weaknesses; yet this direct source of information has often been neglected in the past. Experience in the Gaspé and Lower St. Lawrence Region should be closely studied for indications of how techniques of "action research" and "social animation" can be used to foster a community-wide sense of involvement.

(3) Apart from general employment and growth policies, anti-poverty policies should have a strong orientation towards people. This may seem obvious, but a study done for the Economic Council on policies for rural adjustment has effectively shown how an excessive orientation towards physical resources rather than people can lead policy astray and cause it to be less helpful than it might otherwise have been in curing social distress.[1] Certainly, well-conceived anti-poverty policies will have many elements in common with policies to foster regional and area development and to accelerate national economic growth. In areas such as the Gaspé and Lower St. Lawrence Region, anti-poverty and regional development policies may to a considerable extent coincide. In other areas, however, where poverty occurs more in the form of pockets, anti-poverty policies should have a more distinct character of their own. The "trickle-down" effects of national and regional growth and development policies do not constitute an adequate solution to the problem of poverty.

(4) Anti-poverty policies should also be strongly oriented towards poor people. Again, this may seem obvious, but it is too much taken for granted that almost any welfare or social development policy tends to have such an orientation. The extent to which it actually has, can only be determined by carefully identifying poverty groups and evaluating the impact of policy on them.

(5) The achievement of a correct blend of income-maintenance policies and other anti-poverty policies that seek rather to improve

[1] See Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment*, Special Study No. 7.

people's capacity to participate more effectively in Canadian economic life is extremely important. Where it can be effective, the second class of policy is greatly to be preferred. But for many people such as the old and disabled it cannot be effective, and in many other cases may need to be supplemented by income maintenance, temporarily or intermittently.

(6) In fighting poverty, great emphasis should be placed on economic use of available funds and skills, and on the maximum development and employment of modern techniques of policy evaluation. This is not hard-heartedness but compassionate realism. In a society in which there are large, growing and competing claims on scarce resources, the resources available to fight poverty will always be limited, so that it will always be highly important to see that the greatest possible lasting benefit is achieved for each dollar spent. Moreover, we would add that the greater the certainty with which beneficial results can be predicted to flow from a well-planned structure of anti-poverty programs, the stronger will be the claims on total resources which can be voiced on behalf of those programs.

The Spectrum of Existing Policies

A Canadian attack on poverty does not of course start from scratch. Canada already has in operation, or on the statute books scheduled for implementation within the relatively near future, an impressive inventory of social legislation. There are important Canadian policies in all four of the major categories of anti-poverty programs mentioned in our brief survey of the U.S. war on poverty: manpower programs, individual improvement programs, community betterment programs, and income maintenance programs. In some areas, particularly income maintenance, the coverage of Canadian programs is superior to that of their U.S. counterparts.

It should be noted also that the comprehensiveness of this inventory has been significantly improved in recent years. Under the Canada Assistance Plan, for example, provinces may at their option combine four previously separated federal-provincial assistance programs (for the aged, the blind, the disabled, and the unemployed) into a single program. Assistance is based on a more comprehensive and flexible assessment of recipients' budgetary needs, and federal cost-sharing is extended for the first time to aid to needy mothers and their dependent children. In general, the Plan sets out to close previous gaps in the

social security system. Some of its features are rehabilitative and preventive in character, designed to help people by their own efforts to rise and remain above poverty.

A selection of other relatively recent additions to the stock of social legislation and social policies would include the monthly guaranteed income supplement to certain Old Age Security pensions, major developments in manpower policy by both federal and provincial governments, and new training and other manpower initiatives sponsored by municipal governments and voluntary agencies.

But while the inventory is impressive, the means immediately available for assessing its impact on Canadians are not. Apart from a few illustrious exceptions, remarkably little has been done by way of systematic evaluation of these policies in operation, either separately or in combination.

One of the great uncertainties is the extent to which the existing structure of policies in fact constitutes an attack on poverty—the extent, that is, to which its benefits flow to those most in need. This uncertainty comes very much to the fore when proposals are made for major new anti-poverty measures such as the negative income tax or other income guarantees.[1] We do not wish to pass judgment one way or another on such proposals at the present time; we confine ourselves to noting that their adoption has been advocated by a number of distinguished figures, and to recommending that the possibility of their usefulness for Canada be subjected to serious and thorough study. But such a study must embrace, among other things, an examination of the costs and anti-poverty effects of a considerable range of existing policies which income guarantees would to some extent replace and to some extent supplement. Only in this way will it be possible to form a proper judgment as to whether some type of broader income guarantee might usefully be added to the Canadian armoury of weapons against poverty.

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[1] Various forms of guaranteed minimum income have been proposed by different writers. The simplest form would be a minimum income grant paid by the government to all, regardless of means; if it were subject to income tax, part of it would be recouped in this fashion. Other forms of guarantee have been proposed that would operate more directly through the existing tax system. Under one form of "negative income tax", an official minimum income level would be established; all family heads and nonfamily individuals would be required to complete income tax returns; and where actual income fell below the official minimum, a "negative tax payment" by the government would make up the difference. Under another form, the payment would consist of "unused" income tax exemptions by those with incomes too low to be subject to tax. Many negative income tax proposals incorporate graduated incentives for recipients to seek work. The Guaranteed Income Supplement now payable to certain old age security pensioners is a type of negative income tax.

It will be clear that we have not ourselves been able to conduct at this stage a thorough and searching examination of the existing structure of Canadian social policies. Some very limited and preliminary enquiry has suggested, however, that both the coverage and efficacy of many parts of the structure leave much to be desired. Objectives are not always clearly defined, or have not been redefined in the light of changing circumstances. It is difficult, for example, to discover an authoritative statement of the fundamental objectives of the Family Allowances program in the circumstances of 1968. This is not to say that Family Allowances and other long-established programs are not continuing to serve some highly useful purposes but these purposes should surely be re-examined in the light of the many important economic and social changes that have occurred over the last generation.

In some areas of policy, there appears to be an undue bias towards the mere alleviation rather than the eradication and prevention of poverty. Lack of co-ordination, not only between but within levels of government, is often apparent. In some places there is overlapping; in others, gaps. Objectives of policies and success in achieving objectives are rarely subjected to regular review. Often the data that would be required to do this are lacking. There is fairly strong evidence in some areas of high administrative overheads and inefficiencies.

The above must of course be regarded as a very limited and tentative assessment. Its main significance is that it appears enough to indicate the desirability of a much more thoroughgoing appraisal.

Near-Term Measures

As a first step in developing a more effective attack on poverty, all levels of government should immediately review, clarify and update the objectives of their existing social policies. This in itself may be enough to uncover many significant duplications, gaps and conflicts of objectives. It should also give some preliminary indication of the extent to which policies are really beamed at people living in poverty.

Secondly, consideration should be given to setting up organizations for achieving better co-ordination of social policies within and between governments, and between governments and the many voluntary agencies active in the social welfare field. Even if all that is achieved at the outset is a more systematic exchange of information and increased discussion of basic issues, these in themselves will be valuable. Several instances have been reported to us of different departments of the

same government active in the field of anti-poverty policies proceeding in substantial ignorance of each other's activities, with little exchange of current operating information, let alone research results. At the federal level, the Special Planning Secretariat of the Privy Council Office, during the period when it was heavily concerned with anti-poverty matters, gave promise of being a useful co-ordinating and information-providing device. It should be revived or replaced in a more durable and effective form, with a clear responsibility to co-ordinate research interdepartmentally and organize regular assessments of federal social policies. It should also continue the very real assistance which the Secretariat was able to provide to voluntary social agencies seeking guidance through the maze of federal programs.

Greater efforts should at once be made to exploit the considerable anti-poverty potential of the Canada Assistance Plan. This applies particularly to the preventive and rehabilitative aspects of the Plan, and its capabilities to aid those whose low income is due, not to a virtual absence of earnings, but to an insufficiency of earnings. As we noted earlier, this group accounts for a large proportion of the poor—a proportion not in the past well served by a program structure heavily weighted by "categorical" types of income maintenance.

There are indications also that the efficacy of the Canada Assistance Plan is being impeded by insufficient feedbacks of information from the provinces—information vitally needed for the effective exploitation of the Plan's full potential. This should surely be remedied. It seems intolerable that an absence of information should come between the poor and their needs.

The federal government should at an early date take the initiative of encouraging the development of a small number of pilot projects of intensive research into urban poverty. Suitable areas for study should be marked out in major metropolitan centres and carefully examined by interdisciplinary teams of researchers. As recommended earlier, action research and social animation should be among the techniques employed. Two major objects of these pilot studies should be: first, to develop effective research techniques for more general use later; and, second, to obtain a first critical assessment of the effectiveness of the various social policies for which the federal government is at present wholly or partly responsible.

The Senate of Canada might consider the advisability of creating a committee to enquire into the problem of poverty in Canada. An earlier Senate enquiry into the problems of land use in Canada helped to bring about the Agricultural Rehabilitation and Development Act

(ARDA) in 1961. The enquiry we propose would deal with all aspects of poverty, urban and rural. Many excellent witnesses, both Canadian and foreign, would be available to appear before the committee, whose work could also be aided by a small but competent research staff. The work of such a committee could do much to define and elucidate the problem of poverty in Canada, and to build public support for a more effective structure of remedial measures.

A Longer-Term Strategy

The longer-term measures which we propose consist essentially of building up with all reasonable speed the knowledge and understanding necessary for the elimination of poverty in Canada. These measures would amount to a comprehensive evaluation and reappraisal of the structure of all policies, both governmental and private, having a major bearing on the problem of poverty, including a careful evaluation of the advantages and disavantages of new proposals such as the negative income tax and other forms of minimum income guarantee. The work would draw on the skills of specialists in different social and behavioural sciences. It would have to be well co-ordinated under the direction of persons experienced both in research and in the assessment of the practicability and administrative efficiency of existing and proposed programs.

There would have to be common criteria of program evaluation. To be consistent with our proposed emphasis on helping those most in need, this would involve the establishment of acceptable minimum standards of living for families and individuals in Canada. In terms of income, such standards would likely differ appreciably between regions, between urban and rural areas, and even between cities, reflecting differences in costs and other circumstances affecting family budgets. The establishment of such standards would be a difficult and controversial enterprise, but, we believe, essential. If social policies are to be assessed from the standpoint of what they are doing for those living in poverty, this group of people must be more precisely identifiable.

Anti-poverty programs should, however, be assessed not only by their actual or potential success in lifting people above poverty lines, but also by the way in which they bring this about. To the greatest extent possible, they should do so by fostering opportunities for independence and full participation in the Canadian economy and Canadian society. The availability of such opportunities is particularly important for the Indian, Eskimo, and Métis peoples.

The vicissitudes of life being what they are, the need for direct income maintenance programs will never disappear completely. There will always be some families and individuals unable to participate fully and independently in economic life because of age, disability, ill health, or other reasons. In addition to ensuring adequate standards of living, social assistance to such people should be provided in a way that fosters their full participation in other aspects of our common life. Assistance should be extended to them as a right rather than a privilege, with no stigma attached.

Very close attention should be given to the hazards of different anti-poverty programs working at cross-purposes. Instances have frequently been reported where attempts by members of families to increase earnings have resulted in abrupt declines in or even the termination of income maintenance or other social assistance. (For example, a family may be forced to move immediately out of subsidized housing into other accommodation at a substantial increase in rent which may exceed the increase in earnings.) In many such cases, the increased earnings have in effect been "taxed" at very high marginal rates, sometimes amounting to 100 per cent or more. This type of occurrence defeats the purpose of anti-poverty policies designed to encourage the development of income-earning potential. It is of course no easy matter to devise policy mixes that ensure adequate minimum income but also incorporate incentives to seek earnings, but this is all the more reason for devoting much thought and effort to good policy co-ordination.

A searching appraisal of the most effective means of eliminating poverty should, of course, be deeply concerned with the costs of existing and proposed programs. It should make the maximum feasible use of the most up-to-date analytical methods. Cost-benefit analysis can be employed in some areas. Certain problems will no doubt be encountered, such as limitations of data and lack of a sufficient run of experience to give any reliable reading on what some programs are accomplishing. But strong efforts should be made to overcome data problems, to encourage the use of at least the cost-benefit type of framework to evaluate programs, and to build into new programs data feedback systems which will facilitate full-scale evaluation in due course.

Use of experimental methods should not be neglected. One particularly interesting experiment is under way in the United States: various forms of negative income tax will actually be paid to approximately

1,000 low-income family heads in the State of New Jersey over a three-year period. Among other things, this experiment will permit observation of the effects of a negative income tax on the incentive to seek paid work. This has always been a major concern in connection with the negative income tax and other minimum income guarantees.

While the appraisal we envisage would be much concerned with welfare and related social policies, it should look also at other policies having an important impact on low-income families. These include regional and other economic development programs, and policies affecting rates of growth and levels of aggregate demand in the economy. Attention should also be given to the impact of price increases and price levels on the poor. Some evidence is emerging from the United States that the urban poor, in particular, may pay more for identical consumer goods than other people do.

It would be highly desirable to assemble more adequate and up-to-date information than now exists concerning standards of nutrition and health among poor people in Canada. Such information might indicate groups in the population who could benefit from food aid and other interim measures.

Finally, tax considerations should not be exempted from an appraisal of policies relating to poverty. Among other things, it will be important to take into account the impact on low-income groups of sales and real property taxes. Some of the studies done for the Carter Royal Commission on Taxation will be relevant in this connection.

In thus describing the kind of longer-term appraisal which we feel is required at this stage in order to develop more effective anti-poverty policies in Canada, it is important to keep clearly in mind the Canadian constitution and the fact that social policy is a field of concurrent jurisdiction in which all three levels of government are active on a large scale. Nor have we referred to the important discussions and decisions regarding social policy which lie ahead of the federal and provincial governments between now and the expiration in 1970 of agreements under the Established Programmes (Interim Arrangements) Act.[1] Important changes in the relative roles of the different levels of government in the field of social policy appear to be in prospect.

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[1] The Established Programmes (Interim Arrangements) Act of 1965 enabled the provinces to "contract out" of certain shared-cost programs on an interim basis, pending the development of more permanent arrangements. Only one province, Quebec, chose this option.

These impending discussions and changes would seem to make a fundamental appraisal of social policy in Canada very timely. They would also strongly argue for the desirability of making the appraisal a joint project, conducted on behalf of all three levels of government, with a view to producing a legacy of information, analysis and evaluative techniques that will permit governments and private agencies, each in their own spheres of responsibility, to work more effectively towards the elimination of poverty. Various kinds of intergovernmental arrangement are conceivable. Whatever arrangement is adopted should be one involving and eliciting the support of all levels of government, whose co-operation will be absolutely essential in the supply of information and many other respects.

For our own part, we intend to pursue further research into the problem of poverty in Canada, and will be reporting on it in subsequent Annual Reviews. Every effort will be made to dovetail this work effectively with the increased research which we hope will be undertaken by others.

The task of eliminating poverty is both complex and of high national priority. We believe that this is an urgent matter that warrants early consideration at the highest level of intergovernmental consultation.

7

Regional Aspects of Federal Economic Policies

LIKE THE elimination of poverty, the objective of improved regional balance is one aspect of the still broader goal of "an equitable distribution of rising incomes". By "improved regional balance" we mean both the narrowing of interregional income disparities and the full and efficient use of available resources in each region.

A number of aspects of regional problems and performance have been explored in earlier Reviews. Briefly, our findings were these:

—Differences in both the levels of economic and social well-being and in economic opportunity among the various regions and provinces of Canada are large, and have persisted with only modest change for over 40 years. This persistence has been remarkable; neither strong national economic growth nor the strains and turbulence of depression and war have had lasting effects on the basic pattern of regional disparities. There is little reason to suppose that the historical mix of market forces and public policy is likely to lead in good time to a significant reduction in these disparities.

—One of the two broad groups of influences that help to explain the disparities is variation in the use of human resources. For example, it is estimated that roughly half the difference between the average level of income in the Atlantic Provinces and Canada as a whole is accounted for by a relatively low proportion of the total population in the working-age group, the fact that relatively

fewer working-age people actually seek work, wide seasonal fluctuations in work availability, and unemployment rates which over the post-war period have averaged about one-third higher than the national average.

—The other set of influences is reflected in the variation among regions in average levels of productivity (which we have crudely estimated in terms of earned income per employed person). The factors underlying this variation include differences in the educational attainments of the labour force; in the extent and quality of natural resources; in the quantity and quality of the buildings, machinery and equipment used in production; in the structure of economic activity—that is, in the "mix" of industries and occupations; in the degree of urbanization; and in the provision of "growth-related" public services such as transportation, communication, education, health and welfare. We would expect that even after disparities in the quantity and quality of labour, capital and natural resources have been allowed for, there would remain substantial differences among the various regions in the efficiency with which these resources are used and combined.

This earlier analysis does not enable us to define in precise terms to what degree or over what period of time income disparities would be reduced through the adoption of specific policies. But it does provide a basis for setting out the broad policy posture necessary to achieve a better regional balance. We believe this objective should be sought in two interrelated ways:

First, by accelerating the growth of productivity in the lagging regions.

