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CHAPTER IX

SEASONAL FLUCTUATIONS

An analysis of seasonal changes in immigration and emigration is desirable for two purposes, first to make possible the correction of the crude data for typical seasonal variation so that the cyclical element may be more readily analyzed; and secondly, as a basis for comparison with the seasonal fluctuations in employment.

CORRECTION FOR NORMAL SEASONAL VARIATION

Necessity.

With few exceptions, immigration and emigration both exhibit pronounced seasonal fluctuations. Furthermore, when statistics of the total movement are separated into their constituents, the several elements are found to exhibit different typical seasonal movements. To illustrate, the typical seasonal for the "no occupation" group is essentially different from that for the groups for which the designated occupations are "laborer" or "farm laborer." In all groups, however, the seasonal is sufficiently pronounced to make direct analysis of the original data difficult. To facilitate study of the susceptibility of the migratory currents to cyclical fluctuations in employment, it is necessary, as we have noted in previous chapters, to determine the typical seasonal movement and by abstracting this typical seasonal fluctuation from the original data, to leave a residue which represents the best available estimate of the influence of the remaining elements—trend, cycle, and accidental factors.

In most instances, it has been found desirable to eliminate also the influence of the trend, leaving "cycles" which represent the influence of cyclical and "accidental" factors alone.

Period.

An examination of graphs of the various immigrant and emigrant series reveals the fact that prior to the middle of 1914 most of them evidence a reasonably consistent seasonal movement, but that in

subsequent years, the war, the abnormal situation in transport immediately following the war, and the influence of the quota act, have distorted the seasonal movement from any close resemblance to that exhibited prior to the war. Consequently, it has seemed expedient to base the computation of the normal seasonal, in most instances, upon the pre-war years, despite the fact that for many series data are available for only five pre-war years (beginning Jan. 1, 1909).

Method.

For the longer series, such as male immigrants, beginning in 1893, the typical seasonal has been obtained by adding and averaging like months (e. g. all the Januarys) and adjusting the results for any upward or downward bias ascribable to a trend in the data. The adjusted results were then translated into percentages of their mean, giving *twelve seasonal indices* or type numbers.

In some cases, particularly for shorter series where the seasonal indices were to be used in isolating the cyclical movement, they have been computed by somewhat more refined methods, principally by the link-relative method developed by Professor Warren M. Persons or by finding the typical percentage deviation from a trend-cycle curve obtained by computing a twelve-month moving average and adjusting this average to make it represent our best estimate of the course of the cycle and trend.

Quota-Period Seasonals.

With the exception of certain classes of arrivals who are not counted against the quotas, the immigration law of 1921 limited the number of aliens of any nationality who might be admitted in any one year to three per cent of the foreign-born persons of such nationality resident in the United States as shown by the Census of 1910, and permitted a maximum of twenty per cent of the annual quota for any nationality to be admitted in any one month. The new quotas begin to be available on July 1st of each year, hence this law has tended to concentrate arrivals in July and the four following months. It was, therefore, necessary to make a special computation of the typical seasonal variation for the period since the quota law went into effect. This computation was based upon immigration data for the period from July, 1921, to June, 1924, inclusive. Such a short period, of course, does not give a clearly adequate basis for estimating the typical seasonal movement under

the 1921 restrictive law; but the use of the indices so computed yields a cycle curve which appears to be a reasonable estimate of the post-war cycle in immigration (see Chart 24 in Chapter VI).[1]

PRE-WAR SEASONAL TENDENCIES IN ARRIVALS

In the following pages, we first examine the pre-war seasonal movements in arrivals, in departures, and in the net result of arrivals less departures. We then turn to an examination of the available evidence concerning seasonal fluctuations of employment in those industries in which immigrants engage in large numbers, in order to lay the basis for determining to what extent seasonal fluctuations in migration synchronize well with seasonal variations in employment opportunities.

In most cases seasonal changes are described in terms of *typical seasonal fluctuations*, by which is meant that part of the total observed fluctuations which are, on the average, ascribable to seasonal influences as distinguished from the longtime trend and cyclical influences; but in one or two instances (see Chart 55) attention is directed to the *crude seasonal distributions*, which are the average distributions of the data over the months of the year without any adjustment for the fact that the distribution may be in part due to a growth factor.

Principal Similarities.

The major features of the seasonal movements of the various groups of immigrants can be quickly noted by scanning Charts 48 and 49, and the tables upon which they are based.

For most classes of incoming aliens, the volume is small in January and February, with an incoming rush in March, April, and May, a falling off in midsummer, and a moderate recovery in September and October, followed by a decline in November and December.

Male and Female Immigration.

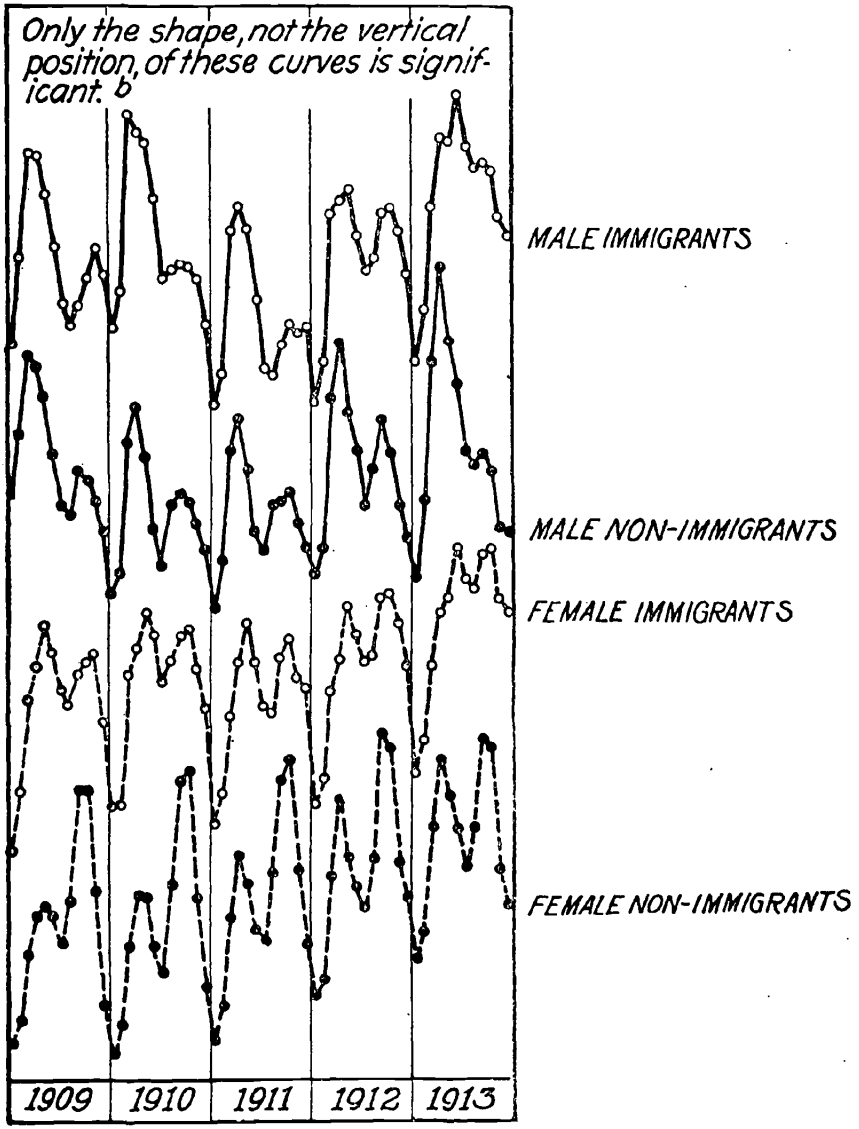
Inasmuch as the movement of male immigration has been the primary series used in our analysis of the cyclical aspects of industry, it is pertinent to inquire as to what differences exist between the seasonal fluctuations of the male immigrant group and those of other immigrant groups.

[1]The Immigration Act of 1924 again modified the seasonal movement in immigration by its provision that not more than *ten* per cent of any annual quota may be admitted in any month except in cases where such quota is less than 300 for the entire year.

CHART 48

SEASONAL FLUCTUATIONS IN ALIEN ARRIVALS.

Note the similarity from year to year in the shape of the curves.



[a]The numerical data for male immigrants are in Appendix Table II. The other curves are plotted from monthly data published by the U. S. Bureau of Immigration and Naturalization in its monthly *Immigration Bulletin.*

[b]For a more complete discussion of the method of constructing the above chart, see footnote (b) to Chart 27, in Chapter VII.

