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Educational Planning for the Future

Just as education is, by definition, a futures-oriented activity, so Future Studies is also, by definition, an educational activity. This paper attempts to show how Future Studies can be used in longer term education planning, particularly as it relates to demographic trends in Canada in the next twenty-five years. "Demographic trends" describe the size, age and distribution of the Canadian population along with the speculations on the direction and rate of change of these trends in the future. There are two important time periods and their effects to be considered: the change in the birth rate between 1939 and 1959 (the number of births increased by 12,000 a year on average over the 20 years) and the birth rate from 1959 to 1976 (where the number of births dropped each year by about 9,000 a year on average for these 15 years).¹

Why spend time looking at the phenomenon of birth? Because it is the pattern of births that sets the future profile of the whole population. Although immigration can influence the size of the population, it is much less important in dictating the distribution. Secondly, educational planners have struggled through the years since World War II attempting to deal with the problem of this tide of children, often without clearly understanding the implications of such a flood. Nor are the fall-outs of the baby-boom over. The effects of this demographic shift will be with us all for many years to come.

What are these effects and how will they influence future planning in education? This paper speculates on some possible changes and their implications. These speculations are not predictions. (Readers may have other scenarios which, for various reasons,

they would prefer to this one.) The purpose of this forecasting is rather to stimulate thinking about possible futures and to act as an early-warning system for further discontinuities which may develop over the longer term.

purpose of future studies

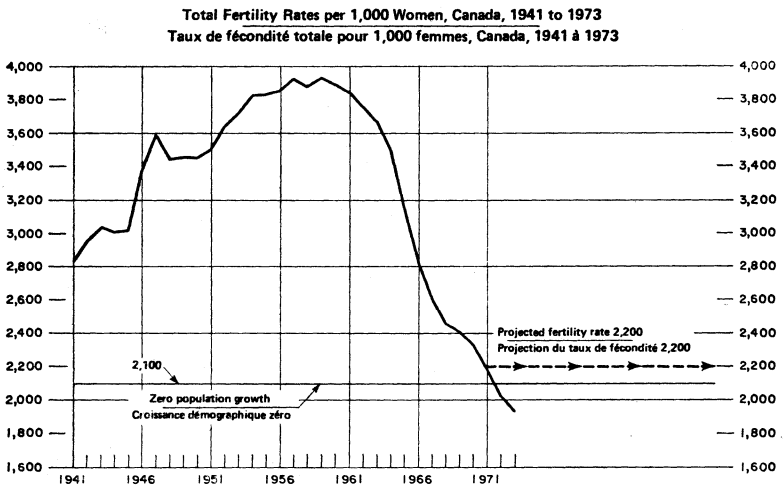
What is the purpose of this type of activity? Briefly, Future Studies provides the framework within which planning can take place.² It asks broad questions about where, as a society, we are going. Often there is a normative dimension to these inquiries. For example, examination of the nature and characteristics of the concept "quality of life" implies a "value-added" connotation. Questions arise about what *ought* to be done if quality of life is to be improved. Similarly, once some agreement is reached on what ought to be done, further questions arise on how-to-do-it. Generally, the latter questions are easier to answer than the former.

Secondly, Future Studies differs from Policy Planning or Strategic Planning in both the range and time frame of its inquiries. It may act as an early warning system, pointing out the dangers and/or constraints of certain current behavior or trends. For example, the future scarcity of jobs for the rising number of university students suggests that wise policy planning today should take account of changing economic and social conditions related to the baby-boom cohort and the subsequent fall in the birth rate. Future Studies also examines trends to indicate possible future directions in which society may be heading and attempts to draw out the implications of these trends. Interesting speculations can be advanced on the effects of the rising divorce rate, the falling birth rate, the current housing shortage, and the competition among young people for jobs and space during the next 15 years. Put together, statistics in these areas of social change suggest possible radical alterations in life-style, goal-seeking and expectations.

Thirdly, Future Studies can seek to develop alternative, desirable futures coupled with suggestions for ways in which these futures might be achieved. For example, an alternative *modus vivendi* can be found in an experimental farm in Prince Edward Island called the "Ark."³ Conceived by scientist John Todd and his co-workers and supported by the Federal Government, this complex will be energy self-sufficient and ecologically sound. By recycling waste products it will produce fish, fruit and vegetables without artificial fertilizers. By harvesting wind and solar power it will replace electricity and fossil fuels.