Second, by assuring the fullest and most efficient use of each region's human and material resources.

The purpose of this Chapter is to assess the regional implications of three broad groups of federal government policies against the criteria suggested by our earlier analysis. The Chapter will consider:

(1) fiscal and monetary policies for economic stabilization;
(2) policies affecting longer-run development, including growth-related budgetary expenditures, tariffs, transportation and manpower training and mobility;
(3) applied regional programs for resource adjustment, area industrial development, and comprehensive planning and development for the Atlantic Region.

In Canada's federal system, the provincial governments also have substantial powers and scope for influencing regional development. In

view of their great importance for regional balance, an examination of provincial government policies and programs at some future date is obviously desirable.

The federal policies listed above by no means exhaust the range of policy measures with regional implications. Nor are they confined to measures that have a specific geographic focus. Many policies oriented towards the national economy may also have fundamental and far-reaching impacts upon the development of particular regions.

Concern for regional problems has long been a pervasive, though sometimes implicit, influence shaping federal economic and social policy. During the formative years of Confederation, and indeed up to the 1920's, the emphasis of federal policy was on national economic development—the development of a unified market economy, held together by regional specialization and east-west trade, in which all regions would share in growth and prosperity. The key policy strategies were the opening up and settlement of the resource frontiers, the development of an all-Canada continental transportation system, and the protective tariff.

These strategies did not entirely disappear in the 1920's and 1930's. There were extensions of federal measures in the area of transportation, such as subsidization of rail and water movement, and new development expenditure for air transport. But there was increasing emphasis—accelerated by the Great Depression—on economic stabilization, on transfers of income to the slower-growing regions, and on broadening the range of ad hoc responses to support specific economic sectors suffering from periodic or long-term decline.

Within the past decade a further change in emphasis appears to have emerged. Policies have evolved with increasing awareness of the long-term persistence of regional imbalances and their economic, social and political implications. There have been extensions of traditional approaches for improving regional balance and a number of innovations in policy responses, including the recent focus on manpower resources and the broader approach to regional development illustrated by the Atlantic Development Board.

Clearly a very wide variety of considerations has entered into the formulation of this extensive array of policies. However, our aim here is not to catalogue past motives and objectives. Rather it is to appraise major elements of this complex policy structure in the light of the considerations that we believe to be relevant today. Do these policies have any effects on regional income differences or rates of manpower utilization? How have they changed in size and impor-

tance over the years? Have they simply been transfers of income that would have to be continually increased to keep income differences from widening, or have they contributed to self-generating growth in the lagging regions?

Our work in this difficult area of policy evaluation is still very preliminary. Much remains to be done in clarifying the most effective mix of policies to achieve improved regional balance along with our other basic economic and social goals. This clarification must be approached both comprehensively and systematically, supported by much more effective use of modern evaluation techniques.

STABILIZATION POLICIES AND REGIONAL BALANCE

Monetary and fiscal policies are of strategic importance for the smooth and stable growth of the national economy—the management of total demand to assure high and expanding employment, reasonable price stability, and a viable balance of payments. But in Canada the "national" economy comprises a number of very different regional economies, and the impact of a national stabilization policy differs among these regions. This section examines these differing impacts and goes on to discuss two related questions. First, can a case be made for stabilization policies that attempt explicitly to discriminate among the several regions? Second, even if such a case can be made, could the federal government effectively implement such policies?

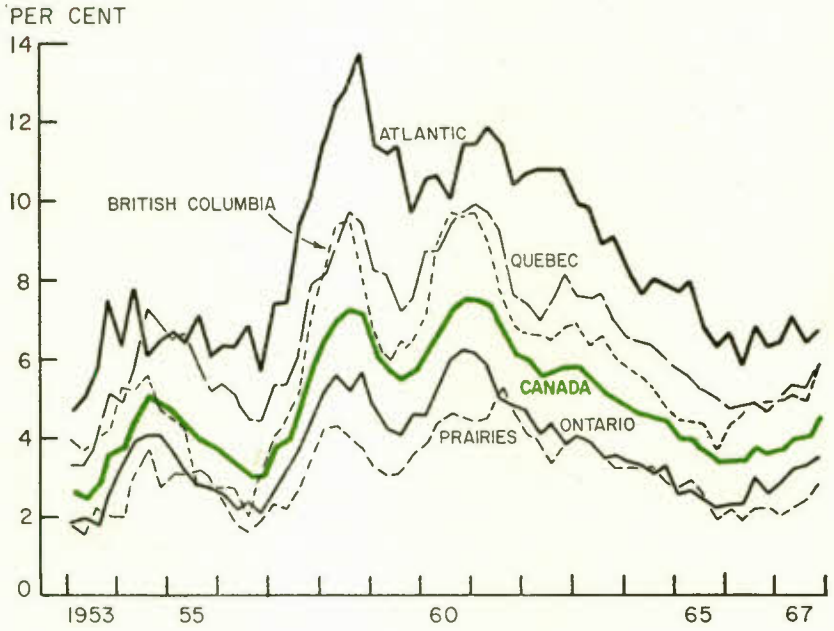
The case for regionally discriminating stabilization policies in Canada has come to rest largely on the persistence of higher unemployment levels in the lower-income regions at times when national economic conditions, dominated as they are by the more prosperous provinces, call for policies of restraint. Actually, the *movements* of the major economic variables are strikingly similar in all regions of the country. For example, apart from somewhat greater variability in crop production on the Prairies, the concurrent movements show up clearly in measures of regional output and income. They also appear in the changes in consumer prices. Chart 7-1 shows that the timing of changes in unemployment rates in the various regions is also very similar.

But while unemployment in the lower-income provinces tends to move in unison with the national aggregate level, the Chart reveals also that the *level* of unemployment in the Atlantic Provinces, and to a lesser degree Quebec, is persistently higher than the national average at all times. This largely reflects a higher degree of "structural"

unemployment in those areas.[1] Moreover, although total unemployment in the Atlantic Provinces falls when the national average is falling, their *share* of total unemployment tends to rise as economic activity increases. By contrast, Ontario's *share* tends to be lower when economic activity is high and higher as the economy moves into a recession; this reflects the fact that declines in the national level of industrial activity tend to be more pronounced in the more highly industrialized areas of the country.

CHART 7-1

UNEMPLOYMENT RATES BY REGION



Note: Seasonally adjusted quarterly averages.
Source: Based on data from Dominion Bureau of Statistics.

In these circumstances, expansionary fiscal and monetary policies will be looked upon with favour by all regions when the national unemployment rate is high. But when policies are used to restrain demand pressures that appear to originate mainly in the higher-income

[1] Frank T. Denton and Sylvia Ostry, *An Analysis of Post-War Unemployment*, Staff Study No. 3, Economic Council of Canada, Ottawa, Queen's Printer, 1965.

regions, the possibilities for conflicts of regional interest increase. Regardless of varying regional economic circumstances, the impact of a general policy of restraint is likely to be diffused throughout the national economy, with braking effects not only on the higher-income regions in which such effects may be most appropriate, but also on the lower-income regions just as they appear to be making promising progress towards fuller use of resources.

It has also been suggested that measures of credit restraint may fall with greater severity on the low-income regions because of structural factors and imperfections in the capital markets. The low-income regions of Canada contain relatively larger numbers of small firms. Small firms rely more upon bank financing and other short-term sources of funds than their larger counterparts, so they are more exposed to a tightening of bank credit. Moreover, it has been alleged that in periods of monetary restraint the banking system, more from institutional than commercial reasons, operates in ways that impose particular handicaps on borrowers in the low-income regions; for example, it has been claimed that in such periods there tends to be a greater concentration of lending to their larger corporate customers. Provincial and municipal governments in the low-income regions have claimed that they suffer from similar handicaps in financing during periods of restrictive monetary policy.

The evidence has not thus far provided a great deal of support for these various contentions. Moreover, the removal of the interest rate ceiling on bank loans, the removal of the prohibition of bank lending on mortgages, greater attention to small business banking, as well as provincial and municipal access to funds from the Canada and Quebec Pension Plans, have already begun to help reduce the basis for the concerns about such impacts. More generally, recent studies, including those of the Royal Commission on Banking and Finance, suggest that changes in monetary policy do not have a very large impact on levels of economic activity in the short run.

The fact remains that national measures of restraint do take effect well before a satisfactory level of employment is ever reached in the low-income provinces. But whether regionally discriminating stabilization policies could make a major contribution to a better regional balance is open to question. In large part (though unfortunately precise measurements are not readily available), the persistently high unemployment levels in the low-income regions appear to arise from structural factors rather than from the kinds of imbalances with which stabilization policies are best able to cope. Thus the most promising

measures for dealing with such imbalances are likely to be found in other policy areas. Nevertheless, the possibility of obtaining some gains from pursuing regionally discriminating policies which would be consistent with the Council's proposed strategies for stabilization deserves further examination. At the same time, the present difficulties of formulating and implementing such policies at the federal level should not be underestimated. We turn now to discuss some of these difficulties.

Implementing a Regionally Oriented Stabilization Policy

In framing a regionally oriented stabilization policy, the federal authorities would have to concentrate largely on fiscal rather than monetary policy, and especially on the expenditure side of the budget. Even here the scope is perhaps less than is generally realized, and knowledge of the regional impact of federal expenditures is at present too limited to permit the formulation of a comprehensive regional strategy.

Monetary policy is not generally considered to be an instrument that can be applied on a differentiated basis among the regions, given the essential unity of the capital market. A regionally discriminating monetary policy would require lenders to offer terms that depended upon the location of the borrowers, and to see that the funds were not re-lent elsewhere. This might work in particular lending activities such as house-building or farm credit, but even there it would appear to call for government intervention of one type or another, since commercial criteria alone may not suffice. Some government lending facilities are, of course, available now, such as the Industrial Development Bank, the Farm Credit Corporation and the Central Mortgage and Housing Corporation. However, it seems likely that the access to financing is not the chief problem of the slower-growing areas, so other measures would be required in any event.

Regionally discriminating tax changes for stabilization purposes would also face serious difficulties. Specific regional tax discrimination has been avoided in Canada in the past because it would offend the basic principle of equal treatment of persons or businesses having essentially the same tax-paying capacity. This does not, of course, rule out all regional implications. The tax structure, as we note below, may have regional effects through concessions to particular industries (or establishments in designated areas).

But the more important questions for a regionally oriented fiscal policy relate to expenditures. Just how far could changes in federal

expenditures be selectively distributed in order to sustain expansion in the slower-growing regions, even under conditions of restraint in total spending? What is the regional impact of any given federal expenditure?

The first of these questions brings up several problems. Federal expenditures represent a much smaller proportion of total government spending than in the past. Moreover, not only is there an increasing lack of flexibility on the expenditure side of the federal budget, but the machinery for systematic regional allocation appears to be very weak.

Direct federal expenditures on goods and services, perhaps the most important category for stabilization policy, amounted to only $4.3 billion or about one-third of expenditures on goods and services in Canada by all levels of government in 1967. The remaining two-thirds were accounted for by provincial and municipal governments.

There is also considerable evidence to indicate that federal expenditures cannot be quickly changed to deal with short-run changes in the national economy. A dominating proportion is devoted to contractual or statutory payments that cannot be easily or quickly raised or cut back in response to short-run changes in the economic situation. Such items as the interest on the public debt and shared-cost programs with provincial governments are essentially contractual obligations which must be fulfilled. The wide range of transfer payments to individuals and business firms, including pensions, allowances and business subsidies, must be paid out to all qualified recipients at the rates and times prescribed by parliamentary statute. The substantial outlays involved in legislative, protective and administrative services cannot be readily varied on a cyclical basis. National defence, external obligations and foreign commitments, and even developmental expenditures, are also relatively inflexible.

In virtually all of these areas any significant variation in expenditures is not a simple matter of a short-term adjustment of expenditure plans. Rather, what would be typically involved is a major shift in policy that should reflect a change in longer-run priorities and needs. Several of these program areas such as fiscal transfers and grants to the provinces for post-secondary education, hospital insurance, and welfare assistance have also been the most rapidly expanding fields of federal spending. The result has been a steady decline in the proportion that can be readily varied for stabilization purposes. Additional complications arise if this limited potential must be manipulated on a regionally selective basis.

To compound these difficulties, there is no readily available information on the allocation of all federal expenditures among the regions. It is true that some federal departments maintain records of regional allocation. But regional allocations of the whole range of federal expenditures are extremely difficult, and necessarily arbitrary. A partial allocation is attempted in the following section of this Chapter. Our main point here, however, is that a far more comprehensive and systematic reporting system would be required if a reasonably good regionally oriented stabilization program were to be contemplated. Work is now under way that would provide a basis for such a reporting system.

Even if we did have an accurate and up-to-date accounting of federal expenditures in the various regions, we would still lack the analytical framework required to support such a policy. Because of "leakages" or "spillovers", the full impact of an expenditure program is not likely to be confined to the region in which it is initially located. This is true of course for the country as a whole. An increase in investment expenditure in Canada, for example, will be reflected partly in increased imports of material and equipment from other nations.

Similarly, expenditure on a building or a road will have some effects on employment in the particular locality, but it will also create demand for materials, machinery and equipment, and frequently for managerial and skilled labour from other regions of Canada or even from abroad. Furthermore, the indirect effects of the program, through the spending of those employed locally, will bear partly on commodities produced in other areas. Smaller areas of the country are likely to feel both international and interregional leakages more heavily simply because their size works against self-sufficiency. It may, of course, be possible to choose expenditure programs that minimize these leakages—those that employ a maximum of local labour, for example. These may assist income maintenance but once again the choice of such programs should depend more on their long-run potential for reducing regional income disparities.

In summary, the maintenance of a high level of demand in the country as a whole is a vital prerequisite for improved regional balance. The extent of unemployment is reduced in all regions, though not to the same degree, and the background of national growth provides opportunities for labour mobility that would otherwise be lacking. Some further benefits might accrue if regional considerations could be built more explicitly and systematically into fiscal policies for stabilization—assuming as we do that present statistical and analytical

deficiencies can be overcome—as long as these policies are framed within a longer-run strategy for development. But the possibilities here should not be allowed to detract attention from more promising policy areas.

FEDERAL DEVELOPMENT POLICIES AND REGIONAL BALANCE

National policies of particular significance for regional growth and development have taken many forms. The whole complex of measures cannot be considered in any detail here. But this section will provide a basis for appraising some of the regional effects of policies in several key areas: federal development expenditures; tariff policy; transportation policy; and manpower policy.

Regional Distribution of Federal Development Expenditures

The definition, identification and provincial allocation of what we have termed federal development expenditures involve some tricky conceptual problems and, inevitably, a certain degree of arbitrariness.[1] But even with these cautions in mind, this type of approach throws up some useful insights into the problem.

Development or growth-related expenditures should be defined to include all programs that may increase the supply and use of productive resources or improve their productivity. Such a broad definition would in the first instance at least encompass programs for health care, education, labour force mobility, development of natural resources and industry, applied scientific research and technology, transportation, communication and other production-related social capital. For the purposes of this Chapter, social welfare, defence, public debt service, national administrative and routine regulatory expenditures were excluded. Revenue equalization payments, on the other hand, were included. Although their ultimate use cannot be broken down, it can be assumed that they are used to support the largest provincial cost items—education, health and transportation.

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[1] The methods of allocation employed are similar to those used in an earlier federal government study for the total budget of fiscal year 1961-62. See Reply of the Minister of Finance to Question No. 741 by Mr. Balcer, made Order for Return, July 22, 1964, House of Commons (Ottawa, November 4, 1964). It should be noted, however, that in the present analysis two-thirds of all expenditure allocated was based upon its provincial location (compared to two-fifths in the previous study). The same reservations on techniques of distribution, the significance of a single year's data and the rapid growth and change in expenditures, that were noted in the earlier study, apply to the estimates here for 1964-65.

For some preliminary insight into their regional impact, growth-related expenditures of the federal government as defined above for the fiscal year 1964-65 (the latest year for which it was possible to make the calculations) were allocated provincially. In all, these expenditures amounted to $2,566 million or about 35 per cent of the total federal budget.

Table 7-1 shows a rather striking result of this analysis. There was a strong tendency for per capita federal development expenditures to be highest in provinces with the lowest per capita incomes. Indeed, in Prince Edward Island and Newfoundland these expenditures were the equivalent of more than one-quarter of personal income per capita. Quebec was perhaps the most notable exception to the general pattern in 1964-65, in part because this province had not yet built up to high levels of expenditure under the Hospital Insurance and Trans-Canada Highway programs. Also the expenditures in Saskatchewan were particularly high in 1964-65 as a result of the large outlays for the South Saskatchewan Dam.

TABLE 7-1—PER CAPITA PERSONAL INCOME AND FEDERAL DEVELOPMENT EXPENDITURE BY PROVINCE

	Personal Income $\overline{1964}$		Federal Development Expenditure, 1964-65	
	$	Rank	$	Rank
Ontario	2,153	1	98	10
British Columbia	2,118	2	114	9
Alberta	1,839	3	128	8
Saskatchewan	1,838	4	185	5
Manitoba	1,801	5	151	6
Quebec	1,626	6	132	7
Nova Scotia	1,384	7	201	4
New Brunswick	1,263	8	212	3
Prince Edward Island	1,236	9	344	1
Newfoundland	1,081	10	310	2
Canada	1,849		133	

NOTE: Per capita personal income is averaged for three years, 1963-65, indicated by a bar over the centre year 1964.