The differences in the seasonal tendencies of male and female immigration are indicated in Chart 48. The four curves represent male immigrants, male nonimmigrants, female immigrants, and female nonimmigrants, respectively, for each of the five years from 1909 to 1913, plotted on a ratio scale so that equal percentage changes are represented by equal vertical changes. Only the shape of these curves and not the position of a curve on the chart is significant. Each of the four series shows a decidedly regular and characteristic seasonal fluctuation throughout this five-year period. The spring peak is marked for the male series, both immigrant and nonimmigrant; but the fall peak is almost as large as the spring peak for the female immigrant series, and is decidedly higher for the female nonimmigrant series. As would be expected, it is evident from these curves that the immigration of women, particularly of the nonimmigrant group, is less affected than is male immigration by the inducements which create the spring peak in the incoming movement, including the desire to be on hand for the summer boom in employment which, as we shall see presently, occurs particularly in outdoor employment.

To facilitate comparison with other series, two sets of indices of seasonal fluctuations in male immigration have been computed. One of these is based upon data for the period from 1893 to 1913, inclusive (see Table 58 and Chart 54). The second computation, based upon data for the period from January, 1909, to June, 1914 (Table 53 and Chart 49), was prepared for use in comparisons with other elements in migration for which statistics are available only during a few years prior to the war. The seasonal movements indicated by these two computations are, in general, similar. The spring peak is somewhat less pronounced when only the shorter period is considered; but whether the shorter or the longer period from 1893 to 1913 are used, male immigration exhibits a seasonal variation with a low point in mid-winter (January) and a slight rise in February, followed in March, April, and May by three months of very large immigration. After May, the movement declines rapidly and remains low through the balance of the year with a moderate recovery in the early fall.

Various noteworthy differences among the seasonal movements of the several classes of arrivals are illustrated in Chart 49.

Citizens and Aliens.

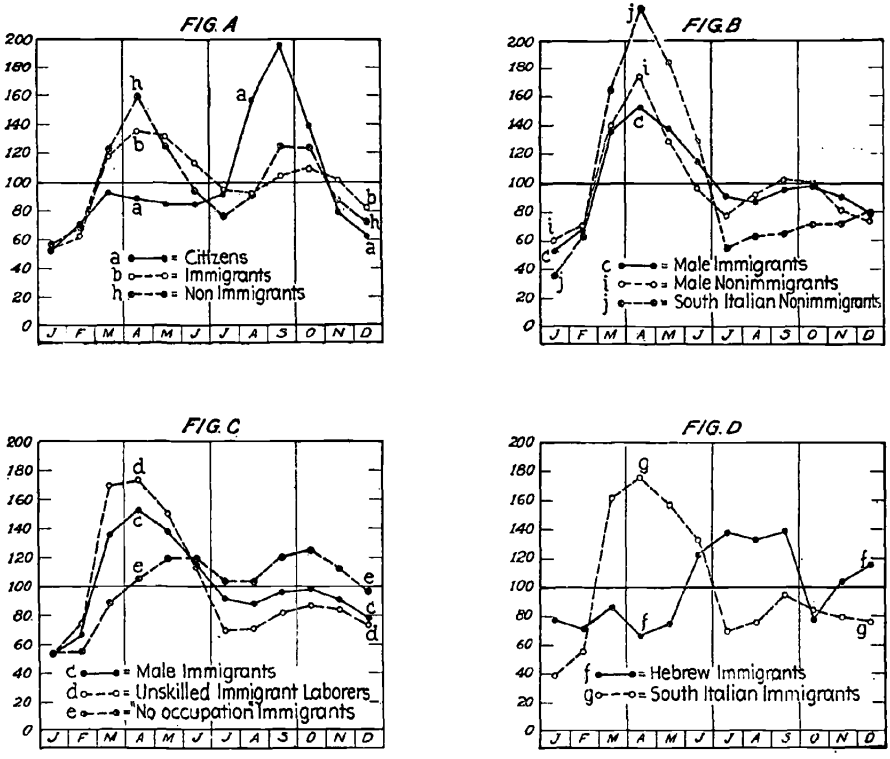
The three curves in Fig. A, of Chart 49, represent, respectively, returning citizens of the United States, alien immigrants, and alien

nonimmigrants. The seasonal distribution of arriving citizens is dominated by the summer tourist travel, with the bulk of arrivals in August, September, and October, in direct contrast with the alien groups, which reach their peak in April, or about five months earlier than the peak in the number of citizen arrivals.

CHART 49

PRE-WAR SEASONAL FLUCTUATIONS IN ARRIVALS.

Average of twelve months = 100



•Numerical data in Table 53, in columns lettered to correspond with the numbering of the curves in the above chart.

Immigrants and Nonimmigrants.

It is noteworthy that the seasonal movement of nonimmigrants bears a much closer resemblance to the immigrant seasonal than it does to the citizen seasonal. Whether both sexes are considered (Fig. A of Chart 49) or males only (Fig. B), we find that nonim-

migrants show an even greater peak in April than the immigrants. This is notably true for the South Italian nonimmigrant group. On the other hand, we found, in examining Chart 48, that the seasonal movement of female nonimmigrants exhibits less tendency to peak in the spring. Thus it would appear that, while the alien nonimmigrant is on the whole guided in his choice of sailing months by much the same considerations that influence the alien intending to establish permanent residence in the United States, yet the tendency toward the spring concentration is most marked among

TABLE 53—INDICES OF PRE-WAR SEASONAL FLUCTUATIONS IN ARRIVALS*

Monthly average—100

MONTH	CITIZENS	IMMIGRANT ALIENS						NON-IMMIGRANT ALIENS		
		TOTAL	MALE	UNSKILLED	NO OCCUPATION	HEBREWS	SOUTH ITALIAN	TOTAL	MALE	SOUTH ITALIAN
	a	b	c	d	e	f	g	h	i	j
Jan...	51.8	52.8	52.7	52.9	53.4	77.0	38.7	56.6	60.4	35.3
Feb...	71.4	62.8	66.9	74.3	55.0	70.9	55.7	68.5	70.6	62.2
Mar...	93.0	117.4	135.8	169.3	88.0	85.4	161.9	122.1	140.6	164.3
Apr...	88.7	135.5	152.4	173.5	105.3	66.1	175.9	159.1	173.6	222.0
May..	84.7	131.9	137.7	150.2	119.3	74.5	156.9	124.2	128.9	184.3
June..	84.7	113.6	114.9	113.8	119.3	122.6	132.3	94.6	97.2	128.4
July ..	91.5	95.0	90.8	69.4	103.1	137.1	69.9	76.5	77.9	54.7
Aug...	157.3	93.1	87.3	70.8	103.5	132.3	75.6	90.9	92.5	63.4
Sept...	196.3	104.9	95.8	81.1	120.0	138.3	94.4	124.4	103.0	64.3
Oct. ..	139.2	109.8	97.9	86.6	124.8	77.0	83.5	123.2	100.4	70.8
Nov...	79.2	100.8	90.1	83.9	112.1	103.4	79.4	87.3	81.0	71.9
Dec...	62.3	82.5	78.1	73.8	96.2	115.4	75.9	72.6	73.8	78.8

*Computed from U. S. Bureau of Immigration and Naturalization, *Immigration Statement and Inward Passenger Movement*, monthly issues July, 1907, to February, 1909; and *Immigration Bulletin*, monthly issues, March, 1909, to June, 1914. The periods covered by the data are as follows: Series a, b, and h, July, 1907, to June, 1914; series i, July, 1908, to June, 1914; series d, January, 1909, to December, 1913; and series c, e, f, g, and j, January, 1909, to June, 1914.

those elements in the nonimmigrant group for whom it is most likely that the opportunity for employment is the incentive for their voyage to America.

Unskilled Workers and Non-Workers (Fig. C, Chart 49).

Of special interest are the contrasts between the seasonal movements of those who represent additions to the unskilled element in the wage earning group in this country, and those immigrants who are listed as having "no occupation." In preparing Fig. C, in Chart 49, we assumed that those incoming immigrants listed as "laborers" and "farm laborers" might be grouped as "unskilled workers," and have compared the seasonal fluctuations of this group with those of the immigrant aliens in the "no occupation"

group. While there is a close similarity in the direction of changes from month to month, with the exception that the spring peak of the "no occupation" curve is two months later than the peak for unskilled workers, the spring rush is distinctly more pronounced among the latter group. This suggests that employment considerations are among the factors explaining the relatively large immigration of the working classes in March, April, and May.

