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QUANTITATIVE AND QUALITATIVE ANALYSIS OF TOKYO POPULATION RENEWAL

This is a translation of a statistical analysis of the entire body of population change and movement in Tokyo between 1930 and 1935. By the use of the term "population renewal", the author, TOYOURA Asakichi (豊浦淺吉) indicates that he has not limited himself to numerical differences in population increase and decrease but rather has considered the quantity and quality of the various movements making for population change.

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QUANTITATIVE AND QUALITATIVE ANALYSIS OF TOKYO POPULATION RENEWAL

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APPENDIX B (Tables)

T.N. An attempt has been made in this translation to retain some of the flavor of the original Japanese in order to indicate some of the differences between Japanese and American statistical methods and approach.

I. THE URBAN CONCENTRATION OF POPULATION AND THE COMPOSITION OF POPULATION RENEWAL.

Since the expression "urban concentration of population" has long been in circulation and the facts of urban concentration of population in Japan itself have become evident, one might wonder whether both the meanings inherent in this expression and the facts therein involved are not already only too well known, and tend to dismiss the subject by attributing stability to the concept of urban concentration of population, and pointing out merely apparent facts. However, if a moment's thought is given to this subject, it soon becomes clear that those things which are supposedly self-evident are in actuality surprisingly little understood. It is said that the cities are expanding by reason of the concentration of rural population; but in just what way is this population concentrating, and just how are the cities expanding? These questions cannot be adequately answered at a glance. Thus, the city population, on the one hand, is suffering from undue hypertrophy, while the rural population, on the other hand, becomes increasingly atrophied, and the resultant condition gives rise to a variety of lesser problems, for which it is necessary not only to apply alleviatory measures, but also to adopt some plan of radical cure. However, for the most part there have been so far only haphazard efforts in this direction. Such efforts are totally ineffective. What is needed at the moment is a logical, scientific plan, and it is therefore important to stress an understanding of the actual conditions of the decline of rural population and the expansion of urban population. Twenty years ago an expansion of the city of Tokyo to its present extent would have seemed inconceivable.

At the outset, in spite of city planning, the matter has reached a state where the present intra-city population has grown to 6,000,000 and reached a saturation point. Moreover, within the short space of 10 years that saturation point will be passed, and it is impossible to predict the extent to which the population will further expand. One instance is the case of water service. At one time the Murayama-chosuichi *1 was expected

*1 村山貯水池

to be adequate, but it has become necessary to rush construction work on Kokawachi *1 after the expansion already made at Yamakuchi-chosuichi *2. Moreover, in anticipation of future difficulties, a search is being made for further plentiful water sources. Thus, we go on fumbling in the dark, unable to predict how the population will expand in the future and where it will stop. This is because available research on population expansion (including the census) has been so inadequate that even the conditions of the past are not understood. It must be admitted that logical prediction of future trends is almost impossible.

The following exposition of a few ideas with regard to population changes in Tokyo is, of course, no attempt to predict future trends, but only an extremely rough discussion of the facts involved in the population increase of the past few years. It goes without saying that everyone must already have some general knowledge concerning the population increase in large cities like Tokyo. However, our reason for undertaking further discussion is that we have discovered some things which add to existing knowledge on the subject, by using as a key new material which could not have been unearthed with past resources. This being the case, we must give a moment's attention to ascertaining what the nature of available information on Tokyo's population expansion has been.

There are extremely few facts generally known from available resources with regard to the population increase in Tokyo.

(1) The most commonly heard things are such as follow: Since the 1930 population of Tokyo (within the 1935 city limits) was 4,970,839 and the 1935 population was 5,875,667, in these five years the population of Tokyo increased 904,828 (a yearly average of about 180,000). In the same period the population of Japan proper increased from 64,450,005 to 69,254,148 — that is, 4,804,143 -- so that the Tokyo population increase amounted to about 19% of the population increase of the entire country. There is an immediate tendency to think that in this period Tokyo has absorbed almost 20% of the national population increase, but that is not correct. This will be clearly seen from the explanations given later. Nevertheless, such opinions typify the commonly accepted knowledge concerning population increase in Tokyo.

*1 小河内 *2 山口貯水池

(2) The above interpretation is based on a static population at two points in time, as one sees at a glance. If we follow this line of reasoning a step further, a second theory appears which would include the dynamic conditions for the same period. This method surveys the surplus influx by comparing the natural increase with the total population increase for the same period. Accordingly, since the yearly natural increase in Tokyo is approximately 60,000 to 70,000, of the 180,000 total population increase each year approximately 110,000 to 120,000 are people who have come in from the provinces to become new Tokyo residents. This line of thought, too, seems reasonable at first, but actually is equally fallacious. The above numerical difference will never show directly the amount of the influx, since this method completely neglects the amount of efflux, and thus can reveal only a part of the influx.

(3) Next is a qualitative as well as quantitative survey, but this is a method which barely scratches the surface of the composition of population increase by comparing the age composition of the static population two points in time. The difference here, too, as in (1) is a purely numerical one, and it is impossible to get a qualitative picture of the population influx and renewal from these figures.

(4) A new means of computing the content of population increases and decreases by utilization of existing resources was devised by Mr. Inoma of the Municipal Census Commission. It is called the "Statistical Analysis Method for Urban Influx" *1, and is a method which enables a survey applicable not only to the city's condition, but also to the rural exodus. This method computes the loss and gain of population in each age group, by taking the static population at two points in time and combining and comparing the population in these groups with the yearly births and deaths in the respective age groups. In brief, this method first computes at time B the living residue of the population existent at time A in the various age groups; then it compares the above living residue with the population existent at time B divided into age groups and the plus and minus differences in the yearly age levels thus obtained indicate respectively the influx and efflux surpluses.

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*1 Publications of the National Conference on Population Problems, No. 1, page 236 ff.

From the standpoint of population statistics, this is a very interesting method. We can acquire a certain degree of knowledge regarding the characteristics of the Tokyo influx population by adopting the above method; but, the results obtained by this survey method as well, are actually limited in scope just as those above, and what is clarified is not the total amount of the influx and efflux between two points of time, but rather the maximum of the influx surplus and the minimum of the efflux surplus. So we find that this method, too, does not fulfil the aim of covering the substance of population renewal in its full breadth. However, this is unavoidable because of the limitations of past source materials.

It is impossible for all the above methods to bring to light a full picture of population renewal. The first and third completely ignore natural increase and decrease and give inadequate consideration to population efflux; the opinions ("from the point of view of the metropolis alone") of the second and fourth attempt to show population influx with the basic assumption that there is absolutely no efflux. However, it is incorrect to ignore the efflux so completely. When the fact of efflux is recognized, it is immediately clear that the influx is not as determined above, although there is a marked tendency to draw the hasty conclusion that this shows the direct number of the influx and its qualities. In brief, one may say that the views held up to now have had a tendency to look only at a balance of the results of general movements. In other words, it is not unlike attempting to guess the total amount of export and import trade by looking merely at the surplus of imports and exports on the trade balance sheet. Just as the quantity and content of the total body of imports and exports must be presented to bring to light an over-all picture of trade, in order to obtain an over-all picture of the renewal of city population, so, in regard to the renewal of population as well, one must not limit oneself to the mere numerical differences of increase and decrease, nor to a comparison of static population alone, but must closely investigate the over-all changes in the various basic causes, from the natural to the social. Then concrete consideration must be given the question of what type of source materials shall be considered essential to the clarification of population renewal. First an abstract analysis should be attempted of the various basic causes of population renewal, and then the

actualities of the Tokyo population renewal should be thoroughly investigated.

What we here call "population renewal" indicates the whole body of population change and movement between two points of time. It means not limiting oneself to the mere numerical differences in static population increase and decrease at two points of time — in other words it means taking into account the quantity and quality of the various movements, not only with respect to the various essential causes of natural increase and decrease, but also with respect to those of social increase and decrease, and attempting a close investigation of all these.

If this paper makes some small contribution to the study of urban population, and serves some use in ascertaining the actualities of the Tokyo population increase, not as a result, but as a process, and, further, enables the clarification, to some extent, of the facts of urban population concentration in our country and its meaning, this writer will know the joy of having exceeded his expectations.

II. ANALYSIS OF NECESSARY MATERIALS FOR POPULATION RENEWAL.

In the past, as set forth above, the data generally available has been insufficient for a clear understanding of the numbers and composition of population renewal.

In order to understand what population renewal is, many facts concerning all the constituent elements of a renewed population must be made clear. What statistical materials are needed to meet this requirement?