SOURCE: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

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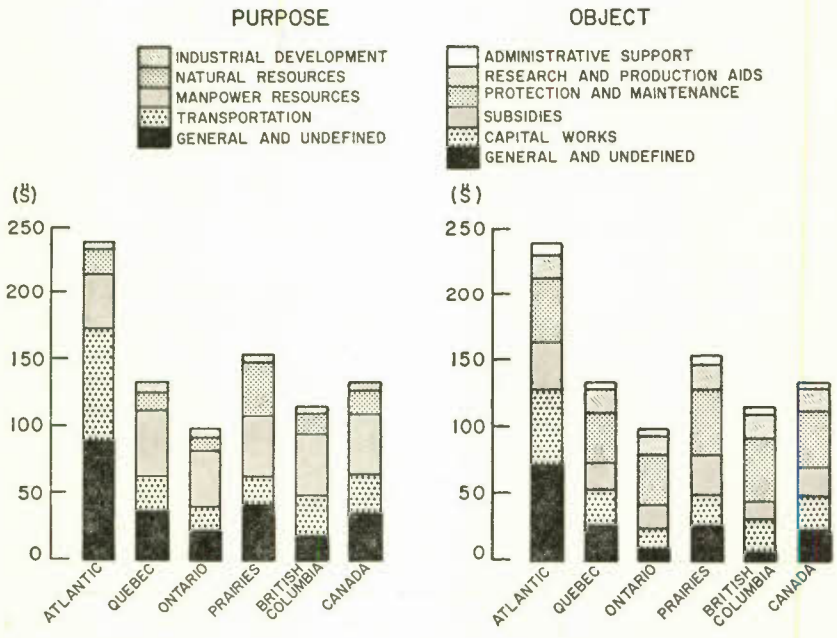
In the light of these figures, it can certainly be concluded that these federal expenditure programs worked to narrow existing income differences among the regions. If other federal expenditures, especially social welfare programs, were included, these results would be reinforced. But income maintenance alone is likely to be only a palliative. The more important question concerns the contribution of these expenditures to the acceleration of long-term growth rates—that is, to the forces and processes generating income growth based on productivity advances.

As we noted earlier, our present analysis does not enable us to measure the quantitative impact of various programs on the growth of the regions. Instead, we have tried by appropriate classification of the 1964-65 expenditure programs (Chart 7-2) to detect any conscious, deliberate strategy of improving performance in the low-income regions by increasing utilization of resources or raising output per

CHART 7-2

PER CAPITA FEDERAL DEVELOPMENT EXPENDITURE BY REGION, 1964-65



Source: Based on data from *Public Accounts of Canada, 1964-65,* and estimates by Economic Council of Canada.

employed person. Undoubtedly some of the federal programs have done just this—the more recent manpower programs provide a notable example—but our appraisal fails to reveal any clear over-all design for coping with the underlying problems of regional imbalance.

In all regions except the Atlantic Provinces the largest proportion of federal development expenditures, by purpose, in 1964-65 was devoted to manpower programs. These programs, which are discussed in more detail later, appear to rate quite high in respect of the requirements for accelerated regional growth indicated by our earlier analysis. On the other hand, most of the expenditures in the lowest-income region, the Atlantic Provinces, were on transportation and various residual or undefined programs.

Our appraisal, rough as it is at this stage, suggests that the considerations entering into the wide array of transportation expenditure programs in the Atlantic Provinces have not primarily been those relating to our requirements for accelerating regional growth. At least, it is not apparent that they have been part of any co-ordinated and conscious design in the appropriate directions.

The residual category of programs includes a long list of comparatively small items related to general development, such as the national statistical services, certain scientific and technological research, basic mapping and technical surveys and the national parks service. But it is dominated by the inclusion of federal revenue equalization payments to the provinces. We assume that these payments support growth-related provincial expenditures, especially education, health and transportation, but to what extent these can be claimed to reflect a deliberate design for the acceleration of growth is very much an open question.

The allocation of expenditures by object also fails to reveal any particularly conscious aim to accelerate growth in the low-income regions. The classification suggests that there was some redistribution towards the Atlantic Provinces in the form of capital expenditures that might be consistent with such an aim. But there were also larger expenditures per capita in these provinces on subsidies which, though they may have assisted in income maintenance, have had questionable results for the promotion of economic growth.

Although it is difficult to detect a clear regional development strategy in the 1964-65 expenditure figures, major changes in a number of programs have been implemented in recent years which seem likely to produce a more appropriate regional impact. These include the change in the calculation of revenue equalization payments to lower-income

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provinces, the institution of fiscal transfers for post-secondary education, the extension of manpower training, changing transportation policies and the growth of applied area development programs. We turn to a number of these developments later in this Chapter.

Corresponding to the issue of regional distribution of federal development expenditures is the obverse issue of the regional impact of the federal tax structure. In the past the federal government has made use of particular tax incentives or concession arrangements in order to assist the longer-run growth of certain industries or designated areas. Where these industries or the defined areas are substantially concentrated in certain regions, such tax incentives and concessions have had important regional effects. Unfortunately these effects have not been closely investigated; indeed, even the Royal Commission on Taxation paid little direct attention to this question. To what extent such tax incentives and concessions have either been based on considerations directly related to, or have influenced, regional growth and balance in the sense which concerns us in this Chapter therefore cannot be delineated at this time.

National Tariff Policy

Of all the major instruments of national economic development, perhaps none has proved to be a more potent source of interregional tension than the system of protective tariffs and related commercial policy devices. It is a time-honoured and enduring ritual at federal-provincial conferences on fiscal and economic problems for Ontario to remind the country that it provides about 45 per cent of the total direct tax revenues flowing into the national treasury, and for the Atlantic and western provinces to rejoin that, among the various burdens they carry, the tariff provides Ontario with its sheltered market while most of their own producers must sell abroad at competitive world prices. Over the years regional unevenness of the cost of the protective tariff has been regularly used to support arguments for providing an elaborate structure of regional and national transportation subsidies, special assistance to primary producers in agriculture, fisheries and mining, tax concessions of particular regional interest, and revenue equalization payments to the lower-income provinces.

As we have already indicated, the initial purpose and effect of the protective tariff, together with a national transportation system, was to establish an east-west trading relationship, involving a considerable degree of regional economic specialization. The manufacturing and

industrial core of the country developed in Ontario and Quebec, with a strong primary resource orientation in the other regions. The expectations of the Atlantic Provinces that they would also perform an important national manufacturing and service function were frustrated both by changing technology and by the westward shift of North American population and activity. How much this broad historical picture of regional patterns might have been altered by a basically different commercial policy cannot be known. But it is relevant for our purposes to look at the regional effects of the tariff in the present day, and to suggest how the problem of regional balance might be affected by freer trade.

In broad terms, we can distinguish two major influences upon the various regions resulting from the imposition of a tariff on imported goods—one from the side of consumption and the other from the side of production.

The broad structure of the tariff and the traditional view of its national and regional impact are generally familiar. One of the main effects of tariffs is that purchasers of goods pay higher prices for certain commodities than they would pay for the same goods at duty-free import prices. The amount involved is what has been called the "cash cost" of the tariff. Earlier studies have suggested that this "cash cost" of the Canadian tariff is substantial. Not only do Canadian consumers pay substantially more for many finished products as a result of the tariff, but most Canadian producers pay more for a wide variety of materials, machinery and components as a result of the tariffs on these items; and these higher costs of production are reflected in the prices of goods produced in Canada. All Canadian consumers and producers share in the cash cost of the tariff to the extent that tariffs affect the price of the goods they buy. But the impediments that tariffs impose to access to some cheaper sources of supply in adjacent areas of the United States tend to result in a somewhat larger cash cost in the Atlantic Region and the western provinces than in Central Canada.

But a far more important effect of tariffs is that they tend to depress the levels of output per employed person in Canada. In particular, tariffs shelter or cause inefficiency in contemporary Canadian industry by encouraging product diversity over a wide range of protected products, limiting efficiencies that could otherwise be gained from scale and specialization. This was one of the major conclusions in Chapter 6 of our *Fourth Annual Review,* in which we indicated that

the effects of Canadian and foreign tariffs combined are reflected in higher prices for machinery and other material inputs, and in the basic structural pattern of large net imports of manufactured products.[1] Recent studies have concluded that this "production effect" of the tariff (both Canadian and U.S.) may be very substantial—indeed that the economic costs to Canada may be significantly higher than the "cash cost" of the Canadian tariff—and that these combined economic costs may constitute a very significant element in the large and persistent gap in productivity levels and in the average levels of real standards of living between Canada and the United States. In fact, this element could well be even larger than that arising from the educational disparities between the two countries discussed in the *Second Annual Review.*

In summary, the consumption aspect of the national tariff suggests important relative gains in real income for the Atlantic, Prairie and British Columbia regions if the tariff were reduced or eliminated. There would be little net change in Quebec, and some relative decline in Ontario. But if the production aspects of the tariff are even more important than the consumption aspects, large, new and difficult questions arise about tariffs—questions which cut across many traditional views. For example, is it perhaps the main manufacturing regions of Central Canada, rather than the Atlantic Region or the western provinces, that are now bearing the main economic costs of tariffs? Also, is it possible that substantial tariff reductions, even though they would benefit Canadians in all parts of the country, may have the effect of *widening* rather than *narrowing* regional income disparities—particularly between Ontario and the Atlantic Region? And have the tariff reductions over the past two decades in fact been tending to offset other forces working towards the narrowing of interregional disparities (thus helping to explain the stubborn persistence of the wide disparities in Canada)? The Council does not have answers to such questions at this time, but these and related questions raise important issues requiring further examination.

National and Regional Transportation

Since Confederation, transportation has played a key role in federal development policy. Recently, the federal government's expenditures

[1] See also D. J. Daly, B. A. Keys and E. J. Spence, *Scale and Specialization in Canadian Manufacturing*, Staff Study No. 21, Economic Council of Canada, Ottawa, Queen's Printer, 1968.

on transportation and communications have been running at an annual level of well over half a billion dollars, and it is estimated that they have been equivalent to roughly one-eighth of total railway transportation costs, one-quarter of air transportation costs, and about one-third of water transportation costs. For roads and pipelines the federal outlay is relatively small.

These figures hardly begin to convey the importance of the federal government's role in this field. They embrace such programs as subsidies and subventions, grants, direct construction of physical facilities and the provision of services with or without charge to the industry. But federal transportation policy covers an even wider spectrum, including loans, regulation and control of commercial rates and services, and restrictions on entry into certain forms of transportation. In addition, of course, federal Crown agencies such as the Canadian National Railways and Air Canada operate major transportation systems. Both direct expenditures and the regulatory functions have had pronounced regional impacts.

Federal government programs have undoubtedly stimulated the development of various transportation systems beyond the level that could be supported solely by the market. These programs, along with technological improvements in the transportation industry itself, have undoubtedly also stimulated and encouraged the development of resources and certain lines of economic activity in the various regions in many ways, some of which are described below. They have contributed to national economic integration and they have raised the average level of income in all parts of Canada. But from a regional perspective the net effect of this wide range of policies has been to increase the pull towards the more highly industrialized regions of Central Canada. In this sense at least, these policies may have complicated the task of achieving a better regional balance in economic development.

Over the last 20 years, federal response to transportation requirements has been immensely complicated by the swift advance of transport technology and the emergence of competitive forms as well as the rapid changes in the structure of the economy. It has been difficult to find a consistent and coherent focus in federal transportation policy. Many of the specific programs, however, have obviously been framed to provide an economic advantage to one region or the other, and it is this aspect of policy that we are concerned with here. Unfortunately, it is still not possible in many cases to measure these benefits, although techniques now emerging promise some progress in

this direction, so that it is not always clear that the intended advantages were actually achieved. What follows is a brief summary of the effects of federal transportation policies in the various regions of Canada.

Atlantic Region—As indicated in Chart 7-2, the four Atlantic Provinces received the largest per capita share of federal transportation expenditures in 1964-65. National transportation policies seem clearly to have provided the Atlantic Region with more adequate transportation facilities than would have been provided on a purely commercial basis. But this has not enabled the Region effectively to overcome the handicap of distance from the central Canadian market. Even in maritime transport, the improvement of the St. Lawrence Seaway, and particularly the extension of the navigation season, has tended to reduce the Atlantic Region's role. However, this role may be strengthened in the future through new technological developments of many kinds, perhaps including giant freight liners and containerization.

Several federal transportation policies, beginning with the construction of the Intercolonial Railway, were specifically designed to tie the Atlantic Region in with Central Canada. Two subsequent attempts to enable the Region to export to central Canadian markets—the Maritime Freight Rates Act (which provided an annual federal subsidy of about $15 million) and freight subventions on movement of coal—seem to have produced only marginal benefits. Indeed, the main effect of the latter has been to prolong the life of a declining industry at a high national cost relative to the benefits involved.

There have also been policies designed mainly to improve difficult internal communications in the Atlantic Region. Such policies include the subsidies on the Prince Edward Island and Newfoundland ferries; the subsidies to coastal shipping; the rail rate reductions under MFRA for intraregional rail transportation; and the highway grants made by the Atlantic Development Board, in addition to the federal expenditures in the Atlantic Region for the Trans-Canada Highway. The proposed causeway to Prince Edward Island is of the same nature. Whatever the long-run benefits flowing from some of these policies, their over-all contribution to an improved regional balance could be very much enhanced if they were formulated and implemented within the context of a comprehensive regional planning framework.

Prairie Region—The Prairie Region is perhaps the best example of both the successes and the difficulties of national transportation policies

in Canada. The great distances from external markets and sources of supply, the nature of its basic agricultural industry and land settlement, and unduly optimistic expectations all contributed during earlier periods of development to the building up of a very large and ultimately expensive internal transportation system. Both private and public sectors were involved in programs of overinvestment in the system.

Federal transportation policies designed specifically to aid the Prairie Region have been confined largely to reducing the transport cost of its exports. The Crow's Nest Pass rates on grain, the feed grain freight subsidies, the establishment of the Port of Churchill, the national oil policy and associated pipeline construction, the St. Lawrence Seaway, all have had this effect. Only the railway "bridge" subsidy (whose effect has been very small) was intended to reduce certain freight costs in both directions although the Port of Churchill and the Seaway also have this potential.

The effect of the Crow's Nest Pass grain rates is clear. Whether or not the rates are remunerative to the railways, they have kept the costs of grain shipments to export markets lower in some years than they would otherwise have been. In 1961, the MacPherson Commission on Transportation concluded that there were years in which the revenues from Crow's Nest Pass grain rates failed to cover all the properly assignable costs of the movement, thus suggesting that there was some income benefit to grain producers. On the other hand, the long-run effect of such rates was probably to slow the pace of adjustment of prairie agriculture. Construction of the Seaway also provided income benefits to grain producers.

Pacific Region—With the exception of certain coastal shipping subsidies, the role of national transportation policy in the Pacific Region in the past has consisted chiefly of measures to link a viable, resource-based Pacific-oriented economy to the Atlantic-oriented central region. This was the principal aim of building the transcontinental railways, developing the transcontinental airlines and constructing the Trans-Canada Highway. Exports from the Pacific Region move largely by sea, and freight charges from other regions are influenced by the availability of the water alternative and U.S. rail competition.

The first change in the eastward orientation of transport policies came when policies were modified to promote the more extensive use of West Coast ports for exports. First the Crow's Nest Pass rates were made applicable to the West Coast. This was followed after the Second World War by the application of feed grain freight assistance to

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British Columbia, the removal of the mountain rail freight differential and the provision of subsidies for the movement of coal to the Pacific for export.

It seems clear that national transportation policy will need to focus more on increases in West Coast transportation facilities, particularly in the form of investments in seaport and aviation facilities and north-south and trans-Pacific air routes. The growing importance of Pacific coastal and overseas trade will be as significant for this region as traditional outlets have been for Central Canada.

Central Canada—The original transportation policies were specifically designed to link other regions more closely to Central Canada. In spite of various elements of transportation policy intended to meet special regional needs and to moderate regional disabilities, national transportation policies have undoubtedly continued to support the primacy of Central Canada in terms of economic maturity and per capita income. For instance, government expenditures on water transportation have been largely concentrated on the improvement of the facilities of the main internal waterway in Canada—the Great Lakes-St. Lawrence system—with a consequent increase in the economic role performed by the centres located on this route. Both the rail lines and airline routes have a strong east-west orientation hurdling natural barriers and again enhancing the function of the central region. Employment in the air industry has become increasingly concentrated in Central Canada, particularly in Montreal. Moreover, air transportation, together with vastly improved methods of communication, have enhanced the advantage of the Toronto and Montreal metropolitan areas in supplying an increasing range of managerial and professional services.

