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BULLETIN NO. P-4

THE FUTURE POPULATION OF CANADA



OTTAWA

PREFACE

The development of population fertility statistics and mortality rates in the Bureau has made this bulletin possible. It deals with a subject of great scientific and popular interest, viz., the future size of Canada's population. While the bulletin does provide some estimates relating to the period up to 1971 it does not attempt to predict what Canada's population actually will be towards the end of this century. The estimates given are based on assumptions which completely disregard the influence of factors which may be important determinants of the actual population of the future.

Numerous cautions are incorporated in the text to prevent misunderstanding of the figures. It should be clearly understood that these projections of population size for Canada to 1971 are based on definite assumptions which are clearly stated. No allowance is made for offsetting factors such as migration, war, etc. It is assumed in them that both mortality and fertility rates in Canada will continue to fall and that they will follow a pattern indicated by recent trends. Paragraph 2 (page 1) of the bulletin makes clear how the estimates are valid only if the assumptions on which they are based prove to be the future pattern of events. If, for example, Canada were to have a large immigrant movement or if, due to some unforeseen development, fertility trends should change, such factors would exert influences not included in the assumptions on which the estimates are based and would produce different results.

Possible changes through internal migration require that provincial and regional data be used with special caution and that constant reference be made to the assumptions on which they are based.

This study is the work of Dr. Enid Charles, Mr. Keyfitz and Mr. Roseborough. Acknowledgments are due to Dr. G. A. Lemieux and Mr. A. H. LeNeveu for advice. Miss P. F. E. Chrysler, Miss L. M. Podham and Miss P. Whelan did the computations and Mr. J. W. Delisle drew the charts. Acknowledgments are also due to the League of Nations for permission to reproduce charts from "The Future Population of Europe and the Soviet Union".

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OTTAWA - CANADA

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Population: F-4

THE FUTURE POPULATION OF CANADA

PART I. TEXT

1. INTRODUCTION

In the past 50 years, the problem of population size has assumed a position of considerable significance. This interest has resulted in an intensive study of past trends of fertility and mortality rates of all countries and an attempt, on the basis of past experience, to project particular populations 30 - 50 years into the future. The value of population projections lies, not in their prophetic qualities, for it cannot be too strongly emphasized that no attempt is made to predict what the total population of a community will be at some future date, but in their examination of what consequences must ensue if no unforeseen agencies intervene to affect drastically past trends. From this examination, it is possible to suggest the general factors which must be taken into account before any attempts be made to change the size of the population - either through migration or by alteration of birth or death rates. At the same time, the projections of past trends are valuable in that they suggest possible population changes which will affect legislation in the fields of housing, educational policy and pensions. Strictly speaking then, the population processes to be studied here are useful mainly as a frame of reference within which population problems may be studied profitably.

Accordingly no attempt is made to predict future events, nor is there any attempt to assess the importance of all past events. Wars, migration, epidemics, famines, depressions, affect the orderly sequence of events, but an accurate prediction of the effects of such phenomena in the future is impossible. Because of this we consider only those processes of population change which on the basis of past experience are likely to continue regardless of the pressure of more dramatic developments. The processes of change here described stem from very definite assumptions made on the basis of past events, and upon an orderliness of events unaffected by crises. Accordingly the results are true only under these assumptions, and they have predictive value only to the extent that the assumptions are valid.

Computations were made not within the scope of one set of assumptions only, but upon different assumptions which may reasonably be taken to circumscribe the likely course of events. In this way, it was thought possible to assign certain limits within which the population will probably lie unless unforeseen agencies are brought to bear upon its maintenance or unless active steps are taken to avoid the consequence of present conditions.

The most usually acceptable way of making population projections is to take the nearest accurately known population and to apply to each age group a given set of fertility and mortality rates. These can be selected in two ways. We can use the fertility and mortality rates of the time at which the projection is made, or we can assume that these rates change in the future in a way which is logically related to their past history. The first of these ways gives a dramatic picture of the effects of current fertility and mortality on population growth, but it is unlikely that such estimates will correspond at all closely to actual future populations, since modern history affords us no example of such stability over any lengthy period. The history of all countries of which we have statistical knowledge is one of continuous decline in both fertility and mortality over the past 100 years with slight temporary fluctuations.

Though uniform Dominion-wide statistics are of very recent date in Canada, there is sufficient evidence to indicate that our history conforms to the general pattern. The trend in fertility before the period covered by vital statistics is discussed in Census Bulletin F-1. The trend between 1921 and 1939 is shown in Figs. 13 & 14. Our knowledge of changes in mortality is even scantier, but what little we know of mortality conditions in earlier years and the changes between 1931 and 1941^x indicate that the improvement in mortality has followed much the same course as elsewhere. Hence all the estimates to be presented are made in the second of the two ways described above, i.e., they all assume that both fertility and mortality rates will continue to decline in some way.

The projections of the present study show the population of Canada from 1940 to 1971, not as it will be but as it would be under two sets of assumptions. Four estimates have been computed: Estimates A and B are based on one set of assumptions, Estimates C and D on the other. Both sets have one assumption in common - that no migration takes place over the Canadian border or between provinces during the period. This is necessary because past experience gives no basis for assuming any consistent trend. The rapid influx of population to Canada ceased before the first World War and was followed by a period of loss to the United States and some gain from Europe. Unless some new development occurs which would lead to a reversal of present immigration policies, it does not seem likely that external migration will greatly affect the future size of the population.

With respect to vital rates, the assumptions for the estimates diverge. For Estimates A and B the method devised by F. W. Notestein and colleagues for projection of European populations was used.^{xx} Estimate A is the result of the application of the hyperbolic curves drawn by Dr. Notestein for Europe to Canadian fertility and mortality rates. The assumption made is that both mortality and fertility in Canada will fall and that their fall will be at the rate shown by the various countries of Europe when they were at the levels at which we now stand. Canadian experience over the past twenty years shows a moderately close correspondence with the rates of fall derived from European data. The mortality rates between 1921 and 1941 fell somewhat faster than Notestein's curves would indicate while the fertility rate fell somewhat slower. Because of this, the rates used are different from those

^x Census Monograph No. 13, Canadian Life Tables, 1931; Canadian Life Tables, 1941; Bulletin F-1.

^{xx} "The Future Population of Europe and the Soviet Union" (League of Nations, Geneva, 1944), ch. 1 and appendix I.

which would have been predicted on the basis of Canadian experience alone with the result that the population projected in Estimate A may be considered a minimum limit. The justification for such a projection lies in the fact that it makes possible a comparison of Canadian results with those which Dr. Notestein shows for European countries. In Estimate B the same process is applied to each province individually. The Canadian total of Estimate B differs from that of Estimate A in that it is a total of the results of provincial projections. This gives a slightly higher total population than that obtained by treating Canada as a unit.

In Estimates C and D the same assumptions are made about mortality as in Estimates A and B, since the difference between Canadian and European experience was slight over all age groups taken together and would have little effect on total population size. Future fertility rates in these assumptions were based solely on Canadian experience from 1931 to 1939. Since this was a period of rapid decline in fertility, the projection of fertility for Canada as a whole is identical with that obtained from Estimate A but there are considerable differences in provincial rates of fall. However, a second difference in assumptions results in a larger future population in Estimates C and D. The Notestein projections ignored the effect of World War II on demographic trends. The course of Canadian vital trends in wartime^x makes it probable that this procedure would under estimate the numbers of future births. Hence we have assumed that fertility rates will decline from their wartime peak until they reach the 1939 level in about 1946. Thereafter, they will decline in the manner just described. According to Estimates C and D, therefore, the effect of World War II in Canada would be a net gain in births.^{xx}

At the same time, Estimates C and D consider the effects of internal migration trends during the war period because in both the projection is based on the estimated population of June 1, 1944. Whether the post-war period will see a shift in internal migration would be difficult to predict. An analysis of the trend since 1921 with its emphasis on rural-urban migration would appear to be basic, in spite of the opening up of the Prairies and some backing up on the land during the depression. Since 1921, five provinces have shown consistent movements, - into Ontario and British Columbia and out of Prince Edward Island, New Brunswick and Manitoba. Saskatchewan gained somewhat in the 1921-31 period and lost heavily thereafter. It would appear that the urban future of Ontario and British Columbia is firmly established and that some movement in that direction will continue from Prince Edward Island, New Brunswick, Manitoba and Saskatchewan. Since some recession from the 1944 level may be expected, our estimates should give relative provincial size fairly well in the near future, but thereafter internal population movements may change the picture materially.

Provided the assumptions of a continuance of secular trends in fertility and mortality agree with future experience, these estimates provide limits to the probable future population of Canada. Estimates A and B, as has been said, show a lower limit; Estimates C and D show an upper limit. Details of the assumptions made will be set forth in the next section.

Population figures for Estimates A, B and D are given in Basic Tables 1, 2 and 3. Estimate C will only be referred to incidentally since it adds little in-

^x Charles "Canadian Vital Statistics During the War Years", Can. Journ. Pub. Health, November, 1944.

^{xx} For a more detailed account see Appendix.

formation of value. We recommend that readers who wish to use a figure for future populations without going into methodological details or forming their own judgment of the relative probability of the different estimates, should use the figures of Estimate D. Populations for years and age groups not shown in the table can be obtained by simple interpolation. Sections 2, 3, and 4 give a brief description of the results and the main features are summarized in Section 5. Technical details of the methods used will be found in the appendix.

The following points should be borne in mind when reading the tables:

(a) No internal or external migration is assumed in Estimates A and B after 1941, and in Estimate D after 1944.

(b) All populations are overestimated by the amount of military deaths after June, 1941. These were not known completely at the time the estimates were made. They are of the order of 35,000.

(c) Estimate A relates to all Canada, Estimates B and D to the nine provinces, excluding Yukon and the Northwest Territories.

(d) In Estimate A the populations are of January of the given year. In Estimates B and D the populations are of June of the given year.

(e) Estimate A is based on the official Census population. Hence the age-group 0-4 years in 1941 is underestimated throughout.

(f) Estimates A and B are made on similar assumptions, the difference between them being due to the fact that Canada as a whole is the unit in the former, and the individual provinces are the units in the latter. Estimate D is based on a different set of assumptions.

(g) In Estimates A and B the base year is 1941. Hence the age structure of the estimated population of 1940 does not correspond precisely to that of subsequent populations. Similarly in Estimate D the base year is 1944, and so the age-structure of the 1941 population does not correspond precisely to that of later years.

Since so much misconception exists as to the predictive value of population projections, it may be well to reiterate some of the main points involved. Population projections are in the first instance solely statements of the results of current trends in fertility and mortality. As such they are useful as a guide to public policy and it is irrelevant whether or not they agree with the actual population of the future. Administrators and citizens are, however, not content to stop at this point but require to know what is the most probable estimate of the future population. To answer this judgment is required to decide in what way future events are likely to modify the operation of past trends. The difficulty is well illustrated by the difference in the numbers of births postulated in our two sets of estimates. Though, as far as we know, nothing has occurred to reverse the trend towards smaller families, temporary fluctuations of great magnitude in the number of births are seen in response to short-term changes in economic conditions. The smaller the family gets, the more pronounced are these fluctuations, since first and second births form an increasing proportion of the total and these follow pretty closely the marriage rate, which in turn follows the trade cycle. Consequently, predicting the most probable number of births, even a year ahead, involves predicting, among other things, the amount of unemployment.

In spite of the difficulties, the statistician cannot escape the responsibility of contributing his judgment as to the probable future course of population. Though as liable to error as that of any other citizen, his opinion may be somewhat more well-informed. It is the opinion of the authors of this report that, in the absence of any migration movements, either internal or external, and with allowance for military deaths which have not been included, the most probable future population of Canada will lie between the upper and lower limits of the estimates shown, and most probably nearer the upper limit.

2. RESULTS

(i) Canada as a whole

The population of Canada began to increase rapidly after 1900 with the impetus given it by European migration. After 1931, with the restrictions placed upon immigration, the population has continued to grow, but at a rate which is becoming progressively smaller. Thus the decennial rate of increase which was 34 p.c. and 22 p.c. in the expanding period 1901-1921 was less than 11 p.c. in the last census period 1931-1941.^x Estimate B assumes the same rate of increase in 1941-51 and Estimate D a slightly higher rate, but with both the assumed trends in fertility and mortality the rate of increase will continue to decline and the population will reach a maximum by the end of the century. Thereafter it will decline slowly. On the bases of Estimate C, assuming fertility and mortality remain unchanged after 1970, the population would reach its maximum of 15 million around 1990.

The total populations according to Estimates B and D are shown in Fig. 1. When war-time trends are taken into account, Estimate D shows a continued upward trend of numbers which should reach an upper limit in the last decade of the century. Estimate B, on the other hand, shows an upward trend that begins to flatten out rather perceptibly after 1961. The increase of population will continue to become progressively smaller in the near future even without any further decline in fertility, for the population is aging as a result of declining fertility in the past and this means more deaths and fewer births. Fig. 2 illustrates the change in age structure of the population between 1941 and 1971 for Estimate B. Estimate D would show an age structure similar in the older ages but with larger numbers in the ages 0-29. Both show a decrease in the number of births and children to age 14. In spite of a favourable age structure, a continuation of past trends would lead to a net reproduction rate falling below unity about 1950 to 1955, and hence to an ultimately declining population. This suggests that social action directed to stabilizing family size at a level adequate for a stationary or moderately increasing population would have more chance of success in the next ten to fifteen years than at a later period when fertility rates may have fallen below the desired level.

(ii) Provinces and Regions

The rate of increase in numbers for Canada as a whole does not represent the trend in the provinces separately. Differences in economic and cultural conditions influence birth and death rates and the resultant populations vary in size and age structure. The proximity of the frontier period in Canadian history has affected the trends in population for the various provinces. Nevertheless, by 1941 the decennial increase was fairly similar for all.^{xx} In the older regions, growth since 1901 has been reasonably consistent although the Maritime region has fluctuated considerably. Before 1931, Prince Edward Island shows an undulatory trend with a decrease in population which reached its largest amount between 1901 and 1911. Nova Scotia shows a growth which became progressively smaller until 1901, and then rose in the subsequent two decades. In the 1921-31 period it shows a loss. The New

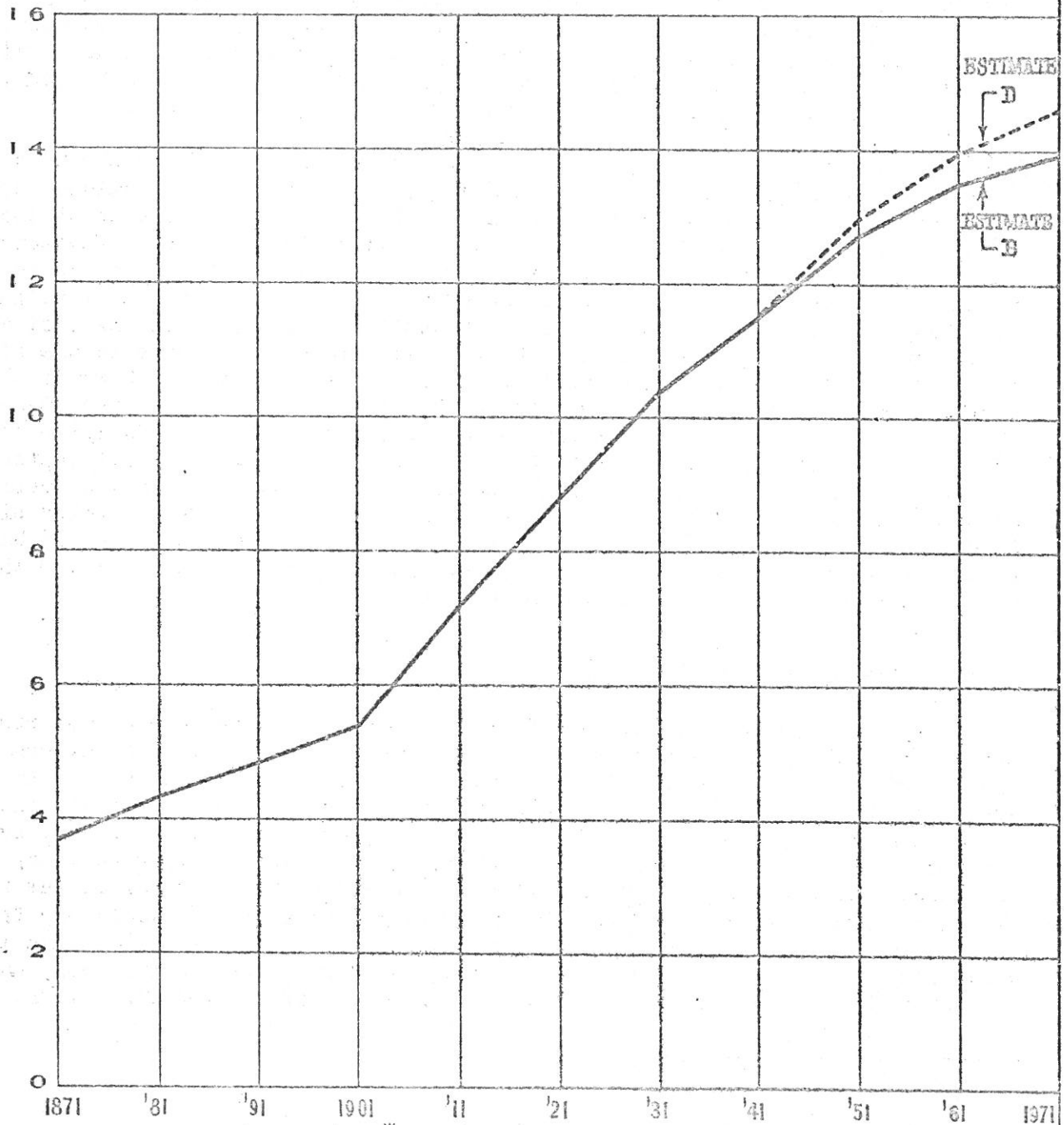
^x The Canada Year Book 1943-44 (Ottawa, 1944) p. 78.

^{xx} Vide Canada Year Book 1943-44. Ch. IV, Section 1.