In dealing with any population group, one is faced in actuality with the people who have been born and grown up in a place - the indigenous group - and the people from elsewhere who have moved in - the non-indigenous group. Since population renewal depends to a large degree on migration, as well as on births and deaths, it is necessary to include these factors in both the static figures and in the figures showing change.

Analyzing the above factors, as shown in Diagram 1, (see Appendix A), at time A we have Population P, composed of the indigenous population X and the non-indigenous population Y. In reaching time B, Population P will, for a variety of reasons, experience changes in approximately the following manner:

These various causes of change,

(1) Births (G)

(2) Deaths (S)

(3) Incoming movements (E)

(4) Outgoing movements (A)

show a mixture of aspects at any given time; but if we take them up individually for the sake of illustration, they merely express the increase or decrease of population in the period A-B. Actually, however, they have undergone extremely complicated processes, and are recognized for the first time as having assumed definite form. If we look at the indigenous population, X, at time A, we see that in reaching time B it is decreasing due to deaths (Sx) and outgoing movements (Ax). On the other hand it is increasing owing to births (Gx), and as it reaches time B, it becomes X'x, a component of X'.

This may be expressed:

(1) $X = X'x + Sx + Ax$ or,

$X'x = X - (Sx + Ax)$

At the same time the non-indigenous population Y is diminishing because of deaths (Sy) and outgoing movements (Ay). While it is in the process of forming an indigenous population due to births (Gy), it is transformed into Y'y, a component of non-indigenous population Y', as it reaches time B.

This may be expressed:

(2) $Y = Y'y + Sy + Ay$ or,

$Y'y = Y - (Sy + Ay)$

Thus, in order to express population change clearly in terms of the processes of change, it is obvious that statistical materials must be available which are capable of analysis.

Next, considering births, we find that not only are there births in population P's indigenous group, X, (expressed Gx) and from its non-indigenous group Y (expressed Gy) but that there are also births among the incoming movements of population (E), which process is expressed Ge.

Of course, marriages between the groups X, Y, and E are not represented, but if we make a hypothetical division of births (G), it is possible to represent births in accordance with the respective origins of the fathers and mothers. That is,

(3) $G = Gx + Gy + Ge$

However, births (G) are not themselves static, and are a quantity which continually changes, from the moment of birth onward. In other words, since the beginning of life is weak, and infants are exposed to the usual intense hazards of death, there is a decrease through death (Sg). Also, because of the moving of parents or other circumstances there are outgoing movements on the part of the infants born (Ag). There is one additional item to be mentioned - component X'g of the reconstituted indigenous population X'.

This component of the indigenous population may be expressed

(4) $X'g = G - (Sg + Ag)$, or,

$X'g = (Gx + Gy + Ge) - (Sg + Ag)$

Thus births (G) expressed in equations (3) and (4) become the objective of a detailed analysis. Next, deaths (S) depend not only on Sx coming from population P's indigenous group X and Sy coming from its non-indigenous group Sy; but also there is Se coming from incoming movement E after time A, and since there is also Sg coming from births after time A, as already set forth, we may express the matter in the following equation:

(5) S = Sx + Sy + Sg + Se

Since it is necessary to classify research of population renewal into its respective elements, for the purpose of observation, deaths should be analyzed as in equation (5).

Next there are changes in the incoming movements subsequent to time A; one part of the incoming movement naturally dies (Se), and one part moves away (Ae), and thus there is a decrease. On the other hand, births (Ge) are adding a new element to group X', and there is a transition to a new element in the changed population Y', namely Y'e

The equation may be written as

(6) E = Ye + Se + Ae or,

Ye = E - (Se + Ae)

In addition, when we look at the outgoing movement after time A, not only do we have Ax coming from the indigenous population (X) of time X, and Ay coming from non-indigenous population Y, but also Ag coming from the outgoing movement of children born subsequent to time A.

In the same way, there is the accretion Ae coming from the incoming movement subsequent to time B (T.N. seems to be mistake for time A, as time B is the terminus ad quem).

It may be otherwise expressed as

(7) A = Ax + Yx + Gx + Ex

and thus, experiencing fluctuations due to births and deaths, and incoming movements and outgoing movements, the original indigenous population, X, becomes X'x, and, combined with the surviving infants among new births X"g (Sic. for X'g), becomes the new indigenous population X'. The original non-indigenous population Y becomes Y'y and, combined with the population derived from the settlement of incoming movements, Y'e, becomes the new

non-indigenous population Y'. The original population P, composed of X and Y, is transformed into P', composed of X' and Y'. Thus

(7) $P' = X' + Y'$, or

(8) $P' = (X'x + X'g) + (Y'y + Y'e)$, or

(9) $P' = \left[\left(X - \left\{ Sx + Ax \right\}\right) + \left\{ G - Sg \right\} \right] + \left[\left(Y - \left\{ Sy + Ay \right\}\right) - \left(E - \left\{ Se + Ae \right\}\right) \right]$, or

(10) $P' = (X + Y) + (G + E) - (S + A)$.

As indicated by the equations above, we can mark every element of population change. If we wish to examine the process of change in general, detailed analysis is necessary. What sort of statistical materials should we be equipped with to make this analysis possible?

I. It is necessary first of all to take the static population figures, divide them into indigenous and non-indigenous groups, and specify sex, age, occupation, and other items. In particular, the place of birth and the time of arrival or of departure of the persons coming from elsewhere must be investigated. Among the materials of the national census, there are tabulations of population by place of birth, and it is possible to get combined data on place of birth and age, but there is no additional information available. It is hoped that in the future we may have more information under these and other headings.

II. Next, the vital statistics should be investigated at least yearly in accordance with the following, and if these are compiled, it will be possible to have a close understanding of the static population change.

1. The first credit entry is births,
2. The second is the non-indigenous population.
   (a) This requires the same breakdown as the preceding with respect to births. That is, (the population of Tokyo alone being in question) how many are births among that portion of the population born in Tokyo, and how many are births among that portion born outside of Tokyo. It would be extremely helpful to have such figures. This is extremely recondite; so since we can here calculate what percentages of births there will be, respectively, in the indigenous population and

in the non-indigenous population, we should like to have statistics indicating also the percentage of inheritance of the new births. In this connection, if, as part of future data gathering, we obtain data on the places of birth of the fathers and mothers of the infants, it will be of help.

(b) The second credit item, non-indigenous population, is one concerning which it is difficult to gather data in the same way as in the opposite case. (T.N. i.e. Those who leave.) However, it is possible to obtain data with reference to this item solely by means of the Law of Temporary Domicile as it is at present in effect in this country, in the same manner as formerly obtaining data on vital statistics (the so-called gathering of data on natural vital statistics). Therefore, it is not necessarily very difficult. If, henceforth, we investigate the movements of population by occupation or by migration, I think that the gradual exploitation of this sphere of investigation also has great potentialities. The fact which should be made clear with respect to the non-indigenous population is that it is not simply the excess portion of the population which has left the city, but comprises the data whose essential attributes with respect to the total amount of incoming population can be clearly seen.

(2) The debit items are, of course, deaths and removals.

(a) Data should be gathered categorizing deaths, also, in the same manner as births, into the number of deaths among those born in Tokyo City, and among those born in the provinces, and into indigenous persons and persons who have come from outside. In connection with this point, the deaths of recently-born infants should be handled in the same fashion.

(b) Outgoing movements likewise should be divided into those persons who have been born in Tokyo who leave, and those who have been born in the provinces who leave. If we can ascertain these things it will be very helpful.

In the manner indicated above, we can not only clarify population change in a more detailed way than formerly, but we also see the need for statistical material with respect to natural changes and on social changes. In particular, if we give some attention now to static population figures and figures on natural population change, they will be rather useful. The field of statistics of social change has some wholly undeveloped portions. If the established system of reporting temporary domiciles were to be carried out in this field as well, and reports made on the progress of the masses, investigation would be easy; so it is necessary first of all to study methods of promoting this matter of reporting to the authorities. Next, problems will arise with respect to the items reported, but that is not so difficult a matter as conducting the reporting itself. At any rate, it is one-sided to have no migration statistics among the vital statistics; and as with statistics of natural change, the fact that there are no migration statistics means that data is incomplete and, as a result, errors of observation arise.