The central region's large population, together with its concentration of industrial activity, has provided a basis for economies of scale and specialization in the form of lower transport costs and a greater variety of transport services. Federal policies controlling rail rates in the past were designed, among other things, to reduce differences throughout Canada between a rate charged on a high-density line and a low-density line. To the extent that it left rail rates higher in Central Canada than they otherwise would have been, it has probably brought about some loss of rail traffic to trucks—traffic which perhaps could have moved at lower real cost by rail. The virtual freeing of railway freight rates from government control will introduce greater flexibility of rate adjustment to the advantage of Central Canada, but rates in all regions are likely to be closer to the real costs of moving goods.

Changing Policy Perspectives—Since the Second World War, there has been a wide variety of un-co-ordinated adjustments in federal transportation policy. These have been due to very rapidly changing transportation technology, as well as accelerated economic and social changes having an important bearing on Canada's transportation patterns and needs. These conditions have led to the passage of the National Transportation Act, intended as a new phase in national transportation policy in Canada. One of its primary objectives is the more effective co-ordination of all federal government regulatory activities in the field of transportation. Other explicit objectives are the closer matching of transportation charges to their real costs, and the reduction or elimination of subsidies to transportation in general. Railway rate control is being substantially abandoned, except for certain rates directly related to regional interests.

The traditional transportation policy was originally framed in a broad national context, and explicit regional policies only gradually developed. Although many of these regional programs have survived—even if under increasing attack—it is hoped that they will undergo substantial change to make them better conform to the regional balance criteria suggested by the Council. There is no doubt that many of these programs have not only served development purposes, but also helped to mitigate regional disabilities. It is difficult to avoid the impression, however, that their contribution to improved regional balance has not been great.

In the process of developing the new phase of national transportation policy, we believe that much more careful and consistent attention should be given to the role of transportation policy in the improvement of regional balance. In this process, it is conceivable that quite different approaches and emphases may be required than those which have dominated national transportation policy in the past. For example, less emphasis may be appropriate on the traditional east-west transportation links, and much greater emphasis may be needed on intraregional transportation development (including metropolitan and urban transportation systems) and on improving international transportation links.

The Canadian Transport Commission has ample regulatory flexibility to facilitate such shifts in emphasis. But any such shifts will require close co-operation and co-ordination between the federal and other levels of government in many different ways—for example, in such matters as investment in publicly provided facilities, taxation, subsidies, and control of common carriers.

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Manpower Training and Mobility Programs

In recent years manpower development has come to be viewed as a major instrument for accelerating the growth and efficiency of the national economy and its various regions. This section takes a closer look at various efforts to upgrade the average level of education and to align labour supply with labour requirements.

Efforts to Support Education and Training—In Canada, education is a provincial responsibility. However, the federal government has played some part in helping to finance education and training. Direct financial support for education has comprised two main elements. First, since the early 1950's, universities and colleges have received federal grants to assist in meeting an accelerating growth in both student enrolment and the costs of higher education. These grants have now been replaced by a system of fiscal transfers to the provinces that have financed a rapidly increasing share of university and post-secondary education over recent years. Second, sizeable contributions to meet both capital and operating costs have been made to provinces undertaking agreed programs of technical and vocational training. In addition, the federal government has indirectly helped to accommodate the rapid rise in provincial expenditures on education, as well as in other areas of provincial responsibility, through changes under which the provinces have come to occupy an increasing share of the income tax field and through the system of equalization payments to the lower-income provinces.

The substantial revision in the system of equalization payments in the 1967-68 fiscal year provided significant per capita increases for all provinces whose tax capacity is calculated at less than the national average. Far-reaching changes in the scope and content of more direct federal support for education and training were also introduced in the past two years. The total federal fiscal transfer to a province for post-secondary training is now determined on the basis of either a $15-per-capita payment, or 50 per cent of the operating costs incurred by the province, whichever is higher. At the same time, the shared-cost program for technical and vocational training is being phased out; and the federal government has assumed full financial responsibility for an expanded adult training program, including substantial allowances to trainees.

Federal outlays on post-secondary education and training for two fiscal years are shown in Table 7-2. Between 1964-65 and 1967-68, federal expenditures more than tripled, while the pattern of regional

distribution shifted markedly in favour of the lower-income regions. For some of the provinces with limited fiscal capacity, federal transfers in respect of post-secondary education now cover well over 50 per cent of operating costs. Similarly, the federal adult occupational training program, introduced in April 1967, appears to have its greatest proportionate impact in the Atlantic Region, where the average level of education in the labour force is well below the average for Canada, and where the rate of unemployment and underemployment is consistently higher.

TABLE 7-2—FEDERAL FINANCIAL ASSISTANCE FOR POST-SECONDARY EDUCATION AND TRAINING BY REGION

	1964–65			Estimated 1967–68		
	Expenditure	Persons Eligible	Expenditure per Person Eligible	Expenditure	Persons Eligible	Expenditure per Person Eligible
	($ million)	(Thousands)	$	($ million)	(Thousands)	$
Atlantic	12	608	19	47	663	71
Quebec	52	2,034	25	160	2,308	69
Ontario	41	2,619	16	166	2,938	56
Prairies	20	1,235	16	88	1,320	67
British Columbia	11	659	17	40	794	51
Canada	135	7,154	19	501	8,023	62

NOTE: "Persons eligible" refers to the labour force plus full-time post-secondary students. The expenditure data for 1964–65 include university grants and federal participation in technical and vocational training; for 1967-68 the estimates include the new payments system in support of university and post-secondary education, the "phase-out" expenditures for technical and vocational training and the new program of adult occupational training.

SOURCE: Based on data from *Public Accounts of Canada*, 1964-65, and estimates by Economic Council of Canada.

Employment and Mobility Programs—The level and rate of growth of productivity may be adversely affected by imperfections in the labour market that prevent workers from shifting to superior employment opportunities. For maximum effectiveness, manpower policy should be directed towards reducing the obstacles to mobility as well as upgrading education and training. This requires counselling and

placement services, the development of better labour market information, and the use of financial aids to facilitate mobility.

For most of the period since the end of the Second World War, the functioning of the labour market has been influenced directly through the National Employment Service. Because of the limited scope of its operations and certain administrative handicaps, the NES impact on the labour market was minimal. The employment service is being reorganized and strengthened, under the Department of Manpower and Immigration created in 1966, to enable it to provide more effective counselling, placement and related labour market services.

In the same year, a new Manpower Mobility Program was introduced. This provided financial assistance (in the form of a loan or a grant) to unemployed workers who undertook to move to new jobs outside their local areas. The program was amended in 1967 to provide assistance entirely in the form of grants; the coverage was extended to include underemployed workers and farmers displaced under the farm-consolidation program of the Agricultural and Rural Development Agency (ARDA); provision was made to partially offset losses on the sale and subsequent purchase of the mover's home; and grants were extended to workers travelling to training courses or to other areas to explore job availabilities. The most recent version of the program appears to strengthen the possibilities for effectively stimulating the movement of persons from lower- to higher-productivity employment both within and among the various regions.

To sum up, federal policies for the development and utilization of manpower have evolved rapidly in recent years. At the same time, the design of these policies has tended to shift away from the cruder principles of per capita distribution or shared-cost expenditures (which ignore varying fiscal capacities among regions) in favour of guidelines which are intended to reflect differing regional needs more accurately. In other words, these policies are likely to exert a more than proportionate impact upon those regions in which education and training is lowest and where labour market imperfections are greatest. It would appear, therefore, that the major thrust of federal policies, which help to stimulate education, training and labour market adjustment to economic and technological change, favours not only the growth of productivity and income at the national level but also the reduction of interregional income disparities. In the longer run, this could well turn out to be one of the federal government's largest and most important contributions towards achieving the objective of improved regional balance.

APPLIED REGIONAL DEVELOPMENT PROGRAMS

The applied regional development programs are distinguished by two features: first, their attempt to provide a better basis for sustained employment and income growth (as opposed to mere income maintenance through transfer payments) and second, their explicit orientation to well-defined geographic regions, ranging from small areas such as counties or labour market areas to major regions such as the Atlantic Region. The programs have been applied on the basis of existing political-administrative geographic units; no attempt has been made to define a new system of regions expressly tailored to the economic development objectives.

The central concern of these programs is to attack the problems of low-productivity employment or unemployment facing groups of individuals in well-defined locations. Characteristically, these problems arise because of a "marginal" participation in national economic growth—the rural resident engaged in marginal farming, fishing or forestry, the unemployed who live in slow-growing locales, and the average resident of the Atlantic Provinces and Eastern Quebec. The direct expenditure of funds is the major instrument for achieving the objectives of all the programs. Outlays on both capital and operating account are designed to raise the average level of incomes by developing and rationalizing the use of natural and human resources, strengthening the economic infrastructure, or influencing the location of expanding and new manufacturing establishments.

Area Development Agency (ADA)

The Area Development Incentives Act (1963) is administered by the Area Development Agency within the federal Department of Industry. It is one of the major instruments designed by the federal government to cope with the problems of high unemployment and low income in specified areas. At the present time, an area is eligible for the program if one or more of the following conditions apply: the rate of unemployment is severe and substantially above the national average; there has been a large and persistent decline in the volume of employment; or the level of underemployment, as reflected in average levels of income, is well below the national average. The basic geographic unit used for defining area boundaries is the same as that employed by the Canada Manpower Centre (formerly the National Employment Service) in delineating the regional or local labour market. In some cases, census divisions or counties are used. Statistical

deficiencies, in fact, limit the range of choice of geographic areas for the incentives program.

When the program was established in 1963, 35 areas were designated for assistance. In 1965 the number was increased to 81 when, among other modifications, the level of income was added as a criterion. In the review of the program in 1967 the number of areas was again raised. These numbered 92 as of the end of 1967. While the total number of designated areas has thus increased over the years, some—particularly in Ontario—were dropped from the program because they no longer met the statistical criteria. As may be seen from Table 7-3, the five eastern provinces now account for two-thirds of the total number of designated areas and, with the exception of the regions surrounding the urban centres of Fredericton, Saint John and Halifax-Dartmouth, the whole of the Atlantic Region and much of Eastern Quebec are designated. Sparsely populated areas in the northern parts of the provinces have been excluded from the program.

The program consists largely of subsidizing capital investment in new manufacturing establishments in these areas or in the expansion of existing establishments. Until 1965, this subsidy took the form of a "tax-holiday" or a three-year exemption from federal income tax, plus special rates of depreciation for tax purposes on new machinery, equipment and buildings. Since then, the tax exemption has been replaced by a grant of up to one-third of the capital cost of new machinery, equipment and buildings with an upper limit of $5 million per project. Furthermore the grant is exempt from federal income tax and does not reduce the amount of capital cost allowances which may be used for tax purposes.

Table 7-3 gives a rough idea of the major lines of the program and of its different effect on the various regions of the country. It should be carefully noted that the data reflect the intentions of the applicants and that these may not be fully realized. Bearing in mind the difficulties of measuring the value of tax exemptions or accelerated depreciation allowances, it may be roughly estimated that, from the inception of the program to the end of 1967, a total of $370 million has been committed in the form of grants or allowed as tax exemptions. The Table summarizes some key features of the subsidy program cumulated over the four-year period since it was introduced. In broad terms the $370 million of incentives has been associated with a total investment of $1.8 billion in 845 projects for new or expanded capital facilities in the designated areas. Furthermore, applicants for the subsidy have estimated that the new or expanded facilities have provided

about 50,000 new job opportunities. With somewhat more than 50 per cent of the total value of subsidies going to the designated areas in the Atlantic and Quebec Regions, a higher or equivalent percentage of total investment (63 per cent) and estimated direct job opportunities (54 per cent) have been located in economically stagnant areas in those five provinces. The program has succeeded, in an obvious sense, in achieving its narrowly defined purpose—the expansion of employment opportunities in depressed areas.

TABLE 7-3—REGIONAL ASPECTS OF THE AREA DEVELOPMENT PROGRAM, CUMULATED TO DECEMBER 31, 1967

	Canada	Atlantic Provinces	Quebec	Ontario	Prairie Provinces	British Columbia
Number of Designated Areas (as of the end of 1967)	92	26	33	12	18	3
Total Investment (Millions of dollars).....	1,845	676	481	436	202	50
Percentage distribution...	100	37	26	24	11	3
Value of Capital Subsidy (Millions of dollars).....	370	106	90	127	34	13
Percentage distribution...	100	29	24	34	9	4
Estimated Direct Employment.....	49,864	16,308	10,538	18,164	3,110	1,744
Percentage distribution...	100	33	21	36	6	3
Number of Projects.....	845	243	207	239	103	53
of which: New Facilities..	478	141	97	141	62	37
Expansions.....	367	102	110	98	41	16
Value of Capital Subsidy per $100 of Total Investment (Dollars).....	20	16	19	29	17	26
Total Investment per Unit of Associated Employment (Dollars).....	37,000	41,450	45,650	24,000	65,100	28,500

NOTE: The data are compiled from active applications for assistance under the Act. Active applications exclude rejections, withdrawals and suspensions. Estimates of total investment and the anticipated number of direct job opportunities represent the intentions of the applicants.

SOURCE: Based on data from Area Development Agency.

The estimated number of new job opportunities is apparently associated with a relatively high level of total investment. In other words, the capital-labour ratio for the subsidized projects appears to

be higher than the average ratio of capital stock per worker in all manufacturing in Canada. In general, high capital-labour ratios in industry tend to be associated with high levels of labour productivity, wages and income (although not necessarily with high levels of factor productivity). In this respect, it should be noted that the value of incentives needed in relation to total investment was lower and total investment per unit of estimated direct employment was higher than average in the designated areas of the Atlantic and Quebec Regions. To this extent, the "effectiveness" of the subsidy program and the favourable influence on average levels of productivity have been comparatively greater in the two lagging regions of Canada.

In part, however, this result arises from the industrial distribution of incentive payments. Capital subsidies are provided for practically every type of manufacturing enterprise, including primary resource-based industries, as long as they meet certain standards of credit-worthiness, but the most prominent branch of manufacturing that has been subsidized is primary pulp and paper. Over the four-year period, subsidies for this particular activity amounted to $110 million or 30 per cent of the total. These in turn were associated with an investment of $716 million or 39 per cent of the total value of fixed capital facilities put in place under the program. Judging from the data for the 31 projects in primary pulp and paper, this is a very capital-intensive industry: the average capital outlay per worker amounted to roughly $127,000 as compared with about $26,000 per worker for the average of the 814 projects covering all other industries. By its very nature, it must locate very near the resource it exploits and generally well outside populated centres.

In the projects encouraged by the program, there could be important indirect impacts, through what might be described as "backward" and "forward" linkage effects in stimulating other supplying or purchasing industries. Unfortunately, the area development program is not essentially designed to promote such indirect benefits. The designation of areas has been based on past recorded economic stagnation rather than future viability or economic potential. Generally, the indirect impact of capital-intensive investment is likely to be greatest when it is undertaken in the larger populated centres. The incentive program, however, tends to result in a dispersal of investment. In the case of the primary resource-based industries, such as pulp and paper, as well as other industries such as the chemicals and chemical products industry (the second largest industry subsidized under the program), materials, equipment and even specialized labour skills required for production

are largely brought in from sources outside the area in which they are located, while their products are generally marketed over large distances. Such industries, therefore, provide a relatively weak base for satellite activities and for self-generating growth and development in the designated area.

Fundamentally the subsidy program aims at influencing the location of capital investment. Whether the subsidies also encourage a higher level of investment and employment than would otherwise occur cannot conclusively be answered. In either case there is good reason to believe that the decision to invest would have been taken (perhaps at a date further in the future) and the particular location chosen, even in the absence of the subsidy. This is especially true of investments in which the ADA subsidy represents a small part of the total financing required. In the case of some pulp and paper mills for example, provincial financial support and guarantees of adequate wood supply have been important influences on investment decisions. Uncertainty about the usefulness of incentives also applies to other resource-oriented industries and to expansions of capital facilities which constituted 44 per cent of all the projects aided. In other words, the true impact of the program should be judged from the 478 new facilities affected by incentive payments less those industries which are resource-oriented. The remainder of "footloose" enterprises represent the "core group", the location of which can be said to have been effectively influenced by the incentive program.

The area development program was shaped at a time when unemployment levels throughout the country were inordinately high. Consequently, its orientation towards alleviating distress in those areas suffering from the rapid pace of economic change is understandable. The program, nevertheless, ignores some of the important and now widely recognized sources of long-run growth in regional productivity and income. It assigns little or no importance to the long-run viability of specific industries, nor to inter-area "leakages" affecting the potential capacity of the designated area to permanently sustain a higher level of employment. Furthermore, it has favoured a wider dispersal of industry, and has ignored the opportunities of achieving economies of scale and specialization associated with increased concentration of economic activity in growth centres. In the *Second Annual Review,* we referred particularly to the important role that such centres could play in the lagging regions.

These considerations suggest the need for a reappraisal of the area development program and its impact upon regional balance. We

believe that the most appropriate place for capital subsidies will be found within a wider framework of a comprehensive regional development plan. Under such a plan, capital subsidies could be effectively co-ordinated with other development instruments, particularly manpower training and mobility and measures aimed at achieving more effective development and exploitation of agglomeration opportunities.