Figure 1

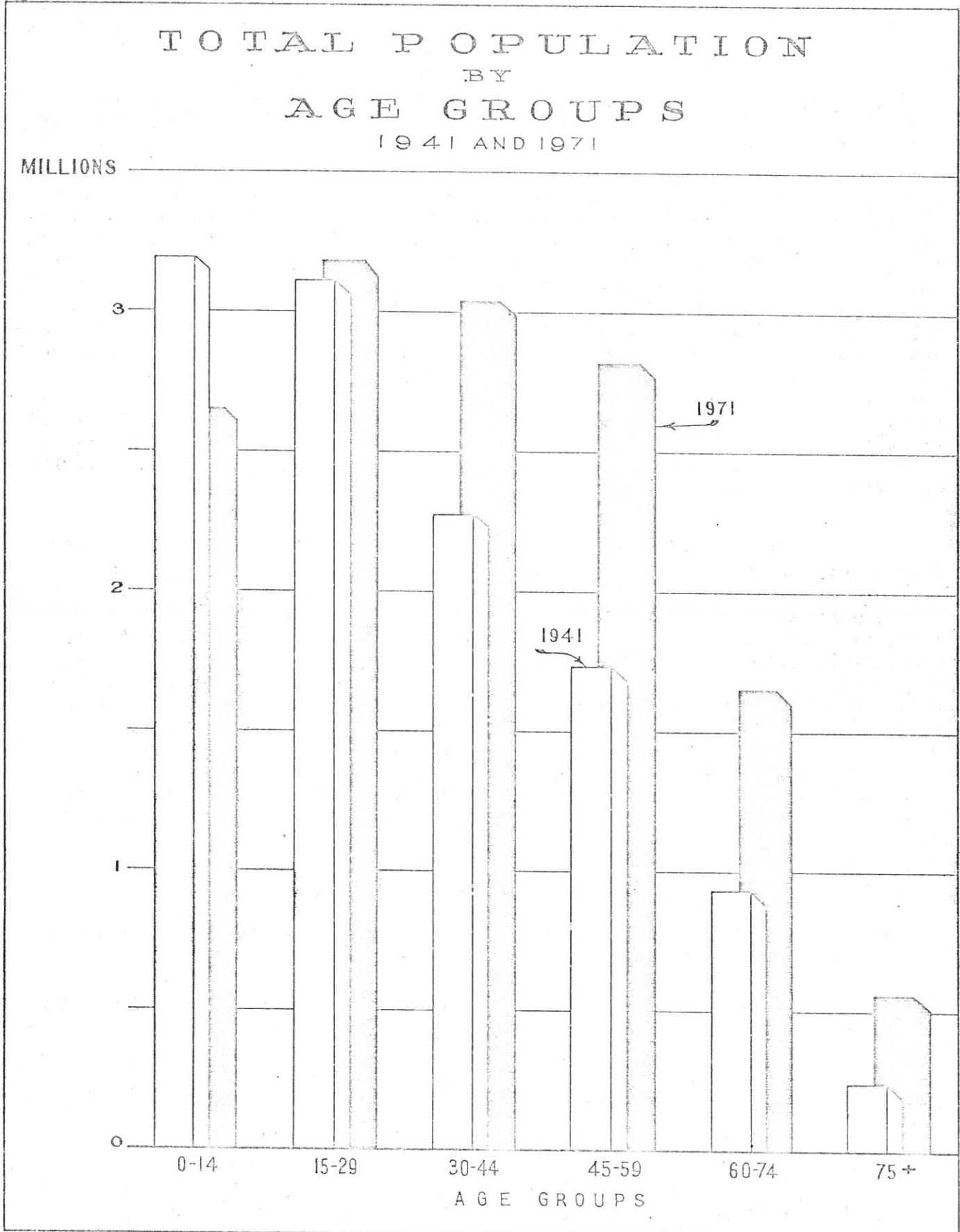
POPULATION TRENDS IN CANADA * 1871 - 1971

MILLIONS



* Yukon and N.W. Territories omitted from 1911-1971

Figure 2



Brunswick trend has been similar to that in Nova Scotia, although in no decade does it show population loss. The region as a whole shows a population increase in the 1931-41 period which, it has been suggested, was due to lack of inducement to migrate during the depression years.^x The population of Quebec, 1901-1931, increased at a fairly constant rate, and the same was true for Ontario. The greater increase occurred in Quebec. In the 1931-41 period, both show a smaller increase, that in Ontario falling faster than that in Quebec.

The Western provinces, which were affected most by the immigrant surge after 1901, show trends similar to the older regions in the 1931-41 period. Manitoba received its greatest increment of growth in the late nineteenth century, and since then the population increase has fallen until in 1931-41 its numbers increased only 4.2 p.c.^{xx} Saskatchewan and Alberta show an even more precipitous decline, the total population in Saskatchewan having decreased in the 1931-41 period by nearly 3 p.c. Both Manitoba and Alberta show increases in population which are lower than their natural increase. In all three the declining growth appears to be the result of the depression, the prolonged drought, and immigration to Ontario and British Columbia. Though British Columbia, like the rest of the west, shows both a numerical and percentage increase in 1931-41 lower than that for the preceding decade, its percentage increase is larger than any other region in Canada, being 17.8 p.c. - nearly 2 p.c. greater than the next highest, Quebec. This is mostly due to migration from the Prairies.

As has been said, the Canadian population appears to have been growing less rapidly in every decade after 1911. With the exception of the Maritimes, the separate regions have shown a similar trend. And although the Maritime provinces show a percentage increase in the 1931-41 period higher than for any period after 1901, the increases are lower than the natural increase would allow.^{xxx} Future population growth as described by the projections of this study are the logical continuation of this trend without the disrupting influences of war and migration. A summary of detailed projections by province and by region is given in Table I. It must be remembered that the projections for individual provinces are of a highly tentative nature, for it is impossible to make any probable estimate of the extent of internal migration in the post-war period. The effects of internal migration upon provincial populations for the period 1941-44 may be seen if the population sizes for each province according to Estimate B and D are compared by

^x O. A. Lemieux, "Population Changes Revealed by the 1941 Census", Canadian Journal of Public Health, Vol. 35, No. 3, pp. 120-131.

^{xx} Canada Year Book. op. cit., p. 81 for percentage changes of population 1871-1941.

^{xxx} O. A. Lemieux, op. cit., pp. 125-124.

decade for all age groups unaffected by fertility rates after 1939. Because internal migration disturbs provincial population size to this extent, any observations made in the following discussion about provincial or regional trends should be accepted with the greatest of caution and with a constant reference to the assumptions upon which they are based.

According to the projections for Estimate D, the first province to reach its maximum population is British Columbia. Accounting for about 7 p.c. of the population of Canada, it should reach its maximum about 1960. With the lowest fertility rate, it is in an unfavourable position for future growth although immigration during the war years may affect the trend markedly. The increase in population over the whole period 1941-1971 is 21 p.c., which is higher than that for Ontario, Manitoba and Saskatchewan. According to Estimate B, British Columbia reaches its maximum population after 1951 and declines in the 1961-71 period by nearly 3 p.c. In the whole period, 1941-71, the increase in population is only 1.5 p.c. It must be remembered that Estimate B assumes no internal migration after 1941 and hence does not take into account the industrial expansion on the west coast which the war engendered.

TABLE I. - POPULATION PROJECTIONS FOR CANADA AT TEN YEAR INTERVALS, 1941-1971
(000's omitted)

	Estimate B				Estimate D		
	1941	1951	1961	1971	1951	1961	1971
CANADA	11,490	12,722	13,504	13,917	12,943	13,963	14,606
Maritime Provinces.....	1,130	1,278	1,398	1,495	1,283	1,436	1,573
Prince Edward Island .	95	106	116	124	99	112	124
Nova Scotia	578	643	691	726	366	728	778
New Brunswick	457	529	591	645	518	596	671
Quebec	3,332	3,822	4,193	4,453	3,897	4,354	4,701
Ontario	3,788	4,051	4,154	4,142	4,180	4,342	4,382
Prairie Provinces	2,422	2,711	2,904	2,997	2,609	2,838	2,960
Manitoba	730	804	843	853	787	835	854
Saskatchewan	896	1,007	1,092	1,136	923	1,011	1,062
Alberta	796	900	969	1,008	899	992	1,044
British Columbia	818	860	855	830	974	993	990

Ontario, with the next lowest fertility rates, is the first province after British Columbia to reach its maximum population. Estimate B suggests that this will occur by 1961. In the whole period 1941-71 the percentage increase is 9.3. Estimate D shows a population which continues to increase after 1971, although the trend suggests that a turning point will be reached soon after that time. In the period 1941-71 the percentage increase of population is 15.7, the lowest increase for all provinces, and less than half the increase for Quebec.

The population positions for Quebec and Ontario are reversed by 1971. Fertility rates for Quebec fall more rapidly in the period than those of any other province. But the early decline in the birth rate in Ontario places it in an unfavourable position for future growth, while the fall of the Quebec rate does not

reach the Ontario level of 1920 until 1940. Because of the difference in demographic position, Quebec by 1960 will have a population nearly equal to that of Ontario and after that time will increase in size somewhat above that of Ontario. Nevertheless in both Estimates B and D, Quebec is approaching a turning point in population, the percentage increase in the 1941-51 period of 15 p.c. falling in the 1961-71 to 6 p.c. for Estimate B, and from 17 p.c. to 8 p.c. for Estimate D. If fertility were to continue to decline in the future as in the past, the population of both provinces would ultimately decline at approximately the same rate.

A similar trend to that of Quebec is shown for the Maritimes. Growth continues in the three Maritime provinces to 1971 but it does so at a slower rate for each subsequent decade. For the region as a whole the percentage increase drops from 13 p.c. in the 1941-51 period to 7 p.c. in the 1961-71 period by Estimate B. Estimate D shows a drop from 13.5 p.c. to 9.5 p.c. for the same period.

The population trends in the Prairie region suggest that a declining population will be reached sooner than in Quebec or the Maritimes. Estimate B shows an increase by 1971 of 24 p.c. over the total population of 1941. When the exodus of workers in the 1941-44 period is taken into account, Estimate D shows that the percentage increase falls to 22 p.c.

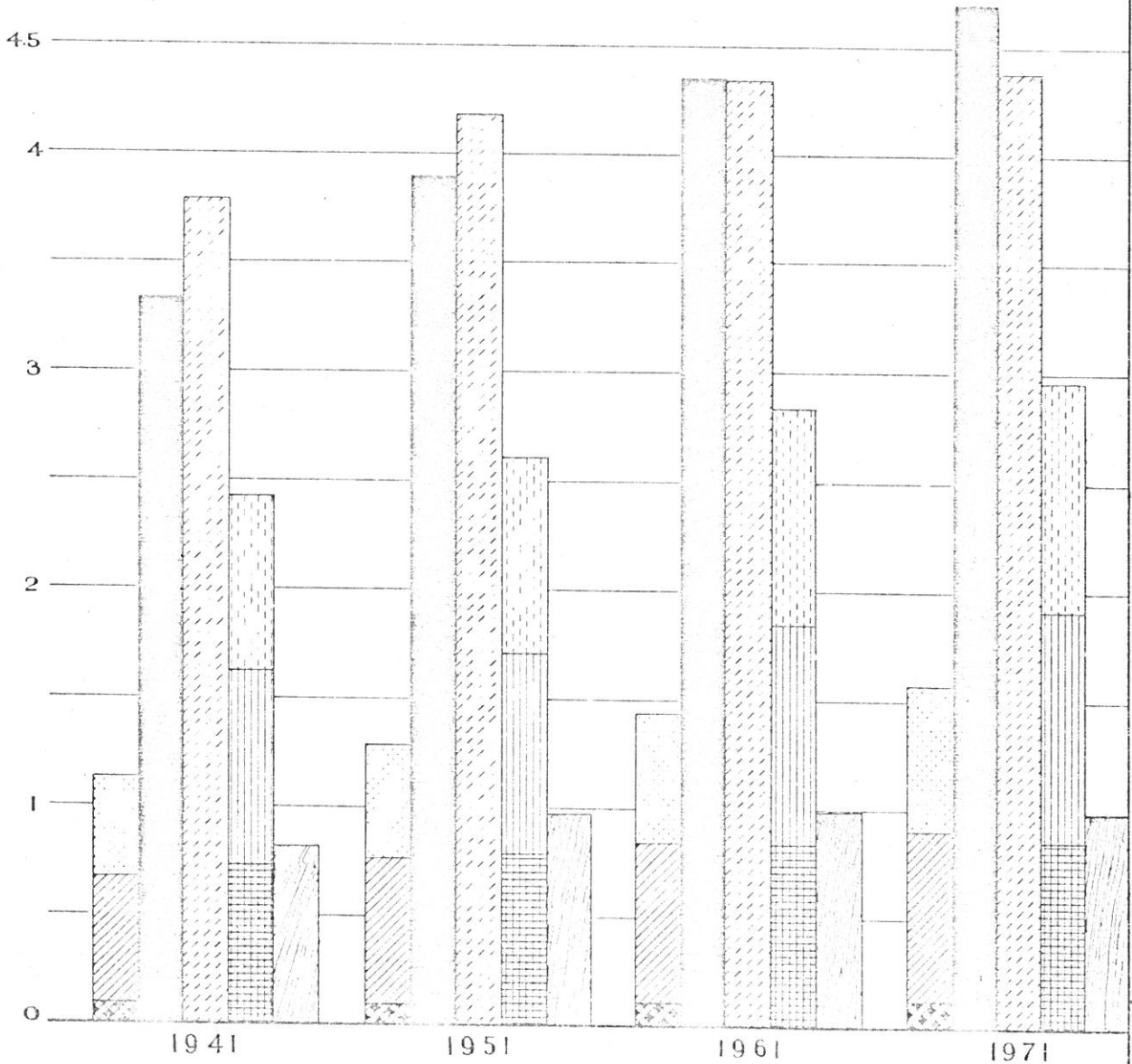
According to the rates of fall assumed up to 1971 in Estimate B, no province could at that time, expect an increasing population far into the future. According to Estimate D, Prince Edward Island and New Brunswick would still have increasing populations in 1971 if no further fall in fertility occurs. Regional differences in population growth are illustrated for Estimate D in Fig. 3. In 1941, the largest population was concentrated in Ontario. By 1961, Ontario and Quebec should have similar populations although both increase throughout the period. By 1971, Quebec grows to a figure larger than Ontario. In terms of percentages of the Canadian population, Quebec increases from 29 p.c. in 1941 to 32 p.c. in 1971, while Ontario decreases from 33 p.c. in 1941 to 30 p.c. in 1971. Despite growth, the proportions in the Prairies and the Maritimes remain almost constant; the proportion in the former region is 1 p.c. less, in the latter 1 p.c. more by 1971. British Columbia, with almost constant population throughout the period, maintains a constant proportion of the population. Similar illustrations for Estimate B would show little difference. The proportion of the population in the Prairies would be constant despite continued growth. The Maritimes would show a percentage increase of about 1 p.c., while British Columbia with almost constant population would show a percentage decline of over 1 p.c. by 1971.

The age pyramids (Fig. 4) show the age composition projected for 1971 (Estimate D), superimposed upon that of 1941. The age structure of the Maritimes in 1941 suggests potentialities of growth for some time in the future for the weight of population is in the younger ages. The same is true for Quebec and the Prairies. Ontario in 1941 shows signs of a potential population decline since the younger age groups are smaller than their predecessors and the same is true for British Columbia.

Figure 3

DISTRIBUTION[#] OF THE POPULATION BY REGIONS 1941 - 1971

MILLIONS

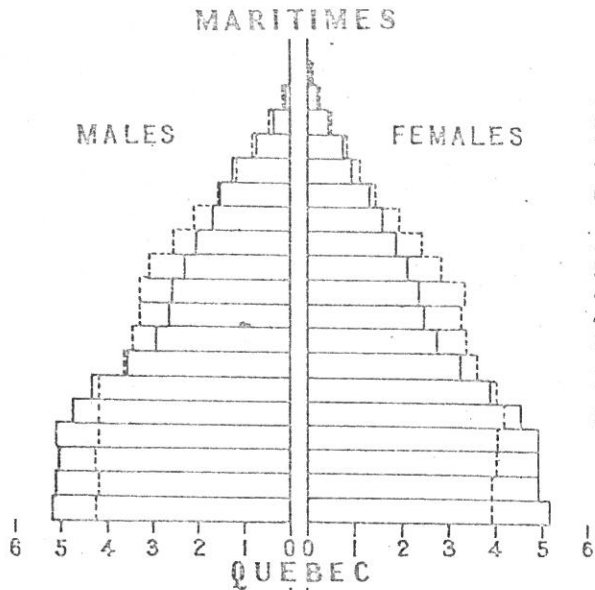


[#] Estimate D

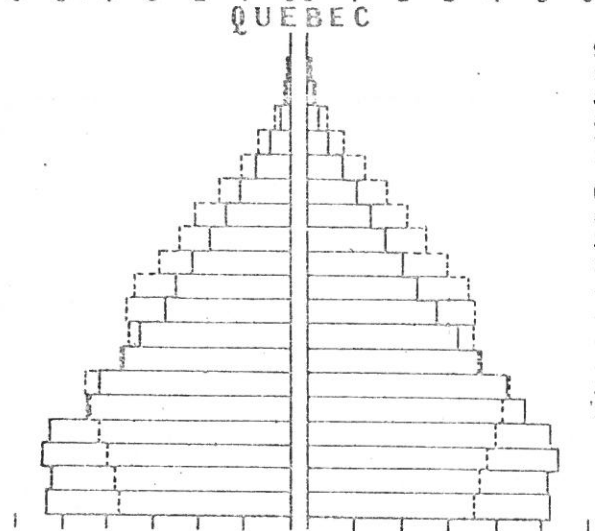
Figure 4

AGE PYRAMIDS OF PROJECTED POPULATION BY REGIONS 1941-1971

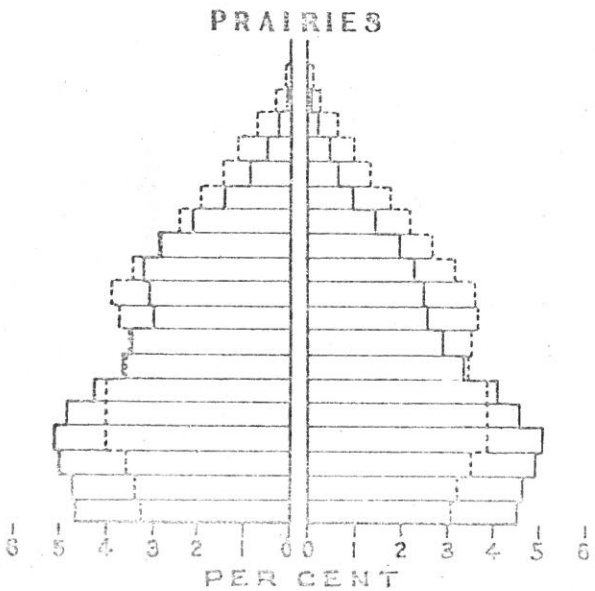
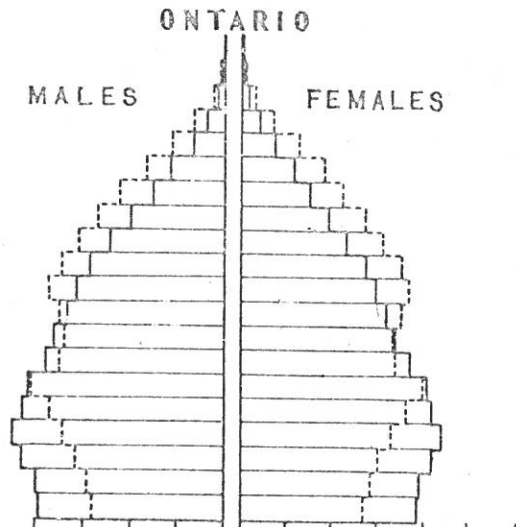
1941 ———
*1971 - - - -



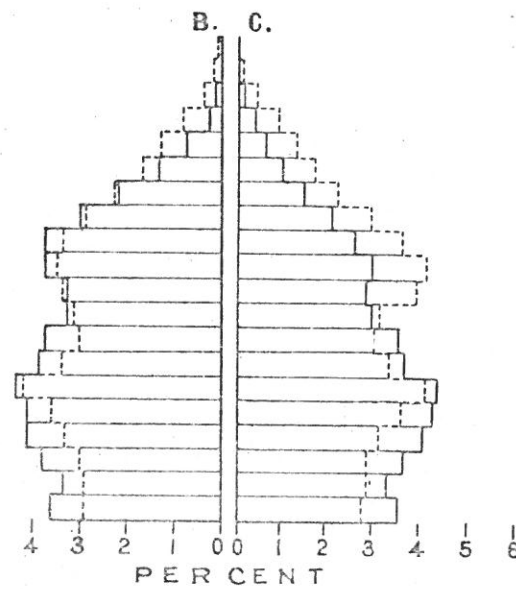
95 +
90 - 94
85 - 89
80 - 84
75 - 79
70 - 74
65 - 69
60 - 64
55 - 59
50 - 54
45 - 49
40 - 44
35 - 39
30 - 34
25 - 29
20 - 24
15 - 19
10 - 14
5 - 9
0 - 4



95 +
90 - 94
85 - 89
80 - 84
75 - 79
70 - 74
65 - 69
60 - 64
55 - 59
50 - 54
45 - 49
40 - 44
35 - 39
30 - 34
25 - 29
20 - 24
15 - 19
10 - 14
5 - 9
0 - 4



95 +
90 - 94
85 - 89
80 - 84
75 - 79
70 - 74
65 - 69
60 - 64
55 - 59
50 - 54
45 - 49
40 - 44
35 - 39
30 - 34
25 - 29
20 - 24
15 - 19
10 - 14
5 - 9
0 - 4



* Estimate 0

By 1971, the shape of the population structure for Ontario, British Columbia and the Prairies shows signs of bulging in the middle years and tapering at the base. In Ontario and the Prairies there are fewer children and young people up to age 20 in 1971 than in 1941, but the total population continues to grow because the increases in the ages over 20 exceed the losses below that age. Estimate B shows fewer people in 1971 than in 1941 up to age 35 for Ontario and to age 20 for the Prairies. For British Columbia, Estimate B, the increase in the years after 35 just balances the loss for ages under 35. Estimate D suggests slight numerical losses for ages under 15 years and small gains above that age.