III. QUANTITATIVE COMPUTATION OF VARIOUS BASIC FACTORS AFFECTING THE RENEWAL OF POPULATION IN TOKYO.

The matters which are treated below not only do not fulfill all the requirements mentioned in the preceding section, but do not satisfy more than a small portion of them. If only the former materials were available, this would be absolutely impossible, but with new materials, there is a possibility of complying with the various requirements of the preceding section. That is to say, since the materials cannot be perfectly organized, the deficiencies which exist will be supplemented by an academic computation. Such a computation is of course extremely daring, and it may well be that we will be taken to task because of such action; however, we propose to take this chance.

Before proceeding to take up the computation, a clarification of the rules of terminology and sources of the materials is in order. In the following, a reference to "Tokyo-Shi" will indicate the boundaries of present-day Greater Tokyo in 1935, and the 1930 population figures have been converted to conform to these boundaries. Also, the 1935 population figures are within the scope of the investigation conducted at the instance of Tokyo-Shi, but the so-called Special Investigation Areas (Article 9 of the Census Enforcement Regulations) are not included. However, since the population figures of 1930 do include these areas, the population increase for the period mentioned above is actually over 900,000, but in the materials which are treated below, it will appear as only 880,000. The term "renewal of population", does not refer to momentary changes, but concerns the total change of the preceding five year period, and this can merely be surmised.

It will be observed that total population has been divided into "Tokyo-born", and "provincial-born". The former refers to persons born within the boundaries of present-day Tokyo; and those who have previously moved outside the city limits but have returned are also included therein. The latter refers not only to persons born in the provinces within the country, but it should be understood that it also includes persons born in overseas territories or foreign countries.

The sources of the materials are as stated below:

(a) Static population statistics.

1. Reports of the 1930 and 1935 Census, compiled by Fu-Ken (T.N. Provinces), Tokyo-Fu (Cabinet Statistics Bureau).
2. Statistical report for Tokyo-Shi of the 1930 Census and Supplemental Investigation (Tokyo-Shi).

(b) Vital Statistics.

1. Annual vital statistics (Cabinet Statistics Bureau).
2. Annual Tokyo-Shi vital statistics (Tokyo-Shi).
3. Annual Emergency Report of Tokyo-Shi vital statistics (Tokyo-Shi).

Among the above, the focal data for this report are the results of the aforementioned Supplemental Investigation. In this connection, in addition to names, classification by sex, date of birth, and present residence, which are itemized in the Census, the Supplemental Investigation includes the three items — date of establishing residence, place of birth, and citizenship or nationality. The collected statistical tables concerning these items, comprise the aforementioned statistical report. Below, using the results of the investigation as a starting point, we shall set forth the necessary quantitative computation of the various basic factors of the renewal of population in Tokyo-Shi during the five year period from 1930 - 1935.

1. Assumption of the quantity of Tokyo-Shi born among the 1930 population.

In regard to the population of 1930, which has been converted to conform with the boundaries of Tokyo-Shi in 1935, the amount of Tokyo-Shi (as of 1935) - born and provincial-born is unknown. This is necessary in order to measure the respective contribution of the Tokyo-Shi - born population and the provincial-born population to the renewal of the population during the period from 1930 to 1935. 2,332,252 of the 1930 population of 4,870,000 were born in Tokyo-Fu. According to the investigation of 1935, the number of persons born in Tokyo-Fu, exclusive of those born in Tokyo-Shi, amounted to 48,437 *1.

*1 Based on Tokyo-Shi Statistical Annual, No.35, Part 2, Population Compilation Supplement.

Consequently, the balance remaining after deducting about 60,000 from the 1935 Tokyo-Fu - born population is the Tokyo-Shi - born figure. Accordingly, the Tokyo-Fu - born population, in 1930, excluding Tokyo-Shi, as opposed to the total population, can be assumed to be about 50,000 plus. Thus, in the 1930 Tokyo-Shi population, it would probably not be excessive if, out of the Tokyo-Fu-born of 2,332,252, about 2,280,000 were considered to be that portion which is Tokyo-Shi-born.

2. Computation of the number of births during the five year period following 1930.

The number of births in Greater Tokyo can be traced back to 1932 in the Imperial Vital Statistics, but prior to that date this factor is unknown. The fact that the number of births, which is one of the basic factors of population change, is unknown, is unfortunate, since in its absence neither this nor its relationship to the other basic factors can be calculated. Accordingly, the annual number of births during the aforementioned five year period must of necessity be computed from other figures. The source materials of this computation are the number of persons under five years of age in 1935 (that is, thenumber of survivors of the persons born during the period from 1931 to 1935 inclusive)and the average death rate for the persons under five years of age. Fortunately, since the investigation made by Tokyo-Shi in 1935 included the death rate for each age group, these can be combined. This is, of course, a fairly rough solution. In the 1935 population figures, the number under one year of age is the number of survivors of those born within the preceding year but does not include infants who have died, according to the death rate for persons under one year of age. Likewise, the number of persons one year of age is the number of survivors of those born in the next preceding year, excluding persons who have died, according to the death rates for persons under one year and persons one year of age. Since the residue is similar, let us call the 1935 population under one year of age x_0, the number which are one year of age, x_1, etc., and the death rate for persons under one year of age, d_0, the death rate for persons one year of age d_1, etc. Thus:

G_0 (number born in 1935) $= X_0 \div (1 - d_0)$

G_1 (number born in 1934) $= X_1 \div (1 - d_0 + d_1)$

G_2 (number born in 1935) $= X_2 \div (1 - d_0 + d_1 + d_2)$ etc.

Since it is possible to resolve the annual number of survivors into the number of births by the survivorship rate, as shown above, the total number of births for the five years following 1930 can be calculated. The result of the calculation as shown in Table 1 (see Appendix B) is about 760,000. However, since the Census is taken as of the first of October, and the Vital Statistics are computed for a period beginning in January and ending in December, there is a discrepancy of two months for each year.

Consequently, the figures of Table 1 cannot be said to be entirely accurate, but they are adequate as a rough approximation. For example, if we compare the results of the computation and the figures for the years following 1932 which are presented in the Imperial Vital Statistics, it becomes clear that the computed figures in each case are about 3% to 10% greater. This is due, first of all, to the fact that the Imperial Vital Statistics are compiled according to information received from the place of domicile, and children whose place of birth is not the residence of the parents are compiled separately. Moreover, in cities, such as Tokyo, in which there are many migrants, calculation is made on the assumption that these migrants properly report the birth directly to their permanent domicile; however, during the recording of the birth report, it frequently happens that the place of birth also handles it. In the second place, the Census includes persons from overseas territories and foreign countries, but the Imperial Vital Statistics do not include the births of such persons. Finally, in the third place, the death rate given in the Tokyo-Shi Investigation, which is the source material of the converse computation, also includes the entire death rate of persons from overseas territories and foreign territories on the basis of their domicile. It may well be that these differences are an influential factor in creating a portion of the gap between the number of births in the above-stated computation and the number of births in the Imperial Vital Statistics.

3. Distribution of Infant Births.

The number of births during the five year period, which was computed as stated above, is approximately 760,000. However, among these 760,000 infant births, how many will there be who can be assumed to be of native Tokyo blood, and how many are there who have been born of provincial

blood? This question is a matter for conjecture, and if we analyze the expansion of the population of Tokyo by births, and the effect upon this process by the characteristic traits of the citizens of Tokyo, would not the expansion of the population be impossible in the absence of the fresh and vigorous blood of the provincial citizens? The above stated facts are necessary in order to answer the question to what extent this is so; under ideal conditions, it would be possible to do so. Accordingly, in order to observe what portion of infant births are due to the Tokyo-born population, and what portion are the contribution of the provincial-born population, these factors will be distributed in the following manner:

In the first place, as the position of the Tokyo-born population and the provincial-born population which must be observed as the basis of the distribution, we will take not merely the 1935 figures of each, but the average of 1930 and 1935 figures. In the second place, if we examine the composition of the segments of each of these population figures (see Diagram 7, 8, Appendix A), the percentage of those within the productive age groups is markedly different. This ratio can be computed to be 80 for the provincial-born, as compared to 40 for the Tokyo-born. Furthermore, in regard to the average value of both groups mentioned above, they are found to have a weight of 1 to 2 respectively, and the total number of births, 760,000, can be proportionately distributed on this basis. (Here we assume that there is no difference in productivity between the Tokyo-born and provincial-born population.) While the result of this computation is, of course, no more than a hypothetical estimate, it can be calculated that there are 210,000 births from the Tokyo-born population, and 550,000 births from the provincial-born population.