It will be observed from Fig. C that the seasonal curve for male immigrants is, in general, similar in shape to that for unskilled workers but exhibits a somewhat less pronounced variation.

Selected Races.

That immigrants of different races vary materially in their choice of months in which to immigrate is indicated in Fig. D of Chart 49. The South Italians, who participate in large numbers in summer construction activities, arrive chiefly in March, April, and May; whereas the incoming movement of Hebrews peaks in June to September.

PRE-WAR SEASONAL TENDENCIES IN DEPARTURES

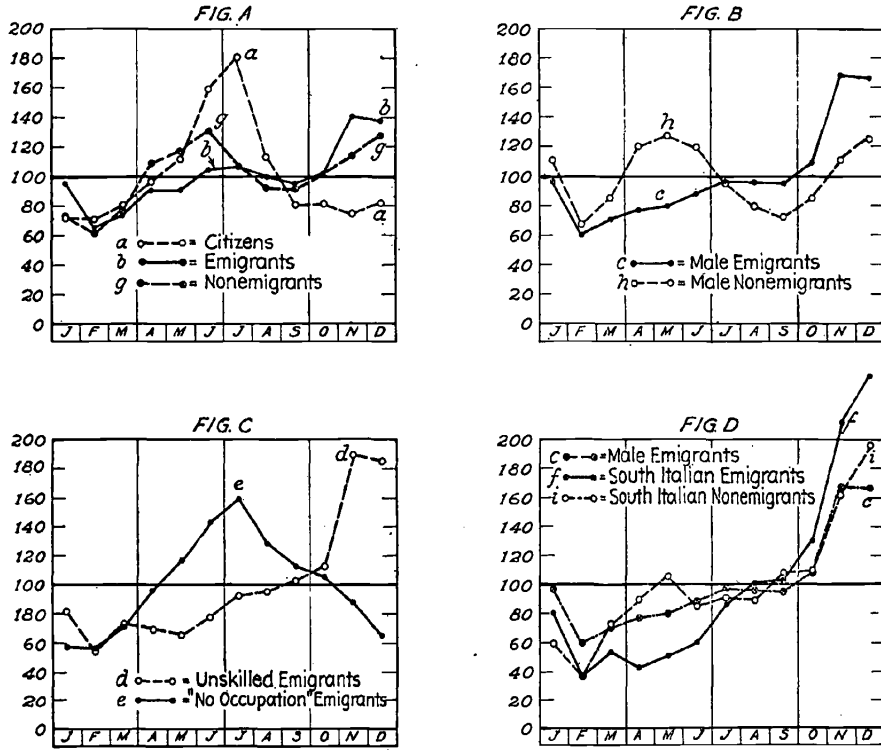
(See Chart 50)

When we turn to the pre-war seasonal variations in departures, we find differences akin to those discovered in arrivals. The citizen element peaks in July; while the alien departures, notably of emigrants, are numerous at the close of the year. (Fig. A of Chart 50). As between male emigrants and male nonemigrants, the early winter boom is more pronounced in the emigrant group. That this outward rush at the close of the year is associated with employment conditions is suggested by the comparisons in Fig. C, Chart 50. The departures of those emigrants who indicate that they have no occupation reach a peak in June, July, and August; but the unskilled workers emigrate in largest numbers during the months of November and December. In Fig. D, we have the seasonal movements of male emigrants and of South Italians. The South Italians, both of the emigrant and of the nonemigrant groups, show a November and December movement which is more pronounced than that for male emigrants of all races combined. This outward rush of the South Italians in the early winter is probably due in part to their aversion to the relatively rigorous winter in the United States.

CHART 50

PRE-WAR SEASONAL FLUCTUATIONS IN DEPARTURES.*

Average of twelve months = 100



*Numerical data in Table 54, in columns lettered to correspond with the numbering of the curves in the above chart.

PRE-WAR SEASONAL TENDENCIES IN NET MIGRATION

(See Chart 51)

The best evidence of the seasonal variation in the net migration of aliens covers the seven pre-war years from July, 1907, to June, 1914. When the number of departing aliens, both emigrants and nonemigrants, is subtracted from the number of arriving aliens, both immigrants and nonimmigrants, we find that in the seven years under consideration the seasonal distribution of the net movement is as given in the first two columns of Table 55.

TABLE 54.—INDICES OF PRE-WAR SEASONAL FLUCTUATIONS IN DEPARTURES*
Monthly average = 100

MONTH	CITIZENS	EMIGRANT ALIENS					NON-EMIGRANT ALIENS		
		TOTAL	MALE	UNSKILLED	NO OCCUPATION	SOUTH ITALIAN	TOTAL	MALE	SOUTH ITALIAN
	a	b	c	d	e	f	g	h	i
Jan.	71.3	94.9	96.2	81.7	57.1	80.0	72.9	110.7	59.4
Feb.	70.8	65.3	60.0	54.2	56.2	36.9	61.0	67.5	36.9
Mar.	80.1	73.8	70.2	72.9	70.3	53.4	77.4	85.3	72.1
Apr.	96.3	90.2	76.8	69.4	96.5	43.4	108.8	120.0	89.0
May	111.4	90.7	79.7	65.8	116.6	50.7	117.6	127.3	105.5
June	159.1	105.0	87.9	77.6	142.8	59.5	130.7	119.6	84.5
July	180.5	106.2	96.4	92.0	159.9	86.5	105.8	96.3	90.5
Aug.	113.3	99.6	95.8	95.6	128.9	100.3	92.5	79.9	88.8
Sept.	80.3	95.2	95.0	102.7	113.0	102.6	91.1	72.2	108.0
Oct.	81.1	101.2	108.0	113.0	106.1	130.0	101.6	85.2	108.4
Nov.	74.3	140.6	167.5	189.4	87.2	211.6	113.8	110.9	161.5
Dec.	81.7	137.4	166.1	185.2	65.2	244.5	127.3	125.3	195.3

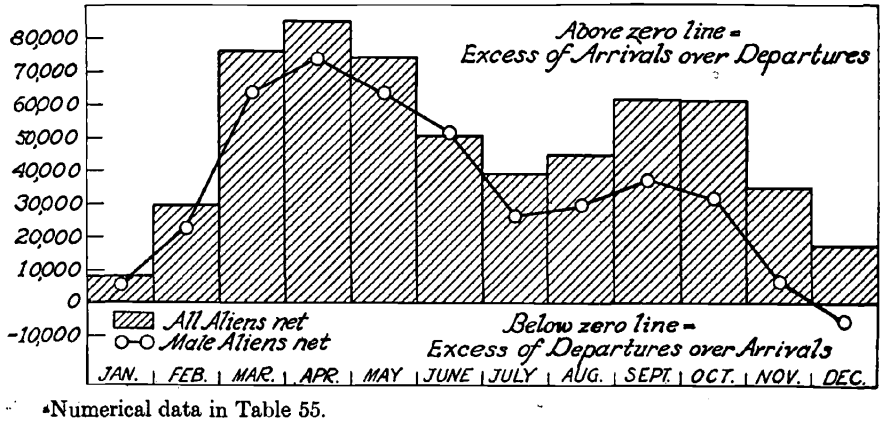
*Computed from statistics in the 1907 to 1914 issues of the monthly bulletin of the U. S. Bureau of Immigration and Naturalization. The periods covered by the data are as follows: Series b and g, July, 1907 to June, 1914; series d, e, f, and i, January, 1909 to June, 1914; and series a, c. and h, January, 1910 to June, 1914.

Similar data for male aliens have been used for the period from January, 1910, to December, 1913, inclusive, in arriving at the figures in the last two columns of Table 55. In Chart 51, we have a graphic presentation of the average distribution by months, first

CHART 51

PRE-WAR SEASONAL DISTRIBUTION OF NET IMMIGRATION*

Unit = one person



*Numerical data in Table 55.

for aliens of both sexes combined, as shown by the cross-hatched bars, and, secondly, for male aliens only, as shown by the circles.

For both males and all aliens, the net movement is small in January, increases in February, reaches high tide in March, April, and May, ebbs somewhat in midsummer, recovers to a secondary peak in September and October, and then slumps rapidly in November and December.