The Quebec age profile also shows signs of tapering at the base. By 1971, all age groups except the first increase numerically in the 1941-71 period. The percentage increase for the period tends to rise with age. The Maritime region possesses the best profile for future growth. In Estimate D, all age groups are larger in 1971 than in 1941; in Estimate B, there is a slight decline in the ages under 15.

3. COMPARISON OF CANADIAN POPULATION TRENDS WITH EUROPE AND THE UNITED STATES

As has been said above, Estimate A was computed to allow comparison with population trends in Europe and the Soviet Union. The trends of Canada, Europe, some selected European countries, and the United States, projected for 1940-1970, are shown in Fig. 5. The absolute and per cent change for the period in projected total population is illustrated in Fig. 6. In Europe,^x the general conclusion may be drawn that the trend is toward slower growth and ultimate decline within a generation.^{xx} A maximum population of 421 million should be reached, according to the assumptions, about 1960, and a constant population of about 420 million should continue over the period 1955-1970 with a variation of less than 2 p.c.^f (Table II)

The various parts of Europe are not all at the same stage of development. The United Kingdom and Ireland reach a maximum population first - about 1945.^{ff} In the 1940-1970 period the population decreases by about 7 p.c. The Netherlands, which is demographically somewhat similar to Canada, (i.e., has relatively high fertility and low mortality rates) reaches a maximum population by 1965, and maintains a constant position in the subsequent five-year period. The regions in southern and eastern Europe, on the other hand, continue to grow throughout the period, although at reduced rates of increase.

The U.S.S.R., unlike Europe, shows enormous potentialities for growth. The increase in population for the period 1940-70 of 77 million is an increase of over 44 p.c. of the 1940 population.^{xf} It is the only country in the Western world which, on the basis of past trends, indicates possibilities for continued growth.

^x Europe in the sense used here includes that part of the continent west of the 1937 boundaries of the Soviet Union.

Vide: F. W. Notestein et al., op. cit., pp. 20 - 21.

^{xx} I. B. Taeuber: "The Development of Population Predictions in Europe and the Americas". *Estadística*, September, 1944, p. 333.

^f F. W. Notestein et al., op. cit., p. 46.

^{ff} *ibid.*, p. 60

^{xf} *ibid.*, p. 68.

Figure 5

POPULATION TRENDS OF SELECTED DEMOGRAPHIC REGIONS 1940 - 1970

MILLIONS

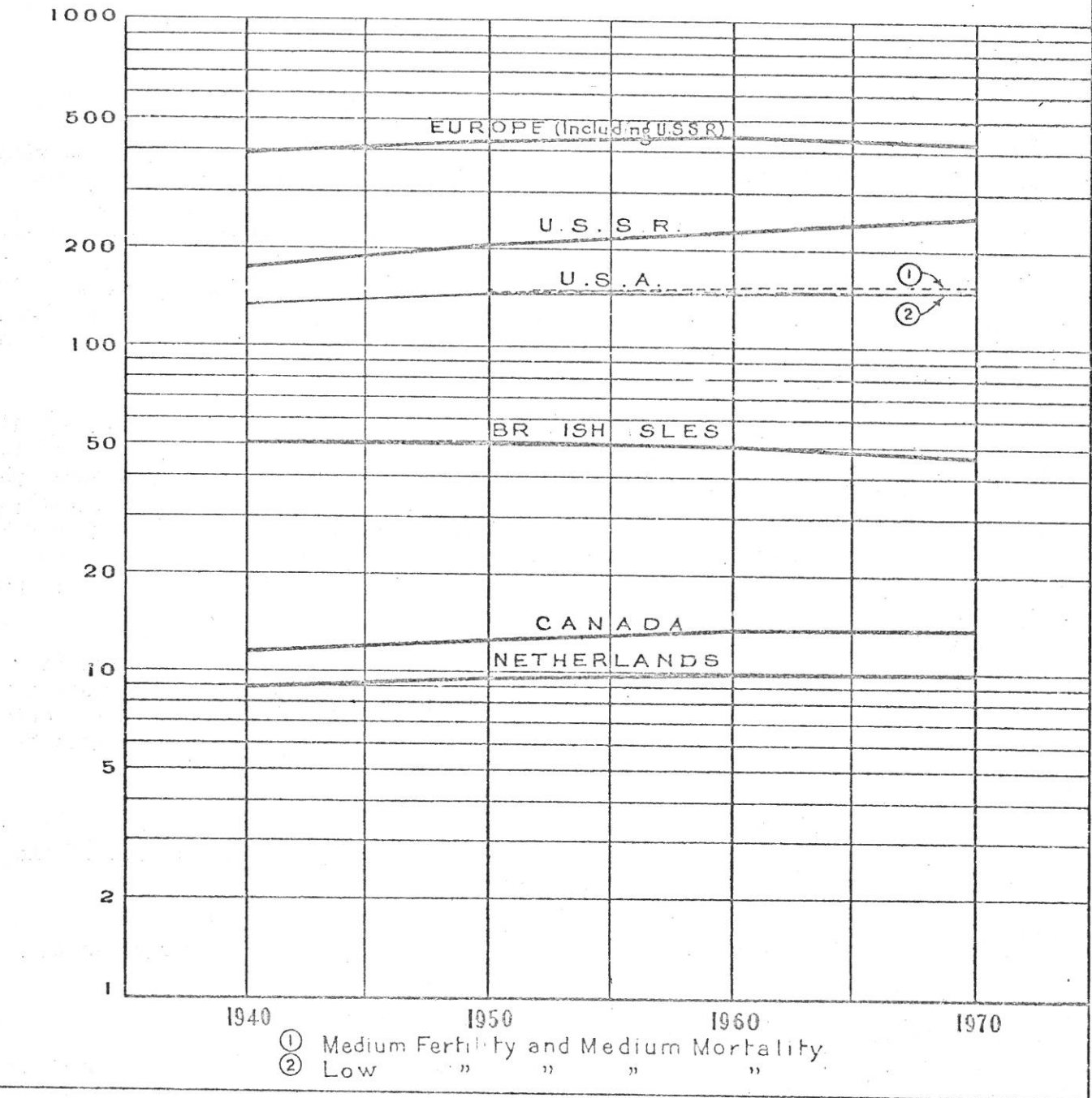
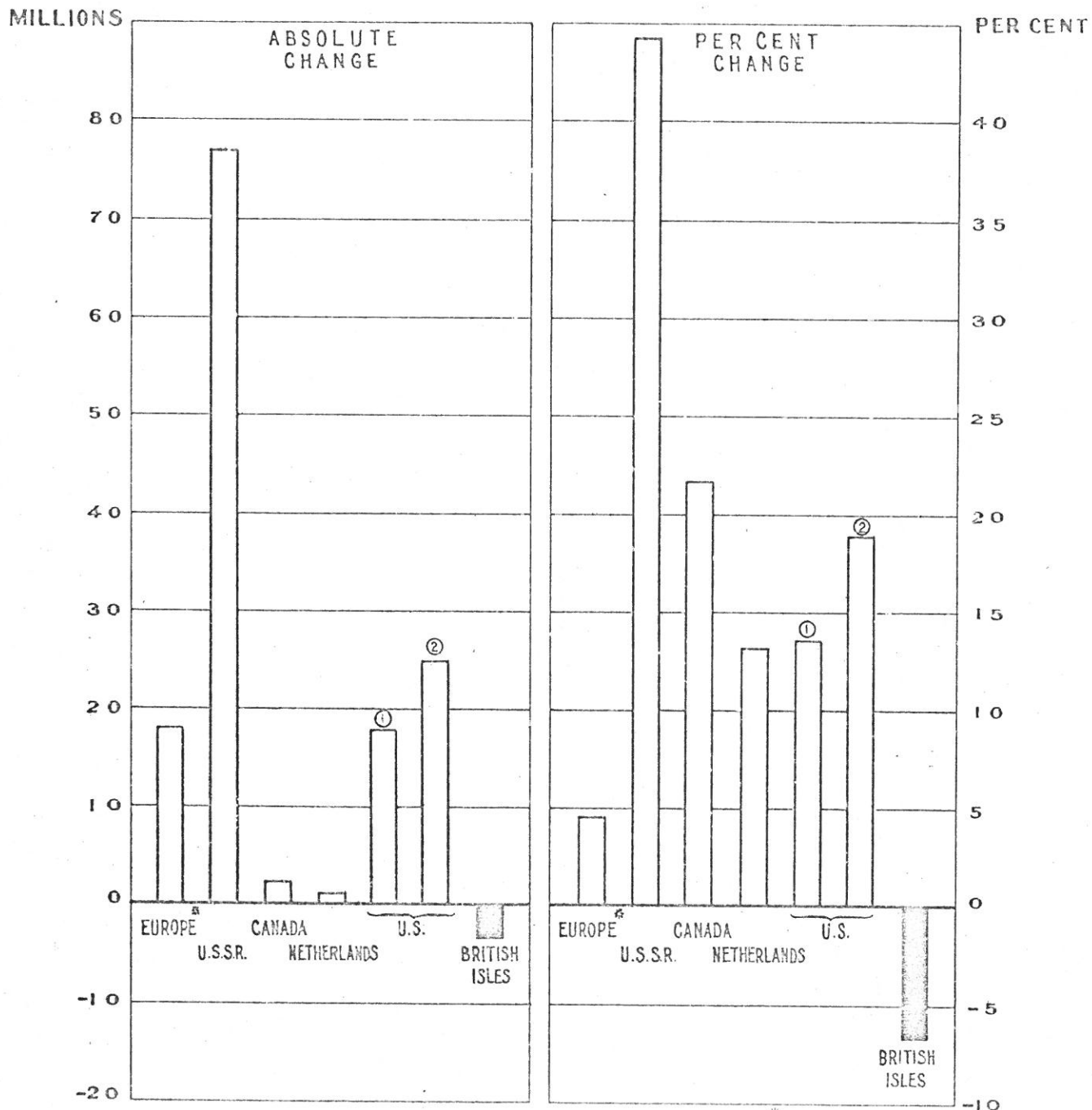


Figure 6

ABSOLUTE AND PER CENT CHANGE FROM 1940 TO 1970 IN PROJECTED TOTAL POPULATION OF SELECTED REGIONS



* Excluding U.S.S.R.
 ① Low fertility, medium mortality
 ② Medium " " "

TABLE II. - PROJECTED TOTAL POPULATION FOR SELECTED REGIONS AT TEN-YEAR INTERVALS.

1940 - 1970

000's omitted

	1940	1950	1960	1970
Europe ^x	399,000	415,000	421,000	417,000
U.S.S.R. ^x	174,000	203,000	228,000	251,000
Netherlands ^x	8,840	9,550	9,950	10,000
United Kingdom and Ireland ^x	50,200	50,600	49,400	46,800
United States ^{xx} (1).	132,532	143,896	151,646	157,442
(2).		143,148	148,393	150,476
Canada	11,363	12,576	13,393	13,821

^x F. W. Notestein et al: "The Future Population of Europe and the Soviet Union".

^{xx} W. S. Thompson and P. K. Whelpton: "Estimates of Future Population of the United States". (1) medium fertility, medium mortality, no immigration.
(2) low " " " " "

Both Canada and the United States appear to be following the trends evident in Europe. Canada continues to grow throughout the period but at a decreasing rate. It is demographically less advanced than the United States. The two estimates shown for the United States are not computed in the same manner as those for Europe and Canada. Hence some caution must be exercised in their use. The estimate based on low fertility, medium mortality, no immigration, and that based on medium fertility and mortality, no immigration, seem to be most nearly comparable to those of Europe, the U.S.S.R. and Canada.^x Like Europe and Canada, both these estimates suggest a maximum population for the United States before the end of the century. The low fertility estimate suggests that the maximum will be reached by 1970; the assumption of medium fertility pushes the turning point forward to 1985.^{xx} Confining our comparisons to Europe, where the assumptions are the same, we see that in the period 1940-1970, Canada increases proportionately faster than any European country except the U.S.S.R., Roumania and Yugo-Slavia.

The difference in stages of demographic development may be seen in the age structure. Europe in 1940 (Fig. 7 & 8) shows a population at the turning point; the population is concentrated in the age groups below age 35 but the earliest age groups are no larger than their predecessors. The age structure of the U.S.S.R., which reveals the great gashes caused by war, civil disorder, famine and abortion,^{xxx} nevertheless, shows potentialities for continued population growth. The Netherlands has an age profile similar to that of Europe as a whole but shows the possibility of some further growth. Canada shows more potentialities of growth for some time in the future. Even though the population under 5 is smaller than the population 15-19 years of age, the weight is definitely based on the younger ages.

^x W. S. Thompson and P. K. Whelpton, "Estimates of Future Population of the United States". National Resources Planning Board, Washington, 1943.

^{xx} *ibid.*, p. 29.

^{xxx} F. W. Notestein, et al., *op. cit.*, p. 114.

Figure 7

AGE PYRAMIDS OF PROJECTED POPULATION FOR EUROPE AND U.S.S.R. 1940 - 1970

1940 ———
1970 - - - - -

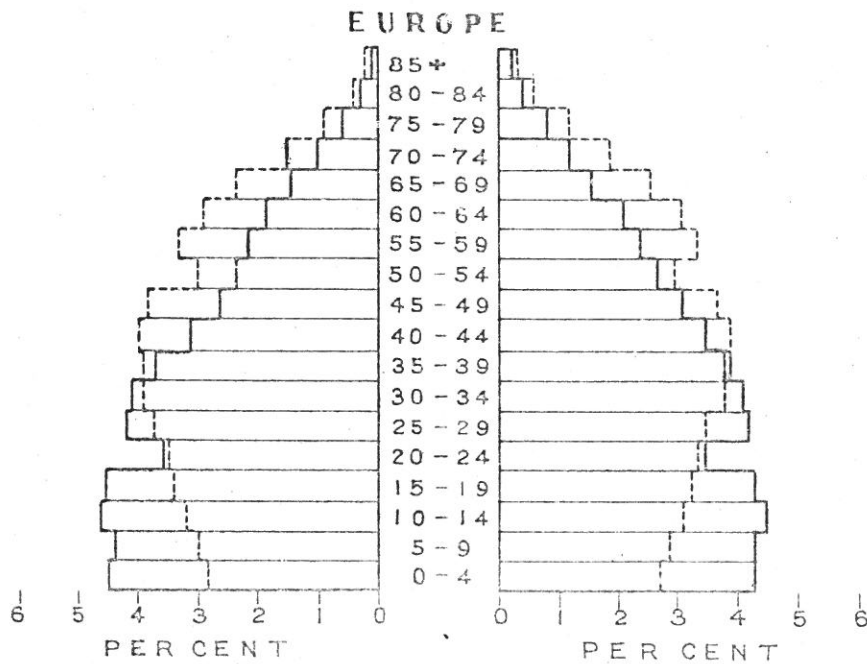
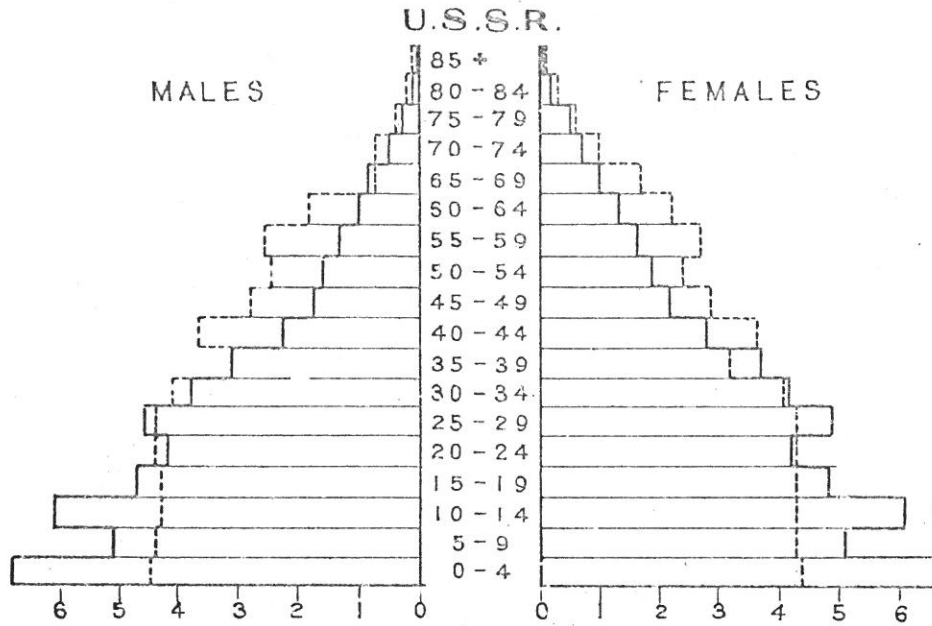
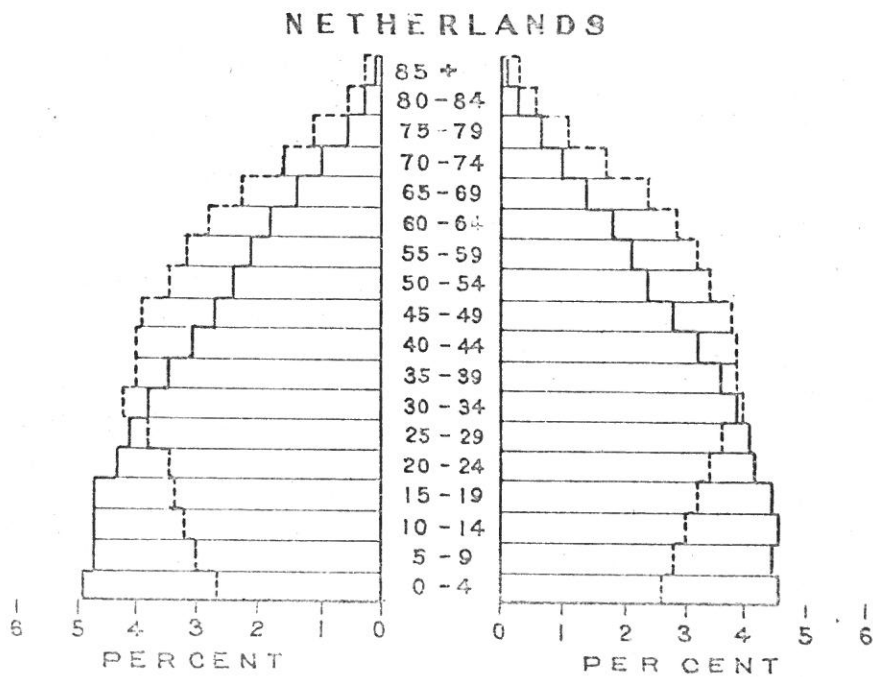
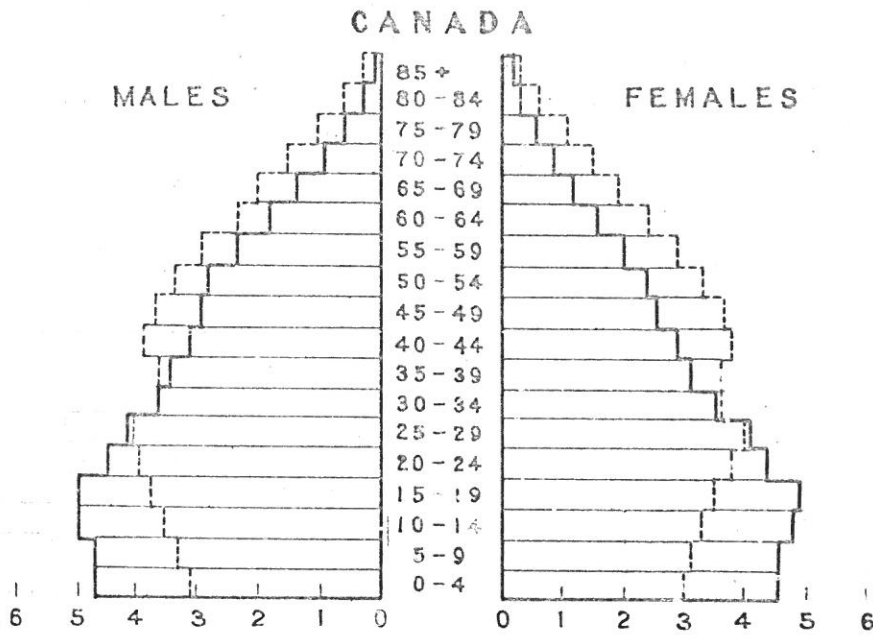