Rural Resource Adjustment Programs

Rural resource adjustment programs include: the long-standing soil and water conservation activities of the Prairie Farm Rehabilitation Administration (PFRA), operative in the three Prairie provinces since the "dirty thirties"; the companion program for the dyking and protection of marshland agricultural areas in the Maritime Provinces (MMRA); more recent and successively changing approaches towards problems of development throughout rural Canada generally under the joint federal-provincial auspices of the Agricultural and Rural Development Act (ARDA); and the still newer attempts of the federal Fund for Rural Economic Development (FRED) to grapple in a comprehensive way with particular localized pockets of acute rural poverty.

To the present, these diverse activities have largely involved the investment of capital funds in major dams and irrigation works, in widely scattered farm water and livestock pasturage development, and in dykes, drainage and flood control—all intended to achieve a better or more intensive use of land as a basis for increasing rural incomes. From 1945 to 1967, cumulative federal outlays amounted to roughly half a billion dollars, mainly in the Prairie Region; the appropriation for fiscal 1967-68 was about $60 million.

The first three of these programs have been described and evaluated in some detail in a special study for the Council.[1] Broadly speaking, the objective of rural rehabilitation policy, particularly since the Second World War, has been to ease the adjustment to many of the disruptive and far-reaching changes in Canada's primary industries and rural areas. In their initial phases, the programs tended to focus upon the better use and conservation of physical resources—land, water and trees. In more recent years, as the trend towards urban-oriented economic activity has become more pronounced, attention is properly shifting to a more direct concern for human resources, including their training, mobility and employability.

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[1] Helen Buckley and Eva Tihanyi, *Canadian Policies for Rural Adjustment.*

Some aspects of this special study bear directly upon the question of regional balance. It is clear that the problem of low rural income—in marginal agriculture, fisheries, primary forestry or, as often occurs, any combination of the three—is an important dimension in interregional income disparity. A heavy relative incidence of these low rural incomes is encountered throughout the Atlantic Region and Eastern Quebec. The problem is also acute in some other provinces, except that its depressing effect on average income levels is more substantially offset by the much greater weight of more prosperous sectors of the economy.

The incidence of low rural incomes has provided a rough kind of guide to the regional distribution of the federal rehabilitative effort. The initial impetus for PFRA and its reclamation, conservation and resettlement programs in the 1930's was a clear response to the problems of acute farm distress and poverty in the Prairie Region. Nevertheless, much the larger proportion of its total cumulative expenditure was undertaken in the more normal circumstances of the post-war period, and especially in Alberta and Saskatchewan, where average incomes have fluctuated around national levels. Moreover, perhaps half of the cumulative expenditure was required for major dams and irrigation works, and there is little evidence that the main benefits of the total post-war program accrued to marginal and submarginal farmers.

Federal outlays for the reclamation and protection of Maritime marshlands, totalling about $21 million since 1948, were clearly directed towards a low-income region. They represented an early attempt to raise regional incomes by improvement of the resource base. Again there is little evidence of returns in the form of significant increases in incomes. In both the Prairie and Maritime cases, however, it is probable that in the early stages the investment programs contributed secondary benefits. These consisted of easing the problems of adjustment in rural areas facing out-migration and pressure on net incomes. Nevertheless, the total benefits from these investments have apparently been much less than those potentially available from manpower training and mobility programs.

The regional incidence of the newer federal-provincial rural rehabilitation programs under ARDA is suggested in Table 7-4. Under the 1962-65 agreement, funds were apportioned among the provinces by a formula which attached considerable weight to the size of rural population and the value of farm output. At the same time, allocations to different categories of projects clearly reflected the influence of the

physical resource conservation programs which had been pioneered in the West by PFRA. Actual outlays fell considerably short of the levels initially proposed, largely because the provinces were unable or reluctant to initiate the shareable projects as they were called upon to do under the agreement. In the second phase, federal funds were nevertheless greatly increased; provincial allotments were altered to take much greater account of the distribution of small, low-income farm units; and increased flexibility and innovating features were introduced into the scope of the programs. The main question raised in the Council's special study, however, was whether investment in land use projects is likely to yield economic benefits commensurate with the costs, or provide measurable increases in income for the rural poor.

TABLE 7-4—FEDERAL ARDA EXPENDITURES AND ALLOTMENTS BY PROVINCE

	1962–65 Agreement, Actual Expenditures		1965–70 Agreement, Allotment of Funds	
	($ million)	(Percentage)	($ million)	(Percentage)
Newfoundland	0.6	2.5	6.9	5.5
Prince Edward Island	0.2	1.0	3.6	2.9
Nova Scotia	0.4	1.8	9.0	7.2
New Brunswick	0.5	2.0	8.4	6.7
Atlantic	1.7	7.3	27.8	22.3
Quebec	9.9	41.2	28.3	22.7
Ontario	0.8	3.5	25.3	20.2
Manitoba	2.7	11.2	9.1	7.3
Saskatchewan	5.9	24.7	14.3	11.5
Alberta	1.5	6.1	11.5	9.2
Prairies	10.1	42.0	34.9	28.0
British Columbia	1.5	6.0	8.7	6.9
Canada	24.0	100.0	125.0	100.0

SOURCE: Based on data from Department of Forestry and Rural Development.

We believe that an increased emphasis upon the rehabilitation, training and mobility of rural human resources within the framework of comprehensive area or regional economic development is required.

This is the approach of FRED, initially established as a federal fund of $50 million and subsequently increased to $300 million. The program for special rural development areas provides for the identification of large areas marked by severe concentrations of rural poverty, the formulation by the federal and provincial governments concerned of long-range comprehensive development plans, and agreement on their implementation with major federal financial support. Results cannot be fully appraised as yet, but it now appears that a significant potential has been provided for new forms of development. The federal-provincial agreements already signed and under consideration involve exceptionally large expenditures in these difficult and unexplored fields of public policy. The great need for careful analysis and continuing evaluation is clear. Perhaps the most troublesome question is whether the development of rural areas and their human resources can be successfully tackled without effective integration within the broader framework of the growth of the entire regional economy. Neither ARDA nor FRED provide satisfactory answers to this question.

Atlantic Development Board (ADB)

In contrast to ADA and ARDA which, as our previous discussion has suggested, are mainly oriented to small subprovincial areas all across the country and are constrained within special-purpose bounds, the ADB is a unique federal development agency charged with an exceptionally broad task. Its goal is the "fostering of economic growth" for a large, relatively disadvantaged region encompassing four separate provinces, a land area of 193,000 square miles, and a population of about two million people, or one-tenth of the national total. Although the four provinces are frequently grouped as a region, each has its distinct economic and social characteristics, and the dividing barriers of water and distance, especially for Newfoundland and Labrador, pose obvious problems for an integrated development policy.

Initially established in 1962 as an agency to recommend development projects to the government and to undertake research and planning for the regional economy, the ADB was subsequently transformed into an operational board, with a capital fund of up to $150 million to finance development work. At the same time it is required to prepare, in consultation with the Economic Council, "an over-all co-ordinated plan" for the economic development of the entire region.

By the end of 1967, the Board had committed approximately 75 per cent of the development fund "for financing or assisting in financing various projects...for which satisfactory financing arrangements are not otherwise available". It was also responsible for disbursing $55 million on a shared-cost basis for a separate trunk highway program. The distribution of expenditures by province and by purpose is set out in Table 7-5. In terms of per capita expenditure, the distribution has favoured Prince Edward Island and Newfoundland, the provinces with the lowest average levels of income. The expenditure data shown in the Table clearly reflect the Board's concern with strengthening the whole region's basic social capital infrastructure as a basis for promoting regional economic growth. All of the expenditures thus far have preceded the completion of the comprehensive regional development plan.

TABLE 7-5—DISTRIBUTION OF ATLANTIC DEVELOPMENT BOARD AND TRUNK ROAD FUNDS, BY PURPOSE AND PROVINCE, CUMULATED TO DECEMBER 31, 1967

	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Total
	(Thousands of dollars)				
Electric Power Development	24,000	4,300	12,113	20,000	60,413
Water Development for Resource Processing Industries	8,368	1,322	3,835	1,195	14,720
Industrial Parks and Other Aid for Industry	1,250	150	10,039	3,587	15,026
Trunk Roads and Highways	3,000	1,000	3,000	3,000	10,000
Development Research	—	—	4,400	3,058	7,458
Miscellaneous	2,898	1,275	2,904	—	7,077
TOTAL FOR DEVELOPMENT FUND	39,516	8,047	36,291	30,840	114,694
Trunk Highway Program	16,500	5,500	16,500	16,500	55,000
GRAND TOTAL	56,016	13,547	52,791	47,340	169,694
Percentage Distribution	33.0	8.0	31.1	27.9	100.0

NOTE: Miscellaneous includes special aid to Bell Island, Newfoundland ($1,750,000) and to Sydney Steel, Nova Scotia ($2,000,000).

SOURCE: Based on data from Atlantic Development Board.

The regional planning obligation explicitly imposed upon the ADB marks the first conscious attempt in Canada to approach development on a large and comprehensive scale. Its broad purpose is to evaluate the growth potential of the economy of the Atlantic Region, including the identification of the most promising lines of economic activity to be pursued, and to recommend specific policies and measures for realizing this potential.

The plan, which is still in preparation, will seek to set out broad goals for regional policy, consistent with those adopted by the Economic Council. Studies are being prepared to assess, within a comprehensive framework, the economic potential of each of the sectors of economic activity and the implications for the growth of productivity, income and employment. Other studies will examine the future educational and training requirements for the regional labour force, including management; public organization for efficient resource management and utilization; efficient organization of firms and enterprises, particularly in manufacturing; and the role of urban agglomeration in improving regional economic efficiency.

The regional development plan is intended to provide a comprehensive framework within which alternative policy decisions can be weighed. Among other things, the plan aims to:

—provide information for, and suggest opportunities to, the private sector;

—serve as a setting within which federal government policies and programs for the Atlantic Provinces can be co-ordinated, and within which co-ordination between federal and provincial programs and policies can be achieved;

—guide the Board's disposition of capital funds;

—suggest to provincial governments essential programs and projects within their jurisdiction; and

—reassess on a continuing basis the effectiveness of regional policies in the light of changing economic conditions.

Clearly, the plan is expected to underpin a wide range of crucial decisions affecting the future course of economic development in the region.

Although the basic purposes and broad framework of the ADB provide a potentially powerful approach to the problems of the Atlantic Region, there are perhaps three major weaknesses of the program which are apparent from experience to date.

First is the apparent illogical timing sequence. Sizeable investment outlays have been and are being made in advance of a comprehensive assessment of the economic potential and needs of the region. Implicitly, the Board is suggesting that the increased availability of certain types of social capital or infrastructure are essential in fostering improved efficiency and a more rapid rate of growth of output. This assumption may be appropriate for specific sectors of economic activity but it is not necessarily correct from the perspective of the regional economy as a whole—a perspective which would be provided by the comprehensive plan. No doubt, however, once the political decision to provide the fund was taken, it would have been extremely difficult to delay investment until the plan became available.

The second weakness was mentioned in our *Third Annual Review*—the multiplicity of federal agencies and development programs at work in the region, with only minimum evidence of clearly defined co-ordination and integration in research planning or operations. To the expanding activities and expenditures of all the traditional functional departments, such as Transport and Fisheries, there has been added the growing programs of the new Department of Manpower, the extensive area and regional activities of ADA, ARDA and FRED, and the new industrial promotion responsibilities of the Cape Breton Development Corporation. All of these proceed within the same region for which the ADB has received a broad development mandate. But as far as we are aware, nowhere in the federal government structure is there a central focus, not merely to avoid duplication, inconsistency and contradiction of programming, but also to assure the allocation of scarce federal funds to secure maximum benefits for the region and the country as a whole. There is a clear need for a complete reappraisal of administrative and procedural means for putting federal support for Atlantic regional development on a more rational and well-integrated basis.

If such integration cannot be achieved, it is difficult to see how the third deficiency can be effectively resolved—namely, the present lack of integration among federal departmental activities, the activities of the ADB and provincial policies for growth and development. In particular, if any such regional development plan is to become a useful basis for policies to promote greatly improved economic performance in the Atlantic Region, it is essential that there should be the full participation of provincial governments in the planning exercise, as well as in subsequent decision-making and implementation.

IMPLICATIONS FOR POLICY

Clearly, the formulation of federal economic policies with significant regional implications has a long and varied history running through a number of stages and influenced by a wide variety of considerations. But the stark fact remains that the historical mix of market forces and public policy has not resulted in any significant narrowing of regional income disparities. So whatever the considerations were in the past, we are concerned that attention now be focused more intensively on this objective in the future.

Standing back from the varying and detailed facets of policy, one might hazard the view that federal policies have, on balance, probably prevented interregional disparities in per capita income from widening. This judgment is the more credible when one considers the ad hoc or short-run responses of government policy to economic emergencies and the distribution of expenditures among the various regions. On the other hand, it must be said that there is little indication that these have contributed to a stronger basis for self-sustaining growth in the lagging regions of the country.

The unavoidable impression that emerges from our review of federal economic policies is that they have exerted a pervasive but inconsistent impact upon the various regional economies. If federal policies are to contribute effectively to improved regional balance, an essential first step is that the goal of improved regional balance—including both the narrowing of regional disparities and the fuller utilization of available resources in the lagging regions—should be more prominently and consistently taken into account in the formulation and adaptation of federal policies. This is an overriding need. Second, there should be continuing, comprehensive and systematic appraisal of alternative policy measures to improve regional balance. As a basis for such appraisal we believe that it is now possible to develop and use much better information and techniques of analysis than in the past. The absence of a clear commitment to improved regional balance and of comprehensive and systematic assessment of policy alternatives will inevitably mean conflict, waste, frustration and the ultimate failure of policy.

A commitment to a regional development policy necessarily involves the articulation of appropriate guidelines. On the basis of our analysis to date, we suggest these:

—*Improving the utilization of manpower resources.*

Policies to this end should aim, first, to increase opportunities for higher-income employment by encouraging labour mobility from

low- to high-productivity sectors within the region; second, to increase employment opportunities on the basis of the region's resource and locational advantages, especially its potential advantages; and, third, to facilitate the ready movement of productive factors among regions in response to high-earning opportunities.

—*Raising the level of productivity within each region.*
This should involve raising the level of skill and education of labour and management—human resource development; adoption of advanced technological methods in production; the concentration of economic activity in growth centres; and more efficient use of both labour and capital in the processes of production.

—*Assuring the adequate expansion of growth-related public services.*

—*Stimulating innovation, the application of new technology and the development of new viable lines of economic activity.*

These guidelines suggest that public policy should reinforce the market process of efficient resource allocation and make it work more powerfully and smoothly. Our view is that measures aimed at achieving greater self-generating growth processes in the lagging regions represent a superior method of securing improved regional balance than programs which merely maintain income through transfer payments. Not only do the former policies hold generally greater promise for achieving larger long-term benefits in relation to costs, but they are also more likely to facilitate reconciliation between the goal of improved regional balance and our other basic economic and social goals.

This brings us to two sets of reconciliation problems which confront regional development policies. The first is the possible conflict between maximum national economic growth and improved regional balance. There would be no difficulty if the means adopted to accelerate the rate of growth of income per person in the lagging regions would simultaneously raise the national rate of economic growth. There are good reasons for doubting that such an outcome is probable under all circumstances. For example, a significant shift in resources from higher- to lower-income regions may result in the creation of productive employment opportunities and viable bases for accelerated growth in the lower-income regions at the "cost" of retarding the rate of national economic growth. Thus, in a variety of different ways, there are likely to be "trade-offs" between growth of the national economy and the growth of lagging regions—in much the same fashion as there are "trade-offs" between levels of unemployment and price stability.

The second problem is related to our federal system of shared responsibilities. Particular regions or provinces may set objectives for themselves which are basically incompatible with our definition of the goal of regional balance. For example, any significant volume of out-migration of population and labour force from a region may be viewed as detrimental to its conception of an appropriate rate of regional economic expansion. In other words, the region may feel that the achievement of full employment of both the existing and potential regional labour supply should override the objective of a more efficient use of resources, perhaps with a consequent built-in bias for maintaining industrial and occupational structures at relatively lower productivity levels than would otherwise have prevailed in the region. To the extent that reconciliation problems exist in this sense—and it must be admitted that the relationship between out-migration and economic growth is a complex one—they will need to be resolved in the context of a wide range of cultural and political, as well as economic and social, considerations.

These are complex issues which require much more explicit recognition and detailed assessment than has been accorded them in the past. In this context, reconciliations will obviously be facilitated by agreement that a process of "levelling up" among regions to higher standards of economic performance, and hence of income, is greatly to be preferred over a process of "levelling down". This should be the crux of federal and provincial policy approaches to regionally balanced development in Canada.