Similarly, Future Studies in educational planning must provide

Figure 1



early warning of possible future discontinuities. It must look at present trends and suggest alternatives if planning is to be flexible, responsive and imaginative. This paper will touch on some of the effects of the first baby-boom and the implications of a possible second baby-boom in the 80's. It will examine the relationship between demographic trends and school enrolments, staffing and financing to the year 2000. Finally, it will speculate on possible future effects of these changing conditions on Canadian education.

the first baby-boom: 1939-1959

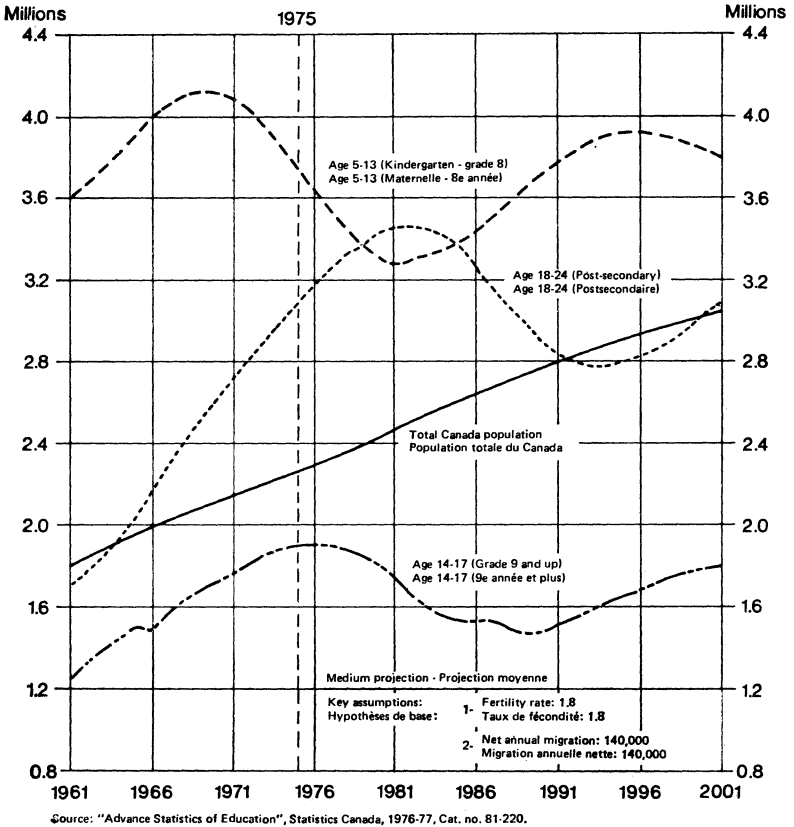
Figure 1 above, gives a profile of the demographic shift known as the baby-boom and the subsequent decline in fertility. The fertility rate is the average number of children per 1,000 women, born through the child-bearing ages. As can be seen, the fertility rate climbed from 2.8 in 1941 to nearly 4 in 1959 and then dropped to 2.2. From 1971-76, the fertility rate has continued to fall (even though the ranks of potential mothers have continued to grow) so that the rate now stands at 1.83 for Canada and 1.65 for Quebec. This is below the level of zero population growth (ZPG) of 2.1.

If immigration were not so important to Canada, the fertility rate alone would give a fairly accurate picture of future population size. But immigration has historically been a major source of population growth, though numbers fluctuate in accordance with government policy. Moreover migration within the country is significant. During the last 15 years, average gross interprovincial movement of people has ranged from about 375,000 to 435,000 annually. Such mobility affects population growth throughout Canada so that Ontario, Alberta and British Columbia are gaining people, while Quebec, the Maritimes and Saskatchewan are losing overall.⁴ In addition, farm populations have decreased dramatically but nowhere more than in the 20-35 age group. One group, those born between 1947-1951, dropped by 62%.

The net annual migration figure is assumed to be 140,000 (*Figure 2*). It should be pointed out that during the past five years, net migration was well above this figure, with a record number of immigrants in 1974 of 218,415. But the largest age group in the immigrant population are those in their 20's, so that this too expands the size of this group relative to the total population.