Figure 8

AGE PYRAMIDS OF PROJECTED POPULATION FOR CANADA AND THE NETHERLANDS

1940 - 1970

1940 ———
1970 - - - - -



The age pyramids for the 1970 projections are superimposed in outline on those of 1940. Except for the U.S.S.R., which continues to show potentialities for continued growth, the age structures show an aging process which suggests the possibilities of decline. This is most advanced in Europe, where the largest concentration of population has moved to ages above 30 years. Canada follows inevitably along the same path with a shift in size to years above 25.

The change which would occur between 1940 and 1970, according to the assumptions made, is shown from another point of view in Fig. 9^f. A changing total population is the result of a variety of changes at different age levels. Thus in Europe all age groups up to 35 are smaller in 1970 than in 1940 but the increase in the upper age groups is greater than this loss so that the total population continues to increase. Canada and the Netherlands show a loss over the period for age groups up to 20 and an increase in all ages above 20. In both the total population continues to grow, the increase in Canada being greater than that in the Netherlands for ages above 20, and the loss being greater for ages below 20 for the Netherlands. In the U.S.S.R. all age groups except the first increase. In all areas the percentage increase tends to rise with age.

The implications of these projected age structures in relation to social conditions are illustrated when the population is divided into children, the aged, and the possible working group. The changes in the total number of people in the specified age groups and the percentage change are illustrated for selected areas in Figs. 10 and 11. The projections for all areas show decreasing proportions of children and increasing proportions of old people. For Europe this trend reaches a stage of minimum dependency about 1960 when for every 2 dependents there are between 4 and 5 persons of working age. From 1960 to 1970 the projections show a constant proportion of people in the productive ages, a declining proportion of children, but an increasing proportion of the aged. These conditions suggest that after 1970, assuming a continuation of the projected trends, each productive worker will have to support directly or indirectly an increasing number of aged persons.

The U.S.S.R. and Canada, on the other hand, both continue to show an increasing proportion of people in the productive ages to 1970. In the U.S.S.R. nearly 36 p.c. of the 1940 population was under 15 years of age and only 4 p.c. was over 65, which means that nine tenths of all dependents were children.^{xx} By 1970 the projections show a decrease of nearly 10 p.c. in the proportion of children and a rise of 2 p.c. in the proportion of old people, i.e., a trend toward lighter dependency. Canada, which is demographically more advanced than the U.S.S.R., also shows a trend toward lighter dependency. In 1940, 28 p.c. of the population was under 15 years of age and 6 p.c. over 65. By 1970 the proportion of children falls to 19 p.c. and the proportion of aged rises only to 11 p.c.^{xxx}

^f *ibid.*, ch. 4 for more detailed graphs of Europe.

^x *ibid.*, p. 160.

^{xx} *ibid.*, p. 155.

^{xxx} These general trends are similar in both Estimates B and D. The differences lie only in the degree of change.

Figure 9

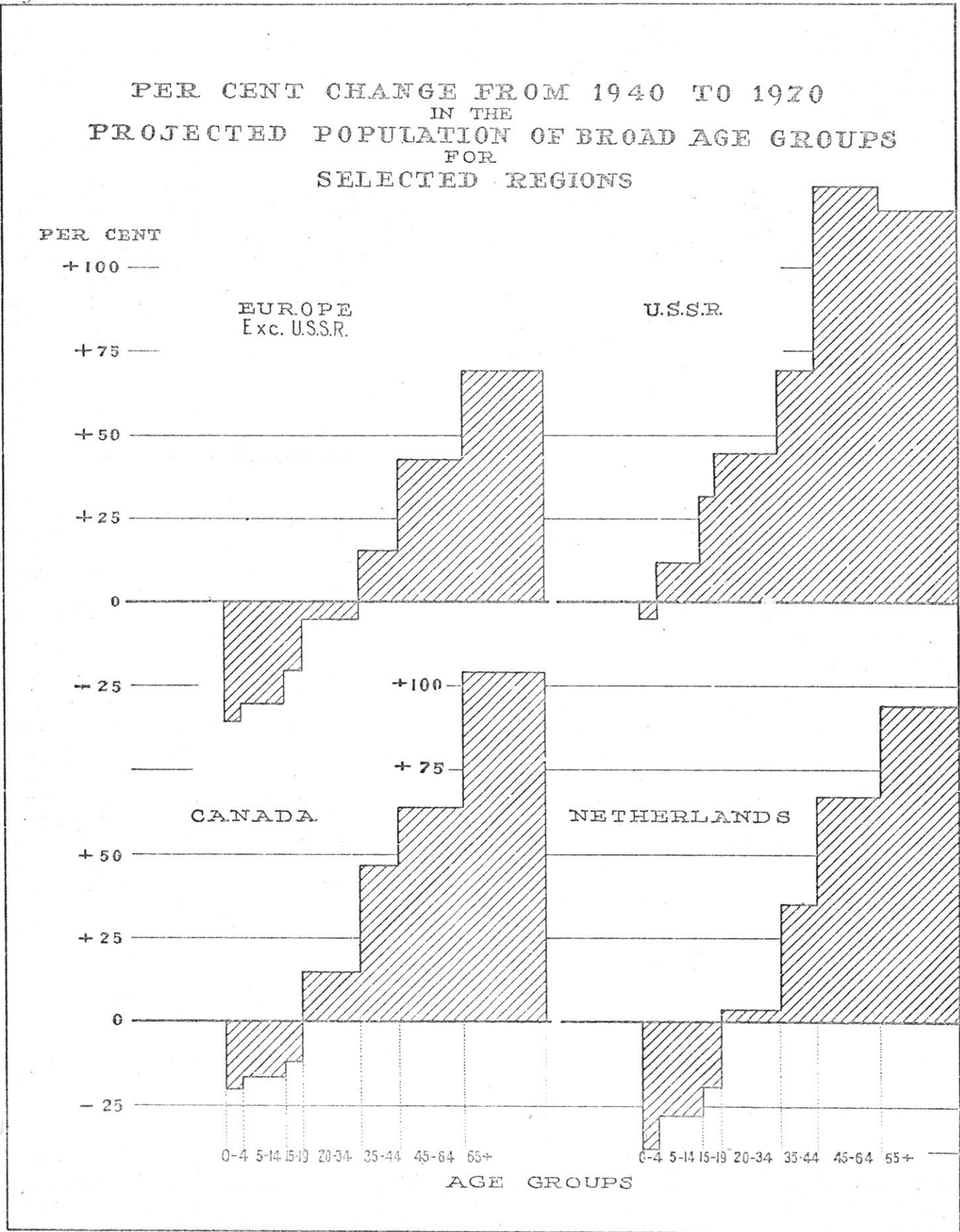


Figure 10

TOTAL NUMBERS IN THE AGE GROUPS 0-14, 15-64, 65+ FOR SELECTED REGIONS 1940 - 1970

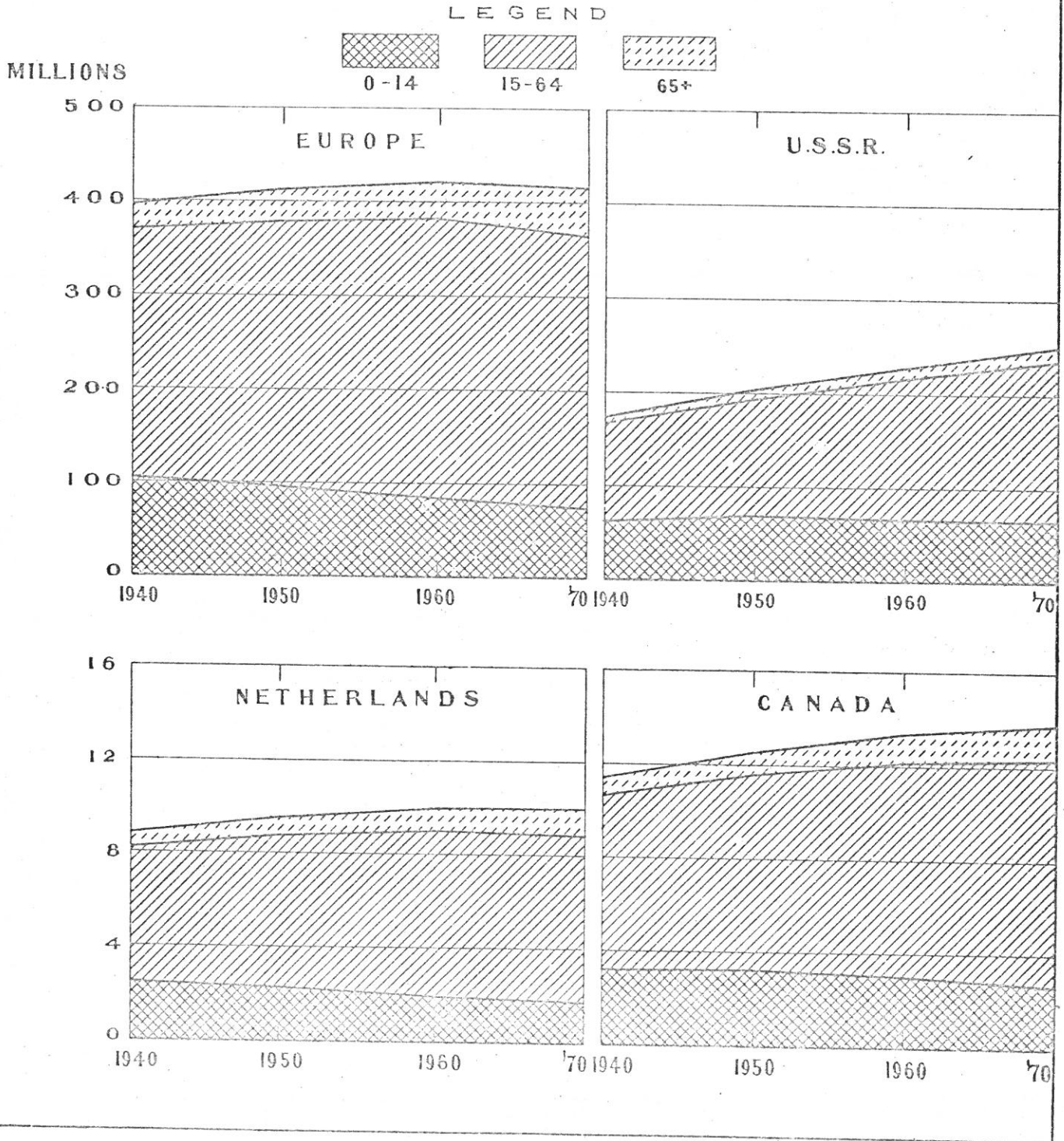
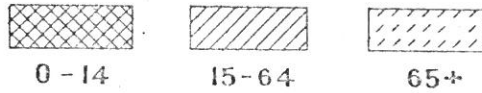


Figure 11

PERCENTAGE OF TOTAL POPULATION IN THE AGE GROUPS 0-14, 15-64, 65+ FOR SELECTED REGIONS

1940 - 1970

LEGEND



PER CENT

100

EUROPE

U.S.S.R.

75

50

25

0

1940

1950

1960

'70

1940

1950

1960

'70

NETHERLANDS

CANADA

100

75

50

25

0

1940

1950

1960

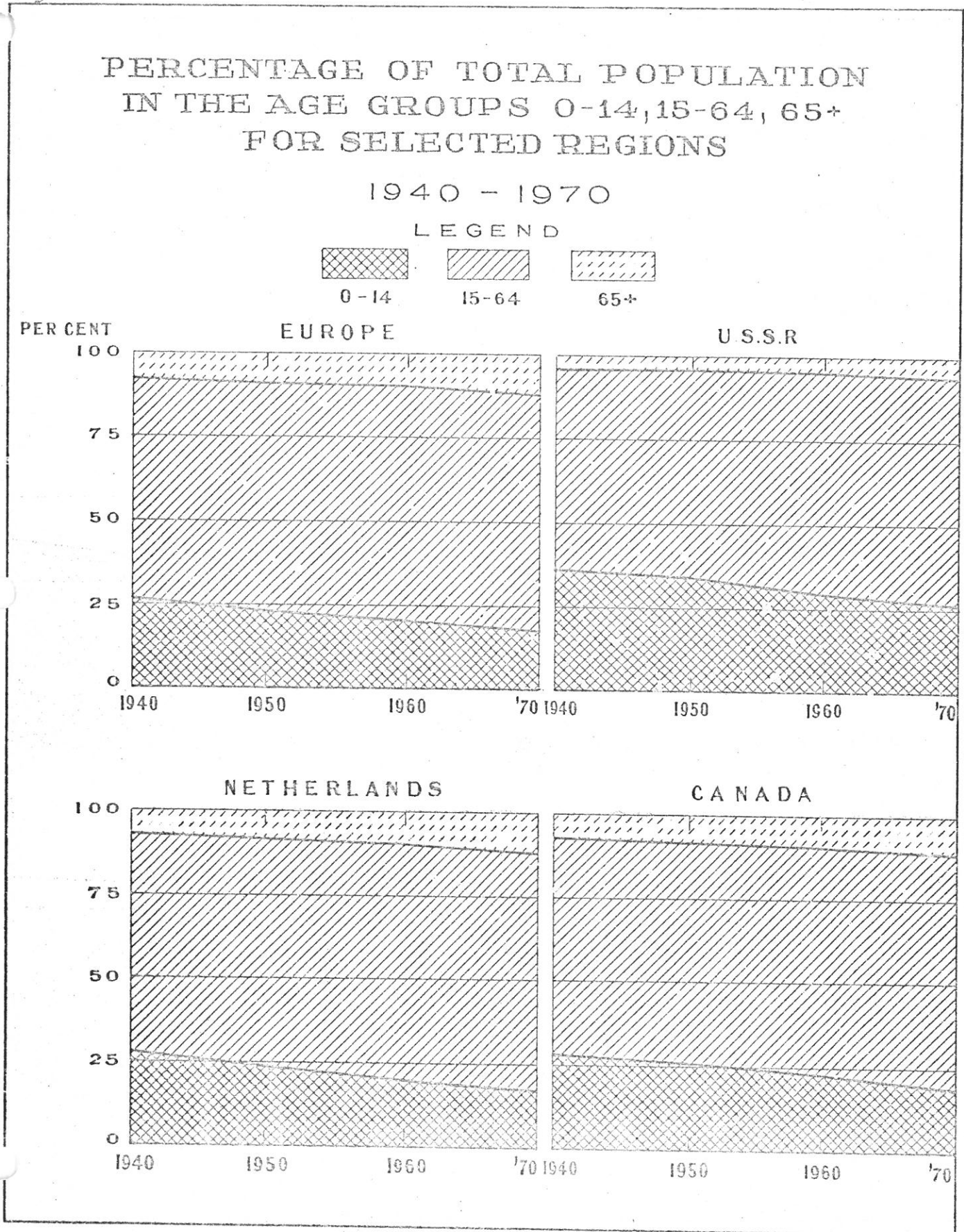
'70

1940

1950

1960

'70



4. SPECIAL AGE GROUPS

One of the chief functions of population projections lies in their attempt to suggest, on the basis of past trends, the changes in the proportion of the population which will be affected by specific economic and social conditions and by particular forms of government activity. For instance, if on the basis of the projections, the proportion of children in the total population falls over a period of a generation, then, providing the assumptions upon which the projections are based have validity, social organizations which are concerned with the education and welfare of children can plan to divert expenditure on buildings, staff, etc., necessary for increasing numbers, into improvements of existing standards. Similarly the prediction of an increasing proportion of old people implies a growing need for medical services, for hospitalization, and for an expansion of governmental aid in the forms of social security and pensions. Population projections suggest future situations for which adjustments and new provisions may be necessary.

In order to study the projected trends for the dependent and productive groups it was necessary to set certain arbitrary limits for each group and to overlook the fact that there is much overlapping between them. In the discussion concerning school population, the limits set are the ages 5 - 19 years. The working population overlaps this group, the limits being the population 15 - 64 years of age. The aged population is the group 65 years and over.