It is also important to recognize the diversity of regions and the necessity for flexible adaptation of national approaches to particular regional circumstances. Certain broad national policies—for example, stabilization policies—provide a necessary though not sufficient condition for achieving the goal of improved regional balance. But strict adherence to the principle of nondiscriminatory application in all national policies can result in inappropriate rigidity in federal support for regional development. What seems to be required is greater attention to the means for meeting some of the differing regional needs. In this context, we believe that the federal government must be prepared to experiment with new innovations in policy approaches and development techniques in the lagging regions. This calls, in turn, for specially designed and much more technically advanced research and policy-planning, together with improved administrative machinery, both at the centre of federal government decision-making and within the regions.

For obvious reasons, the Atlantic Region, more than any other, has been the focus of a wide range of federal government programs and departmental activities. To promote the more efficient achievement of the aims of these programs and activities, to avoid conflict and contradiction among such activities, and to avert confusion and uncertainty in the minds of the regional authorities who have to deal with the various federal departments and agencies, *we recommend that all federal area development programs affecting the four provinces should be co-ordinated within one planning and administrative agency.* Specifically, the framework being erected by the ADB will soon be at hand for guiding in a consistent manner the activities of ARDA, ADA and the Cape Breton Development Corporation. We view the formation of such an agency as an urgent need within the revised framework of departmental responsibilities.

Such an integrated agency would substantially strengthen the administration of federal policies affecting the Atlantic Region. But two further steps must be taken to meet the requirements of effective planning and implementation of policy. The first is the creation of an effective central review and appraisal system to assure co-ordination in programming among all federal departments and agencies. Second, adequate machinery must exist to facilitate joint federal-provincial planning and administration within the area.

The latter suggestion gives rise to the broader issue of federal-provincial co-operation throughout the country. Federal policies exert a pervasive impact in all regions. Yet, under our federal system of government, the responsibilities for growth and development are shared between the central and provincial authorities. It is encouraging that in recent years increased attention has been focused on the need for federal-provincial consultations. Indeed, the constitutional review that was launched earlier this year opens up challenging possibilities for new paths and new approaches for federal-provincial co-operation. Within the terms of reference of that review, scope is provided for airing possible conflicts between national and regional economic goals and for suggesting how they might appropriately be reconciled. Out of this review should emerge the development of more effective, continuing machinery for federal-provincial co-operation on the whole range of issues and policies relating to improved regional balance.

8

Performance in Relation to Goals

BY WAY of a regular check on Canada's social and economic progress, the Council since its inception has undertaken an appraisal of the economy's performance in relation to certain basic economic and social goals. We have defined these goals as full employment, high and sustained economic growth, reasonable price stability, a viable balance of payments and an equitable distribution of rising incomes. The present Chapter continues this regular series of appraisals, particularly in respect of the first four. We emphasize again that these are *not* current or immediate goals, nor are they intended to represent forecasts about what is likely. Rather, we have defined them in terms of challenging targets that the country should seek to attain over the medium-term future.

Similarly, our performance appraisals do *not* represent attempts to undertake "short-term business trends analysis" or to consider the "short-term business outlook". We have already called for the establishment of an independent research institute to prepare and publish such assessments on a regular basis to supplement the extensive existing activities in this field which are carried on in a less public way among government departments and agencies and by many private organizations. Our concern is, instead, with medium-term goals and objectives and with the question as to how the economy is progressing towards their attainment. In other words, the purpose of our examination of the underlying trends in the current economic situation is to ask whether the progress of the economy is currently falling signifi-

cantly short of the goals, whether any such shortfalls are widening or closing or are becoming persistent, and what implications such imbalances may have for policies required to achieve our medium-term goals.

Such questions are particularly important at this time. Over the first half of the decade the Canadian economy swept forward through a strong and prolonged expansion. By the end of 1965 it was operating very close to its greatly enlarged potential and total demand was threatening to continue to advance at an unsustainably rapid pace. However, during 1966 a more moderate rate of expansion emerged. This continued through 1967 with a rate of increase in the actual volume of output that was less than the underlying growth in potential. The economy moved, in effect, into a period of transition and adjustment.

During this period the economy made less satisfactory progress towards the achievement of the goals which we have defined. In particular, productivity advances were reduced, the degree of unemployment rose somewhat, and more rapid increases took place in general levels of prices and costs.

By the latter part of 1967, however, it became increasingly clear that while the economy had developed a number of significant and troublesome shortfalls from the goals, such shortfalls were not then widening. Some appeared to reflect temporary factors. At the same time, unacceptably high rates of increase in general levels of prices and costs emerged, and appear to have become a more persistent problem. Partly associated with this, interest rates reached exceptionally high levels. Increases in prices, costs and interest rates were much more pronounced than might have been expected under conditions of easing demand pressures and rising unemployment. International economic forces, as well as domestic instabilities, had an important influence on these developments.

EMPLOYMENT, PRODUCTIVITY AND PRICES

Employment and Unemployment

The rapid rate of growth that would occur in the labour force over the latter part of the 1960's has been emphasized since the beginning of our work in 1964. In 1967, the increase in the labour force in Canada was just under $3\frac{3}{4}$ per cent, compared with almost 4 per cent in 1966, 3 per cent in 1965 and less than $2\frac{1}{2}$ per cent in the decade 1955-65. This very high rate of labour force growth in the

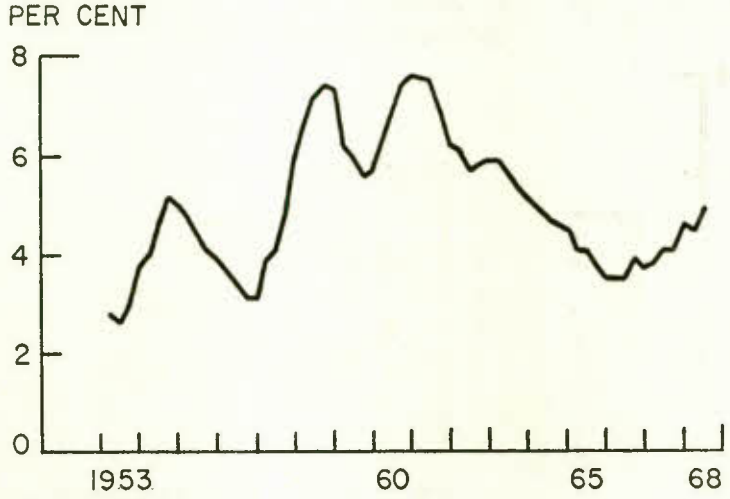
mid-1960's reflected an acceleration in the numbers of young people reaching working age, a new surge in the level of net immigration, and a continued high growth in the participation of women in the labour force. There was some slowing in the rate of labour force growth in the latter part of 1967, but this tendency is not likely to persist, and a high rate of longer-term growth will remain over the medium-term future.

By contrast with the previous six years, the expansion of employment opportunities since early in 1966 has not been rapid enough to fully absorb the marked increase in the labour force. The rate of growth in demand and employment moderated after the spring of 1966 and, as Chart 8-1 shows, unemployment rose from a low of about 3½ per cent of the labour force to 4½ per cent in the fall of 1967, after allowance for seasonal factors. Subsequently, it ranged narrowly around this figure for a time, then moved above 5 per cent in mid-1968 partly reflecting sharply changed conditions in the summer job market for students.

This gradual and limited rise in the level of unemployment differed from most of the earlier post-war experience of periods of business adjustment, reflecting the much milder nature of the slowdown in the economy in 1967. There were more sudden and marked increases in the rate of unemployment in 1953, 1957 and 1960, even though the expan-

CHART 8-1

UNEMPLOYMENT RATE



Note: Seasonally adjusted quarterly data.
Source: Based on data from Dominion Bureau of Statistics.

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sion in the labour force in those years was more moderate. However, the level of unemployment in Canada has recently been significantly above that of the United States for the first time since the middle of 1963.

Output and Productivity

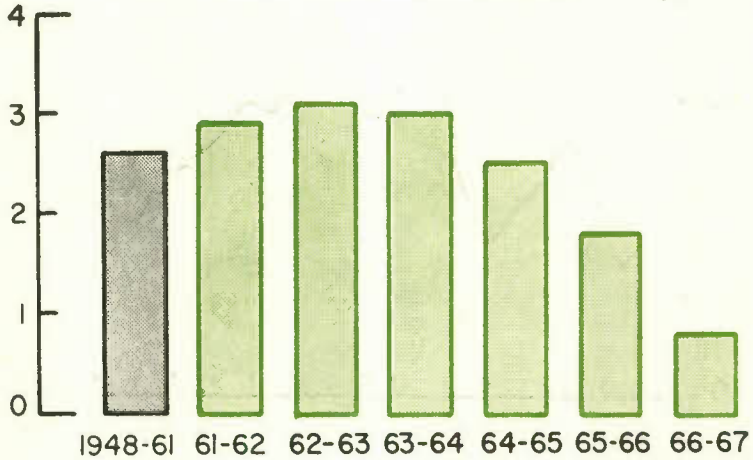
From 1961 to 1966, the average annual increase in real Gross National Product was about 6 per cent, the most prolonged and highest rate of growth in total output of any five years in the post-war period. This reflected not only the reduction of the slack in both plant capacity and in the labour force that existed at the start of the expansion, but also the upsurge in the labour force and significant increases in output per employed person in both the agricultural and nonagricultural sectors.

The increase in over-all demand began to moderate in 1966. This was reflected in a slower rate of increase in real output in the latter part of the year. The slowdown continued throughout 1967 when the increase in real output for the economy as a whole was about $2\frac{3}{4}$ per cent, about half the increase in potential output estimated in the *Fourth Annual Review*. This slower growth was partly accounted for by the smaller western wheat crop. But it reflected, more fundamentally, the lower rate of increase in total employment, a decline in average

CHART 8-2

CHANGES IN REAL OUTPUT PER EMPLOYED PERSON

(AVERAGE ANNUAL PERCENTAGE CHANGE)



Source: Based on data from Dominion Bureau of Statistics.

hours worked, and the more modest increase in output per man-hour. As a result, the increase in real per capita output was only about 1 per cent, well below potential.

The slowdown in productivity growth is shown in Chart 8-2. The concept of productivity used here is output per employed person, or "labour productivity"; this is a bit of jargon that covers everybody, including managers and even the self-employed, but which unfortunately is sometimes loosely and inaccurately interpreted to reflect purely on the individual efficiency and energy of the "working man". Following the acceleration of productivity gains in the early 1960's, as economic slack was being reduced, the over-all rate of productivity growth diminished in the mid-1960's as the economy came close to potential output. In 1966 and 1967, output per employed person did not keep pace with the average annual increase of just over 2 per cent a year that would be required to achieve potential by 1970. But before the end of 1967, stronger and more widespread gains in productivity were reappearing.

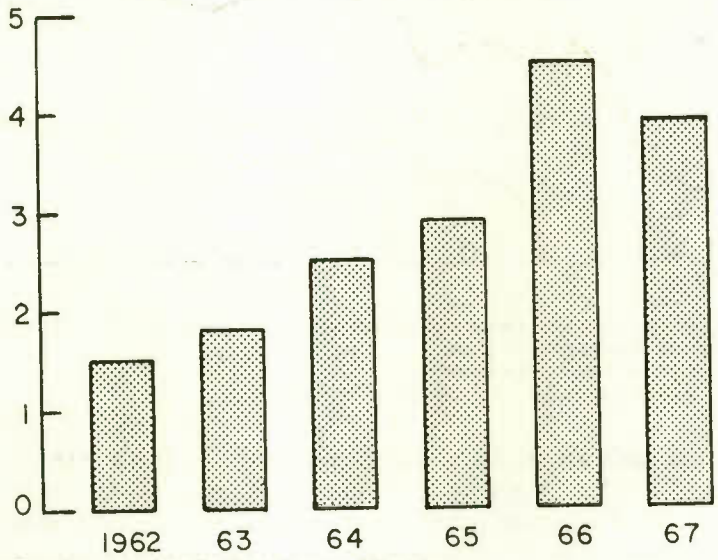
Prices and Costs

The marked general increases in prices and costs through 1966 and 1967 and the pronounced shift in monetary and financial conditions

CHART 8-3

CHANGES IN PRICE INDEX OF GROSS NATIONAL PRODUCT

(PERCENTAGE CHANGE FROM PRECEDING YEAR)



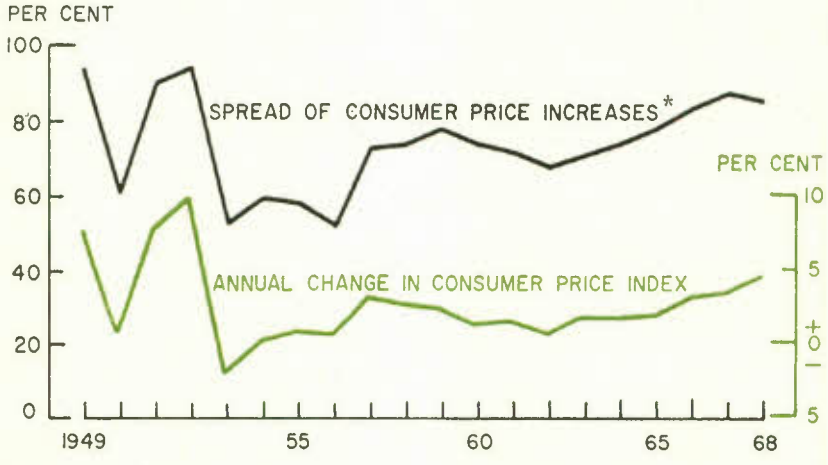
Source: Based on data from Dominion Bureau of Statistics.

contrast sharply with the moderate nature of the adjustments in employment and output. Chart 8-3 shows an increase in the price index of total output in 1967 of about 4 per cent, slightly less than in 1966. These annual increases were higher than in any year since 1952, when the Korean War gave an additional impetus to demand which was already expanding rapidly in the private sector, and when unemployment was well below recent levels.

The high rate of general price increases is also reflected in the Consumer Price Index which advanced by over 4 per cent in 1966 and 1967 (Chart 8-4). Moreover, the advances taking place were not limited to a few selected areas, but were spread over a wide range of items. The top line in Chart 8-4, which shows the percentage of individual items whose prices are higher than a year earlier, indicates that, in the last two years, prices have been marching forward against consumers across a broader front than at any time in the past 15 years.

CHART 8-4

CONSUMER PRICES



*The percentage of the total number of component series of the Consumer Price Index registering price increases over the preceding year.
Note: Data are for January of each year.
Source: Based on data from Dominion Bureau of Statistics.

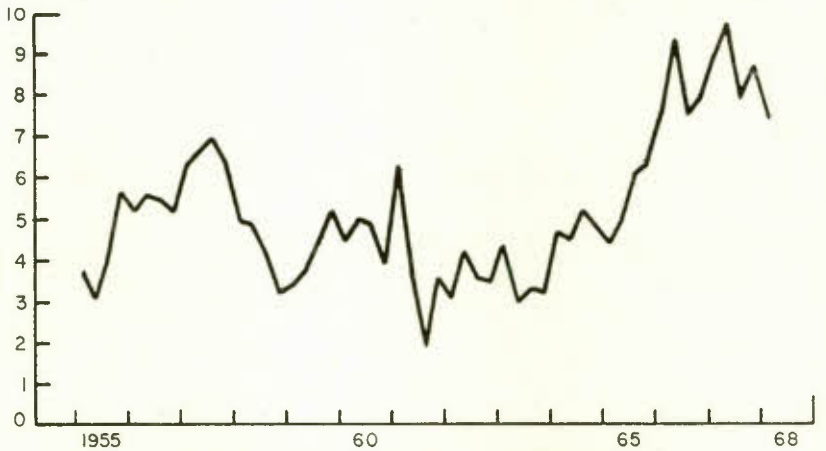
All the main categories of the Consumer Price Index increased in 1966 and 1967. The prices of durable goods rose appreciably after many years of stability and of these nondurable goods also increased at a significant rate. The rise in food prices moderated during most of

1967, but resumed in the latter part of the year. Prices of consumer services also continued to advance strongly, reflecting not only various underlying factors which have resulted in a persistently rising trend in over-all service prices, but also the housing shortages in many urban areas and perhaps even the unusually large influx of tourists in 1967.

Many costs have also increased substantially in the past couple of years—costs of labour, of many materials and of capital. For example, wage increases negotiated under collective agreements have, on average, ranged between 8 and 10 per cent a year in the last two years (Chart 8-5)—the highest increases in well over a decade.