What effect has all of this had on educational planning? Until 1946, each year's crop of students entering Grade I averaged more or less the same, with a few surges from overseas or the farm. But the class of '46 was 20,000 larger than the class of '43 and each class there-

Figure 2



Selected Age Group Populations of Relevance to School Enrolment, for Canada, 1961-2001
Population par groupe d'âges spécifique correspondant aux effectifs scolaires, Canada, 1961-2001

after became 12,000 larger. Portable classrooms, bolt-on wall panels and movable partitions became the order of the day. This went on, year after year, until 1966 when registration began to fall. In 1954, the high schools began going through the same sequence, and in 1957, the same pattern started in the universities.

some effects of the first baby-boom

While the parents of these children had grown up in a world of straitened circumstances, there had also been a belief in progress, orderly growth and achievement through hard work. The next generation grew up in the quite different circumstances of post-war economic expansion. Change and novelty were the norm. More goods, powerful centralized systems, and planned obsolescence replaced thrift and order. There were also more children.

The experiences of the 1946-59 generation in schools — always squeezed into too small a space, with too few teachers — is going to be repeated throughout their lives. Their impact on society and the economy is going to be a continuous strain. (One notes the youth of René Lévesque's supporters at the Paul Sauvé arena on election night, 1976).

Since 1958, unemployment has averaged almost 6%. This spring, it was at 7.4% and almost half were under twenty-four. Rising figures on absenteeism suggest that playing truant on the job continues a high school situation where no one was in control. Crammed into classrooms that were too small for their numbers, sometimes 40 or more, competing for the attention of a single teacher, children of the boom were the generation of the school slum. And now, they are slowly becoming the generation of the unemployment slum.

the second baby-boom

Figure 2, prepared by Statistics Canada, shows the effect of the post-war baby-boom and the subsequent drop in fertility for selected age-group populations of relevance to school enrolment, 1961-2001. This chart assumes a fertility rate of 1.8 for all of Canada and an annual net migration of 140,000 for the next 25 years. What is clear is that the current decline in the annual number of births will not continue until the end of the century. Even if fertility remains low or falls further, an increase in births is practically certain. Before 1985, there will be a second baby-boom. The population increase of women of child-bearing age may more than offset the decline in fertility.

Between the booms, from 1959 to the present, the number of births fell each year. The small cohort born in that period will start to have children in the 1990's. Since there will be fewer potential mothers, there will be fewer babies, and again the size of the young population will shrink.

The fertility turnaround has already diminished the 5-13 age group, which peaked at 4,131,900 in 1970. The decline will continue until the early 1980's when there will be fewer than 3.3 million children in this age range — a 21% drop. But after the baby-boom generation begins to reproduce, this population may grow to approximately 3.9 million in the mid-1990's. By the end of the century, this group will be decreasing again.

The same pattern will apply to the 14-17 age group, although with some time lag. The post-war baby-boom peak will be about 1.9 million in the mid-80's. By the late 80's, the total will have fallen by 24% to around 1.4 million. But at the end of the century, the second baby-boom may produce a new high of 1.8 million. Only after 2001 will this group start to decline again.

Current growth of the 18-24 year old group will continue for seven or eight years. From the 1974 total of 2.95 million, a rise to about 3.5 million is expected in the early 1980's. This group will then decline 22% to approximately 2.8 million ten years later. By 2001, it may have increased again to 3.1 million.

Provincial and sub-provincial population patterns can differ from either regional or national trends. Since Quebec combines the lowest fertility rate in Canada with net out-migration, the apex of the second baby-boom for each age group in this province is only about 80% of the first before another steep decline begins. Urbanization could multiply the effects of the decline in metropolitan areas, while rural localities could be doubly hard-hit. Alternatively, suburban growth might occur at the expense of the school-age population of inner cities.

enrolment patterns — the next 25 years

a) Enrolment: Because enrolment rates are high for both elementary (98%) and secondary (97.4%) schools, population projections closely approximate enrolment. Since the 1970 high of 4.2 million, national elementary enrolment has fallen with the 5-13 age group. By the early 1980's, it will be about 3.2 million. But in the subsequent 15 years, it will rise again to approximately 3.9 million. (See *Figure 3.*)

Secondary enrolment will increase until 1976 to a total of 1.7 million. From then until the late 1980's, it will decline to 1.4 million.