4. Computation of the number of deaths during the five year period following 1930.

In regard to the number of deaths in Greater Tokyo, as in the case of the number of births, the Imperial Vital Statistics prior to 1932 are not available. If the number of deaths is unknown, it cannot be determined whether there has been a natural increase, and therefore it would become impossible to analyze the change in population. Thus, it is important to ascertain definitely the number of deaths. Fortunately, the investigation conducted by

Tokyo-Shi is available. The figure in Table No. 2 (See Appendix B) for the total of this five year period is 387,456. If we compare these figures to the figures of the Imperial Vital Statistics following 1933, in every case the former are approximately 5% greater. Since, in general, the situation is the same as that of births, any discrepancy which may appear is not important.

5. Distribution of the number of deaths.

Just as we have divided the present population and the number of births into Tokyo-born and provincial-born, it is correspondingly necessary that the number of deaths be distributed in the same manner. However, the number of deaths following 1930 includes, first, the deaths of persons counted in the 1930 population (of course taking into account the arrivals and departures during the succeeding five years), and secondly, the deaths of children born during the five year period following 1930. Before analyzing the change of population, it is advisable to apportion these factors, and then to subdivide each of these respectively, as stated above. Accordingly, we shall first compute the number of deaths of infants born within the five year period following 1930, and with this as a basis, we can calculate the number of other deaths. Taking the former, we find from the figures of Table No. 1 that the number of births during the said five year period was 763,314, and the number of survivors in 1935 was 662,956; by the process of subtraction, it can be computed that the number of deaths was 100,358. This figure appears to be extremely high, compared to the total number of deaths, 390,000, but this is not actually the case. For example, (since there are no statistics for the number of deaths classified by age for 1931 and 1932) if we take the average number of infant deaths for the 5 years, 1933 to 1937 inclusive, and regard this as the average number of infant deaths classified by age for the period following 1931, the total 5 year average will be 103,972. A comparison of this with the former figure reveals a difference of about 3%, but in general, it will not vary greatly from 100,000. If we place the infant deaths for the five years following 1930 at 100,000, it will not be excessive. If we subtract this 100,000 figure from the total deaths of 390,000, the remaining 290,000 will be the number of deaths of persons other than infants born after 1930.

If we distribute the said 290,000 proportionately according to the average number of Tokyo-born and provincial-born in 1930 and 1935, the deaths of Tokyo-born can be estimated to be about 120,000 and deaths of provincial-born are about 170,000. Likewise, if we distribute proportionately the 100,000 infant deaths for the five year period following 1930, according to those born of Tokyo-born parents, and those born of provincial-born parents, the former can be roughly estimated to be 30,000, and the latter to be 70,000. Consequently, the analysis of the 390,000 total number of deaths during the five year period, is as follows:

Deaths of children born after 1930.....	100,000
Children born of Tokyo-born parents.....	30,000
Children born of provincial-born parents.....	70,000
Deaths of persons other than the above.....	270,000
a. Tokyo-born	120,000
b. Provincial-born	170,000

6. Computation of influx during the five year period following 1930.

The influx of population for the latest year (from October 1934 to September 1935, inclusive) was 500,994 *1 (excluding the so-called re-entering persons). This figure does not represent the total amount of the population which has entered during the year, but actually indicates only those among the total population influx who remained at the time of the Investigation. In all probability, a substantial number of the persons, who had entered during the year, moved by the time of the Investigation. Assuming these to be about 10% of the total it may be concluded that the total number of persons entering during one year is 550,000. (Since this figure of 550,000 is to be made the basis of future calculations, it will be necessary to scrutinize it carefully, but first this hypothetical conclusion will be advanced). If we assume, for the time being, that the total influx of population for each year is 550,000, the total influx for the five years following 1930 was 2,750,000.

7. Computation of efflux during the five year period following 1930.

The amount of efflux cannot be ascertained directly.

1. According to the results of the Supplemental Investigation,

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*1 Report of the above-mentioned Supplemental Investigation, page 428.

the 1935 Tokyo-born population was 2,780,000. Since 660,000 of this number are the portion added by births during the five year period following 1930, the remaining 2,120,000 may be assumed to be the number of the Tokyo-born portion of the 1930 population which remained in 1935. Since the Tokyo-born portion of the 1930 population was 2,280,000, the balance of 160,000, which is obtained by subtracting the 2,120,000, may be considered to be the loss for the five year period due to death and removals. However, as indicated in sub-section 5 above, deaths of Tokyo-born persons during the period under discussion was about 120,000; so it can be seen that the difference of 40,000 is the number of the Tokyo-born portion of the 1935 population which moved from the city.

Can any reliance actually be placed in this figure? For example, if we compare it with the distribution of population, classified by province of birth, in the 1920 and 1930 census figures, the increase of Tokyo-Fu-born in other provinces in ten years was more than 80,000.*1 However, since the Tokyo-Shi-born comprise nine-tenths of the Tokyo-Fu-born, it can be seen that the greater part of the 80,000 is the increase in Tokyo-Shi-born. If we compare the figures for this ten years with the 40,000 removals during the aforementioned five year period, it can be concluded that the latter is by no means an unrealistic figure. (Of course, it cannot be concluded that the 40,000 removals were entirely the increase of Tokyo-Fu-born in the other provinces; but for the purposes of this study the computation of the number of removals from specified districts will be employed as above.)

2. According to the Report of Supplemental Investigation*2 the total number of provincial-born persons in the 1935 population is 3,070,000 and among these it appears that the number remaining of those coming in during the five years following 1930, is 1,320,000. Consequently, the difference of these, 1,750,000, is the number of the provincial-born portion of the 1930 population which remains in 1935. However, since the provincial-born portion of the 1930 population was 26,790,000 (sic; T.N. this appears to be a typographical error; the correct figure should be 2,690,000), the difference, 940,000, must be the number of removals and deaths during the said five year period. What portion of these were removals? Since the number of

*1 Population supplement of the above-mentioned Tokyo-shi Annual Statistical Report.
*2 Report of Supplemental Investigation, p. 317.

deaths of provincial-born during the five-year period following 1930, as computed in sub-section (5), above, was 170,000, the difference between 940,000 and 170,000, that is, 770,000, can be regarded as the number of removals from the provincial-born portion of the 1930 population during the five year period in question. (Actually, there is necessarily a moment by moment fluctuation of the efflux, but to the same extent, there is a continual variation in the number of deaths; so the computation may be made as above.)

3. The number of removals of the 1930 population during the five year period was, as stated above, composed of 40,000 Tokyo-born, 770,000 provincial-born, total, 810,000; but how much was the total efflux during the same period? This can readily be computed if we know the total influx for the same period. If the total influx of 2,750,000 given in sub-section (6) is accurate, since the number of these remaining in 1935 is 1,320,000 according to the results of the Supplemental Investigation, it can be seen that the remaining 1,430,000 is the number that moved in and moved out again during the five year period. Finally, by adding to this the above-stated 810,000 of the 1930 population, the total efflux during the period can be computed to be 2,240,000. Obviously, this total efflux will be increased or decreased according to whether the computation of the total influx is made larger or smaller.

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IV. ANALYSIS OF TOKYO POPULATION RENEWAL (PART I, AMOUNT OF POPULATION RENEWAL).

The preceding section enumerated a number of the important causes of population renewal individually computed, and the relationship to the whole necessarily was not made clear. Consequently, the following discussion shall synthesize these elements and examine the dissected substance of population turn-over and change. In the analysis which follows, the approximated figures are treated with the understanding that they are provisionally valid.

A. Population Renewal in Tokyo.

In the population figures of 1930, the 2,280,000 Tokyo-born constituted 46% of the total population, but in 1935, 2,780,000 constituted 47% of the total, with an increase of 500,000 in the absolute number of Tokyo-born in the preceding five years. In other words, while the ratic with respect to total population increased a mere 1%, within the group of Tokyo-born, a marked increase of 3.9% during the five years has appeared.

If we now investigate the five year activity in Tokyo-born population, which seems to have increased markedly, on the credit side, births of Tokyo-born population number 210,000, and births of provincial-born number 550,000 - a total of 760,000. On the debit side, deaths in the population of 1930 numbered 120,000, and deaths of infants born since 1930 number 100,000 - a total of 220,000. Add to this, 40,000 persons of the population of 1930 who left Tokyo, and it forms a total loss of 260,000. Viewing Diagram 2 (See Appendix A) as the datum plane of population in 1930, one sees that the population of 2,280,000 decreased 160,000 during the five years to 2,120,000 - a decrease of about 7% for the period. Moreover, of the 760,000 births after 1930, 100,000, or 13%, were lost by 1935, making it 660,000. Thus, while the 2,780,000 Tokyo-born in 1935, composed of the 2,120,000 remaining of the 1930 population plus 660,000 remaining from births after 1930, superficially would seem to be an increase of 500,000, actually it is clear that there is a change of 660,000. However, how was such a vast reproductive turn-over brought about? The general explanation is that although the loss of Tokyo-born population living in 1930 during the period reached 160,000, of

the residue of new births which should be viewed as compensation, that of Tokyo-born did not exceed 180,000, and that part of the difference which is increase amounts to merely 20,000. Thus, the fact is apparent that actually Tokyo-born population is no more than barely accomplishing simple regeneration. Moreover, the reason we see the marked increase of 500,000 in the preceding five years is actually due to the contribution of the 480,000 remainder of births among provincial-born. It can now be pointed out that the true reason why it is possible for it to seem as if the population of Tokyo-born is reproducing on a remarkably wide scale is actually due to the new, vigorous blood of the provincials.