CHART 8-5

AVERAGE ANNUAL PERCENTAGE CHANGES IN BASE RATE WAGES OVER LIFE OF COLLECTIVE AGREEMENTS



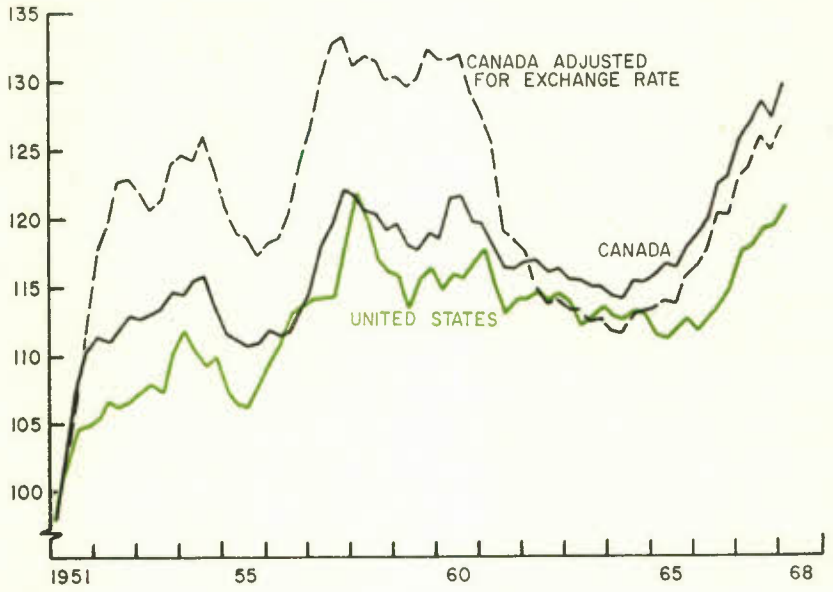
Note: Data relate to quarters in which collective agreements were signed.
Source: Based on data from Department of Labour and estimates by Economic Council of Canada.

In manufacturing, the significant rise in wage rates in 1967 was accompanied by a very small increase—apparently amounting to less than 1 per cent—in output per person employed. Chart 8-6 shows the resulting sharp increase in labour costs per unit of output. The advance in such costs in Canada has in fact been more rapid than in the United States in the last few years.

If the change in the exchange rate is taken into account, the adjusted level of labour costs per unit of output in Canada was still lower in 1967 than it was in 1960; the greater subsequent cost increases in Canada have only partially offset the substantially improved competi-

CHART 8-6

INDEXES OF LABOUR COSTS PER UNIT OF REAL OUTPUT IN MANUFACTURING, CANADA AND THE UNITED STATES

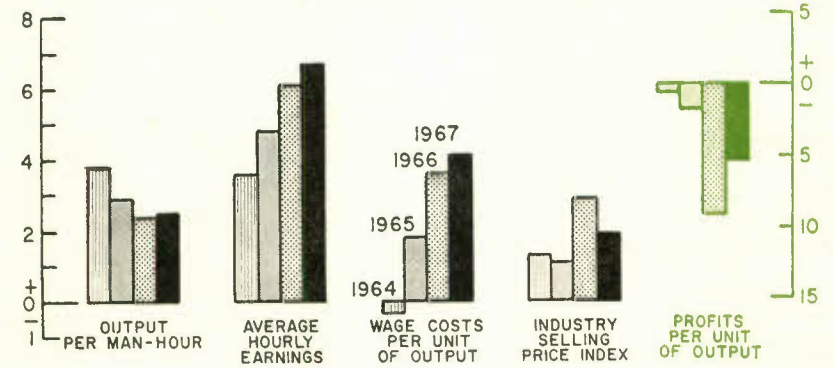


Note: Indexes of seasonally adjusted quarterly data, 1951 = 100.
Source: Based on data from U.S. Department of Commerce, Bank of Canada, and Dominion Bureau of Statistics.

CHART 8-7

CHANGES IN REAL OUTPUT, EARNINGS, COSTS, PRICES AND PROFITS IN MANUFACTURING

(PERCENTAGE CHANGE FROM PRECEDING YEAR)



Source: Based on data from Department of Trade and Commerce and Dominion Bureau of Statistics.

tive position of Canadian producers resulting from the decline in the exchange value of the Canadian dollar.

Some of the main changes in costs, prices and profits for manufacturing over the last four years are brought together in Chart 8-7. Over this period, the increase in output per man-hour slowed down, and average hourly earnings increased rapidly. Wage costs per unit of output declined slightly in 1964, but rose steadily over the following three years with an increase of 4 per cent in 1967. The more rapid rise in these costs than in industry selling prices was associated with a significant drop in corporate profits per unit of output, amounting to about 20 per cent between 1965 and 1967.

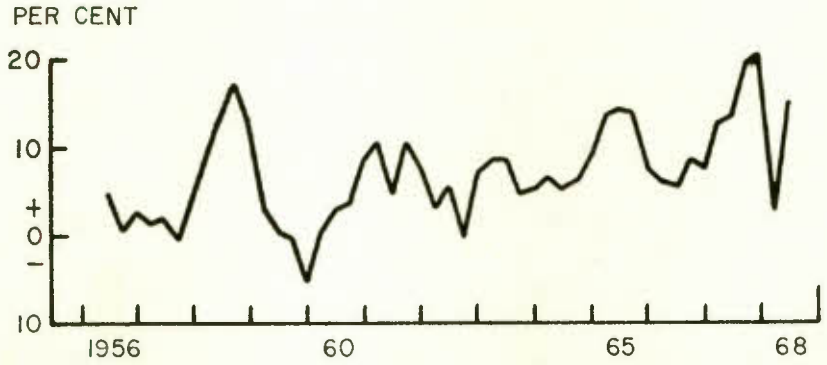
The "price of money" (or the level of interest rates) also increased rapidly in 1966 and 1967. Despite the moderation of expansion in output and employment, long-term interest rates continued to rise with only minor interruptions. By early 1968 they reached the highest levels of this century. Moreover, this came about in the face of a large increase in the money supply[1] (Chart 8-8).

Renewed Expansion

The charts in the previous pages and a wide range of other data indicate that the actual growth of the Canadian economy in 1967 was

CHART 8-8

CHANGES IN THE MONEY SUPPLY



Note: Quarterly percentage changes at annual rate in currency outside banks and chartered bank deposits held by the general public.
Source: Based on data from Bank of Canada and estimates by Economic Council of Canada.

[1] The money supply is defined here as currency outside banks and chartered bank deposits held by the general public. But even if the definition is expanded to include less-rapid growth in what is frequently called "near-money" (the liabilities of nonbank financial institutions such as the deposits of trust companies and credit unions), the increase over this period was still unusually large.

slower than the underlying growth in potential. This weakening was evident also in the United States, but in neither country was it sufficiently pronounced to be classed as a "business cycle recession". Consumer demand and exports of goods and services were well maintained. In addition, the Vietnam War, government expenditures, and the high rate of monetary expansion contributed to the selective and mild nature of the weakening.

Renewed economic strength appeared in the U.S. economy by the middle of 1967, and by early 1968 a very strong and widely based economic expansion was occurring in that country, with reduced unemployment, stronger productivity advances, and more marked and widespread increases in prices and costs. There was also some acceleration in growth in the key European economies in the latter part of 1967, and the OECD expects higher rates of expansion in many member countries in 1968. These external economic conditions provided a favourable environment for renewed expansion in the Canadian economy.

Evidence of such renewed strength emerged in the latter part of 1967. Final demand began to show greater strength in the fourth quarter. Corporate profits reached their low point early in 1967 and increased moderately over the balance of the year. Some of the more sensitive monthly indicators also pointed to renewed buoyancy in the fall of 1967, with a greater increase in output than in employment.

The moderate nature of the economic adjustments in 1966 and 1967 provide additional confirmation for the basic view on the medium-term economic situation which we have expressed in our last two Reviews. The underlying conditions in the Canadian economy—including needs for expanding business investment, and especially for housing and social capital—are favourable to medium-term demand growth.

The volume of business investment rose very rapidly from the early 1960's through 1966, with vigorous efforts to build a stock of plant and equipment adequate for the requirements of a fully employed economy. Since 1966, however, the volume of business investment has declined. A significant further expansion of investment, though clearly not of the order of the catch-up several years ago, is required over the next few years to bring the growth in the economy's capital stock in line with its medium-term potential, and to meet the needs of a continued rapid expansion of the labour force.

In the field of housing, pressure for expansion to meet the mushrooming requirements of urban areas has been greatly intensified as the result of the failure to achieve adequate growth since 1964. Hous-

ing construction has increased markedly during the past year. However, a substantial further expansion is required both to ease existing shortages and to progress towards the levels of new housing construction that would be necessary to meet the needs of the next few years.

Similarly, although total government expenditures must grow at a more moderate pace over the next few years than in the later stages of the 1961-66 expansion, substantially increased resources are required in a number of critical areas of social capital investment. These include universities, hospitals, transportation and the distressingly inadequate facilities of many of our urban municipalities.

To sum up, a variety of temporary factors appear to account largely for the slower growth in demand and the increase in unemployment. We do not mean to imply by this that Canada does not have unemployment problems. There are, for example, the large "structural" unemployment problems in the Atlantic region and in some other parts of the country. There are the problems of the hard-core chronically unemployed. Also, there is the rapidly growing problem of finding appropriate summer employment opportunities for the swiftly rising number of students in secondary and post-secondary educational institutions. It is extremely important that the great productive potentials of these young people not be wasted.

The needs of the economy over the medium-term future remain very large. A basis therefore exists for the growth of actual output more in line with the 5 per cent rate of growth in potential output discussed in our *Fourth Annual Review*. What is required is a rate of growth somewhat less rapid than that experienced in 1961-66 when economic slack was being reduced, but which is more rapid than that of the past year or two when various adjustments were taking place in the economy. How to maintain a reasonable degree of price and cost stability when Canadian economic growth proceeds more rapidly poses difficult tasks for policy.

PRICE STABILITY

The Goal of Reasonable Price Stability

The goal of reasonable price stability was formulated in the following terms in our *First Annual Review:*

> The goal of reasonable price and cost stability is one which is extremely difficult to define. In terms of our preceding discussion of the important role of prices in our economy, and because of the need for flexibility in the pattern of relative prices, we do not believe that a rigid structure of constant prices is a desirable or feasible objective.

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> These flexible price adjustments in response to changes in underlying demand and supply conditions in our market economy should result in some year-to-year variability in over-all prices. However, we would regard persistent and rapid price increases as inappropriate and dangerous.
>
> After careful consideration, we have assumed that if annual average rates of changes in prices and costs to 1970 can be contained within the limits of the ranges of movements over the decade from 1953 to 1963, this would represent the attainment of a satisfactory degree of price and cost stability. Over the past decade, for example, the average annual increases in consumer prices and in prices of all goods and services produced in Canada were 1.4 per cent and 2.0 per cent, respectively, but there have been some moderate year-to-year variations around these rates.
>
> It should be emphasized that a continuation of this performance into the future will undoubtedly be a difficult task to achieve, especially under the high demand and high employment conditions which we have postulated. Some indication of this difficulty is suggested by the fact that the very moderate average annual changes in prices which we have assumed for the future are equivalent to those which took place over a decade which included an extended period of relatively high unemployment and economic slack...
>
> We have also assumed that there will not be strong international price pressures affecting the Canadian economy and, in particular, that reasonable price and cost stability will be maintained in the United States.

This definition of the goal of reasonable price stability implies that for brief periods—as a result of shorter-term economic developments or special forces of a temporary nature—the actual changes in general levels of prices and costs may be above the average annual changes experienced in 1953-63. But we do not consider that price and cost increases which have taken place since 1965, and which are still very much in evidence, are consistent with our formulation of this goal. Not only are the over-all rates of advance unacceptably high, but the dimensions of the advance have been unacceptably broad. Moreover the persistence of the increases is a matter of serious concern to us. It is not surprising that consumer prices and wage rates continued to rise after the moderation of demand increases in 1966; this is a pattern that has typically prevailed in the earlier stages of previous business adjustments. What is disquieting is that, in contrast with previous experience, substantial and pervasive increases have continued right through into a renewed business expansion.

In these circumstances we wish to review briefly a number of aspects of recent price and cost increases, and to consider strategies of policy for achieving a better reconciliation between reasonable price stability and our other basic economic and social goals. The attainment of our price stability goal rests of course on the important assumption that reasonable price stability would prevail abroad, and particularly in

the United States. This assumption has not been fulfilled during the past couple of years. We reject the oversimplified view that the high price and cost increases in Canada in this period are merely a reflection of those occurring abroad. But to some extent—indeed, perhaps to a considerable extent—price and cost increases in Canada have been related to price and cost increases in the United States. There are many channels, both direct and indirect, through which the U.S. increases have been transmitted to the Canadian economy. And among the conditions which could now help most effectively to restore a more satisfactory price and cost performance in the Canadian economy, perhaps none would be more influential than the adoption of effective policies for moderating such increases in the United States. This is particularly true today when the existence of both a fixed rate of exchange and a ceiling on Canada's foreign exchange reserves tend to enlarge the constraints on the use of domestic policies designed to minimize the impact on the Canadian economy of such price and cost increases. The United States has recognized for some time the need for greater price stability. A variety of proposals have been advanced vigorously to achieve this—for example, in various messages by the President of the United States to Congress and in the last two Annual Reports of the U.S. Council of Economic Advisers. The concern about price instability has, moreover, recently found expression in action in the United States to increase taxes and to reduce government expenditures.

Yet, it is important to emphasize that, although external sources of price and cost instability played a significant role in Canadian developments, as they always do, there are additional sources of instability in Canada. These are partly reflected in the fact that, over the past two years, average levels of prices and costs in Canada have risen somewhat more rapidly than those in the United States and in such other major industrial countries as Britain, France, West Germany and Italy. Factors of particular importance in Canada have included the enormous construction boom from 1963 to 1966, which produced large price and cost increases in this sector of the economy—increases which have continued to work their way through the economy with long lags; the serious housing shortages in many urban areas which have contributed to rapidly rising rents; extremely strong pressures for substantial increases in wages and salaries under conditions of relatively little slack in the economy and of sharply reduced productivity gains; and increases in federal and provincial sales taxes which

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have been reflected in increases in the price indexes (although the higher tax collections would act also to restrain private demand).

The exchange rate, together with Canadian tariffs and U.S. and other foreign prices, usually sets upper limits to the prices at which goods produced in Canada can be sold on a continuing basis in domestic markets. Thus, the decline in the exchange value of the Canadian dollar in 1960-62 meant that the competitiveness of Canadian industries was generally substantially improved and that a wide variety of prices and costs in Canada could subsequently rise somewhat—even in relation to price and cost levels in the United States—without any necessarily serious loss of competitiveness vis-à-vis imports. In our *Third Annual Review,* however, we pointed out that although the decline in the exchange value of the Canadian dollar in the early 1960's tended to have some upward influence on Canadian prices, the existence of substantial slack in the economy at that time undoubtedly moderated and retarded the price and cost effects of devaluation. But as the economy came closer to potential in the mid-1960's, the tendency of Canadian prices to adjust to the new fixed exchange rate was accelerated. This may partly account for the more rapid increases in prices and costs in Canada than in the United States. To some extent, this situation may continue.

Policies for Price Stability

In our earlier Reviews, we have explicitly emphasized the difficulties of maintaining reasonable price stability under conditions of high employment and high demand. The *Third Annual Review,* in particular, discussed the problems of a better reconciliation between these goals.

One of the main themes of that *Review* was that there is no simple, easy and quick "policy solution" to price and cost instabilities. A wide range of policies must be brought to bear on the problems. Moreover, such policies are not likely to be very effective if they are applied spasmodically at times when price and cost increases have reached disturbing dimensions. What is required is a continuing program of many policies, more consciously directed at achieving a better price performance over the medium and longer run. This must be predicated on a wider appreciation of two facts: that disturbing increases in prices and costs usually reflect, to a considerable degree, the effects of much earlier imbalances and forces in the economy, rather than current pressures and problems; and that the price-stabilizing effects of many policy changes also take considerable time to work themselves

out. The most effective measures operating to maintain price stability at any given point of time are likely to be those introduced some time ago rather than those implemented currently or only very recently.

In our view, price and cost stability cannot be quickly restored once it has been lost. The real challenge is to develop strategies of policy which will achieve a more consistently favourable environment for maintaining stability over a number of years into the future.

The Canadian economy is in a period of rapidly expanding potentials for economic growth and development. It is imperative, in the interests of all Canadians, that over the years ahead the actual performance of the economy should measure up well to these large potentials. But it is no less imperative that reasonable price and cost stability should also be maintained—indeed, *sustained* high performance is very unlikely to be attained without such stability.

After due allowance for the influence of external price and cost changes, over which Canada may have little or no control, and from which we cannot fully insulate ourselves, we suggest that five essential policy elements are needed to achieve the best possible reconciliation of our price stability goal with other basic economic and social goals. These five elements are:

(1) the "big levers" of demand policies—monetary and fiscal policies;
(2) an equally important group of supply policies;
(3) a number of special policies to cope with particular problems;
(4) greater public knowledge and understanding about prices and costs; and
(5) trade and tariff policies.

In each of our previous four Reviews we have discussed the crucial role of monetary and fiscal policies in achieving high standards of performance in the Canadian economy. Moreover, we have outlined in some detail the basic policy strategies appropriate in the longer run for the achievement of stable and sustained growth of final demand close to potential output. We recognized that short-term instabilities, including instabilities and constraints of external origin that arise from time to time, would call for tactical departures from such strategies. We also recognized that, under conditions of prolonged economic slack, a "stimulating" strategy would be appropriate, or that, under conditions of persistent pressures against the potential output ceiling, a "restraint" strategy would be appropriate. In addition we recognized that the success of Canadian policies, especially monetary policy, would depend critically on the pursuit of comparable strategies in the

United States. In fact, U.S. balance-of-payments difficulties, instabilities in the markets for gold and foreign exchange, and the tighter meshing of Canadian and U.S. monetary policies, through the fixed exchange rate and the ceiling on Canada's exchange reserves, have considerably lessened Canada's freedom to pursue independent policy settings.