TABLE 55.—PRE-WAR SEASONAL DISTRIBUTION OF THE NET MOVEMENT OF MIGRANTS[a]

(Thousands of persons)

MONTH	NET ALIEN MOVEMENT (ARRIVALS LESS DEPARTURES), BOTH SEXES. JULY, 1907, TO JUNE, 1914.		NET MOVEMENT OF MALE ALIENS (ARRIVALS LESS DEPARTURES). JAN. 1, 1910, to DEC. 31, 1913.	
	TOTAL IN 7 YEARS	AVERAGE FOR GIVEN MONTH	TOTAL IN 4 YEARS	AVERAGE FOR GIVEN MONTH
January	57.5	8.2	22.1	5.5
February	207.5	29.6	91.1	22.8
March	530.1	75.7	253.6	63.4
April	593.5	84.8	294.4	73.6
May	517.2	73.9	252.7	63.2
June	354.5	50.6	205.1	51.3
July	271.6	38.8	105.0	26.2
August	312.4	44.6	117.7	29.4
September	429.2	61.3	147.9	37.0
October	428.7	61.2	126.9	31.7
November	243.6	34.8	26.6	6.7
December	124.0	17.7	[d]21.1	[d]5.3

[a]Computed from statistics in the 1907 to 1914 issues of the monthly bulletin of the U. S. Bureau of Immigration and Naturalization.

[d]Excess of departures over arrivals.

The data under consideration represent, strictly speaking, the combined effect of seasonal and trend tendencies. The years before the war were a period of increasing immigration; and that the net immigration in December, for example, is larger than in January is due in part to the rising trend. If the influence of the trend factor were eliminated, the proportion assigned to the earlier months would be relatively increased and that in the latter months decreased, so that the drop at the end of the year would appear even more decided than it does in Chart 51. As we shall presently note more fully, the crude seasonal distribution as given in Table 55 is appropriate for comparisons with changes in employment, and for this reason, and also because of technical difficulties in the way of

satisfactorily determining the trend, we have made no attempt to adjust for the growth factor in presenting the statistics of seasonal fluctuations in net migration.

We have noted the characteristic features of the seasonal movement in the main migratory currents to and from the United States before restrictive legislation intervened to modify the seasonal distribution; let us now note the corresponding seasonal movements in the major occupations in which immigrants engage.

SEASONAL TENDENCIES IN SELECTED INDUSTRIES

The great bulk of newly arrived immigrants, as we have previously noted, are engaged in manufacturing, coal mining, construction, and railway maintenance; hence it becomes desirable to examine the seasonal fluctuations in employment in these industries, in order that we may determine whether the seasonal variations we have observed in migration synchronize closely with changes in employment.

The data available for measuring seasonal variation in these several industries are so fragmentary and diverse in nature, that we feel impelled to give first some explanation of the nature and limitations of the evidence from which our indices are constructed. We then proceed to a comparison of these seasonal employment indices with the corresponding indices for migration.

The evidence considered in arriving at our estimates for the several industries is shown in Charts 52 and 53; and the numerical indices are given in the accompanying tables. The final estimates for comparison with fluctuations in migration appear in Charts 54 and 55. In comparing these charts, the reader should note that the scales used in plotting have been varied so as to magnify the fluctuations for some series, such as factory employment, so that the changes will stand out more clearly.

Factory Employment (Chart 52, Fig. A).

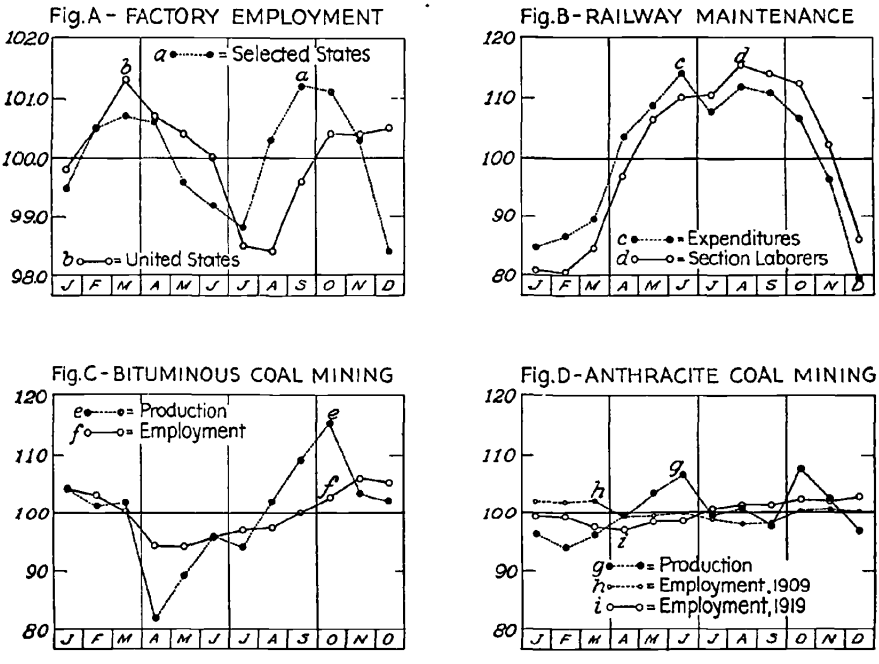
In the process of testing for typical seasonal variation in factory employment, we computed two indices, both of which appear in Chart 52, Fig. A. The first, Curve (a), is based upon our estimates of factory employment in Massachusetts, New Jersey, and New York. The second, Curve (b), is based upon the Census of Manufactures statistics of factory employment in the United States in the census years 1904, 1909, 1914, 1919, and 1921, and upon the

index of factory employment published by the U. S. Bureau of Labor Statistics, for the years 1915 to 1924. To obtain the final estimate, which appears as Curve (c) in Chart 54, Fig. A, an average of the two indices was taken.

CHART 52

EVIDENCE OF SEASONAL VARIATION IN EMPLOYMENT IN SELECTED INDUSTRIES*

Average of twelve months = 100



*For fuller statement of the nature and sources of the data used in constructing curves "a" to "g", see Table 56. Curves "h" and "i" represent the average number of men employed in anthracite mines in the census years 1909 and 1919. *Thirteenth Census of the United States*, Vol. XI, p. 196; *Fourteenth Census*, XI, p. 278.

As indicated by this estimate, factory employment exhibits a spring boom, a midsummer slump, a fall boom, and another slump in midwinter.

Railway Maintenance (Chart 52, Fig. B).

Many foreign-born workers are engaged as section hands in the maintenance of railway tracks and roadbeds. As a measure of

seasonal fluctuation in this occupation, we have the indirect evidence afforded by the amounts expended each month from 1910 to 1921 in the maintenance of way and structures, and also the number of track and roadway section laborers employed at the middle of the month, from July, 1921, to December, 1924, on Class I steam roads in the United States. A seasonal index of these

TABLE 56—INDICES OF SEASONAL VARIATION IN ACTIVITY IN SELECTED INDUSTRIES*

Monthly average=100

MONTH	FACTORY EMPLOYMENT			RAILWAY MAINTENANCE		COAL MINING		
						BITUMINOUS		ANTHRACITE PRODUCTION
	SELECTED STATES	UNITED STATES	COMPOSITE	EXPENDITURES	EMPLOYMENT	PRODUCTION	EMPLOYMENT	
	A	B	C	D	E	F	G	H
Jan....	99.5	99.8	99.6	84.8	81.0	104.2	104.2	96.1
Feb....	100.5	100.5	100.5	86.7	80.6	101.3	103.1	93.9
Mar....	100.7	101.3	101.0	89.4	84.7	101.9	100.3	96.0
Apr....	100.6	100.7	100.6	103.6	97.0	81.8	94.2	99.2
May...	99.6	100.4	100.0	108.7	106.4	89.1	94.0	103.5
June...	99.2	100.0	99.6	114.1	110.0	95.6	95.7	106.6
July...	98.8	98.5	98.6	107.7	110.4	94.0	96.7	99.4
Aug....	100.3	98.4	99.4	111.8	115.4	102.1	97.3	100.9
Sept....	101.2	99.6	100.4	110.9	114.0	109.1	100.0	97.5
Oct....	101.1	100.4	100.8	106.5	112.3	115.3	102.8	107.7
Nov....	100.3	100.4	100.4	96.3	102.2	103.5	106.0	102.5
Dec....	98.4	100.5	99.4	79.5	86.0	102.2	105.2	96.7

*=Computed from data, briefly described below, in such a way as to eliminate so far as practicable the influence of trend, cyclical variations and, in the case of the production and expenditure series, the effect of the varying length of months.

A=Employment in Massachusetts, New Jersey, and New York factories, 1904 to 1914. See Table IV, appendix.