B. Renewal of Provincial-born Population.

In 1930, provincial-born population in Tokyo numbered 2,690,000 or 54% of the total population, but in 1935, when it numbered 3,070,000, it constituted 53% of the total population. The increase appearing in this period was 380,000 or roughly 14%, and constituted 2/3 of Tokyo births. However, the ratio with respect to total population in the period dropped 1%. This would seem as if the absorptivity of provincials of Tokyo had fallen off in this period. Analysis of the major reasons for the 14% increase previously cited indicates the following facts with regard to activity in this period. On the credit side, influx population numbered 2,750,000 - a number roughly equivalent to the total number of the provincial - born population in 1930 streaming in during the five years. On the debit side, losses due to deaths within influx population listed in 1930 are to date 170,000 (about 6% of the original population). Further, efflux population is 770,000 from the population of 1930 (about 29% of original population) and 1,430,000 from influx population since 1930 (actually 52% of the influx population since 1930) - a total of 2,370,000 (40% of the original population plus the entire influx population). In other words, of the 5,100,000 persons contributing to the amassing of renewed population, the actual number which shifted was approximately 3,700,000. Thus, of the 2,690,000 of the population of 1930, 940,000 or about 35% of the original population was due to deaths and efflux; and after 5 years the residue of the original population was 1,750,000 (65%). However, the provincial-born population of 1935

was 3,070,000, having been replenished by 1,320,000 newcomers. This portion actually equals 43% of the provincial population of 1935; and the provincial-born population turn-over during these five years was nearly 50%. The appearance as an increase of 380,000 over the former provincial population is due to the fact that actually the loss of 940,000 has been concealed beneath the surface, and having covered this tremendous loss, the 380,000 increase still appeared. The amazing facts brought to light by using the effectual line of reasoning are that what is disposed of as a 380,000 (14%) increase is a conglomeration of the 2,700,000 influx, 2,200,000 efflux, and 170,000 deaths in that period, and that having lost 35% of the original population, 43% of the renewed population has been filled by the newly-arrived population. One can see by Diagram 3 (See Appendix A) how fluctuating are the provincials who move to large cities like Tokyo.

C. Renewal of Total Population.

The 4,970,000 total population of the city of Tokyo in 1930 had increased to 5,850,000 (actually 5,890,000) in 1935. In other words, there was an increase of 880,000 during these five years equal to about 18% of the original population. A study of the population trends during this period, indicates that, on the credit side, there was an increase of 760,000 due to births and an increase of 2,750,000 due to influx - a total of 3,510,000 or nearly 71% of the original population. This figure is so great that it comes to 73% of the 4,800,000 population increase of the entire country. Opposed to this acquisition of population, those lost by the city of Tokyo during this period were 390,000 dead and 2,240,000 efflux population - a total of 2,630,000, which was over one-half the original population, or about 53%. A survey of the changes to date in the population of 1930 indicates that during this period 1,100,000 were lost, leaving a remainder of the 1930 population in 1935 of 3,870,000. In other words, the loss of the five years is 22% of the original population; the proportion remaining is 78%. Viewed from the aspect of 1935 composition, adding the new increase population of 1,980,000 to the remainder of 1930 population makes a total of 5,850,000; the new population introduced in the five year period constitutes 32% of the whole and the residue of 1930 population

[redacted]

constitutes 68%. The new population was formed with nearly 1/5 [illegible] renewed in the five year period.

If we now tentatively compare the contributions of Tokyo-born and provincial-born to the population changes described above, we see that new population contributed by Tokyo-born was barely 180,000, or no more than 9% of the total (See Diagram 4 Appendix A). In contrast, the contribution which the provincial-born population was able to make to new population was actually 1,800,000 or 91% of the total. Again, viewed from the aspect of population loss, which amounted to 1,100,000, while loss of Tokyo-born population was 160,000 or 15% of the total, loss of provincial-born population amounted to 940,000 or 85% of the total. In other words, it may be said in both gain and loss, the role played by provincial-born has been clearly overwhelming. In other words, comparison of respective gains and losses of the places of origin indicates what may be called a net proportion. (See Table 4, Appendix B) First, since there is a lossof 160,000 of Tokyo-born population as contrasted with the gain of 180,000 in this period, there is a net balance of 20,000, and the net proportion as against the original population of 1930 stops at a mere 1%. On the other hand, since a loss of 940,000 of the provincial-born population is countered by a gain of 1,800,000 during this period, and 860,000 net balance is realized, and the net proportion as against the original population of 1930 reaches 32%. The preceding does not take into account the influx - efflux population of this period; however, inasmuch as in these five years the influx population which went through the period of both static surveys amounted to 1,430,000, if it were added to the ledger, the facts set forth above would doubtless be further magnified.

Thus the slope of total gains and losses of Tokyo population from 1930 to 1935 may be reckoned as follows:

> Since total losses of Tokyo-born population are 260,000 and total acquisitions are 760,000, the total change has reached 1,020,000 or 44% of the original 1930 population. Again, since total losses of provincial-born population are 2,370,000, and total acquisitions are 2,750,000, the total change actually amounts to 5,120,000 or about twice

[redacted]

the original population of 1930. However, in view of the fact that there are 100,000 persons among Tokyo-born who appear as both losses and gain, and similarly there are 1,430,000 persons among the provincial-born, the respective true changes become 920,000 and 3,690,000 with the total change for the entire population reaching 4,610,000. Thus, the aggregate population thrown into the vortex over the five-year period rivals the total population of Tokyo for the year 1930. Moreover, it is the equivalent of one-fourteenth of the national population in 1930 and one-fifteenth of the national population in 1935.

In short, it is manifest that the the change in Tokyo population, which appears to be a population increase of merely 880,000, actually is a vast quantity five times that great, realized by throwing the entire national population into its vortex and passing through tremendous changes.

To emphasize this further, a separate survey of the influx - efflux areas would be required; however, I shall not enter upon this field here. Table 4 (See Appendis B) shows the computation of Tokyo population renewal in the form of a balance sheet.

V. COMPUTATION OF THE AGE-COMPOSITION OF RENEWED POPULATION OF TOKYO.

It is clear from the above how vast is the amount of renewed population in Tokyo, and that the extent of its renewal is far broader than formerly supposed. Let us next examine closely what the characteristics of this vast renewed population are. Among the various attributes of a renewed population, we shall treat here only that of age. Age distribution is regarded as one of the most basic of the various attributes of a population. Consequently, the special characteristics, from the age standpoint, of a population which is changing form as the population becomes renewed or changes within itself, suggest of an intimate relationship with many social and economic phenomena; and though this is true, we are forced to omit inquiry into other attributes and renewed population. The following will make clear the computation of age distribution with respect to various essential points of population renewal.

(1) Charting the Age Distribution of the Population Influx During a Year.

As set forth above, the population coming in within a year can be ascertained from the previously published Statistical Report of Supplemental Investigation (p.46) but this distribution is not directly set forth in that publication. It is generally imagined that the population of a city is concentrated chiefly at the youth (T.N. i.e., Seinen = 15 - 25) and adult levels, but as a matter of fact this point is not definitely established. To make clear whether, in reality, the concentration is in the youth and adult years - and if that is true, what sort of distribution pattern it has - is, from the point of view of grasping the meaning of the concentration of population in cities and of ascertaining the characteristics of the present population renewal in Tokyo, a very important point. However, the same publication (p.386 ff.) gives a combination of data on persons who have come in with groupings according to present age (by year); age at the time of the census, and age at the time of arrival. The difference between the present age and the age at time of arrival is the number of years of residence in the city; so if we wish to inquire into the question of the ages of the people arriving during the latest one-year period, it will be well to leave out differences of

of less than one full year in the two ages.