In each of our previous Reviews, we have also placed strong emphasis on the development of effective supply policies for reconciling conflicting tendencies in the economy and easing the pressures of competing claims for scarce resources. We have especially emphasized policies to strengthen competition, to upgrade the quality of manpower, to promote greater labour mobility, to improve productivity, to facilitate adjustments to technological and other change, and to improve regional balance. Considerable scope remains for strengthening policies and programs in these fields, and for giving such policies weight and status equivalent to monetary and fiscal policies.

In the remaining elements of policy listed above, there remain large unexploited opportunities. In the *Third Annual Review* we suggested that policies were needed to deal with a wide variety of special problems and needs—the problems of pressure points and bottlenecks, the need for greater stability in government expenditures on construction, better co-ordination in federal-provincial fiscal planning, and the consistent application of certain basic criteria for wage and salary determination in the government sector. Some progress has been made towards improved policy performance in these fields but much remains to be done.

Similarly, we made a whole series of recommendations to strengthen the information base and public understanding which is essential for good performance and responsible behaviour in price and wage decisions. Among other things, we called for the establishment of a Standing Committee on Economic Affairs of the Senate and the House of Commons, the creation of an independent economic research institute, the timely documentation of economic trends and the stimulation of broader public debate about such trends, the substantial improvement of statistical information (especially in the fields of prices, costs, productivity and incomes), and the development of greatly enlarged basic economic research. These promising possibilities suggested by the Council remain largely untapped.

Finally, the reductions in tariffs and trade barriers made by most industrial countries during the post-war period, including Canada, have helped to maintain competitive conditions conducive to a greater

degree of price stability than would otherwise have prevailed. Indeed, some countries experiencing significant inflationary problems moved to accelerate implementation of previously negotiated schedules of tariff reductions or even, in a few cases, to introduce unilateral tariff reductions explicitly to moderate inflationary pressures. We drew attention to this policy option in our *Second Annual Review* as one which might be appropriate in circumstances of persistent and large price and cost increases. Such an option—perhaps in the form of an accelerated reduction of Canada's Kennedy Round tariff reductions—might well be appropriate if the recent high and persistent general price and cost increases were to continue in Canada.

The results of the Kennedy Round of tariff reductions may have significant implications for prices. The Canadian tariff cuts are not, on average, as large as those of our major trading partners. Although these reductions will help to retard the rise of prices in Canada, any such "retardation" will be less pronounced here than in our major trading partners over the five-year schedule of reductions. Moreover, significantly improved access to export markets by Canadian producers leading to increased demands on available resources may work to strengthen price and cost pressures in the Canadian economy.

A careful distinction must of course be made between *nominal* and *effective* tariff rates. In terms of the economic implications of tariffs—for example, the implications for productivity and prices—this is an important distinction. Nominal rates are simply the scheduled rates applied to goods imported into Canada. Effective rates measure the protection for an industry as it adds value to purchased inputs in processing its products. In essence, nominal tariffs permit an industry to maintain higher prices for the goods it sells but they also increase the cost of machinery, components and materials used in production. The net effect of these nominal tariff influences on prices and costs, and hence on the ability of a protected industry to charge more for that *part* of its output which it really produces (that is, for "value added"), constitutes "effective protection".

Such aspects of Canada's tariff rates are discussed in a Special Study prepared for the Council. This Study shows that the levels of effective rates in Canada are high, generally much higher than nominal rates.[1] On the whole, effective rates do not appear to have been

[1] Effective rates range up to 100 per cent or more. See the forthcoming study by James R. Melvin and Bruce W. Wilkinson, *Effective Protection in the Canadian Economy*, Special Study No. 9, Economic Council of Canada, Ottawa, Queen's Printer, 1968.

greatly reduced by the Kennedy Round, and the Special Study indicates that some of them have actually increased. The maintenance of a high level of effective rates will make it much more difficult than otherwise to narrow productivity differences between individual industries in Canada and the United States. Our nominal tariff reductions will do relatively little to stimulate a more efficient use of resources in manufacturing, and thus improve our price performance relative to that of other countries.

To sum up, we reiterate that there are no simple policy prescriptions for price and cost stability. Consistent, forward-looking efforts, in which many decision-makers must play some part, are required across a broad policy front.

HIGHER LEVELS OF INTEREST RATES

One of the most perplexing features of the recent period was that financial markets seemed, at least to the average observer, to embark on a course of their own, bearing little relationship to slowdowns in the markets for real goods and services or to changes in the supply of money.

Many of the factors which combined to produce this rather paradoxical situation were not peculiar to Canada. Underlying the generally high interest rates throughout the capital markets of the world over recent years has been the vast and rapidly growing need for capital in relation to available supplies. Moreover, the extremely unsettled conditions which emerged in the international markets for gold and foreign exchange in 1967 resulted in continued high interest rates in Europe where, for most of the post-war period, rates had been considerably higher than in North America. Faced with a deteriorating balance-of-payments position, the United States was forced to raise its rates sharply in order to narrow the difference with Europe and to stem the loss in its gold reserves. Because of the close monetary and financial links between Canada and the United States, Canadian rates rose rapidly along with those in that country. Another consideration contributing to the upward thrust in rates was the substantial increase in government cash requirements in both Canada and the United States. In Canada the increase was particularly marked at the federal level in 1967, but the federal government has announced that it intends to reduce substantially its net cash requirements in 1968.

One of the most important factors affecting conditions in financial markets over the last two years has been an apparent change in investor attitudes towards fixed income securities such as bonds. A preference for stocks, real estate and other forms of investment offering possiblities of increasing future income has been slowly developing for some years, aided by the emergence and rapid growth of new institutional investors. This shift in preference has been given added impetus by the reduction in the real rate of return on bonds inherent in any acceleration in the rate of price increases for goods and services such as occurred over the last two years. Also, under conditions of increased uncertainties in financial markets, various asset holders appear to have shown at least a temporary preference for a higher ratio of cash or very highly liquid assets in relation to other less liquid assets.

High and rising levels of interest rates have created greatly increased financing problems, especially for governments, for residential mortgage financing and for other borrowers dependent on meeting their capital needs through longer-term, fixed-interest obligations. In the past, business capital investment has generally been mainly influenced by the pressure of existing or anticipated demand on productive capacity, and not so much by levels on interest rates. In part, this is related to the fact that the costs of money and capital are usually small in relation to other business costs, or in relation to sales, or even to the anticipated profitability of new investment. But in recent conditions of unsettled capital markets, some business firms appear to have been encountering financing difficulties.

In an environment in which investors have, on the whole, become less receptive to long-term debt instruments, governments are facing significant financing problems. Moreover, it is clear that with the substantial upward shift of interest rate levels, greatly intensified debt management problems had emerged during the first half of 1968. This has been most dramatically revealed by the accelerated liquidation of savings bonds whose yields are no longer competitive with various other forms of savings. However, reduced cash requirements, the expected growth of the Canada and Quebec pension funds, continued access to the U.S. capital market, and the development of new financing potentials in overseas markets, should help to make government financing problems somewhat less acute than would otherwise be the case. Moreover, under recent conditions, various borrowers have been approaching the capital markets in more flexible ways to meet their financing requirements.

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THE BALANCE OF PAYMENTS

Persistent weakness in Canada's balance of payments, whether such weakness is the result of domestic problems or of a less favourable international economic environment than we have generally assumed, would make the achievement of our domestic economic goals very difficult. Considerable public apprehension arose in the early months of 1968 as Canada's official exchange reserves fell rapidly during a period when there was greater general uncertainty and turbulence in the international financial system than there has been for many years. This experience gave rise to questions in various quarters about whether these developments reflected primarily temporary factors or underlying problems that may persist.

Our view is that the Canadian balance-of-payments position itself remains fundamentally strong. The losses of reserves earlier this year largely reflected problems beyond our borders and concerns about new U.S. balance-of-payments measures whose application to Canada was both inappropriate and short-lived.

A number of persisting tendencies and patterns are evident in the structure of Canada's international trade and payments. Our trade continues to be largely based on the exchange of a wide range of raw materials and processed primary products for a highly diversified range of manufactured products and some food and materials. There has also been a very long-term structural deficit on the combined total of the so-called "invisible" items of the current account, such as interest and dividends, business services and tourist expenditures. This deficit has grown over the long run and has tended to be consistently larger than the surplus, if any, on the more volatile merchandise trade account. There has been a strong tendency for changes in the deficit on current account to be balanced reasonably well by changes in net inflows of long-term capital, with both the current account deficit and the net capital inflows increasing substantially during periods of rapid growth.

But at least two important departures from traditional patterns deserve special attention. One of these is the striking growth in Canadian exports of highly manufactured goods in the 1960's. Not only have such exports risen substantially relative to other major categories of exports (such as agricultural products, forest products or mineral products), but they have also risen substantially relative to Canada's imports of highly manufactured products. For example, exports of "end products" (mainly highly manufactured goods) rose

from about one-fifth to one-half of imports of such goods over the period 1961 to 1967. Net imports of such goods, even though they exceeded $3 billion in 1967, have fallen in relation to Canada's GNP since the beginning of the decade. The strengthening in the international competitive position of many Canadian industries, based in part on the decline in the exchange value of the Canadian dollar in the early 1960's, is fundamental to this improvement. A strong competitive position must be maintained and, if possible, enhanced through both vigorous efforts to strengthen productivity gains and avoidance of competition-eroding increases in prices and costs in Canadian manufacturing.

The second recent payments development warranting special attention is the remarkably small current account deficit in Canada's balance of payments in 1967. The surplus on merchandise trade was sufficient to offset a large part of the deficit on "invisibles". At the same time, the "invisible" deficit contracted sharply as a result of the large impact of Expo and other centennial events on tourist expenditures. With the disappearance of some of the special factors contributing to large payments receipts in 1967, a larger current account deficit can be expected to recur. We believe, however, that the deficit will continue to decline, relative to GNP, as it has done over the past few decades.

Finally, we emphasize again that Canada's balance of payments can only be as strong as the international financial position of the United States and the international monetary system as a whole. In the light of the developments in this area which have recently given rise to considerable concern, some perspective on the world monetary system seems desirable.

THE INTERNATIONAL MONETARY SYSTEM

A series of shock waves have reverberated throughout the international financial system since the Fall of 1967. Sterling was devalued in November and although several other devaluations followed, the currencies of the major countries remained firm. However, these devaluations were followed in December by substantial speculation in gold and foreign exchange, apparently largely based on the view that the continued worsening in the balance-of-payments position of the United States would eventually culminate in an increase in the price of gold. This speculation subsided temporarily in mid-December when the U.S. government reaffirmed its determination to maintain the existing gold price level. In January 1968, the United States announced that it

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proposed to undertake a number of steps designed to improve its balance-of-payments position. The proposed U.S. measures, including particularly those affecting direct investment of U.S. corporations in Canadian subsidiaries, triggered substantial, but relatively short-lived, speculation against the Canadian dollar.

Various measures were taken to counteract this swift march of events. For example, Canada took steps to defend the Canadian dollar and to bolster its international reserve position. Also, early in March the United States granted Canada an exemption from its mandatory direct investment measures. In the wider international arena, following intense speculation in gold in March, the central banks of a number of leading nations agreed to buy and sell gold only among themselves at $35 an ounce, leaving commercial users and speculators free to buy gold at the going market price. Subsequently, there was agreement among a number of leading nations to proceed more quickly towards the creation of new international monetary assets (Special Drawing Rights) as a basis for *long-term* expansion in the international monetary system. This points the way towards a significant longer-run evolution in this system, at least in terms of facilitating the gradual growth of international monetary reserves. But the restoration of confidence, and progress towards the removal of vulnerabilities, in the international monetary system are issues that must continue to be of major concern to the world monetary authorities.

At the end of the Second World War, there were still vivid memories of the currency collapse, the unemployment of the Great Depression, and the resort to tariffs, exchange control and competitive exchange depreciations of the inter-war period. In a conscious attempt to avoid repetition of these events, there was a deliberate effort to formulate guidelines for policies and to establish new institutions that would facilitate strong and stable expansion of world trade and payments.[1]

Such an expansion has in fact been achieved over the last 20 years, supported by the main industrial countries and facilitated by the reduction in trade barriers. There have been six general multilateral reductions in tariffs and other trade barriers, of which the Kennedy Round completed last year was the largest. Also, regional free trading arrangements have developed, notably the comprehensive arrangements encompassed by the European Economic Community and the

[1] These institutions included the International Monetary Fund, the World Bank and associated organizations, the General Agreement on Tariffs and Trade, the Organization for Economic Co-operation and Development, U.N. agencies such as the Food and Agriculture Organization, and others.

European Free Trade Association. Adjustments in individual industries to the substantially more open international trading environment have been accommodated fairly readily under conditions of well-sustained economic expansion.

By the late 1950's it became clear that European countries generally were no longer in balance-of-payments difficulties, and that the "dollar shortage" characteristic of the earlier part of the post-war period had vanished. Steps were taken to dismantle foreign exchange controls, to make European currencies generally convertible into dollars, and to virtually eliminate the discriminatory import controls established earlier. These steps, together with tariff reductions, substantially increased the freedom of trade and the international mobility of capital.

These developments have been reflected in a major growth in world trade. In fact, world trade has grown more rapidly since 1950 than total output.

The general post-war international economic environment has been highly favourable to the development of industrial economies such as Canada's—more persistently favourable than at any time since before the First World War. However, behind this imposing performance there are at least three important underlying vulnerabilities in the world pattern of trade and payments.

First, there has been an obvious lack of agreement among major countries as to how balance-of-payments adjustments should be shared between those in deficit and those in surplus. Earlier in the post-war period this did not greatly affect international monetary stability. At the end of the Second World War, the United States was the major economic power among the industrially advanced nations of the western world, and was in a position to play a predominant role in attempts to resolve international economic problems. However, the striking growth of the European countries and their increased level of gold and foreign exchange reserves has brought a shift in relative economic and financial strength. This shift, together with the increase in the long-standing U.S. deficit, has brought into much sharper focus disagreements about how to share the burdens of adjustments. New agreements on appropriate policies to deal with fundamental and persistent international economic imbalances are now urgently required.

The potential effect of the U.S. *basic balance-of-payments deficit* (that is, a capital outflow in excess of its surplus on current account) was partially obscured during the extended period of economic slack beginning late in the 1950's. But during the 1960's it became increas-

ingly apparent as the U.S. economy moved closer to high levels of utilization, as a large outflow of private U.S. capital to Europe continued in response to the rapidly expanding market opportunities there, and as other factors came into the picture, including U.S. involvement in Vietnam. A widening range of balance-of-payments measures has been introduced by the United States in an effort to reduce the over-all payments deficit and the resulting outflow of gold.

The traditional rules of the game would call for countries persistently losing gold to follow deflationary policies, and for those gaining gold to follow more expansionary policies. However, the United States has operated with higher levels of unemployment and lower rates of capacity utilization than Europe for more than a decade. There is an understandable reluctance in that country to encourage greater slack domestically for balance-of-payments purposes. In contrast, the major countries of the European Economic Community have tended to gain exchange reserves, even though unemployment levels have been low and wages and prices have been increasing more rapidly than in countries losing reserves. They are anxious to restrain the rate of domestic price and cost increases, despite the fact that their balance-of-payments positions clearly indicate that they are maintaining strong international competitive capabilities.

The second element of increasing vulnerability underlying international trade and payments is the fact that under the gold exchange standard the world's growing need for money depends in an important way on the supply of gold available to the monetary authorities. This supply is influenced by the profitability of gold mining and new discoveries, as well as by the net demand for gold for nonmonetary purposes. During recent years there has been a growing tendency for gold to flow into private commercial uses and hoarding rather than into monetary gold stocks, and it has become increasingly clear that new measures are required to achieve an adequate growth in international monetary reserves. The decision of the leading central banks in March 1968 not to add to the total of their *collective holdings* of gold is related to the plan to create alternative forms of exchange reserves.

Third, the move to full convertibility of the major currencies in 1958 exposed the system to the dangers of wide swings in short-term capital movements between countries. Questions have therefore arisen about the adequacy of mechanisms for coping with this vulnerability—for example mechanisms in the form of the reciprocal currency arrangements between central banks in the main industrial countries.

Performance in Relation to Goals

The series of shocks which occurred over the winter of 1967-68 has made governments more aware of the potential vulnerability of the international financial system, and is encouraging more active steps to deal with the underlying problems. In Canada, the speculation against the Canadian dollar early in 1968 has served to re-emphasize the close interdependence between the international financial system and our own economic situation. In these circumstances, the Canadian government and officials are continuing to give active leadership and support to further strengthening of the world financial system.

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First Annual Review: Economic Goals for Canada to 1970 (EC21-1/1964, $3.50)	Council—Conseil
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