B=Employment in factories in the United States, as given in the U. S. Census of Manufactures for 1904, 1909, 1914, 1919, and 1921; and in statistics of factory employment for 1915 to 1924, issued by the U. S. Bureau of Labor Statistics.

C=An average of Series A and B.

D=Expenditures for maintenance of way and structures, with adjustment for varying length of month, 1910 to 1921. Interstate Commerce Commission, *Thirty-Fifth Annual Report on the Statistics of Railways in the United States.*

E=Track and roadway section laborers at middle of month, July, 1921, to December, 1924. Interstate Commerce Commission, *Wage Statistics Class I Steam Roads in the United States*, monthly issues.

F=Tonnage of bituminous coal produced, 1913 to 1922, adjusted for varying length of months. U. S. Geological Survey, *Mineral Resources of the United States*, 1921, Pt. II, p. 464, and weekly reports of coal production in 1922.

G=Employment in bituminous coal mines, as given in the *Fourteenth Census of the United States, Mines and Quarries*, for 1909 and 1919; and in the U. S. Bureau of Labor Statistics, *Monthly Labor Review*, for April, 1920, to March, 1922.

H=Tonnage of anthracite coal produced, 1913 to 1921, adjusted for varying length of months, U. S. Geological Survey, *Mineral Resources of the United States*, 1921, Pt. II, p. 465.

maintenance expenditures, with an adjustment for the varying length of the months, is shown as Curve (c) in Chart 52, Fig. B; and an index constructed from the aforementioned employment data appears as Curve (d). Although this index of employment is based upon a very short period, it is sufficiently well supported by the collateral evidence of the index of expenditures to lead us to accept it as a reasonably accurate approximation.

Railway maintenance is distinctly a warm-weather occupation being low in the first quarter of the year, then rising rapidly to a high level in June and the following four months, then sharply declining in November and December.

Bituminous Coal (Chart 52, Fig. C.)

For monthly employment in bituminous coal mining, we have only the fragmentary evidence in the U. S. Census of Mines and Quarries for 1909 and 1919 and in the data issued by the Bureau of Labor Statistics for the two years from April, 1920, to March, 1922. An index based on these fragments appears in Curve (f) of Chart 52, Fig. C. The second curve on this chart represents seasonal fluctuations in the tonnage of bituminous coal produced, in the years 1913 to 1922, adjusted for the varying length of the months in the year. Bituminous coal mining is characterized by a large amount of intermittent employment, which is probably not fully reflected in the employment statistics. For this reason, and because of the fragmentary nature of the direct statistics of employment, we have used the index of variations in production as a measure of seasonal fluctuations in bituminous coal mining employment.

The resulting seasonal curve is almost the reverse of that computed for railway maintenance. The period of greatest inactivity occurs in the second quarter, notably in April, followed by an increase in the late summer and early fall and a decline again at the close of the year.

Anthracite Coal Mining (Chart 52, Fig. D)

The direct evidence of employment by months in anthracite coal mining is even scantier than for bituminous coal; and, accordingly, for an index of seasonal variation in this industry, we have utilized a curve based upon production in the years 1913 to 1921 (see Curve "g", Fig. D). This index exhibits only a mild fluctuation with peaks in June and October. Employment by months in the census years 1909 and 1919 (Curves "h" and "i") shows an even milder fluctuation.

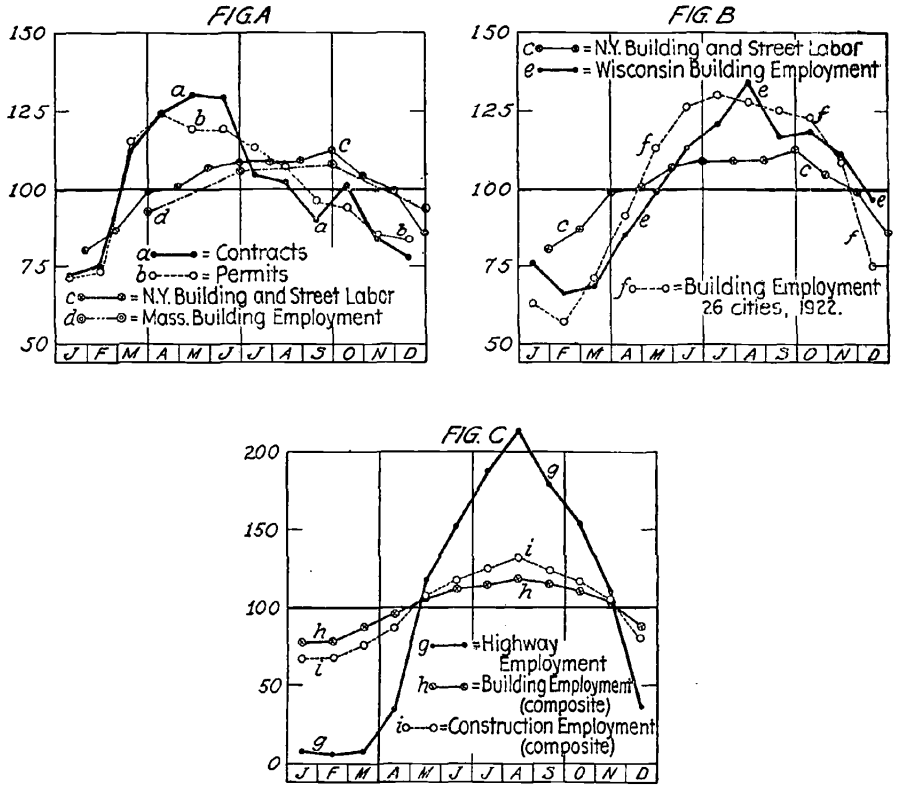
Construction (Chart 53)

Seasonal fluctuations in the construction industry are of particular importance to the immigrant. It is a well-known fact that a large proportion of the unskilled work in outdoor construction is

CHART 53

SEASONAL FLUCTUATIONS IN CONSTRUCTION*

Average of twelve months = 100



*Sources:

Curve a = seasonal indices of the value of contracts awarded in 27 northeastern states, January, 1910, to June, 1922, computed by Mr. J. B. Hubbard, *Review of Economic Statistics*, January, 1924, p. 35.

Curve b = the value of permits in 66 selected cities, 1910-1922, ibid.

Curve d = unemployment inverted, computed from percentages of trade union building workers unemployed at the end of each quarter. The seasonal indices are: Mar. 31, 92.8; June 30, 105.6; Sept. 30, 107.9; Dec. 31, 93.6.

For data from which curves c, e, f, g, h and i, were constructed, see Table 57 and footnotes.

carried on by foreign-born laborers, including, probably, a large proportion of those temporary immigrants known as "birds of passage" and also other newly arrived aliens. The general seasonal character of the construction industry is a matter of common

knowledge, but for quantitative measures of seasonal changes in the numbers employed in construction, we have been forced to rely upon estimates pieced together from fragmentary data obtained from various sources. The constituents used in this computation, together with the final estimate, are shown in Chart 53. The upper section of this Chart (Fig. A) affords an opportunity to compare

TABLE 57.—INDICES OF SEASONAL FLUCTUATIONS IN CONSTRUCTION EMPLOYMENT*
Average of the twelve months = 100

MONTH	BUILDING AND STREET LABOR IN NEW YORK STATE	BUILDING EMPLOYMENT IN WISCONSIN	COMPOSITE INDICES		
			BUILDING	HIGHWAY CONSTRUCTION	HIGHWAY AND BUILDING CONSTRUCTION
	A	B	C	D	E
Jan.	79.7	75.2	76.6	7.3	66.7
Feb.	86.6	65.9	77.4	5.6	67.1
Mar.	99.1	68.0	86.9	6.6	75.4
Apr.	100.5	84.7	94.8	33.8	86.1
May	106.7	99.5	105.1	116.9	106.8
June	108.2	112.5	111.3	151.4	117.0
July	108.6	120.1	114.1	187.8	124.6
Aug.	109.0	133.5	118.2	213.2	131.8
Sept.	112.2	116.2	114.6	178.3	123.7
Oct.	104.1	117.8	110.0	153.8	116.3
Nov.	99.6	110.6	103.7	109.8	104.6
Dec.	85.4	96.2	87.5	35.7	80.1

*Computed from the following data:

Series A. Employment in New York building and street labor, 1902-1914 computed from percentage of trade union members unemployed at the end of each month. New York State Bureau of Labor Statistics, *Annual Report and Bulletins.*

Series B. Percentage change in the number of employees engaged in the construction of buildings, January, 1922, to December, 1924, *Wisconsin Labor Market*, monthly issues.