FIGURE 3

Turning Points in Elementary Education, Selected Variables, Canada*

	Base 1961	High 1970	Change from 1961 to 1970		1974	Low 198
			No.	%		
Elementary:						
5-13 population age group.....'000.	3,595.3	4,131.9	+536.6	(+ 14.9)	3,833.6	3,249.9
Estimated enrolment rates.....%	97.8	100.7			98.0	98.0
Enrolment: Kdgn. to Grade 8.....'000.	3,514.8	4,161.2	+646.4	(+ 18.4)	3,758.4	3,184.2
Student teacher ratio (full-time).....	26.8	24.3			23.8	22.0
Number of full-time teachers.....'000.	131.3	171.4	+ 40.1	(+ 30.5)	157.9	133.0

*Statistics Canada, *Advanced Statistics of Education, 1976-77.*

Notes: 1. Years indicate the beginning of academic year. Numbers are rounded but percentage changes have been calculated on unrounded numbers, hence % changes may not reflect exactly changes in numbers shown.

2. These figures are based on an earlier projection from Statistics Canada with the key assumptions of fertility rate 2.2 and net annual migration of 60,000. Note that *Figure 2*, a more recent projection, assumes a fertility rate of 1.8 and a net annual migration of 140,000.

FIGURE 4

Turning Points in Secondary Education, Selected Variables, Canada

	Base 1961	1974	1976	Change from 1974 to 1976	
				No.	%
Secondary:					
14-17 population age group.....'000	1,243.0	1,849.4	1,875.0	+25.6	(+1.4)
Estimated enrolment rates.....%	72.0	97.4	98.1		
Enrolment: Grade 9 and up.....'000	895.0	1,800.7	1,840.0	+39.3	(+2.2)
Student teacher ratio (full-time).....	21.0	16.8	16.8		
Number of full-time teachers.....'000	42.6	107.2	109.5	+ 2.3	(+2.1)

Note: Years indicate the beginning of academic year.

But in the next decade, there may be close to a 40% increase, resulting in a high of 1.8 million students. (See *Figure 4*.)

A 20% enrolment rate for 18-24 year olds, if continued, would mean a rise from 562,000 to 670,000 students in the early 1980's. (See *Figure 5*). Ten years later, numbers will have fallen 22% to recover again at the end of the century (660,000) — a net rise of more than 16%. However, the non-compulsory nature of post-secondary education and provincial variation in education develop-

Change from 1974 to 1981		High 1995	Change from 1981 to 1995		Change from 1974 to 1995		Change from 1970 to 1995	
No.	%		No.	%	No.	%	No.	%
-584.6	(-15.3)	4,369.0	+1,120.0	(+34.5)	+535.4	(+14.0)	+237.1	(+5.7)
-574.4	(-15.3)	98.0	+1,097.6	(+34.5)	+523.1	(+14.0)	+120.4	(+2.9)
-24.1	(-15.3)	4,281.6	+ 46.1	(+34.5)	+ 22.0	(+14.0)	+ 8.5	(+5.0)
		23.8						
		179.9						

1988	Change from 1976 to 1988		2000	Change from 1988 to 2000		Change from 1974 to 2000	
	No.	%		No.	%	No.	%
1,425.0	-450.0	(-24.0)	1,974.0	+549.0	(+38.5)	+124.6	(+6.7)
100.0			100.0				
1,425.0	-415.0	(-22.5)	1,975.0	+550.0	(+38.6)	+174.3	(+9.7)
16.8			16.8				
84.8	- 24.7	(-22.6)	117.6	+ 32.8	(+38.7)	+ 10.4	(+9.7)

ment will influence enrolment. Additional considerations such as the economy, competition for jobs, and attitudes towards education will also affect this group.

This new group of children will, however, come from the baby-boom generation of parents, whose own aspirations and career patterns will have been so much affected by their numbers. However, some demographers argue that the likelihood of a second baby-boom is declining. The larger proportion of young people who are under-

FIGURE 5

Turning Points in Post-secondary Education, Selected Variables, Canada

	Base 1961	Present 1974	1982	Change from 1974 to 1982	
				No.	%
Post-secondary:					
18-24 population age group.....'000	1,711.4	2,951.5	3,340.0	+388.5	(+13.2)
Estimated enrolment rates.....%	10.6	19.2	20.0		
Enrolment: Total					
full-time post-secondary.....'000	182.0	567.5	670.0	+102.5	(+18.1)
Student teacher ratio (full-time).....	13.8	12.0	12.0		
Number of full-time teachers.....'000	13.2	47.4	55.8	+ 8.4	(+17.7)

Note: Years indicate the beginning of academic year.

employed or unemployed is less likely to have children. Increasing numbers of women in the labor force also contribute to declines in fertility. John Kettle points out that if birth rates are to have a significant effect for a second baby-boom, they must rise quite quickly in the next few years. If birth rates have not risen by 1984, we could assume that it is unlikely there will be another baby-boom.⁵

b) Teachers: As enrolments at each level rise and fall, the need for teachers, physical plant and financing will be affected.