(a) School population

The definition of the school population as that group between the ages of 5 and 19 years, can in a general sense set the limits of grade school education. That such a definition gives an upper limit which includes the early years of university education is realized but the 5 year age groups in which the projections were computed prevent a more detailed break-down. At the same time, the proportion of youth in school between the ages of 6 and 19 is over 10 per cent of the population for each age within its group; the proportion of youth in school after age 19 falls quickly.* The age group 5-19 has been further divided into two groups, 5 - 14 and 15 - 19. The former may be considered as defining the limits of primary school education and the latter is composed chiefly of the secondary school group. Here again no accurate distinction can be made to separate the two groups. Nevertheless such a division will show in a general way the demographic problems which should be considered if changes in education policy be planned in the next thirty years.

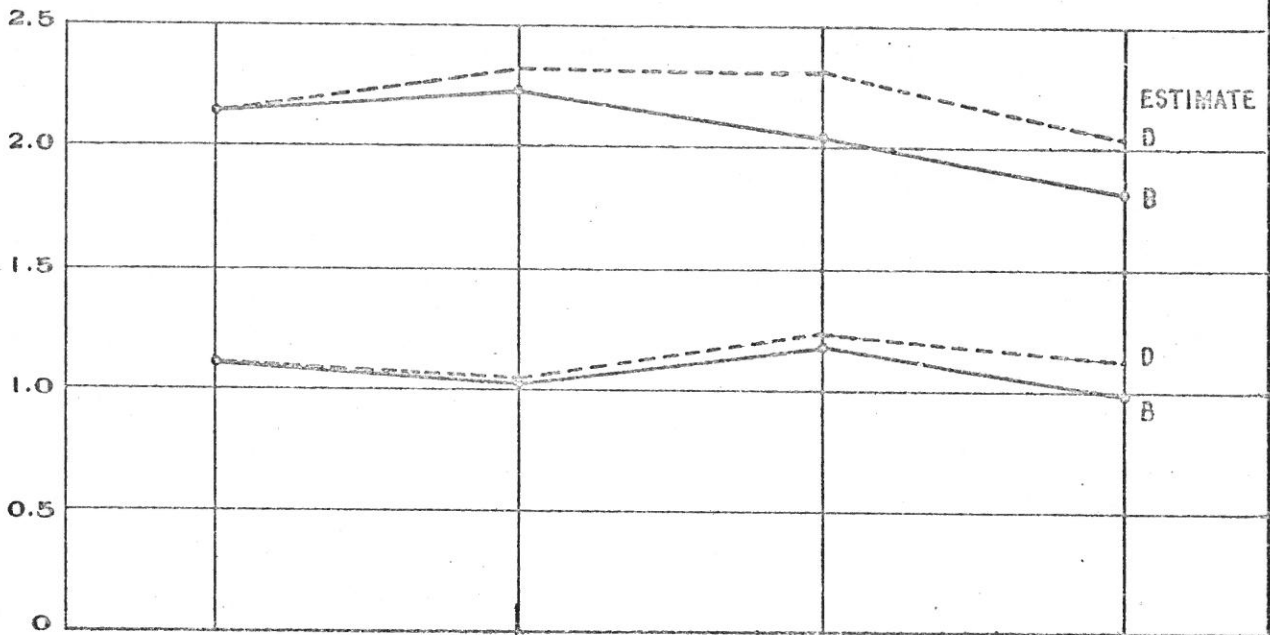
The youth projections for Estimates B and D are given in Table III for Canada as a whole and by region, together with the amount and percentage change for the period. The trends for Canada as a whole are shown graphically in Fig. 12. The projection for Estimate B suggests a rise in the numbers 5 - 14 years in 1951 and a slow decline after that time. By 1971, if fertility continues to decline, the number of children in primary schools should be about 85 per cent of the 1941 group. On the basis of Estimate D, the 5 - 14 year age group increases to 1951, remains almost constant over the subsequent ten-year period and by 1971 falls just below its 1941 level. The decrease over the whole period would be about 5 p.c. The proportion of people in the 15 - 19 year group fluctuates throughout the period 1941-71, but on the whole the total number remains fairly constant. By Estimate B the 1971 level is about 12 p.c. lower than that of 1941; by Estimate D it decreases less than 1 p.c.

* Population Bulletin No. C-10 (Dominion Bureau of Statistics)

Figure 12

TOTAL NUMBERS IN SCHOOL AGE GROUPS 5-14, 15-19 FOR CANADA, 1941-1971

MILLIONS



TOTAL NUMBERS IN AGE GROUP 15-64 FOR CANADA, 1941-1971

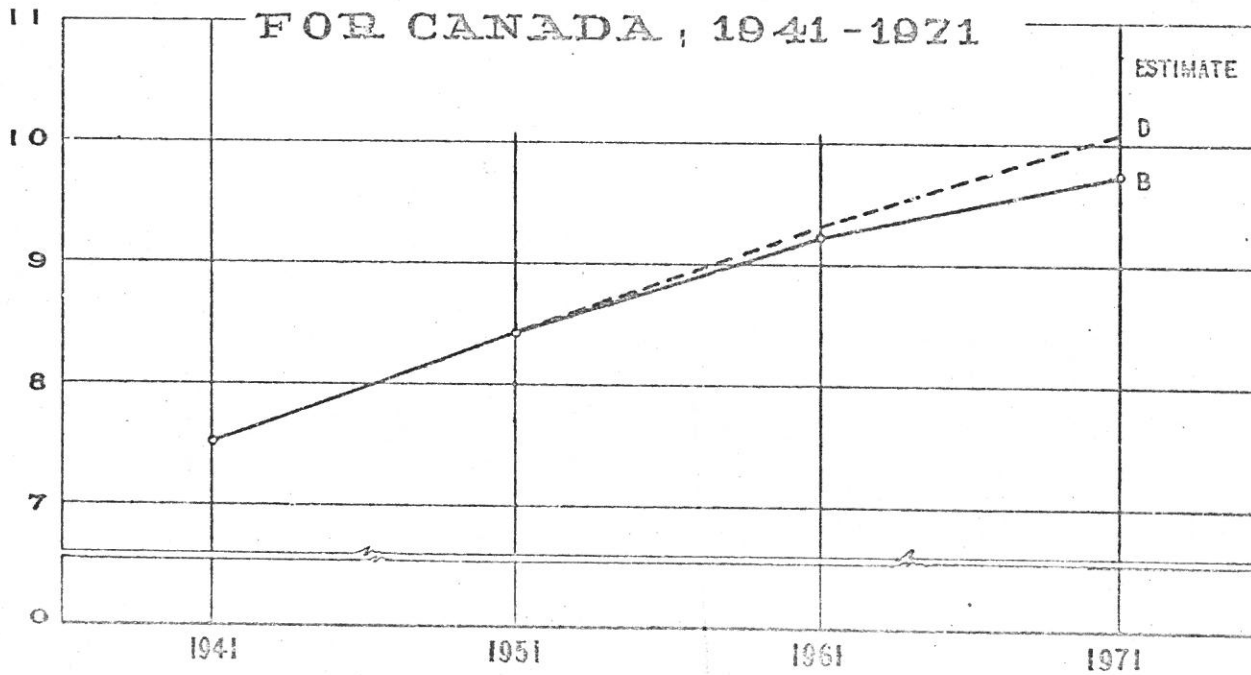


TABLE III. NUMBER OF PERSONS IN AGE GROUPS 5-14 YEARS, 15-19 YEARS, BY REGIONS, 1941-1971

ESTIMATES B AND D

(000's omitted)

Region and Age Group	NUMBER				CHANGE							
	1941	1951	1961	1971	1941-1951		1951-1961		1961-1971		1941-1971	
					Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
CANADA												
5 - 14 (B)	2,145	2,222	2,034	1,813	77	3.6	- 188	- 8.5	- 221	- 10.9	- 332	- 15.5
(D)		2,516	2,300	2,031	171	8.0	- 16	- 0.7	- 269	- 11.7	- 114	- 5.3
15 - 19 (B)	1,118	1,032	1,181	988	- 86	- 7.7	149	14.4	- 193	- 16.3	- 150	- 11.6
(D)		1,043	1,234	1,114	- 75	- 6.7	191	18.3	- 120	- 9.7	- 4	- 0.4
Maritime Provinces												
5 - 14 (B)	227	248	237	224	19	8.4	- 9	- 3.7	- 13	- 5.5	- 3	- 1.3
(D)		252	267	258	25	11.0	15	6.0	- 9	- 3.4	31	13.7
15 - 19 (B)	114	112	130	117	- 2	- 1.8	18	16.1	- 13	- 10.0	3	2.6
(D)		111	132	130	- 3	- 2.6	21	18.9	- 2	- 1.5	16	14.0
Quebec												
5 - 14 (B)	710	747	700	643	37	5.2	- 47	- 6.3	- 57	- 8.1	- 67	- 9.4
(D)		781	795	722	71	10.0	14	1.8	- 73	- 9.2	12	1.7
15 - 19 (B)	351	343	398	343	- 8	- 2.3	55	16.0	- 55	- 13.8	- 3	- 2.5
(D)		346	419	387	- 5	- 1.4	73	21.1	- 32	- 7.6	36	10.3
Ontario												
5 - 14 (B)	626	638	553	473	12	1.9	- 85	- 13.3	- 80	- 14.5	- 153	- 24.4
(D)		676	630	530	50	8.0	- 46	- 6.8	- 100	- 15.9	- 96	- 15.3
15 - 19 (B)	339	299	341	265	- 40	- 11.8	42	14.0	- 76	- 22.3	- 74	- 21.8
(D)		307	361	299	- 32	- 9.4	54	17.6	- 62	- 17.2	- 40	- 11.8
Prairie Provinces												
5 - 14 (B)	468	461	440	387	- 5	- 1.1	- 21	- 4.6	- 53	- 12.0	- 79	- 17.0
(D)		452	470	406	- 14	- 3.0	18	4.0	- 64	- 13.6	- 60	- 12.9
15 - 19 (B)	247	224	240	214	- 23	- 9.3	16	7.1	- 26	- 10.8	- 33	- 13.4
(D)		217	237	234	- 30	- 12.1	20	9.2	- 3	- 1.3	- 13	- 5.3
British Columbia												
5 - 14 (B)	116	130	104	86	14	12.1	- 26	- 20.0	- 18	- 17.3	- 30	- 25.9
(D)		155	138	115	39	33.6	- 17	- 11.0	- 23	- 16.7	- 1	- 0.9
15 - 19 (B)	67	54	72	49	- 13	- 19.4	18	33.3	- 23	- 31.9	- 18	- 26.9
(D)		62	85	64	- 5	- 7.5	23	37.1	- 21	- 24.7	- 3	- 4.5

The differences in regional trends are also shown in Table III. By Estimate B British Columbia and Ontario show the greatest decline in the school age population for the period 1941-71. Except for the age group 15 - 19 years in the Maritimes, which shows an increase of 2.6 p.c. by 1971 over the 1941 total, the other regions also show some decline. On the basis of Estimate D, both the Maritimes and Quebec show an increase over the period. In the case of Quebec the increase for the age group 5 - 14 years is less than 2 p.c. In both, the trend shows a fall from the 1961 total. The other regions all show some decline for the period.

We may conclude that on the basis of either estimate there is no reason to assume much change in the proportions of the school population for the next thirty years. If the continued decline in fertility assumed in these estimates does in fact take place, then the period would appear to be the turning point in the use of primary and secondary educational facilities. After 1970 the effects of fertility decline will lead to a smaller school population. This is particularly true of the primary school group which shows evidence of decline as early as 1961. For this age group, the opportunity will arise to divert resources no longer needed to take care of an increasing population to present-day standards of efficiency. This suggestion refers only to the over-all picture. Internal population movements may lead to empty schools in one district, while in another they are crammed beyond capacity. If opportunities for higher education continue to be extended to an increasing proportion of the population, in line with the trend of recent years, the demand for greater facilities on this account will outweigh any possible effect of demographic change.

(b) Working Population

Since the very young, the old, and housewives, form erratic components of the labour force, it is difficult to set accurate limits to the working population. The trends in an industrial society would appear to lean towards more extensive employment of women and to less utilization of men 15 - 20 years and over 65 years. We shall define the working population as that group between the ages of 15 and 64; in other words, we shall discuss the potential labour force and make no attempt to study the group actually employed.

In 1941 the population of working age was about 7.5 million. According to Estimate B, there would be a net increase of about 2.2 million by 1971; Estimate D shows a net increase of over 2.6 million or 34 p.c. of the 1941 total. (Table IV). The number of potential workers, then, continues to rise throughout the period, but it does so at a decreasing rate (Fig. 12). For Estimate B the increase between 1941 and 1951 is about 12 p.c. of the 1941 total; between 1951 and 1961 the net increase falls to 9.7 p.c. and in the final decade 1961 to 1971 the net increase is only 5.3 p.c. over the 1961 total. A similar trend is projected in Estimate D although the decline is not so great.

In all the provinces there is some expansion of the potential labour force in the period. Quebec shows the largest numerical increase; British Columbia by Estimate B has the lowest, while Prince Edward Island has the lowest numerical increase in Estimate D. By Estimate D the 1971 potential labour force in the Maritimes and Quebec is over 50 p.c. greater than its 1941 level; Ontario and British Columbia show an increase of less than 20 p.c. Estimate B suggests an increase in British Columbia for the whole period of less than 5 p.c., while Ontario shows a low net increase of only 13.4 p.c.

TABLE IV. NUMBERS OF PERSONS AGED 15 - 64, YEARS, BY REGION

ESTIMATES AND D

(000's omitted)

Region	NUMBER				CHANGE							
	1941	1951	1961	1971	1941-1951		1951-1961		1961-1971		1941-1971	
					Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
CANADA (B)	7,530	8,423	9,244	9,733	898	11.9	816	9.7	491	5.3	2,205	29.3
	(D)	8,418	9,331	10,092	888	11.8	913	10.8	761	8.2	2,562	34.0
Maritime Provinces (B)	693	810	929	1,031	112	16.0	119	14.7	102	11.0	333	47.7
	(D)	797	923	1,054	99	14.2	126	15.8	131	14.2	356	51.0
Prince Edward Island (B)	56	67	75	84	11	19.6	8	11.9	9	12.0	23	50.0
	(D)	61	70	81	5	8.9	9	14.8	11	15.7	25	44.6
Nova Scotia (B)	352	412	467	508	50	13.8	55	13.3	41	18.8	145	40.3
	(D)	420	490	535	58	16.0	60	14.3	55	11.5	173	47.8
New Brunswick (B)	230	331	387	439	51	18.2	55	16.9	52	13.4	159	56.8
	(D)	315	373	438	36	12.9	57	18.0	65	17.4	158	56.4
Quebec (B)	2,092	2,491	2,865	3,113	399	19.1	374	15.0	253	8.8	1,025	49.0
	(D)	2,430	2,892	3,243	388	18.5	412	16.6	355	12.3	1,153	55.3
Ontario (B)	2,532	2,750	2,890	2,905	188	7.3	140	5.1	16	0.6	344	13.4
	(D)	2,795	2,970	3,054	233	9.1	175	6.3	84	2.8	492	19.2
Prairie Provinces (B)	1,602	1,806	1,973	2,102	204	12.7	167	9.2	129	6.5	500	31.2
	(D)	1,708	1,874	2,051	106	6.5	166	9.7	177	9.4	449	29.0
Manitoba (B)	493	542	582	605	49	9.9	40	7.4	23	4.0	112	22.7
	(D)	521	553	599	28	5.7	42	8.1	36	6.4	106	21.5
Saskatchewan (B)	592	658	736	799	86	14.8	68	10.2	63	8.6	217	37.3
	(D)	604	664	734	22	3.8	60	9.9	70	10.5	152	26.1
Alberta (B)	527	596	655	693	69	13.1	59	9.9	43	6.6	171	32.4
	(D)	583	647	718	56	10.6	64	11.0	71	11.0	191	36.2
British Columbia (B)	576	571	587	573	- 5	- 0.9	16	2.8	- 9	- 1.5	2	0.3
	(D)	638	672	683	62	10.8	34	5.3	13	1.9	109	18.9

For Estimate D, no region shows a loss of labour force throughout the period. In the Maritimes and Prairies the absolute rate of growth is well maintained throughout the period. Elsewhere the increase in the number of potential workers tends to become smaller in each succeeding decade. We must reiterate yet once more that these estimates represent trends. Internal population movements are likely to result in the labour force figures for each province being very different from those given. They have some interest as indicating the regions of Canada from which the working population of Canada is likely to come in the next thirty years. Estimate B shows an absolute increase which continues to decline for each subsequent decade in Quebec, Ontario and the Prairies. The absolute increase in the Maritimes rises in the 1951-1961 period and falls slightly in the last period. British Columbia shows a loss in its labour force in the first and last periods.

Although the working population continues to grow throughout the period, there is considerable change in the age distribution within the group and a trend towards an increasing proportion of workers over 45 years of age. Yet Canada as a whole continues to have a young labour force throughout the period 1941-1971. Estimate B shows a numerical decrease in the proportion of the youngest group (15 - 34) after 1961; Estimate D shows a numerical increase (Table V). But the proportion of the total potential labour force in the 15 - 34 year group drops from 52.5 p.c. in 1941 to 43 p.c. or 45 p.c. by 1971. On the other hand, workers over 45 years of age increase steadily from 2.1 million in 1941 to 3.5 million by 1971 for both estimates, so that about one million more workers enter the oldest age group than enter the youngest. In general the trends shown in either estimate suggest that the problem of the older worker will assume increasing importance in the future. As the supply of younger workers decreases, industry may be forced to employ a larger proportion of people over 45 years of age. And as the supply of older workers increases it may give rise to changes in the use of productive capacity and to changes in the goods and services which will be sought from both industry and government.

(c) Aged Population

The number of persons 65 years of age and over, which will be the group considered as aged in the present discussion, nearly doubles between 1941 and 1971. For both Estimates B and D, the number rises from about 765,000 in 1941 to about 1.5 million by 1971. (Table VI). This numerical increase is proportionally larger than the increase of the total population over the same period. Thus the percentage of old people in the population increases from 6.7 p.c. in 1941 to 11.0 p.c. in 1971 for Estimate B and 10.4 p.c. for Estimate D.

This trend is at different stages in the various regions. In Quebec and the Prairies the aged population more than doubles between 1941 and 1971. For the Prairie region, by Estimate B, the aged population in 1971 is 152 p.c. greater than it was in 1941. For Quebec, Estimate B shows an increase of 120 p.c.; Estimate D shows an increase of 118 p.c. The increases for Ontario and British Columbia are not as large; both show at least an 80 p.c. increase over the whole period and by Estimate D the aged population in British Columbia doubles. In the Maritimes the proportion of old people in the population rises less rapidly throughout the period.