Series C. Weighted average of Series A, Series B, and employment in 1922 as reported by contractors in 26 cities, read from curve in *Seasonal Operations in the Construction Industries—Report of a Committee of the President's Conference on Unemployment*, p. 51.

Series D. Computed from statistics of the number of common laborers employed on Federal Aid projects in the fourteen states of the New England, Middle Atlantic and East North Central districts in 1922, 1923, and 1924, made available by the courtesy of Mr. J. G. McKay, Chief, Division of Highway Economics and Transport, U. S. Bureau of Public Roads; and from percentage changes in the number of employees engaged in the construction of highways in Wisconsin from January, 1922, to December, 1924, as reported in the *Wisconsin Labor Market.*

Series E. An average of Series C and D, with weights of (6) assigned to building and (1) to highways.

seasonal indices for the value of contracts awarded (Curve "a"), and the value of building permits (Curve "b"), with estimates of employment in building, computed from statistics of unemployment among trade union members in New York building and street labor, by months, and in Massachusetts building trades by quarters (Curves "c" and "d", respectively).

It is evident that the peak in building employment does not coincide with the peak of contracts awarded or of permits granted, but occurs some three or four months later. Consequently, though they have a wider geographical scope and extend over a longer period of years than the available direct statistics of employment or unemployment, it does not appear desirable to utilize the contract or permit figures as indices of seasonal variation in employment.

In Fig. B, the curve for New York building and street labor is repeated, and curves are added to indicate the seasonal variation in Wisconsin building construction during the three years from 1922 to 1924, inclusive, and also employment as reported by contractors in twenty-six cities of the United States in 1922. (See footnotes to Table 57 for sources.) To obtain a composite estimate of seasonal fluctuations in building employment, weights of six, three, and one were assigned to the New York, Wisconsin, and 1922 series, respectively, and the result is plotted as Curve "h" in Fig. C of Chart 53.

Our index of seasonal variation in employment on highway construction (Curve "g", Fig. C, Chart 53) is also admittedly only an estimate based upon fragmentary data. The statistics used cover the years 1922, 1923, and 1924, and include (1) the number of common laborers, by months, on highway projects receiving Federal aid in the fourteen states included in the New England, Middle Atlantic, and East North Central sections, and (2) employment on highways in Wisconsin. In computing the index of highway construction these two series were weighted by the relative population of the states represented.

Finally, a composite index of employment in construction (Curve "i" in Fig. C, Chart 53) was computed by combining the building and highway indices, assigning a weight of six to the building and one to the highway series. Obviously, this index of construction employment must be taken as a rough approximation. It indicates small activity in the first quarter of the year; increasing employment in the second quarter; maximum activity in the third quarter; and then a decline in October, November, and December.

In some of the subsequent comparisons, the index for railway maintenance and the index for construction have been weighted by the estimated numbers employed in these occupations in 1909 and combined into an index of "Selected outdoor industries" (Curve "f" of Fig. C, Chart 54).

Using the same method of weighting, the indices for all the industries under consideration—that is, factory employment, bituminous and anthracite coal mining, railway maintenance, and construction, have been combined into an index of seasonal fluctuations in "all selected industries" (Curve "g" of Fig. D, Chart 54).

Limitations.

Before proceeding further, it may be well to summarize the limitations of these indices of seasonal variation. In the first place, the object in mind has been to obtain evidence of seasonal fluctuations which may be applied to the years immediately preceding the Great War, since the indices of seasonal variation in migration are computed chiefly from data for these years. It has been necessary, however, to utilize some employment data applying to more recent years. Furthermore, these evidences of employment conditions have in some instances been fragmentary and indirect. While care has been taken to make the indices as representative of the actual conditions as possible, and we have no reason to believe that they are inaccurate in material respects, yet the existence of a considerable margin of possible error must be recognized.

A further source of possible misinterpretation of the significance of seasonal fluctuations in employment lies in the inadequacy of the available information concerning the extent of dovetailing of employment in various industries. When industries are separately considered, the aggregate account of seasonal fluctuation may be magnified by the failure to take into account that workers may shift from one industry to the other when periods of activity do not coincide. On the other hand, the consolidation of data for several industries may create the impression of a more uniform seasonal distribution of employment than actually exists for most workers. It is obvious from the data which we have been examining that factory employment is declining in midsummer while activity in the outdoor industries is increasing; but, unless idle factory workers shift readily to outdoor industries, a consolidation of the data for all the important industries may convey an exaggerated impression of the degree of seasonal regularity in employment. While such an index is useful for present purposes, it is not an adequate measure of the variation in employment for individual workers or groups of workers.

We have analyzed separately the seasonal fluctuations, first in migration, then in employment. We may now turn to a direct comparison of the degree of similarity in these seasonal movements.

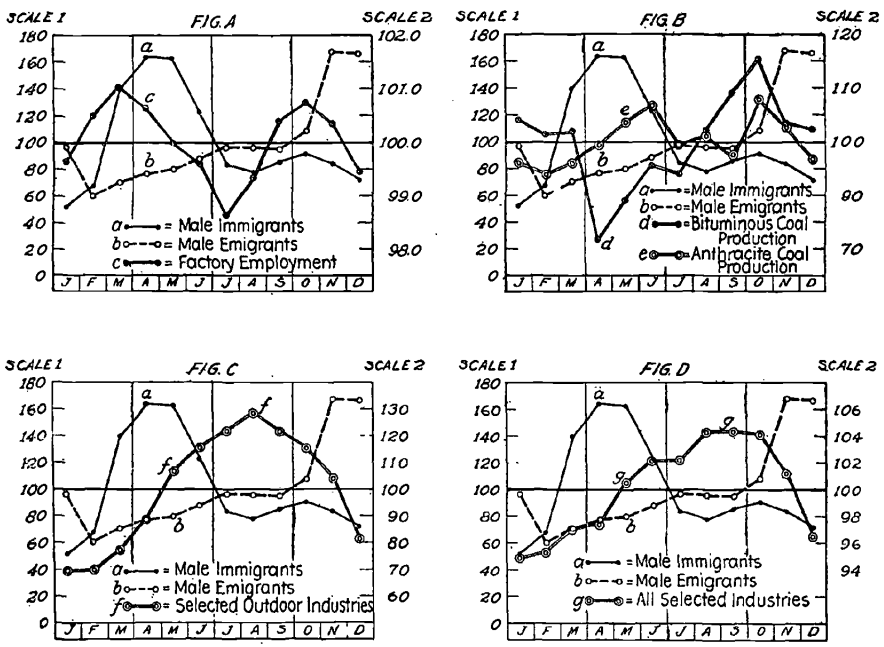
COMPARISON OF SEASONAL TENDENCIES IN IMMIGRATION, EMIGRATION, AND EMPLOYMENT

The most significant of the several indices of seasonal changes in migration and employment which we have been discussing in the preceding pages are brought together in Chart 54. In each of the

CHART 54

SEASONAL FLUCTUATIONS IN EMPLOYMENT AND PRE-WAR MIGRATION.

Scales: No. 1 = Immigration and Emigration
No. 2 = Employment
Average of twelve months = 100



*Numerical data for Curve "a" are in Table 58, column A; Curve "b", Table 58-A; Curve "c", Table 56-C; Curve "d", Table 56-F; Curve "b", Table 56-H; Curve "f", Table 58-C; and Curve "g", Table 58-D.

four sections of this chart the curves for male immigration and for male emigration are repeated, and for comparison therewith there is given, in Fig. A, the index for factory employment; in Fig. B, the

index for bituminous coal and also for anthracite coal, both based on production; in Fig. C, the index for selected outdoor industries; and in Fig. D, the index for all selected industries. To avoid a possible misinterpretation of the relative violence of the seasonal fluctuations in the several industries, it should be noted that for each of the sections in Chart 54, Scale 2, for employment, has a different scale unit.