Diagram 5 (See Appendix A) and Table 5 (See Appendix B) contain data drawn up in this manner. The material shown in the diagram is by single years, but here (T.N. in the table) the totals are by five-year groups only. However, the figures derived yield a result of 500,958, which is somewhat less than the estimated figure. This is an unavoidable error which arose because of the conflict inevitably operating in obtaining the difference between present age and age upon arrival. Making proportional allotment of these conflicting figures to each age group, we get adjusted figures yielding the total as in Table I above. This population entering in one year is not completely in accord with the above. Furthermore, because it already had some departures, the figure obviously does not accurately cover the whole of the population arriving in one year. However, though the characteristics of the incoming population are not precisely stated by this figure, it is hoped that we may be able to gain a fairly clear picture of them.

On looking at the characteristics of a population group entering during one year, we find that the majority of its members are between the ages of 12.3 and 30. In other words, when we look at the divisions into single years (in the chart) the largest of these groups among the males is at 14 years (21,000); and the one at 15 years is next largest. The nearest figure among the other groups is at about 20 years of age (roughly 15,000). Among the females, the largest group is at 18.9 years (over 16,000), and with this point as center, the size of the groups falls off gradually on either side. Thus among the 15 - 30 group of incoming persons, which amounts to 62.5% of the men and 64.5% of the women, the percentages of men and women at the productive age-levels are, respectively 76.5% and 77.4%. Since this is true, the average age is likewise for the most part low: among the men it is 21.5 years, and among the women 21.9 years. Since the average age of men is slightly lower than that of women on account of the projection at 14.5 years, it shows the largest group among males to be those who arrive just after completing elementary school, those who come for training in trades, and also those who come in order to enter higher schools. This appears to account for those coming in.

(2) Derivation of Composition of Population Entering and Remaining During the Five Year Period Beginning 1930.

The population which entered and remained during the five-year period beginning in 1930 is drawn directly from the previously mentioned publication *1 and is set at 1,320,000, but its age-distribution is not directly set forth in that publication. This too is a very important basic figure in the fulfilment of our present aim of analyzing the characteristics of the renewal of population in Tokyo in the five year period beginning in 1930. Therefore as with the preceding item, it is derived by combining the two sets of figures: those of present age and those of age at time of entry*2.

The method of derivation is as above, and differences of less than 5 years between present age and age at time of arrival have been taken into account. The minor conflicts thus arising have been compensated as in the previous example, and the results are shown in column 2 of Table 7 (See Appendix B).

(3) Computation of the Composition of the Whole Population Which Entered During the Five Year Period Beginning in 1930.

The figures computed in the preceding paragraph are the age-distribution figures for the population entering and remaining between 1930 and 1935.

Thus, of course, they do not show the outlines of the whole population group which has come in within this period. However, in order to show clearly the characteristics of population renewal in their full breadth, it is necessary to make clear the age-distribution of the whole incoming group. Although this is very difficult, we already have a clue to it.

Composition of the population entering during one year must be, so to speak, the key to the riddle. We must, therefore, establish some assumptions. In the figures already set forth, of the 500,000 who came in during the latest year, those who departed prior to the taking of the census are overlooked. The question arises as to whether these should be regarded. The

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*1 Statistical Report of Supplemental Investigation, p.428.

*2 Ibid. pp.332 ff.

writer considers them to be about 10 per cent [illegible] already been shown that the total number entering in one year is 550,000. It is doubtful that the number entering each year since 1930 is the same. Of course, to suppose that the entries of each year of a five-year period should be precisely equal is not to be considered - but it is not possible to calculate just what the variation is. For this reason the writer will establish the assumption that the difference is not great, and that the entering population in each year is equal. If this assumption is accepted, then the computation of the total population entering during the five-year period is extremely easy. In other words, if we set down the age-divisions of year groups by single years and repeat the process five times, we get a picture of the entire population entering during the five year period. However, as before, the setting down of the overlooked portion of the whole population entering during one year is omitted. The combined figure thus obtained indicates a discrepancy with the 2,750,000 predicted earlier. It too, as in the previous example, should be adjusted by making a proportional allotment to each age level. Naturally proportional allotment among the constituents of the population which departed was also considered, but this was not done. The outline of the whole entering population, insofar as reconstitution has been possible, is set down in column 1 of Table 7. (See Appendix B)

(4) Computation of the Composition of the Population Lost from the Entire Population Entering during the Five Year Period beginning 1930.

It is possible to ascertain the constituent elements of the entire population entering after 1930, in accordance with the foregoing; and the constituent elements of the population entering during that period and remaining are set forth (Table 7, column 2). Thus if we subtract the age-groups of the portion of the entering population from the (T.N. corresponding) age-groups of the entire entering population, we get the composition of the population lost from the entire population entering during the five-year period since 1930. (Table 7, column 3)

(5) Computation of Composition of the 1930 Population Remaining in 1935.

The elements requiring clarification among the characteristics of population changes affecting the population entering since 1930 have been

prepared. However, with respect to the study of the characteristics of population renewal, we must also verify the maintenance of the 1930 population. First, at the time of the 1930 census, what changes had the composition of the population present during the preceding five years undergone? Of course, these are nothing more or less than the losses due to deaths and departures. But in (2) we have already calculated the composition of the population entering and remaining for the five year period. If we compare this with the age-distribution in 1935, we should get the answer. That is, if we subtract from the figures for the age-groups of the 1935 population the figures for the age-groups of the population entering and remaining (2), the remainder is the population which has not died or departed between 1930 and 1935 (Table 8, column 3, see Appendix B). In Diagram 9 (See Appendix A), line A gives the age-distribution of 1935, and connecting the points taken at distances on the inner side of line A indicating the separate age-groups of the population remaining, we get line D, the portion of the 1930 population remaining. However, in this diagram the under-five-year group consists of the survivors among those born after 1930 plus those at present under five years of age who belong to the population entering and remaining - it is not merely the number of those remaining of the 1930 population.

(6) Computation of the Composition of the Population Lost from the 1930 Population.

If we can calculate a portion of a whole, then we can ascertain what the remainder is. The composition of the portion of the 1930 population dying or departing can be determined by comparing the composition of the 1930 population and the portion of the entering population which remained. However, since the 1930 population included a five-year-old group, the zero-year-old group, of 1930 must be compared with the five-year-old group of 1935.

In the following case likewise, if we shift each age-group of the 1930 population five years, and subtract from them each age-group of those entering and remaining (5) we get the composition of the population lost (Table 9 column 3, Appendix B).

This is the space between line D and line B (the 1930 population) in Diagram 9 (Appendix A).

(7) Computation of the Composition of the Entire Population Lost during the Five Year Period subsequent to 1930.

The computation of the composition of the entire population lost is indispensable to the investigation of the characteristics of population renewal. We already know the composition of the portion lost from the entering population, and we have now been able to set figures for the structure of the lost portion of the 1930 population. If we total the figures for the various age-groups of both, the structure of the whole of the lost group becomes clear. However, since the portion of the 1930 population lost through the deaths of those born after that year is not included, the number of such must, of course, be added in order to get a figure for the total lost population (Table 7, column 5, See Appendix B).

Thus we arrive at a clarified general picture of the characteristics of population renewal. But the reader may be concerned about the fact that the foregoing computations do not distinguish all the essential causes of the movements which have been displayed in the present analysis of the numbers involved in population renewal. The writer plans to try to distinguish all the cases; however, the inability to distinguish the relative proportions of deaths and departures, and, further, to distinguish among them the respective portions born in Tokyo and born in the provinces, is regretted. Regarding the distinguishing of deaths and departures, there are at present some clues, but they have not been perfected, and up to the present no method of doing so has been discovered. In conducting the analysis of the characteristics of population renewal which is to follow, the figures given above will be taken into account.

VI. ANALYSIS OF TOKYO POPULATION RENEWAL (PART 2, CHARACTERISTICS).

Before analyzing the characteristics of population renewal, it would be useful to devote a few words to the position of influx population with respect to the structure of the population of Tokyo.