TABLE V. - AGE DISTRIBUTION OF THE POTENTIAL LABOUR FORCE 15-64 YEARS, BY REGION,
1941 - 1971

ESTIMATES B AND D
(000's omitted)

Region and Age Group	Number				Per Cent of Total 15-64 Years			
	1941	1951	1961	1971	1941	1951	1961	1971
CANADA								
15-34 Years (B)	3,955	4,217	4,278	4,185	52.5	50.1	46.3	43.0
(D)		4,234	4,371	4,538		50.3	46.8	45.0
35-44 " (B)	1,434	1,756	2,058	2,039	19.1	20.8	22.3	20.9
(D)		1,741	2,070	2,041		20.7	22.2	20.2
45-64 " (B)	2,141	2,455	2,908	3,511	28.4	29.1	31.4	36.1
(D)		2,443	2,890	3,513		29.0	31.0	34.8
Maritime Provinces								
15-34 Years (B)	389	435	460	474	55.7	53.7	49.5	46.0
(D)		432	464	506		54.2	50.3	48.0
35-44 " (B)	122	165	208	213	17.5	20.4	22.4	20.6
(D)		159	205	210		20.0	22.2	19.9
45-64 " (B)	187	210	261	344	26.8	25.9	28.1	33.4
(D)		206	254	338		25.8	27.5	32.1
Quebec								
15-34 Years (B)	1,184	1,337	1,423	1,418	56.6	53.7	49.7	45.5
(D)		1,336	1,456	1,547		53.9	50.3	47.6
35-44 " (B)	400	510	621	668	19.1	20.5	21.7	21.4
(D)		505	621	672		20.3	21.5	20.7
45-64 " (B)	508	644	821	1,032	24.3	25.8	28.6	33.1
(D)		639	815	1,029		25.8	28.2	31.7
Ontario								
15-34 Years (B)	1,265	1,272	1,244	1,176	49.4	46.3	43.0	40.5
(D)		1,302	1,291	1,289		46.6	43.5	42.2
35-44 " (B)	518	587	639	602	20.2	21.3	22.1	20.7
(D)		595	660	610		21.3	22.2	20.0
45-64 " (B)	779	891	1,007	1,128	30.4	32.4	34.8	38.8
(D)		898	1,019	1,155		32.1	34.3	37.8
Prairie Provinces								
15-34 Years (B)	847	926	910	887	52.9	51.3	46.1	42.2
(D)		879	882	910		51.5	47.1	44.4
35-44 " (B)	237	364	460	447	17.9	20.1	23.3	21.3
(D)		335	430	427		19.6	22.9	20.8
45-64 " (B)	468	516	603	768	29.2	28.6	30.6	36.5
(D)		494	562	714		28.9	30.0	34.8
British Columbia								
15-34 Years (B)	270	247	241	230	46.9	43.2	41.1	39.8
(D)		285	278	286		44.7	41.4	41.3
35-44 " (B)	107	130	130	109	18.6	22.8	22.1	18.9
(D)		147	154	122		23.0	22.9	17.8
45-64 " (B)	193	194	216	239	34.5	34.0	36.8	41.3
(D)		206	240	277		32.3	35.7	40.4

TABLE VI. - NUMBER OF PERSONS 65 YEARS AND OVER, BY REGION, 1941-1971

ESTIMATES B AND D
(000's omitted)

Region	Number				Per Cent of Total Population			
	1941	1951	1961	1971	1941	1951	1961	1971
CANADA								
(B)	765	1,016	1,285	1,529	6.7	8.0	9.5	11.0
(D)		1,018	1,281	1,523		7.9	9.2	10.4
Maritime Provinces								
(B)	87	100	117	132	7.7	7.8	8.4	8.8
(D)		98	115	132		7.6	8.0	8.4
Prince Edward Island								
(B)	9	10	11	12	9.5	9.4	9.5	9.7
(D)		10	10	10		10.1	8.9	8.1
Nova Scotia								
(B)	47	53	62	68	8.1	8.2	9.9	9.4
(D)		52	62	71		7.8	8.4	9.1
New Brunswick								
(B)	41	37	44	52	6.8	7.0	7.5	8.1
(D)		36	43	51		7.0	7.2	7.6
Quebec								
(B)	177	223	295	389	5.3	5.8	7.0	8.7
(D)		224	293	386		5.8	6.7	8.2
Ontario								
(B)	302	373	465	549	8.0	9.2	11.2	13.3
(D)		377	467	554		9.0	10.8	12.6
Prairie Provinces								
(B)	132	217	289	333	5.5	8.0	10.0	11.1
(D)		212	282	317		8.1	10.0	10.7
Manitoba								
(B)	46	69	90	103	6.3	8.6	10.7	12.1
(D)		68	89	100		8.6	10.7	11.7
Saskatchewan								
(B)	46	79	104	117	5.1	7.8	9.5	10.3
(D)		75	99	108		8.1	9.8	10.2
Alberta								
(B)	40	69	95	113	5.0	7.7	9.8	11.2
(D)		69	94	109		7.7	9.5	10.4
British Columbia								
(B)	67	103	119	126	8.2	12.0	13.9	15.2
(D)		107	124	134		11.0	12.5	13.5

The trend toward an increasing proportion of old people in the population implies an intensification of the problems of the aged. The emphasis upon change and the depreciation of tradition prevalent in modern industrial society, and the social structure which such a society engenders have placed the aged in a precarious economic and social position in which more of the responsibility for their welfare is being of necessity assumed by the state. From the point of view of social services the problem of an increased proportion of old people may be solved by increasing the amount of social security and pensions, but the expression of growing dissatisfaction with the position which the aged are forced to assume when their productive capacity is no longer recognized by the majority and their social status is changed by superannuation.^x More thought will probably be given in the future not only to the problem of widening state services for the aged but also to a careful consideration of the whole position of the aged in North American society.

(d) Conclusions

Three major developments in specific age groups emerge from the projection of future population. First, the potential labour force continues to increase throughout the period for which the projections are made, but the increase occurs at a decreasing rate which raises the possibility of an eventual decline. Secondly, the proportion of children in the population begins to decline in the period 1941-1971 while the proportion of old people continues to rise. The former decreases more rapidly than the latter increases so that the trend for the period is toward a state of lighter dependency. This trend, together with the increase of productive workers, suggests that the burden of dependency will be spread over a greater number of people, and hence the effect of an increase in the aged population with the heavier burden which it entails, will not be so costly a problem per capita. Finally, the trend is toward an aging population.

x cf. Talcott Parsons: "Age and Sex in the Social Structure of the United States", Am. Soc. Rev. Oct. 1942. "The Kinship Structure of the Contemporary United States". Am. Anthropologist, Vol. 45, No. 1.

5. SUMMARY

1. Tables 1, 2, and 3 show the projected population of Canada from 1941 to 1971 according to two different sets of assumptions. In all, fertility and mortality rates are assumed to decline in the future as they have done in the past. In Estimates A and B the rates of fall are those which conform to European experience, and no interruption of the process of decline due to the war is assumed. In Estimate D, the rates of fall are extrapolated from Canadian experience alone, and it is assumed that the rising birth rate of the war years results in a net gain of births. In all the tables no internal or external migration is assumed after the base years.

2. The population of Canada has been increasing at a slower rate since 1920. According to the projections the rate of increase will continue to fall off. If the trend towards smaller families continues, and no large-scale immigration occurs, the population will reach a maximum of about 15 million towards the end of the century, and thereafter will begin to decline.

3. Canada is likely to increase faster in the next thirty years than any region of Europe outside the Soviet Union.

4. As a result of declining fertility, the population is aging. There will be more workers in the older age groups, fewer children, and more old people.

5. Although older, the potential labour force will continue to increase up to 1971, both in absolute numbers and proportionately to the rest of the population. The burden of social dependency will be somewhat lighter and will be shifting from children and young people to the aged. Eventually, if fertility continues to decline, the position will be reversed, and increasing numbers of old people will be supported by proportionately fewer persons of working age.

PART II

BASIC TABLES

Table 1. POPULATION PROJECTION, 1940-1970

No.	Age Group	Total Population			
		1940	1950	1960	1970
		(000's omitted)			
1.	All ages	11,563	12,576	13,393	13,821
2.	0 - 4 years	1,054	1,096	947	837
3.	5 - 9 "	1,054	1,145	1,002	880
4.	10 - 14 "	1,114	1,036	1,031	936
5.	15 - 19 "	1,127	1,052	1,135	994
6.	20 - 24 "	1,010	1,092	1,023	1,070
7.	25 - 29 "	950	1,074	1,034	1,118
8.	30 - 34 "	819	993	1,071	1,007
9.	35 - 39 "	734	909	1,051	1,016
10.	40 - 44 "	672	796	967	1,048
11.	45 - 49 "	634	707	876	1,018
12.	50 - 54 "	583	629	754	922
13.	55 - 59 "	494	573	650	812
14.	60 - 64 "	384	499	553	669
15.	65 - 69 "	290	393	468	539
16.	70 - 74 "	209	278	364	411
17.	75 - 79 "	132	172	235	290
18.	80 - 84 "	69	88	121	165
19.	85 - 89 "	25	34	47	67
20.	90 - 94 "	7	9	12	19
21.	95 years and over	2	1	2	3

ESTIMATE A, CANADA

Male Population				Female Population				No.
1940	1950	1960	1970	1940	1950	1960	1970	
(000's omitted)								
5,837	6,410	6,787	6,972	5,526	6,166	6,606	6,849	1.
535	560	484	429	519	536	463	408	2.
533	583	512	450	521	562	490	430	3.
563	524	551	478	551	512	530	458	4.
568	531	577	507	559	521	558	487	5.
508	550	517	544	502	542	506	526	6.
480	540	521	568	470	534	513	550	7.
422	499	540	508	397	494	531	499	8.
384	461	529	512	350	448	522	504	9.
347	409	485	528	325	387	482	520	10.
334	367	442	509	300	340	434	509	11.
314	324	306	460	269	305	368	462	12.
269	299	334	407	225	274	313	405	13.
206	264	280	338	178	235	273	331	14.
153	208	233	271	137	185	230	263	15.
107	144	186	201	102	134	178	210	16.
66	86	118	141	66	86	117	149	17.
33	42	59	80	36	46	62	85	18.
11	15	22	32	14	19	25	35	19.
3	4	5	8	4	5	7	11	20.
1	-	1	1	1	1	1	2	21.

Table 2. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
		(000's omitted)			
CANADA (x)					
1.	All ages	11,490	12,722	13,504	13,917
2.	0 - 4 years	1,050	1,056	941	840
3.	5 - 9 "	1,044	1,191	993	883
4.	10 - 14 "	1,101	1,031	1,041	930
5.	15 - 19 "	1,118	1,032	1,181	988
6.	20 - 24 "	1,030	1,032	1,020	1,030
7.	25 - 29 "	965	1,096	1,015	1,164
8.	30 - 34 "	842	1,007	1,062	1,003
9.	35 - 39 "	758	940	1,074	998
10.	40 - 44 "	676	816	984	1,041
11.	45 - 49 "	635	727	908	1,043
12.	50 - 54 "	591	637	775	938
13.	55 - 59 "	508	577	668	843
14.	60 - 64 "	407	514	557	687
15.	65 - 69 "	306	408	473	553
16.	70 - 74 "	217	291	376	415
17.	75 - 79 "	137	179	245	295
18.	80 - 84 "	71	92	127	171
19.	85 - 89 "	27	38	48	71
20.	90 - 94 "	6	10	13	22
21.	95 years and over ...	1	-	1	2
Prince Edward Island					
22.	All ages	95	106	116	124
23.	0 - 4 years	10	10	10	9
24.	5 - 9 "	10	10	10	9
25.	10 - 14 "	10	9	10	10
26.	15 - 19 "	9	10	10	10
27.	20 - 24 "	8	9	9	10
28.	25 - 29 "	7	9	9	10
29.	30 - 34 "	6	8	9	9
30.	35 - 39 "	5	7	9	9
31.	40 - 44 "	5	6	8	9
32.	45 - 49 "	5	5	7	8
33.	50 - 54 "	4	5	6	7
34.	55 - 59 "	4	4	4	7
35.	60 - 64 "	3	4	4	5
36.	65 - 69 "	3	3	4	4
37.	70 - 74 "	3	3	3	3
38.	75 - 79 "	2	2	2	3
39.	80 - 84 "	1	1	1	1
40.	85 - 89 "	-	1	1	1
41.	90 - 94 "	-	-	-	-
42.	95 years and over ...	-	-	-	-

(x) Excluding Yukon and the Northwest Territories.

Table 2. POPULATION PROJECTION, 1941-1971

NO.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Nova Scotia				
1.	All ages	578	643	691	726
2.	0 - 4 years	58	57	52	48
3.	5 - 9 "	56	64	54	50
4.	10 - 14 "	55	57	56	52
5.	15 - 19 "	56	55	63	54
6.	20 - 24 "	55	54	56	55
7.	25 - 29 "	50	55	54	62
8.	30 - 34 "	40	53	53	55
9.	35 - 39 "	33	48	53	53
10.	40 - 44 "	30	39	52	52
11.	45 - 49 "	29	32	46	52
12.	50 - 54 "	26	28	37	49
13.	55 - 59 "	23	26	29	43
14.	60 - 64 "	20	22	24	33
15.	65 - 69 "	17	19	22	24
16.	70 - 74 "	13	14	17	18
17.	75 - 79 "	9	10	12	14
18.	80 - 84 "	5	6	7	8
19.	85 - 89 "	2	3	3	3
20.	90 - 94 "	1	1	1	1
21.	95 years and over ...	-	-	-	-
	New Brunswick				
22.	All ages	457	529	591	645
23.	0 - 4 years	50	55	53	51
24.	5 - 9 "	48	57	53	51
25.	10 - 14 "	48	49	54	52
26.	15 - 19 "	49	47	57	53
27.	20 - 24 "	42	47	48	53
28.	25 - 29 "	36	47	46	56
29.	30 - 34 "	31	41	46	47
30.	35 - 39 "	26	35	46	45
31.	40 - 44 "	23	30	40	45
32.	45 - 49 "	22	25	34	45
33.	50 - 54 "	20	22	28	38
34.	55 - 59 "	17	20	23	32
35.	60 - 64 "	14	17	19	25
36.	65 - 69 "	12	14	17	19
37.	70 - 74 "	9	10	12	14
38.	75 - 79 "	6	7	8	10
39.	80 - 84 "	3	4	4	6
40.	85 - 89 "	1	2	2	2
41.	90 - 94 "	-	-	1	1
42.	95 years and over ...	-	-	-	-

Table 2. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
Quebec					
1.	All ages	3,332	3,822	4,193	4,453
2.	0 - 4 years	353	361	333	303
3.	5 - 9 "	348	402	346	315
4.	10 - 14 "	362	345	354	328
5.	15 - 19 "	351	343	398	343
6.	20 - 24 "	304	355	341	350
7.	25 - 29 "	282	343	337	391
8.	30 - 34 "	247	296	347	334
9.	35 - 39 "	217	273	334	330
10.	40 - 44 "	183	237	287	338
11.	45 - 49 "	162	207	262	323
12.	50 - 54 "	140	171	223	272
13.	55 - 59 "	114	146	188	241
14.	60 - 64 "	92	120	148	196
15.	65 - 69 "	71	90	118	154
16.	70 - 74 "	50	64	86	103
17.	75 - 79 "	31	40	52	71
18.	80 - 84 "	16	20	27	37
19.	85 - 89 "	7	7	10	15
20.	90 - 94 "	2	2	2	4
21.	95 years and over ...	-	-	-	-
Ontario					
22.	All ages	3,788	4,051	4,154	4,142
23.	0 - 4 years	298	290	246	214
24.	5 - 9 "	301	344	266	229
25.	10 - 14 "	325	294	287	244
26.	15 - 19 "	339	299	341	265
27.	20 - 24 "	324	321	292	265
28.	25 - 29 "	316	334	295	338
29.	30 - 34 "	286	318	316	288
30.	35 - 39 "	268	309	328	291
31.	40 - 44 "	250	278	311	311
32.	45 - 49 "	233	258	299	319
33.	50 - 54 "	214	236	265	298
34.	55 - 59 "	182	212	237	277
35.	60 - 64 "	150	185	206	234
36.	65 - 69 "	116	145	173	196
37.	70 - 74 "	86	106	135	153
38.	75 - 79 "	55	68	87	106
39.	80 - 84 "	30	36	46	61
40.	85 - 89 "	11	14	18	25
41.	90 - 94 "	3	4	5	7
42.	95 years and over ...	1	-	1	1

ESTIMATE B. CANADA(*) AND PROVINCES - Continued.

Male Population				Female Population				No.
1941	1951	1961	1971	1941	1951	1961	1971	
				(000's omitted)				
1,673	1,919	2,105	2,236	1,659	1,903	2,088	2,217	1.
179	184	170	155	174	177	165	149	2.
175	205	176	161	173	197	170	154	3.
182	174	189	167	180	171	174	161	4.
176	172	202	175	175	171	196	168	5.
148	179	172	178	156	176	169	172	6.
139	172	170	199	143	171	167	192	7.
123	145	175	169	124	151	172	165	8.
110	135	168	166	107	138	163	164	9.
92	118	140	170	91	119	147	169	10.
84	104	130	162	78	103	132	161	11.
72	85	110	132	68	86	113	140	12.
59	75	94	119	55	71	94	122	13.
47	61	73	96	45	59	75	100	14.
36	46	59	76	35	44	59	78	15.
25	32	42	51	25	32	44	57	16.
15	19	25	34	16	21	27	37	17.
7	9	13	17	9	11	14	20	18.
3	3	5	7	4	4	5	8	19.
1	1	1	2	1	1	1	2	20.
-	-	-	-	-	-	-	-	21.
1,922	2,045	2,089	2,078	1,866	2,006	2,065	2,064	22.
151	143	126	110	147	142	120	104	23.
153	176	136	117	148	168	130	112	24.
165	149	146	125	160	145	141	119	25.
172	151	173	135	167	148	168	130	26.
164	162	148	145	160	159	144	140	27.
160	169	149	172	156	165	146	166	28.
145	160	159	145	141	158	157	143	29.
139	156	166	147	129	153	162	144	30.
128	141	156	157	122	137	155	154	31.
120	133	151	161	113	125	148	158	32.
110	120	133	149	104	116	132	149	33.
94	107	121	138	88	105	116	139	34.
76	93	103	116	74	92	103	118	35.
58	73	85	97	58	72	88	99	36.
41	51	65	73	45	55	70	80	37.
26	32	41	49	29	36	46	57	38.
14	16	21	23	16	20	25	33	39.
5	6	8	11	6	8	10	14	40.
1	2	2	3	2	2	3	4	41.
-	-	-	-	1	-	1	1	42.