If the present average elementary pupil-teacher ratio of 24:1 is maintained, the enrolment decline would require 24,100 fewer teachers in the 80's. But if a second baby-boom appears in the 1990's, an increase of 46,000 teachers may be needed (from a low of approximately 134,000 in the 80's to 180,000 in the 1990's).

At the secondary level, the student-teacher ratio is about 16.8:1. In the peak enrolment year of 1976, there will be almost 109,000 secondary teachers. If the ratio is held constant as enrolment falls, about 26,000 of them will not be needed. At the end of the century however, the requirement may rise to 114,000, almost 32,000 over the low of the late 1980's.

When post-secondary enrolment reaches its first high in the early 1980's, about 56,000 teachers will be needed to maintain the current 12:1 student-teacher ratio. But from the early 1980's on to the year 2000, enrolment, and hence teacher demand, will drop about 22%. This means that 12,500 post-secondary teachers would be surplus in the early 1990's. The full impact of a second baby-boom would not hit post-secondary education until after 2001.

1992	Change from 1982 to 1992		2001	Change from 1992 to 2001		Change from 1974 to 2001	
	No.	%		No.	%	No.	%
2,606.0 20.0	-734.0	(-22.0)	3,285.0 20.0	+679.0	(+26.1)	+333.5	(+11.3)
520.0 12.0 43.3	-150.0	(-22.4)	660.0 12.0 55.0	+140.0	(+26.9)	+ 92.5	(+16.3)
	-12.5	(-22.4)		+ 11.7	(+27.0)	+ 7.6	(+16.0)

Obviously, the teachers from the baby-boom group are in for a hard time. Particularly harshly affected will be the fraction of university graduates who might have expected to become university teachers. Not only do they share the universal problem of their age group in having to compete with a great crowd for the available positions but, by the end of the decade, they will find that the demand for university teaching will start to go down. Those born before 1939 will continue to get ahead as long as they work; for the 1951-64 generation, the prospects are either to suffer frustration at being held back or to drop out, to transfer or to develop new careers.

c) Schools: The average number of students in Canada's 15,700 elementary-secondary schools is now 354. In ten years, as enrolment declines, 1,800 fewer schools will be needed to keep this average. However, by the late 1990's, there would have to be a possible 17,600 schools to accommodate the anticipated enrolment increase.

If post-secondary institutions can avoid further expansion up to the peak enrolment years of the early 1980's, existing facilities in numerical terms are adequate. But the fact that fewer young people will be able to get jobs in universities will mean that the creative and innovative role of the universities may suffer. In 2001, post-secondary enrolment will have recovered from its decline only to about the level of the first baby-boom high. Since the population at that point will have a median age of 36 (today, half the population is younger than 28), a conservative, aging staff and plant may fit the temper of the times!

d) Financing: Changes in enrolment and the need for teachers and

facilities will affect the financing of education. Fewer students will not necessarily result in proportional savings. As enrolments fall, the choice will be between lower student-teacher ratios or staff cuts. Lower ratios raise costs but so does the alternative. Teachers released in a cutback are likely to be at **junior levels with lower salaries**. Senior and specialized teachers with high wages will be retained and the unit cost of education will rise. Statistics Canada's latest figures suggest that education costs went up last year by about \$1.5 billion, an increase of \$282 per pupil, in spite of declining enrolment.⁶ Moreover, when enrolment declines, high cost programs like medicine and professional schools with restrictions on admissions are likely to be unchanged. Drops will occur in the less expensive areas of education such as general arts and science courses.

Throughout the decline, buildings and equipment will have to be maintained. Updating of facilities such as libraries, technological installations and scientific equipment must continue, especially at the post-secondary level to attract even a reduced number of students. Closing some schools and using increased bus services will not reduce costs essentially, given the fact that energy costs are rising. In 1972, even before the energy crisis, school transportation in Canada cost more than \$1 million a day. As enrolment falls, unit costs are likely to rise, and when enrolment at each level begins to recover, greater expenditures will be required: more students, more money. These difficulties, created by erratic enrolment, will put great strain on the education system. Awareness of the nature and extent of impending problems may help in the development of realistic future planning that takes account of these new difficulties.

some further implications

While 35.7% of the Canadian population is 19 and under, only 26.7% will be so in 25 years time. A staggering 54.6% of the population will be in the 45-64 age group and 11.8% will be over 65. By 2030, a quarter of the population will be over 60 and only a fifth under 20 years of age.