TABLE 58.—INDICES OF SEASONAL FLUCTUATIONS IN MIGRATION AND EMPLOYMENT[a]
Monthly average = 100

MONTH	MIGRATION		EMPLOYMENT	
	MALE IMMIGRATION	MALE EMIGRATION	SELECTED OUTDOOR INDUSTRIES	ALL SELECTED INDUSTRIES
	A	B	C	D
Jan. . .	51.7	96.2	69.4	94.9
Feb. . .	67.8	60.0	69.7	95.3
Mar. . .	139.7	70.2	77.2	97.0
Apr. . .	163.4	76.8	88.2	97.4
May . .	162.6	79.7	106.7	100.5
June . .	122.3	87.9	115.6	102.1
July . .	83.9	96.4	121.9	102.2
Aug. . .	77.4	95.8	128.7	104.3
Sept. . .	85.2	95.0	121.8	104.4
Oct. . .	90.1	108.0	115.5	104.1
Nov. . .	83.6	167.5	104.1	101.2
Dec. . .	71.7	166.1	81.2	96.5

[a]The bases of the respective indices are:

A. Male immigrants, January, 1893, to December, 1913. (See Table II, in Appendix).
B. Male emigrants, January, 1910, to June, 1914.
C. A composite of indices for railway maintenance and construction (see Tables 56 and 57), weighted according to numbers employed in 1909.
D. A composite of the indices for factory employment, bituminous and anthracite coal mining, railway maintenance and construction (see Tables 56 and 57), weighted according to numbers employed in 1909.

Factory Employment (Fig. A, Chart 54).

Immigration agrees only moderately well with the seasonal fluctuations in factory employment. The peak in factory employment is reached earlier in the year, hence the bulk of the immigrants arrive after the maximum demand has passed. Both series exhibit a summer decline, a fall recovery, and a slump late in the year. For most of the year emigration is increasing while factory employment is decreasing, and vice versa. Emigration declines in February, due partly to the length of the month, while factory employment is increasing, and increases from March to July while factory em-

ployment is diminishing; also the high level in November and December corresponds with declining factory activity.

Coal Mining (Fig. B, Chart 54).

The low point in bituminous coal mining comes in the second quarter of the year, at the period when immigration is greatest, and the peak does not occur until some six months later; hence the spring rush of immigrants is premature if their destination is the bituminous coal mines.

The fluctuations in immigration are somewhat better timed for anthracite coal mining, as the peak of activity in this industry is reached after, rather than before, the high tide of arrivals. In both types of mining, a decline occurs in November and December, coincident with increasing emigration and declining immigration.

Selected Outdoor Industries (Fig. C, Chart 54).

The seasonal fluctuations in immigration are well timed for employment in the outdoor industries. The number of immigrants is small in the stagnant months of December, January, and February, increases with the spring rise in outdoor work, and reaches a peak early enough to make it possible for the bulk of newly arrived immigrants to participate in outdoor work throughout the extent of the summer boom. Then, as outdoor employment declines rapidly in the closing months of the year, the tide of emigration swells rapidly and the volume of immigration recedes.

All Selected Industries (Fig. D, Chart 54).

In general, the composite seasonal movement of employment in all the selected industries exhibits the same features as the index for outdoor industries, hence the comments just made for the outdoor industries can be applied to the combined seasonal fluctuations in employment in the entire group of industries under consideration. The heaviest immigration is when employment is increasing and somewhat in advance of the maximum in employment activity, and the decline in immigration and the increase in emigration at the close of the year coincides with the falling off of employment.

THE NET VOLUME OF ARRIVALS LESS DEPARTURES AND THE MONTH-TO-MONTH CHANGES IN THE NUMBER EMPLOYED

So far in this chapter we have been comparing the seasonal changes in employment and pre-war migration with reference to the time of year at which increases or decreases take place. There

has been nothing in these comparisons to indicate how the volume of immigration or of emigration compares in number of persons with the corresponding change in the number of persons employed To the extent that migrants are members of the working class, the number of arrivals less the number of departures represents a net addition to the number of workers seeking employment. Unless this net addition is accompanied by an increase in the number of persons employed, the necessary result is an increase in the total number of unemployed persons in the United States. If, in a given month, the immigration of workers exceeds the emigration of workers by 50,000, and the increase in the number of employed in the United States is only 30,000, it is obvious that there has been a net increase of 20,000 in the number of the unemployed.

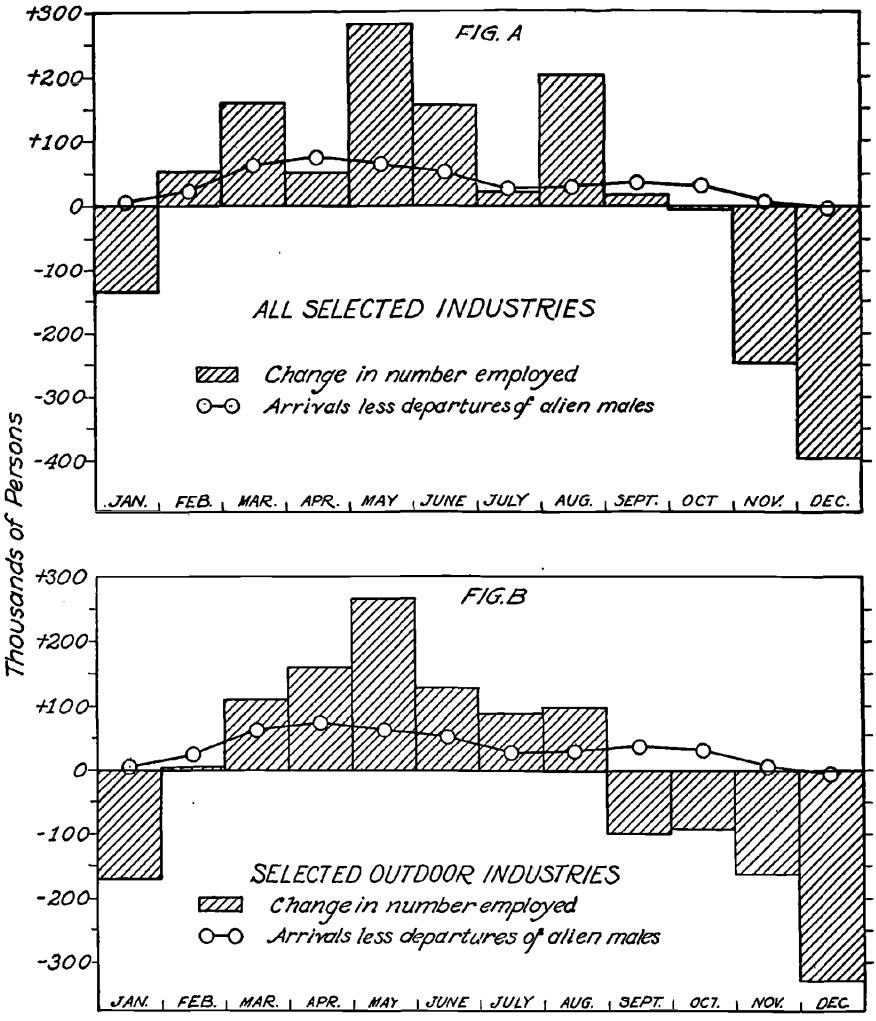
Fully satisfactory data for making comparisons of seasonal net migration and changes in employment are not available, but we have made the best approximation we could, in the following manner. In the first place, for the several industries which have been selected, for reasons previously indicated, as particularly significant when studying employment opportunities for immigrants, we have computed an estimate of the typical number of persons employed in each month of the year in the pre-war period. Statistics for the year 1909 were used in determining the average number of workers to be assigned to each industry. This computation yields an estimate of the typical month-to-month change in the number employed in factories, bituminous and anthracite coal mining, railway track maintenance, and construction work, when the cyclical tendencies have been as far as practicable eliminated, leaving the joint effect of the trend and seasonal factors. Inasmuch as the typical net migration, by months, represents a corresponding increase or decrease in population, it is appropriate to compare therewith the typical change in employment which results from the combined influence of the growth and seasonal elements.

The results of the employment estimates appear in Table 59 and Chart 55.

For the net migration to be used in comparison with the typical month-to-month change in employment, we have selected the excess of arriving over the number of departing male aliens. This group includes those male aliens who are officially classified as temporary migrants—that is, as nonimmigrants or nonemigrants. Many of these come for employment purposes, and hence it ap-

CHART 55

THE PRE-WAR NET MIGRATION OF ALIEN MALES AND THE TYPICAL MONTH-TO-MONTH CHANGE IN THE NUMBER EMPLOYED*



*Numerical data in Tables 55 and 59.

peared advisable to include them, as well as those officially listed as immigrants, in calculating the volume of net migration.

In Chart 55, Fig. A, this net migration series is compared with the month-to-month change in all the selected industries. A bar

above the zero line indicates the estimated increase in the number employed as compared with the preceding month; a bar below the zero line, an estimated decrease from the preceding month. The curve represents the typical pre-war net migration of males in the given month.