Table 2. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Manitoba				
1.	All ages	730	804	843	853
2.	0 - 4 years	62	62	52	45
3.	5 - 9 "	62	70	57	48
4.	10 - 14 "	67	61	62	52
5.	15 - 19 "	73	62	70	57
6.	20 - 24 "	69	66	60	61
7.	25 - 29 "	64	72	61	69
8.	30 - 34 "	53	68	65	59
9.	35 - 39 "	47	63	71	60
10.	40 - 44 "	41	52	67	64
11.	45 - 49 "	42	45	61	69
12.	50 - 54 "	41	39	50	64
13.	55 - 59 "	36	39	42	57
14.	60 - 64 "	27	36	35	45
15.	65 - 69 "	19	29	32	35
16.	70 - 74 "	13	20	27	27
17.	75 - 79 "	8	11	18	21
18.	80 - 84 "	4	6	9	13
19.	85 - 89 "	2	2	3	5
20.	90 - 94 "	-	1	1	2
21.	95 years and over ...	-	-	-	-
	Saskatchewan				
22.	All ages	896	1,007	1,092	1,136
23.	0 - 4 years	85	88	80	68
24.	5 - 9 "	88	88	85	73
25.	10 - 14 "	95	84	87	79
26.	15 - 19 "	96	87	87	84
27.	20 - 24 "	85	93	83	86
28.	25 - 29 "	72	94	86	86
29.	30 - 34 "	60	83	92	82
30.	35 - 39 "	53	71	93	85
31.	40 - 44 "	47	58	82	91
32.	45 - 49 "	48	51	69	91
33.	50 - 54 "	48	44	56	79
34.	55 - 59 "	42	44	48	65
35.	60 - 64 "	31	43	40	50
36.	65 - 69 "	20	35	37	40
37.	70 - 74 "	13	23	32	30
38.	75 - 79 "	8	12	21	24
39.	80 - 84 "	4	6	10	15
40.	85 - 89 "	1	2	3	6
41.	90 - 94 "	-	1	1	2
42.	95 years and over ...	-	-	-	-

Table 2. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Alberta				
1.	All ages.....	796	900	969	1,008
2.	0 - 4 years	75	77	70	62
3.	5 - 9 "	76	84	73	66
4.	10 - 14 "	78	74	76	69
5.	15 - 19 "	78	75	83	73
6.	20 - 24 "	74	77	75	76
7.	25 - 29 "	66	77	74	82
8.	30 - 34 "	57	72	76	72
9.	35 - 39 "	53	64	76	73
10.	40 - 44 "	46	56	71	74
11.	45 - 49 "	44	51	62	74
12.	50 - 54 "	43	44	53	66
13.	55 - 59 "	38	41	48	58
14.	60 - 64 "	28	39	39	48
15.	65 - 69 "	18	31	34	40
16.	70 - 74 "	11	20	29	30
17.	75 - 79 "	7	11	19	22
18.	80 - 84 "	3	5	9	13
19.	85 - 89 "	1	2	3	6
20.	90 - 94 "	-	-	1	2
21.	95 years and over.	-	-	-	-
	British Columbia				
22.	All ages.....	818	860	855	830
23.	0 - 4 years	59	56	45	40
24.	5 - 9 "	55	72	49	42
25.	10 - 14 "	61	58	55	44
26.	15 - 19 "	67	54	72	49
27.	20 - 24 "	69	60	58	54
28.	25 - 29 "	72	65	53	70
29.	30 - 34 "	62	63	58	57
30.	35 - 39 "	56	70	64	52
31.	40 - 44 "	51	60	66	57
32.	45 - 49 "	50	53	68	62
33.	50 - 54 "	55	48	57	63
34.	55 - 59 "	52	45	49	63
35.	60 - 64 "	42	43	42	51
36.	65 - 69 "	30	42	38	41
37.	70 - 74 "	19	31	35	32
38.	75 - 79 "	11	18	26	24
39.	80 - 84 "	5	8	14	17
40.	85 - 89 "	2	3	5	8
41.	90 - 94 "	-	1	1	3
42.	95 years and over.	-	-	-	1

ESTIMATE B, CANADA (x) AND PROVINCES - Concluded

Male Population				Female Population				No.
1941	1951	1961	1971	1941	1951	1961	1971	
			(000's omitted)					
426	474	503	517	370	426	466	491	1.
38	39	36	32	37	38	34	30	2.
38	43	37	34	38	41	36	32	3.
39	57	39	35	39	37	37	34	4.
39	38	42	37	39	37	41	38	5.
38	39	37	39	36	38	36	37	6.
34	39	37	42	32	33	37	40	7.
30	37	38	36	27	35	38	35	8.
30	33	38	37	23	31	38	38	9.
26	30	36	37	20	26	35	37	10.
25	28	32	37	19	23	30	37	11.
26	24	28	35	17	20	25	33	12.
23	23	27	30	15	18	21	28	13.
17	23	22	25	11	16	17	25	14.
11	19	19	22	7	12	15	18	15.
6	12	17	16	5	8	12	14	16.
4	6	11	12	3	5	8	10	17.
2	3	5	7	1	2	4	6	18.
-	1	2	3	1	1	1	3	19.
-	-	-	1	-	-	1	1	20.
-	-	-	-	-	-	-	-	21.
435	447	436	417	393	413	419	415	22.
30	29	23	21	29	27	22	19	23.
28	37	25	21	27	35	24	21	24.
31	29	28	22	30	29	27	22	25.
34	27	37	25	33	27	35	24	26.
34	30	29	27	35	30	29	27	27.
36	33	27	35	36	32	26	35	28.
32	33	29	29	30	35	29	28	29.
31	35	32	26	25	35	32	26	30.
27	31	32	28	24	29	34	29	31.
27	29	34	31	23	24	34	31	32.
31	25	29	30	24	23	28	33	33.
31	24	27	31	21	21	22	32	34.
25	27	22	26	17	21	20	25	35.
18	24	19	22	12	18	19	19	36.
11	17	19	16	8	14	16	16	37.
6	10	14	12	5	8	12	12	38.
2	4	7	8	3	4	7	9	39.
1	2	2	4	1	1	3	4	40.
-	1	1	2	-	-	-	1	41.
-	-	-	1	-	-	-	-	42.

Table 3. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
CANADA (x)		(000's omitted)			
1.	All ages	11,499	12,943	13,963	14,603
2.	0 - 4 years	1,050	1,191	1,051	960
3.	5 - 9 "	1,044	1,246	1,125	991
4.	10 - 14 "	1,101	1,070	1,175	1,040
5.	15 - 19 "	1,118	1,043	1,234	1,114
6.	20 - 24 "	1,030	1,075	1,058	1,166
7.	25 - 29 "	965	1,101	1,025	1,217
8.	30 - 34 "	842	1,015	1,054	1,041
9.	35 - 39 "	758	918	1,078	1,009
10.	40 - 44 "	676	823	992	1,032
11.	45 - 49 "	635	720	888	1,049
12.	50 - 54 "	591	636	780	946
13.	55 - 59 "	508	574	662	824
14.	60 - 64 "	407	513	560	694
15.	65 - 69 "	306	407	472	550
16.	70 - 74 "	217	291	373	415
17.	75 - 79 "	137	180	246	292
18.	80 - 84 "	71	92	127	170
19.	85 - 89 "	27	38	48	72
20.	90 - 94 "	6	10	14	22
21.	95 years and over.	1	-	1	2
Prince Edward Island					
22.	All ages	95	99	112	124
23.	0 - 4 years	10	10	11	11
24.	5 - 9 "	10	9	11	11
25.	10 - 14 "	10	9	10	11
26.	15 - 19 "	9	9	9	10
27.	20 - 24 "	8	9	9	10
28.	25 - 29 "	7	8	9	9
29.	30 - 34 "	6	7	9	9
30.	35 - 39 "	5	6	8	9
31.	40 - 44 "	5	5	7	8
32.	45 - 49 "	5	5	6	8
33.	50 - 54 "	4	4	5	7
34.	55 - 59 "	4	4	4	6
35.	60 - 64 "	3	4	4	5
36.	65 - 69 "	3	3	3	3
37.	70 - 74 "	3	3	3	3
38.	75 - 79 "	2	2	2	2
39.	80 - 84 "	1	1	1	1
40.	85 - 89 "	-	1	1	1
41.	90 - 94 "	-	-	-	-
42.	95 years and over.	-	-	-	-

(x) Excluding Yukon and the Northwest Territories.

Table 3. POPULATION PROJECTION, 1941-1971

No.	Age Group.	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Nova Scotia				
1.	All ages	578	666	728	778
2.	0 - 4 years	58	66	59	56
3.	5 - 9 "	56	68	62	57
4.	10 - 14 "	55	60	65	59
5.	15 - 19 "	56	56	67	61
6.	20 - 24 "	55	55	59	64
7.	25 - 29 "	50	57	55	66
8.	30 - 34 "	40	55	53	58
9.	35 - 39 "	33	48	55	54
10.	40 - 44 "	30	40	53	52
11.	45 - 49 "	29	32	46	53
12.	50 - 54 "	26	28	38	50
13.	55 - 59 "	23	26	29	43
14.	60 - 64 "	20	23	25	34
15.	65 - 69 "	17	18	22	25
16.	70 - 74 "	13	14	17	19
17.	75 - 79 "	9	10	12	14
18.	80 - 84 "	5	6	7	8
19.	85 - 89 "	2	3	3	4
20.	90 - 94 "	1	1	1	1
21.	95 years and over .	-	-	-	-
	New Brunswick				
22.	All ages	457	518	596	671
23.	0 - 4 years	50	60	61	62
24.	5 - 9 "	48	57	60	60
25.	10 - 14 "	48	49	59	60
26.	15 - 19 "	49	46	56	59
27.	20 - 24 "	42	46	48	58
28.	25 - 29 "	36	45	45	55
29.	30 - 34 "	31	39	45	47
30.	35 - 39 "	26	32	44	44
31.	40 - 44 "	23	28	38	43
32.	45 - 49 "	22	23	31	43
33.	50 - 54 "	20	21	26	36
34.	55 - 59 "	17	19	22	29
35.	60 - 64 "	14	17	18	24
36.	65 - 69 "	12	13	16	18
37.	70 - 74 "	9	10	12	14
38.	75 - 79 "	6	7	8	10
39.	80 - 84 "	3	4	4	6
40.	85 - 89 "	1	2	2	2
41.	90 - 94 "	-	-	1	1
42.	95 years and over .	-	-	-	-

Table 3. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Quebec				
1.	All ages	3,332	3,897	4,554	4,701
2.	0 - 4 years	353	412	374	345
3.	5 - 9 "	348	424	390	353
4.	10 - 14 "	362	357	405	369
5.	15 - 19 "	351	346	419	397
6.	20 - 24 "	304	353	353	401
7.	25 - 29 "	282	339	339	413
8.	30 - 34 "	247	298	345	346
9.	35 - 39 "	217	267	331	334
10.	40 - 44 "	183	238	290	358
11.	45 - 49 "	162	204	257	321
12.	50 - 54 "	140	171	224	275
13.	55 - 59 "	114	145	186	256
14.	60 - 64 "	92	119	148	197
15.	65 - 69 "	71	90	117	152
16.	70 - 74 "	50	64	85	108
17.	75 - 79 "	31	40	52	70
18.	80 - 84 "	16	20	27	37
19.	85 - 89 "	7	8	10	15
20.	90 - 94 "	2	2	2	4
21.	95 years and over .	-	-	-	-
	Ontario				
22.	All ages	3,788	4,180	4,342	4,382
23.	0 - 4 years	298	332	275	244
24.	5 - 9 "	301	363	301	257
25.	10 - 14 "	325	313	329	273
26.	15 - 19 "	339	307	351	299
27.	20 - 24 "	324	322	310	327
28.	25 - 29 "	316	344	303	357
29.	30 - 34 "	286	329	317	306
30.	35 - 39 "	268	309	338	299
31.	40 - 44 "	250	286	322	311
32.	45 - 49 "	233	260	299	329
33.	50 - 54 "	214	238	272	308
34.	55 - 59 "	182	214	239	277
35.	60 - 64 "	150	186	209	241
36.	65 - 69 "	116	147	174	198
37.	70 - 74 "	86	107	135	155
38.	75 - 79 "	55	68	88	107
39.	80 - 84 "	30	36	46	61
40.	85 - 89 "	11	15	18	25
41.	90 - 94 "	3	4	5	7
42.	95 years and over .	1	-	1	1

ESTIMATE D, CANADA (x) AND PROVINCES - Continued.

Male Population				Female Population				No.
1941	1951	1961	1971	1941	1951	1961	1971	
(000's omitted)								
1,673	1,958	2,186	2,359	1,659	1,939	2,168	2,342	1.
179	210	191	177	174	202	183	168	2.
175	216	199	180	173	208	191	173	3.
182	189	206	188	180	177	199	181	4.
176	174	213	197	175	172	206	190	5.
148	178	178	204	156	175	175	197	6.
139	169	170	210	143	170	169	203	7.
123	147	174	175	124	151	171	171	8.
110	132	165	167	107	135	166	167	9.
92	119	143	170	91	119	147	168	10.
84	102	127	160	78	102	130	161	11.
72	86	111	135	68	85	113	140	12.
59	74	93	115	55	71	93	121	13.
47	60	73	97	45	59	75	100	14.
36	46	58	74	35	44	59	78	15.
25	32	42	51	25	32	43	57	16.
15	19	25	33	16	21	27	37	17.
7	9	13	17	9	11	14	20	18.
3	4	4	7	4	4	6	8	19.
1	1	1	2	1	1	1	2	20.
-	-	-	-	-	-	-	-	21.
1,922	2,108	2,183	2,198	1,866	2,072	2,159	2,184	22.
151	170	141	125	147	162	134	119	23.
153	185	154	131	148	178	147	126	24.
165	159	168	140	160	154	161	133	25.
172	155	184	153	167	152	177	146	26.
164	162	157	166	160	160	153	161	27.
160	173	153	181	156	171	150	176	28.
145	165	160	155	141	164	157	151	29.
139	156	170	151	129	153	168	148	30.
128	146	161	156	122	140	161	155	31.
120	134	150	165	113	126	149	164	32.
110	121	137	153	104	117	135	155	33.
94	108	121	138	88	106	118	139	34.
76	94	105	120	74	92	104	121	35.
58	73	85	98	58	74	89	100	36.
41	51	65	74	45	56	70	81	37.
26	32	41	50	29	36	47	57	38.
14	16	21	28	16	20	25	33	39.
6	6	8	11	6	9	10	14	40.
1	2	2	3	2	2	3	4	41.
-	-	-	-	1	-	1	1	42.

Table 3. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
		(000's omitted)			
Manitoba					
1.	All ages	730	787	855	854
2.	0 - 4 years ...	62	67	56	48
3.	5 - 9 " ...	62	71	61	51
4.	10 - 14 " ...	67	60	66	56
5.	15 - 19 " ...	73	60	70	61
6.	20 - 24 " ...	69	64	60	66
7.	25 - 29 " ...	64	69	59	69
8.	30 - 34 " ...	53	65	63	59
9.	35 - 39 " ...	47	58	68	58
10.	40 - 44 " ...	41	50	64	62
11.	45 - 49 " ...	42	43	56	67
12.	50 - 54 " ...	41	39	48	61
13.	55 - 59 " ...	36	37	40	53
14.	60 - 64 " ...	27	36	35	43
15.	65 - 69 " ...	19	29	31	34
16.	70 - 74 " ...	13	19	27	26
17.	75 - 79 " ...	8	11	18	20
18.	80 - 84 " ...	4	6	9	15
19.	85 - 89 " ...	2	2	3	5
20.	90 - 94 " ...	-	1	1	2
21.	95 years and over	-	-	-	-
Saskatchewan					
22.	All ages	896	923	1,011	1,062
23.	0 - 4 years ...	85	85	80	68
24.	5 - 9 " ...	88	81	84	73
25.	10 - 14 " ...	95	78	84	79
26.	15 - 19 " ...	96	82	81	83
27.	20 - 24 " ...	85	86	77	84
28.	25 - 29 " ...	72	86	81	80
29.	30 - 34 " ...	60	71	85	76
30.	35 - 39 " ...	53	59	84	79
31.	40 - 44 " ...	47	52	70	84
32.	45 - 49 " ...	48	45	58	82
33.	50 - 54 " ...	48	41	49	67
34.	55 - 59 " ...	42	41	42	54
35.	60 - 64 " ...	31	41	37	45
36.	65 - 69 " ...	20	33	35	36
37.	70 - 74 " ...	13	22	30	28
38.	75 - 79 " ...	8	12	20	22
39.	80 - 84 " ...	4	5	10	14
40.	85 - 89 " ...	1	2	3	6
41.	90 - 94 " ...	-	1	1	2
42.	95 years and over	-	-	-	-

Table 5. POPULATION PROJECTION, 1941-1971

No.	Age Group	Total Population			
		1941	1951	1961	1971
			(000's omitted)		
	Alberta				
1.	All ages	796	899	992	1,044
2.	0 - 4 years ...	75	85	76	70
3.	5 - 9 " ...	76	87	91	72
4.	10 - 14 " ...	78	75	84	75
5.	15 - 19 " ...	78	75	86	90
6.	20 - 24 " ...	74	75	74	84
7.	25 - 29 " ...	66	76	73	85
8.	30 - 34 " ...	57	70	73	73
9.	35 - 39 " ...	53	61	75	72
10.	40 - 44 " ...	46	55	69	72
11.	45 - 49 " ...	44	50	59	73
12.	50 - 54 " ...	43	43	53	66
13.	55 - 59 " ...	38	40	46	56
14.	60 - 64 " ...	28	38	39	47
15.	65 - 69 " ...	18	31	34	39
16.	70 - 74 " ...	11	20	26	28
17.	75 - 79 " ...	7	11	19	21
18.	80 - 84 " ...	3	5	9	13
19.	85 - 89 " ...	1	2	3	6
20.	90 - 94 " ...	-	-	1	2
21.	95 years and over	-	-	-	-
	British Columbia				
22.	All ages	818	974	993	990
23.	0 - 4 years ...	59	74	59	56
24.	5 - 9 " ...	55	86	65	57
25.	10 - 14 " ...	61	69	73	58
26.	15 - 19 " ...	67	62	85	64
27.	20 - 24 " ...	69	65	68	72
28.	25 - 29 " ...	72	77	61	83
29.	30 - 34 " ...	62	81	64	67
30.	35 - 39 " ...	56	78	75	60
31.	40 - 44 " ...	51	69	79	62
32.	45 - 49 " ...	50	58	76	73
33.	50 - 54 " ...	55	51	65	76
34.	55 - 59 " ...	52	48	54	70
35.	60 - 64 " ...	42	49	45	58
36.	65 - 69 " ...	30	43	40	45
37.	70 - 74 " ...	19	32	36	34
38.	75 - 79 " ...	11	19	27	26
39.	80 - 84 " ...	5	9	14	17
40.	85 - 89 " ...	2	3	5	8
41.	90 - 94 " ...	-	1	2	3
42.	95 years and over	-	-	-	1

ESTIMATE D. CANADA^(x) AND PROVINCES - Concluded.