For the 30's to 45's of 2001, life may be difficult. The concentration of this age group is unlike anything that Canada has experienced before. In addition, the phenomenal increase in female participation in the labor force (39.5% in 1970 and projected to grow to 84.9% by 1990) will require extended employment opportunities. If the expected trend continues, and students continue to graduate in record numbers, extra jobs will need to be found at an increasing rate:

300,000 — 1975
700,000 — 1980
1,300,000 — 1985
2,100,000 — 1990.⁷

If government continues to finance post-secondary education at the same rate, the annual number of degree or diploma students graduating will have increased from 186,000 in 1975 to 250,000 in 1985. While post-secondary institutions continue to emphasize an enriched awareness of life, what happens to graduates who cannot find jobs suitable to their level of educational attainment? While training may not be the whole purpose of a university or community college, nevertheless, such institutions, as good corporate members of society, have a responsibility to raise questions continually and openly about their role.

Finally, as was mentioned above, despite enrolment waves, total expenditures on education will not decline, even in constant dollars.⁸ The cyclical nature of the demographic trends means that while one sector declines, another is still growing. Yet due to these waves, while governments at all levels spend approximately 20% of all revenue on education, there will be competing claims in the future from other important sectors. At the moment, job creation schemes, family allowance and unemployment insurance rate high; welfare expenditures now make up more than 20% of all government spending and an increasing amount will have to be spent in the near future on the prison population. For example, as the 18-30 age group attempts to find employment, housing and a satisfactory life-style over the next fifteen years, crime rates may increase. Even if the rate remains constant, the absolute number at risk will be higher — thus creating more demand for police, penal facilities, rehabilitation, and other social services. Energy requirements will grow, accompanied by problems of balance of payments deficits. Transportation systems will have to become more responsive to latent demands — especially as they relate to opportunities for seeking fruitful employment. By the end of the century with an aging population, expenditures will rise for health and social services as well — we shall need more hospital beds, senior citizen housing, medicare and pensions.

Clearly, educators will be faced with the need for flexibility in responding to future planning problems. Confronted with threats to job security, teachers' associations may become more militant, while other responses they may make could include:

— preparing to teach an alternative subject;

- switching from one school system to another as the job market changes;
- preparing for greater geographic mobility.

Society at large will also have to make adjustments by:

- changing life-styles to permit life-long learning;
- encouraging people to perform useful but not vital services and paying them a low but adequate income;
- spreading the work to employ more people but reducing everyone's hours;
- facilitating part-time education, which may help solve some of the problems of the changing distribution of enrolment.

What I have tried to do is to outline the possible shape of the education population for the next twenty-five years and to point out some difficulties that will logically follow. Although most problems, whether personal or national, are not anticipated, in the case of this important sector of society, we do at least have some indications of why and how we need to plan. Many developments *can* be foreseen — and I have by no means exhausted them in this paper. It is my hope that readers will be stimulated to look at other possible effects of the demographic trends indicated here so that educational planning for the future will be imaginative, responsive and flexible.

footnotes

1. John Kettle, "People and Households," *Executive*, July/Aug. 1976, pp. 32-40.
2. Janice J. Tait, *Some Ways of Thinking About the Future*, Department of the Environment, Occasional Paper No. 7, 1974 summarizes the various techniques for looking at different sorts of problems.
3. For an account of the "ark" and how it works, see "The Ark: A Solar-Heated Wind-Powered Greenhouse and Fish Pond Complex," *The Futurist*, Dec. 1974, pp. 296-298.
4. Lewis Auerbach, *Implications of the Changing Age Structure of the Canadian Population*, Study of Population and Technology, Science Council of Canada, Nov. 1974.
5. Kettle, *op. cit.*
6. *Advance Statistics of Education 1976-77*, Ottawa: Statistics Canada, Cat. no. 81-220, 1976.
7. John Kettle, "What Kind of Labor Force? Footnotes on the Future," *Executive*, Sept. 1975, p. 58.
8. Zoltan Zsigmond, "Impact of Projected Population Trends on Post-Secondary Education, 1961-2001," paper presented at the annual meeting of the Statistical Science Association of Canada, Statistics Canada, 1975, p. 34.