TABLE 59.—ESTIMATE OF THE SEASONAL DISTRIBUTION OF EMPLOYMENT IN SELECTED INDUSTRIES IN THE PRE-WAR PERIOD[a]

(Adjusted for cyclical variations but not for trend)

Thousands of persons

MONTH	NUMBER EMPLOYED IN GIVEN MONTH		INCREASE (+) OR DECREASE (—) FROM PRECEDING MONTH[d]	
	ALL SELECTED INDUSTRIES[b]	SELECTED OUTDOOR INDUSTRIES[c]	ALL SELECTED INDUSTRIES	SELECTED OUTDOOR INDUSTRIES
	A	B	C	D
Jan...	8,213.0	992.0	—136.6	—169.6
Feb...	8,266.9	996.6	+ 53.9	+ 4.6
Mar...	8,426.6	1,105.1	+159.7	+108.5
Apr...	8,477.4	1,263.9	+ 50.8	+158.8
May..	8,758.2	1,531.3	+280.8	+267.4
June..	8,912.3	1,661.3	+154.1	+130.0
July ..	8,932.7	1,752.5	+ 20.4	+ 91.2
Aug...	9,134.6	1,851.8	+201.9	+ 99.3
Sept...	9,150.4	1,755.4	+ 15.8	— 96.4
Oct...	9,146.0	1,666.2	— 4.4	— 89.2
Nov...	8,899.1	1,503.4	—246.9	—162.8
Dec...	8,504.0	1,173.7	—395.1	—329.7

[a]These figures represent an estimate of the joint effects of seasonal and trend factors. The indices of seasonal variation given in the preceding tables were applied to the numbers employed in the respective industries in 1909, as recorded in the Census or estimated from other sources, and then the results were adjusted by adding the estimated effect of trend movements as indicated by data for the years 1907 to 1914.

[b]Includes factory employment, bituminous and anthracite coal mining, railway maintenance, and construction.

[c]Construction and railway maintenance.

[d]Computed from Columns A and B, with allowance for trend in computing the December to January change.

Assuming that our estimates present a true picture of the typical changes in employment and in net male migration prior to the quota restrictions, we observe from Chart 55, Fig. A, and the tables upon which it is based, that in January there is a small net excess of alien male arrivals over departures, to the extent of about 5,500 persons, while employment in the selected industries decreases about 137,000. In the following eight months an excess of arriving over departing alien males is, in each case, accompanied by an increase in the number employed. In all these months but April, July, and Sep-

tember, the increase in employment exceeds the net volume of male arrivals. In October and November a decrease in employment is accompanied by a small net immigration, and in December a heavy decrease in employment is accompanied by a small excess of departing over arriving male aliens.

In other words, decreasing employment in January and November is aggravated by a small net excess of arrivals, and in October by net arrivals to the number of about 32,000. Also, in April, July, and September, the increase in employment is not sufficient to absorb the new arrivals.

Only in December, and then only to a small extent, is the slack created by a decrease in employment taken up in part by a net outgo of male aliens.

It is true that in five months—February, March, May, June, and August—the number of workers employed is increasing faster than the net inflow of male aliens, and if there chances to be a shortage of resident workers in these months, immigration may be looked upon as alleviating this shortage. On the other hand, if in these months the increase in employment is in fact not adequate to relieve an existing unemployment situation, then the net inflow of alien workers merely acts to check the decrease in unemployment.

In summarizing the above comparison of the typical net movement of alien males with the month-to-month change in employment ascribed to the growth and seasonal factors, it should be noted that the evidence presented should at best be taken as suggestive rather than conclusive. The data upon which the estimates are based are too fragmentary, and the margin of error involved in the computations too large, to justify treating the computed relations as more than rough approximations. Here, as in the greater part of this chapter, we are dealing with pre-war, and hence pre-restriction, conditions.

With the above qualifications in mind, we may summarize the evidence presented in Chart 55 and the accompanying tables as indicating that the seasonal distribution of male immigration and emigration is such as to aggravate unemployment in six months of the year and to alleviate it slightly in one. In the other five months, being those in which net male immigration is less than the increase in employment, its effect is to alleviate the effects of a shortage of resident workers, if such a shortage exists.

In Fig. B of Chart 55, a comparison similar to that just made for

"all selected" industries is presented for "selected outdoor" industries. Not all of net male migration, of course, goes into these industries, but large numbers of the recent immigrants are employed therein, particularly in pick and shovel work.

Using the same method of interpretation applied to "all selected" industries, and assuming, for purposes of comparison, that the entire volume of net migration is absorbed in these outdoor industries, it would appear that in December a small excess in departures probably lessens slightly a tendency toward increasing unemployment; in six months—March to August, inclusive—the increase in employment is greater than the net number of male arrivals and hence male migration in these months is either alleviating a shortage of labor, or if such shortage does not exist, is merely slowing up the decrease in unemployment which would otherwise arise from increasing activity in these outdoor industries. In February the number of net arrivals is greater than the increase in employment; and in four months—January, September, October, and November—employment is decreasing while arrivals exceed departures, though in January and November the excess of arrivals is not enough to be of appreciable significance.

On the whole, the evidence favors the conclusion that in the months from March to August, inclusive, the seasonal distribution of net male arrivals is well adjusted to the changes in employment due to activities in construction and railway maintenance; that in January, November, and December the net movement is too small to be of great significance; and that in February, September, and October the new arrivals must look largely to other industries for employment.

SEASONAL FLUCTUATIONS IN IMMIGRATION UNDER THE QUOTA ACTS

The preceding discussion has referred, in the main, to the relation between the seasonal movements in migration and employment prior to the Great War. The quota acts of 1921 and 1924 caused material modifications in the seasonal distribution of immigration. The act of 1921 permitted up to twenty per cent of the annual quota to enter in any one month. As the immigration year begins July 1st, the effect of this provision was to concentrate the heaviest immigration in the months from July to November, inclusive. In the first year of the operation of the act, beginning July 1, 1921,

54.9 per cent of the total number of male immigrants arrived in these five months, July to November; in the next year 41.9 per cent; and in the third year, ending June 30, 1924, 63.0 per cent. In other words, the effect of this law was to encourage a large fraction of the total number of immigrants to enter just prior to the mid-winter slump in employment (see Chart 54).

The revision of the quota act in 1924, which limited to ten per cent of its annual quota the number admissible from a given country in one month, again changed the seasonal distribution. This ten-per cent provision tends to distribute immigration somewhat evenly throughout the year, especially from July to April, inclusive; but the distribution is still without regard to seasonal fluctuations in employment. Under this law approximately as many or more immigrants will be admitted in the months of November and December, when employment is declining, as in April and May when the demand for workers is increasing.

CHAPTER SUMMARY

Pre-war immigration and emigration each evidence a characteristic seasonal variation. Immigration, particularly of those classes which are most likely to furnish recruits to the ranks of the workers, has, in the pre-restriction period, a marked peak of activity in March, April, and May. Emigration on the other hand, is at a maximum in the closing months of the year. Consequently net migration shows a large excess of arrivals in the second quarter of the year, a secondary peak in the early fall, and a marked decline in November and December. In fact, a net outgo of alien males occurs in December.

Upon comparison with the seasonal fluctuations in those industries which are the primary employers of immigrant labor, we find that there are considerable differences in the degree to which the seasonal variation in migration and in employment is synchronous. The agreement is poor for bituminous coal mining, fair for anthracite coal mining and factory employment, and still better for the selected outdoor industries, namely construction and railway maintenance.

A comparison by months between net male arrivals and estimates of the typical month-to-month changes in the number of persons employed in the selected industries does not yield unequivocal evidence as to whether migration aggravates or lessens seasonal unemployment. It appears that, on the average, in three of the

four months in which employment decreases, there is an excess of arriving over departing male aliens, resulting, presumably, in an aggravation of seasonal unemployment; that in three more months the increase in employment is not adequate to absorb the net arrivals; and lastly, that in the remaining five months of the year the excess of arrivals, which is numerically less than the increase in employment, may or may not be a helpful factor, according to whether or not the number of unemployed but employable resident workers is adequate to meet the increasing demand for labor. Obviously, any conclusions concerning the net effect of unrestricted migration upon the amount of seasonal unemployment must necessarily be stated with reservations because of the incomplete nature of the data available for the estimates and the involved nature of the computations to which these data must be subjected.

On the other hand, it is more apparent that the seasonal distribution of immigration under the quota act of 1921 was not well timed with respect to the normal seasonal fluctuations in employment, and that the same criticism, though possibly to a lesser extent, is applicable to the quota provisions as revised in 1924.