Male Population				Female Population				No.
1941	1951	1961	1971	1941	1951	1961	1971	
(000's omitted)								
426	474	515	537	370	425	477	507	1.
38	43	39	36	37	42	37	34	2.
38	44	46	37	38	43	45	35	3.
39	38	43	38	39	37	41	37	4.
39	38	44	46	39	37	42	44	5.
38	38	37	43	36	37	37	41	6.
34	39	37	43	32	37	36	42	7.
30	36	37	37	27	34	36	36	8.
30	31	38	36	23	30	37	36	9.
26	29	35	36	20	26	34	36	10.
25	28	30	37	19	22	29	36	11.
26	24	28	34	17	19	25	32	12.
23	23	25	29	15	17	21	27	13.
17	22	22	25	11	16	17	22	14.
11	19	19	21	7	12	15	18	15.
6	12	16	16	5	8	12	12	16.
4	6	11	12	3	5	8	9	17.
2	3	5	7	1	2	4	6	18.
-	1	2	3	1	1	1	3	19.
-	-	1	1	-	-	-	1	20.
-	-	-	-	-	-	-	-	21.
435	500	501	494	383	474	492	496	22.
30	38	30	29	29	36	29	27	23.
28	44	33	29	27	42	32	28	24.
31	35	37	30	30	34	36	28	25.
34	31	43	33	33	31	42	31	26.
34	32	34	36	35	33	34	36	27.
36	37	31	42	36	40	30	41	28.
32	38	32	34	30	43	32	33	29.
31	38	36	30	25	40	39	30	30.
27	36	37	31	24	33	42	31	31.
27	31	37	34	23	27	39	39	32.
31	27	34	35	24	24	31	41	33.
31	25	29	34	21	23	25	36	34.
25	27	24	29	17	22	21	29	35.
18	24	20	23	12	19	20	22	36.
11	18	19	17	8	14	17	17	37.
6	11	15	13	5	8	12	13	38.
2	5	7	8	3	4	7	9	39.
1	2	2	4	1	1	3	4	40.
-	1	1	2	-	-	1	1	41.
-	-	-	1	-	-	-	-	42.

APPENDIX

METHOD

(a) Estimates A and B

(i) Population Base

The Census Population of 1941 was used as the starting point.

(ii) Mortality

For life-table death rates, Notestein found that mortality rates of any given height tended to have a characteristic downward slope which was similar for all countries and at all times.^x This assumption is a generalization of the total European experience from 1921-1939. On the curves which were constructed for Europe the point at each age is found where mortality is equal to average Canadian mortality for the period 1921-1939. The curve is then followed and points on it taken to represent Canadian mortality at the dates required for the projection.

To determine the applicability of the basic curves to Canadian experience, a computation was made to compare the decline from 1931 to 1941 as it actually occurred in Canada with the decline as indicated by the curves. It was found that for the younger ages more improvement was shown in the Canadian figures than the average of the European experience, and in the older ages, less. For males the turning point was age 30, for females 60.

In order to see the significance of these differences, they were multiplied by the 1931 population. Adding the various ages, it was found that the European experience showed, for males, a greater improvement over ten years than Canada 1931-1941, by an amount which would be responsible for about 25,000 deaths in the decade. For females, the improvement was greater than that in Europe by an amount equal to 20,000 deaths per decade. Considering the figure for males, an amount of about 75,000 would be obtained in the course of 50 years, which would represent about 1 p.c. of the estimated 1970 population; for females, the amount would be slightly smaller. The error due to mortality as such would approximately balance between the sexes. However, the greater improvement in mortality predicted for males as compared with Canadian experience 1931-41 would result in somewhat too many males in the projection. Similarly, the lesser improvement for females would result in too few females. In so far as a large part of the discrepancy of 20,000 females is in the reproductive ages, there would be a net effect of slightly decreasing total births.

(iii) Fertility

The following age-specific fertility rates were used: (i) 1921-1922; (ii) 1928-1929. These two sets of rates were averaged to give a rate for 1925. (iii) 1931-1932; (iv) 1938-1939. The two sets were averaged to give rates for 1935. Finally the 1925 and 1935 rates, calculated as stated, were averaged to give rates for 1930. The 1921-22 and 1931-32 rates used were those given in the 1931 Fertility Monograph except those for Quebec. The Quebec rates were calculated in the same way as the Monograph rates. For 1921 and 1922, provincial births were used and estimated rates were calculated. For 1928 and 1929 rates, populations were obtained by straight line interpolation between census figures. The 1938 and 1939 populations were again interpolated in the first place but were finally adjusted to agree with estimates of the Canadian inter-censal population by single years which took account of yearly migration movements.

^x ibid, page 22.

When the height-slope relations actually found in Canada during the period around 1930 were compared with the generalized European experience, the rates of decline in Canada were, on the whole, rather less than those for European rates at the same level. For Canada as a whole, decline was greater among women 15-19 and 20-24 than in Europe. In other age groups it was less, and very much less among women 30-40. In the most important age group 25-29, the difference between Canada and Europe was small. Notestein does not give figures of European declines in gross reproduction rates in the period 1925-1935; but as far as it is possible to judge by comparing his graphs and the ones presented here, the decline in the Canadian gross reproduction rates during this period came very close to the European average. Table VII and Figs. 13 and 14 show the gross reproduction rates used.

Individual provinces show marked deviations from the European trend. In this they resemble the different countries of Europe. The province that agrees best with the European experience is Quebec. In that province decline was greater than expected in the age groups 15-19 and 20-24, the same in the age group 25-29, and less in older age groups. Ontario and British Columbia agreed fairly well with expectation. In Ontario decline was again greater than expectation in the youngest age groups and less in the older. In British Columbia it was greater than expectation in the age groups 40 and over. The Maritimes, on the other hand, all showed a much slower rate of decline and the Prairies, on the whole, a faster rate. Prince Edward Island and Nova Scotia showed increased fertility in the age group 20-24 as well as in the age group 15-19.

There was a slight deviation from the standard method. Age-specific fertility of women 45 and over in British Columbia 1938-39 was outside the limit of the equations connecting y and x in 1930. A rigorous application of the method would have given an increasing fertility in this age group. As the contribution to total fertility would be in any case negligible, the rate was kept stationary.

The Notestein method involves taking the births and deaths as far as they are known beyond the last available census. It was possible to use the natural increase figures up to the end of 1943, while for the remainder of the 1941-46 period the fertility rates calculated were applied to the resulting population. As Notestein used the births of the two years preceding the war as a starting point for projecting fertility rates, the same procedure was adopted. The mortality rates of the years surrounding the census date, 1940-1942, were those used. These are the same as the official Canadian life tables.

As has been said, the application of European experience to Canadian conditions does not give an exact picture of the Canadian experience though the correspondence is close. Nevertheless it has its value. The Notestein method was based on the generalization that certain trends can be seen to operate throughout Europe, suggesting similarities in the social structure of all countries for which statistical knowledge is obtainable. Individual countries deviate from this pattern, markedly so for a short time, less so over a longer period, in ways which reflect individual differences in social pattern. Short term changes of this kind are not easy to predict but there is some reason to believe that the permanent trend will continue in the absence of revolutionary social change. There is considerable evidence to show that this long term trend is undisturbed by wars, booms and depressions. And it is now obvious that neither the German nor the Italian fascist movements changed the pattern. Whether the Russian revolution did so or not still remains to be seen.

A comparison of the Canadian experience with that of Europe suggests the presence of similar basic elements. The experience of individual provinces has deviated from the average in a manner similar to that of individual countries of

TABLE VII. GROSS REPRODUCTION RATES FOR POPULATION PROJECTIONS

	1921-22	1928-29	1931-32	1938-39
CANADA	2.003	1.683	1.604	1.336
Prince Edward Island	1.971	1.634	1.792	1.659
Nova Scotia	1.799	1.607	1.716	1.460
New Brunswick	2.205	1.933	2.029	1.816
Quebec	2.686	2.121	2.006	1.586
Ontario	1.603	1.380	1.319	1.124
Manitoba	2.032	1.524	1.426	1.197
Saskatchewan	2.180	1.894	1.749	1.402
Alberta	1.979	1.806	1.676	1.399
British Columbia	1.351	1.185	1.095	1.029

PROJECTED RATES

	1946-51	1951-56	1956-61	1961-66	1966-71
<u>Estimate A</u>					
Canada	1.075	0.983	0.908	0.845	0.791
<u>Estimate B</u>					
Canada	1.087	0.993	0.924	0.868	0.809
Prince Edward Island ..	1.345	1.222	1.123	1.040	0.970
Nova Scotia	1.170	1.075	0.996	0.930	0.873
New Brunswick	1.432	1.304	1.199	1.113	1.039
Quebec	1.242	1.124	1.029	0.950	0.884
Ontario	0.936	0.866	0.808	0.758	0.714
Manitoba	0.971	0.891	0.824	0.768	0.720
Saskatchewan	1.118	1.019	0.938	0.871	0.813
Alberta	1.124	1.029	0.951	0.885	0.829
British Columbia	0.874	0.814	0.763	0.719	0.680
<u>Estimate C</u>					
Canada	1.225	1.108	1.012	0.931	0.863
<u>Estimate D</u>					
Canada	1.230	1.124	1.022	0.949	0.881
Prince Edward Island ..	1.592	1.474	1.375	1.290	1.217
Nova Scotia	1.324	1.204	1.105	1.022	0.951
New Brunswick	1.676	1.544	1.433	1.338	1.256
Quebec	1.430	1.275	1.151	1.049	0.964
Ontario	1.042	0.951	0.876	0.813	0.758
Manitoba	1.102	0.998	0.913	0.840	0.781
Saskatchewan	1.276	1.141	1.032	0.942	0.866
Alberta	1.281	1.155	1.052	0.967	0.899
British Columbia	0.974	0.914	0.863	0.820	0.782

Figure 15

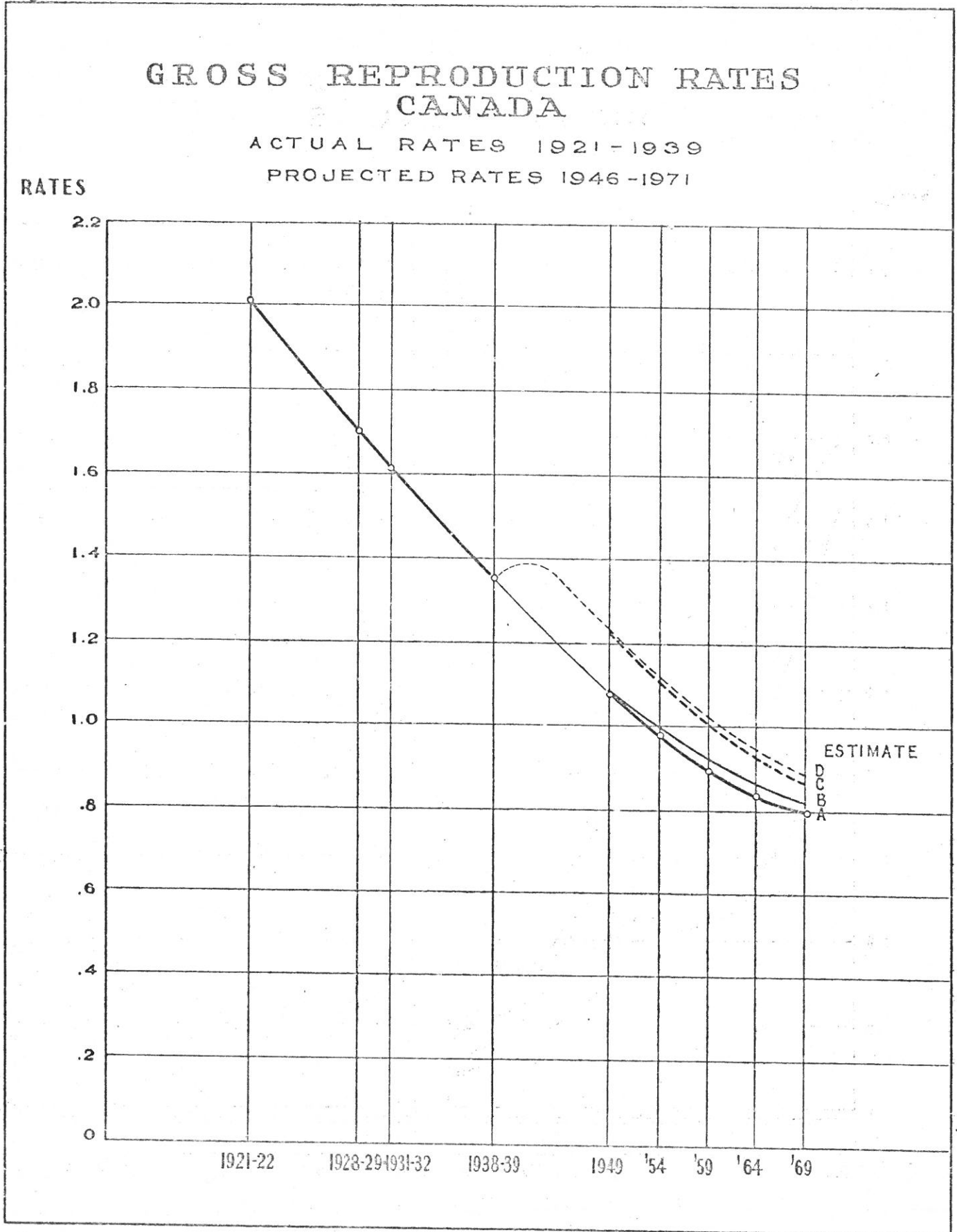
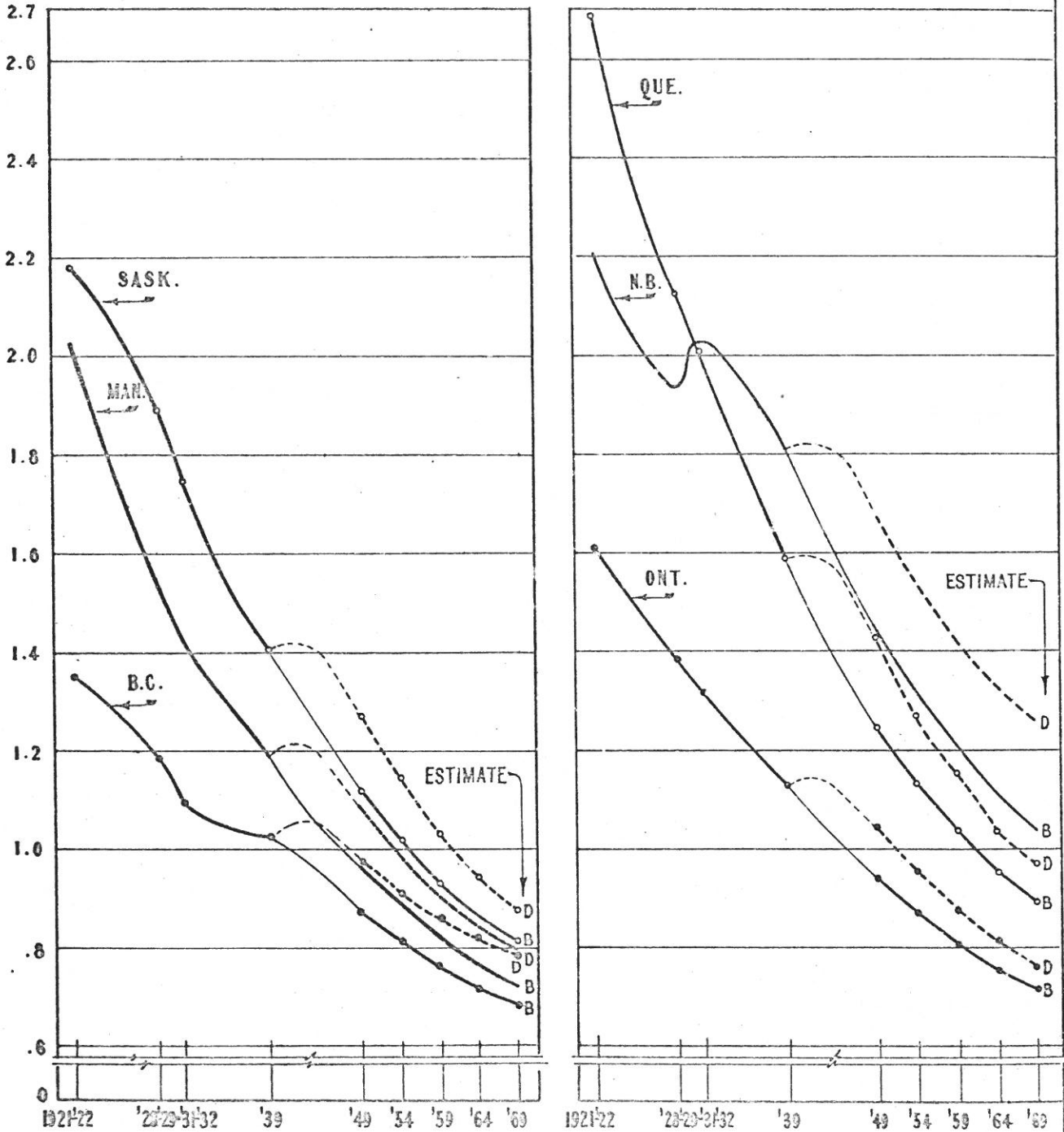


Figure 14

GROSS REPRODUCTION RATES BY PROVINCES

ACTUAL RATES 1921-1939
PROJECTED RATES 1946-1971

RATES



Europe. Slow decline of fertility rates in the Maritimes and fast decline in the Prairies may be explained by selective internal migration movements and different rates of economic expansion and urbanization. In so far as these differences persist, the projected fertility rates for these regions will be respectively too low or too high. On the other hand, there can be seen in the most diverse countries a universal tendency toward a levelling down of fertility differentials. It is possible to assume that in Canada also differences between provinces will tend to become less even if economic differences persist. We may say that the projected fertility rates which are used represent that part of Canada's future which depends on characteristics in its social and economic structure shared in common with all other countries of Western civilization.

(a) Estimates C and D

(i) Population Base

The estimated population for June 1, 1944 was the starting point. The estimate was based on a count of returned ration cards and an adjustment was made for under-enumeration at the Census in the age group 0-4 years.

(ii) Mortality

Mortality rates for C and D were similar to those used for A and B.

(iii) Fertility

For these estimates, hyperbolic interpolation was again used, but based on Canadian experience alone, and height-slope relations determined from the fertility rates of the period 1931-1939.

In allowing for the effect of the war, the projected decline in fertility was postponed for some years. We assumed that the trend in rates reached in 1939 would be resumed in 1946, thus achieving a considerable net gain in births due to the war. This is justified in part by the early marriages of 1941 and 1942. In the young age groups more women are married than for many previous years so that the assumption of a temporary arrest of the fall in fertility is not unreasonable even though large families are declining uninterruptedly.

The number of births 1943-1946 was estimated by examining curves of births by order of birth and age of mother in relation to the crude marriage rate and then extrapolating the trends. This process was used in previous estimates of births but more detailed and more recent information was used here. The estimate obtained suggests that in 1946 fertility rates will be at the following levels: - ages 15-34 - level of 1938-39; ages 35-39 - level of 1943 according to Estimate A, and ages 40-49 - level of 1946 according to Estimate A. After 1946, fertility rates are assumed to fall according to the hyperbolic trend estimated from the Canadian experience of 1931 to 1939. Fertility rates will fluctuate in response to the post-war boom and depression, but this may describe the general trend.

The most marked of the provincial differences in rates of fall have existed since 1871. On the other hand, it is fairly certain that all differences of this kind tend to become equalized in the course of time. The most reasonable assumption for provincial differences would seem to be to take a proportional rate of fall (Y_0) which is the mean between the provincial proportional rate of fall and that for Canada as a whole at the same fertility level. In this way some provincial variety is retained but to a diminished extent. In Quebec and Ontario the rates of fall differ little from those for Canada as a whole. The marked differences lie in the Prairie and Maritime Provinces.

The Canadian total in Estimate D again differs from C in being obtained by adding the provincial figures while in C Canada is treated as a unit.

Since deaths in the armed services overseas were only partially available when the projections were computed, they have not been taken into account. Future populations are thus over-estimated by this amount.