As previously observed, 3,070,000 (52.6%) of the 5,850,000 population of Tokyo in 1935 is influx population (provincial-born). In other words, over one-half the total population are outsiders. However, this is simply a view of mere numerical strength. See Table 6 Appendix B. What comparative weight these populations have as the persons who bear the burden of reproduction of society, is another matter. In order to study the position of influx population in this respect, I shall draw especially upon the so-called "Productive Age Levels"; and comparison and contrast of Tokyo-born and provincial-born will be as shown in Table 6 and Diagram 6. According to these materials, 41% of the males and 40% of the females of the Tokyo-born population are in the productive age level (15-59 years), and over half of the Tokyo-born population are in the child age level. However, the proportions of provincial-born population in the productive age level are 86% of the males and 84% of the females and one can see that their large percentage is filled by persons who have reproductive potentialities, numerically speaking, in contrast to 573,000 Tokyo-born males of the productive age level and 556,000 females - a total of 1,130,000 - there are 1,420,000 provincial-born males and 1,190,000 females - a total of 2,610,000 - or more than double the total of Tokyo-born of productive age level.

In other words, while the percentage of Tokyo-born in the male productive age group is 28.7, the provincial-born percentage is 71.3; and as against the 31.9% of Tokyo-born in the female productive age group, provincial-born number 68.1%. This tells the whole story of the overwhelming position of provincial-born in the productive age levels. In view of this, the position of influx population, which has been disclosed as comprising 53% of the total population, must be considered even more seriously. In view of the fact that influx population fills such an important position, the extremely prominent roll of the provincial-born population in the quantitative composition of population turn-over described in the previous chapter must also be considered natural. (Diagrams 7 and 8 (Appendix B) were offered to illustrate

clearly the contrasts of the two segments of the population.

It is now appropriate to study, from the standpoint of respective age compositions, the characteristics of the various elements of renewed population computed in the previous section.

1. Age Composition of Total Influx Population. An analysis of the male and female components of the total influx population of the five-year period since 1930, breaks down the 2,750,000 figure into 1,285,157 females and 1,464,843 males, or 114 males per hundred females. In other words, influx of males is just 14% greater than that of females. Viewing the influx male population by age, the 20-24 age group is largest, followed by the 15-19 year group, both numbering in excess of 370,000 (26%). These are followed by the 25-29 and 30-34 year groups, which are somewhat smaller, each being in excess of 100,000. The 1,100,000 total in the 15-34 age groups equals 75% of the 1,460,000 odd total influx male population. Moreover, more than 1,250,000 or 85.6% of the total are within the productive age level. Thus, the average age of the total influx male population is 22.50 years.

The 20-24 age group of the influx female population likewise is largest, amounting to over 380,000, or about 30% of the total number. The 15-19 year group is next with more than 320,000, and together with the 170,000 of the 25-29 age group comprises about one-half the total number. The total number in the 15-29 year groups is approximately 880,000, which is 58.4% of total influx female population. Moreover, more than 1,000,000, or 83.3% of the total are within the productive age level. Thus, the average age of the total influx female population is 23.95 years, or somewhat higher than that of the males. It is clear that the great bulk of the influx population is concentrated in the vigorous youth level. (Refer to column 1 of Table 7, Appendix B)

2. Age Composition of Residue Influx Population. It was previously stated that in 1935 the living, non-emigrant residue of the 2,750,000 Tokyo influx population for the five years since 1930 amounted to about 1,320,000. Analyzed according to sex, there are 706,109 males and 612,789 females - or about 15% more males than females. If the male residue influx population is

broken-down according to age, it appears that the 15-19 year group, with more than 200,000, or 29% of the total number, is largest. Next is the 20-24 age group with less than 160,000. This is followed by the 24-29 age group which is somewhat smaller, amounting to nearly 90,000. The 15-29 age group has over 450,000, and amounts to 64% of the total.

More than 570,000, or more than 81% of the total number, are within the productive age bracket. Thus, the average age of the male residue influx population is 22.52 years.

The female residue influx population broken-down according to age reveals that the 20-24 age group is largest and that 15-19 age group is slightly smaller, each numbering from 150,000 to 160,000 and amounting to over 25% of the total. Next comes the 24-29 age group, which numbers more than 70,000. The total number in the 15-29 age group is nearly 390,000 or in excess of 63% of the total. Nearly 490,000, or about 80% of the total, are in the productive age group. Thus, the average age of the female residue influx population is 23.46 years, or about one year older than the male average. (Refer to column 2 of Table 7, Appendix B and to Diagram 10, Appendix A)

3. Ratio of Residue of Influx Population by Age. Of the incoming population of 2,750,000 people who entered Tokyo since 1930, those who remained in 1935 numbered 1,320,000 and the residual rate for the whole influx population over the five year period is 0.479. This figure is by no means uniform year after year, and the ratio varies with the year. In other words, while there are some irregularities, in general, the residual rate is high among the young and falls in inverse proportion to increase in age. Probably this does not indicate a high turnover but rather is due to the fact that the death rate increases with advances in age (Table 10, column d, Appendix B). The general tendencies are as described above; however an interesting fact is the low residual rate among men between the ages of 20 and 39 and among women between 15 and 29 in comparison to other age groups. In particular, the rate for men 25 to 29 and women 20 to 24 is extremely low. As our later analysis of population loss indicates, this fact is written off as connected with the dominance of low age groups in the populations turnover;

however, it may also be maintained that it indicates that many (young people) share the fate of the old due to the exceptionally high death rate in these age groups because of tuberculosis. (See

(See Table 8 Appendix B) Thus, it appears that the residual rate for transients over the five year period is under 50%, that the five years reduce the transient population to less than one-half, and that the residual rate among the low age groups is extremely low for both men and women.

Now let us consider the residual rate from a different angle, the residual percentage of the transient population over the five year period from the view point of the population composition in 1935.(See Table 10, column a.) That the residue of the transient population for the five year period since 1930 is 22.5% and that more than 20% of the total population is made of persons who have entered in the last five years is obvious, but surprising disparities are evident from a consideration of the differences in sex and age. First, as for differences of sex, it is 23.1% of the males and 21.9% of the women, and the residual rate for the 1930 population is much higher for men. In respect to age groups, among men the 15-19 group shows a high rate and it develops that 51.68% of this age group are persons who have entered and remained during the last five years. Furthermore, in the 20-24 age group, 41.92% are recent acquisitions. Among the lower ones are the 25-29 age group (28.93%), the 10-14 age group (22.18%), the 30 - 34 age group (18.55%) and the other groups are about 10%. That is, in the low rate groups the new arrivals for the last five years are about 10%. For women, the highest is the 47.09% in the 15-19 age group, and the age groups are the same as for the men,but the percentage falls slightly. In the 20-24 age group 45.93% or almost half is made up of new arrivals. In addition, there is the 27.98% in the 25-29 age group, 18.04% in the 10-14 age group, etc; in general,the other groups show a higher rate than appears among the men, and cases of more than 10% are not infrequent. A fact worthy of notice is that in the 15-29 age groups for both men and women 30 to 50% are new population acquired during the past five years. Not all these are necessarily capable of social reproduction; even the most vigorously productive population strata cannot develop without depending on fresh populations; is it not characteristic of modern urban populations that their ability to

support themselves is doubtful. So far as young age groups are concerned, it is assumed that this fact is to a certain extent connected with the sanitary conditions in the metropolis. The population composition Line D of Diagram 9 (Appendix A) shows clearly how urban population would change if the usual influx of fresh population from rural areas were lacking.

4. Age Composition of Total Population Loss.

It has already been stated that over the five year period from 1930-1935 the total population loss was 2,630,000. Column 5, Table 7 (Appendix B) shows the composition of the loss. Here the total number is stated to be 2,529,870; but as seen before, the births and deaths during these five years number 100,000, so these, too, must be included. However, for convenience sake we use the figure 2,530,000. If this figure is divided into men and women, the men number 1,382,189 and the women 1,147,681. The men are 20% more numerous than the women. The 20-24 age group among the men suffered the greatest loss (350,000) and amounted to 26% of the total number. Next was the 25-29 age group (280,000) and among the others were the 15-19 group (190,000) and the 30-34 group (130,000). The total of the above from 15 to 34 was over 960,000 and made up 70% of the whole number. The productive age levels are somewhat less than 1,180,000 or more than 85% of the total. Just as in the case of males, in the female population loss, the 20-24 age group's loss was highest (320,000) or 28% of the total; the 15 to 19 age group with a little less than 180,000, the 30-34 age group with close to 80,000. The total of the above from 15 through 34 is 780,000 and makes up 67% of the total. Those in potentially reproductive age brackets number 930,000, or 81% of the total. The average ages for men and women are 27.57 and 27.34 respectively. In contrast to our recognition of the fact that in general the inflowing population is concentrated in the low age groups, the predominance of these age groups in the population loss as well is an unforeseen circumstances.

5. Age Composition of Population Loss of 1930 Population. As heretofore set forth, the aggregate of 1930 population lost from Tokyo due to death or efflux by 1935 totaled 1,100,000 (See Table 9, Appendix B). An analysis

by sex, based upon column 3 of Table 9, indi[illegible] in contrast to 623,455 males, or a ratio of 131 males per hundred females. Examined according to age, the largest group in male population loss is the 20-24 age group, consisting of over 130,000 or 22% of the total. The 120,000 in the 25-29 year group and the 70,000 of the 30-34 age group follow. The total of the 20-34 age group is 330,000 or 63% of the total number. Nearly 350,000 or 79.8% of the total are within the productive age level. Tentatively speaking, the average age is 30.81 years. Since they are calculated on the basis of the age figures for 1935, it would be 25.81 years if they were to be for the ages in 1930.

An examination of the age distribution of female population loss shows that here again the 20-24 age group is largest, the number being slightly in excess of 100,000 or 21% of the total. Next come the 25-29 age group, which is more than 77,000, and the 30-34 age group, which is even smaller, numbering 45,000. The 20-34 age group comprise more than 220,000, representing 47% of the total. The concentration in the youth level is somewhat lower than in the case of the males. Nearly 350,000, or 73% of the total, fall within the productive age level. This, too, is a lower ratio than in the case of the males, and it can be seen that the female population loss is slightly more widely dispersed than the males'. However, the average age, which is 30.9, is very little different from that of the males, and since it is also based upon age in 1930, it is actually 25.9.

As indicated by the aforegoing, the average age of those lost from the population of 1930 during the five years is slightly higher than the average age of total population loss and their distribution is slightly more inclined toward lower age groups; however, the overwhelming portion of the youth age level remains unchanged. See Diagram 10, Appendix A.

6. Proportion of Residue and Loss of 1930 Population According to Sex.

Since the loss from the 1930 population of 4,970,000 is 1,100,000, the residue is 3,870,000. Contrasted to the 1930 population, the proportion of residue for the five-year period is 77.9% and the proportion of loss is 22.1%. In other words, five years time had brought about a loss from the circle of community life of 22% of the population of Tokyo; As previously demonstrated, this loss was offset by an influx population of 1,320,000 and.

660,000 newborn, and even ended in a degree of gain.

The figures of columns (b) and (c) of Table 10 (Appendix B) represent the proportion of residue and proportion of loss of the 1930 population in the five-year period.

Since it is apparent at first glance that either proportion of loss of proportion of residue may be emplpyed to determine the opposite factor, the following is related in terms of the loss ratio. The percentage of loss by sex is 23.66% males and 20.34% females - or about 15% lower. In terms of age, as it was in the previously set forth case of residue population of influx population, losses due to death increase with advancing age, reaching 80% over the age of 90. Needless to say, the death rate is also conspicuously high in the youngest age group. Although it was not made very clear when examining the ratio of residue of influx population, it is clear that the proportion of loss of the 20-24 age group is remarkably high compared to older and younger age groups. For example, lossof both males and females of the 20-24 age bracket numbers about twice that of the 35-39 year group. Only at the 70 year level does the same ratio of marked diminution appear. This is the justification, as previously stated, for recognizing that loss is not only derived from efflux but that a part of its source arises from health factors. Particularly interesting is the fact that it is high in the case of males for the sole reason that males are compelled to move about frequently because of their occupations.

7. Contrasts of Total Efflux Population and Total Population Loss.

Calculations of new ratios and classification according to age with regard to aggregate influx population of the five-year period after 1930 and aggregate population loss due to death or efflux during that period is shown by column (e) of Table 10. According to Table 10, above the age of 25, for each unit of influx, there is a numerical value of 1+ units of loss, thus bringing to light a remarkable excess of loss over influx. This gradually increases in direct proportion to advancement of age, until, in the case of males, reaching the age of 60, it becomes even more marked - with loss amounting to more than double the influx. Finally, above the age of 90, there is a difference of 7.4 units of loss to each unit of influx.

The tendency persists remarkably in the case of females with losses more than doubling the influx after reaching the age of 75; and above the age of 90, they amount to about five times the influx. This fact is self-explanatory. In other words, the greater part of losses is due to deaths; influx is slight as a natural result of the small amount of influx in higher age levels.

Losses of both males and females in the various levels between 10 and 24 years of age are low compared to influx. For example, in the 10-19 year male group, there are 0.5 units of loss per unit of influx - or a ratio of 2 to 1. Also, in the case of female population, a comparison of the same age level indicates 0.6 units of loss per unit of influx, or a ratio of 1.6 to 1. This diminishes in the 20-24 age group, with a ratio of 0.94 units of loss per unit of gain among males and 0.85 units of loss per unit of gain among females.

As in the foregoing, there is no equilibrium between total loss and total influx; and while there is an excess of loss in the higher age group, the excess of influx in the lower age levels is quite sufficient to indicate a flourishing state of population absorptivity in Tokyo. Thus the 3,230,000 males and females in the productive age level in 1930 have increased by 520,000 to 3,740,000.

In other words, 60% of the 880,000 population increase in that period is increase in the productive age level. (See Table 10, Appendix B and Diagram 10, Appendix A). However, the 66.7 percentage of males and 62.5 percentage of females in the productive age level in the total population of 1930 have dropped to 65.4% males and 62.4% females in 1935. Thus, while the women have been holding their own, the male percentage loss has dropped slightly. This is thought to be due to the fact that in spite of vast influx of population in the youth age group, there is a comparatively large excess of loss.

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VII. CONCLUSIONS.

When we combine the results of the above analysis, the following facts are brought conspicuously to light. First, the population which has been introduced into the population renewal process greatly exceeds what we had come to think in the past. In other words, we had viewed the population increase of the five year period as only about 900,000, but it has been made clear that actually during that period a population of several million was involved in the movement; and the actual increase is to be computed by subtracting the above figure from the 4,790,000 original population, giving 3,870,000, to which the new population of 1,980,000 should be added. (T.N. The resultant figure gives the net population increase when subtracted from the original population.)

Second, for the purposes of our study of population renewal we did not limit ourselves to the ambiguous one-way flow of urban concentration, as has been done in the past, but we have also arrived at figures for the large annual efflux population to compare with the extensive annual influx. This is regarding the numerical differences in quantity by their appropriateness for study; however, there can be no doubt that the influx and efflux during the five-year period are at least 2,000,000 each. Thus, the flow of population renewal does not grope along the single road toward concentration, but presents a phenomenon of intense movement in and out, with Tokyo as its core. Of course, since those from this movement who settled to the bottom of the melting-pot which is Tokyo society were, as stated above, more than 900,000 during the five-year period, the number of those moving their residence away from the capital was less than that of those moving to the capital; however, this can not change the fact that the dispersive flow is still extensive.

Third, an extremely large level of the city society is in a state of violent flux. We are inclined to think in such vague terms as whether the Tokyo populace is all composed of one standard element, or at least not suspect that such an intense renewal is going on as we have seen above. However, not only has five years time seen a lossof 1,100,000 of the original population and a replacement by newly-arrived population of 1,320,000, but also, according to the figures above, there was no time for some 1,400,000 to take deep root in Tokyo society -- just like merchandise in a bonded warehouse -- and when

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we consider the extent of the turnover in so short a time, we cannot help being surprised that such a great segment of the city society is constantly fluctuating. Consequently, the length of urban residence of the provincial-born population is quite often short, 43% residing in the city for less than five years, 19% more than five but less than ten years, 15% more than ten but less than fifteen years, 8% more than fifteen but less than twenty years, and thus only 15% staying more than twenty years.*1 This fluctuating phenomenon is like a thing in constant regurgitation. It is a movement resembling breathing.

The fourth point to be noted is the quality of the renewal population. The fact that the influx population is concentrated in the most heavily reproductive class is as was generally expected, but the fact that the loss population (for the most part efflux) shows the same characteristic as the influx population, strikes one as strange. If we suppose that the city sucks in the vigorous young population, exhusts its labor potentialities, then throws it out of the city life disabled, there should always be a selection of the old and decrepit so that the efflux population should be a comparatively high age level; but the facts are just the opposite. Of course, there is a selection of the old and decrepit, too, but we think the characteristic of the loss population signifies rather the opposite. As further research of an extensive and exhaustive nature must be awaited, we can not cope with this point here. However, it might be helpful to present these few explanations:

(1) Tokyo is the number one educational city in the country. Its limits embrace 22 universities and 72 technical colleges, 2 higher normal schools, 4 KŌTŌ-GAKKŌ (higher schools), 276 CHŪ-GAKKŌ (middle schools), women's schools and vocational schools, in addition to 308 miscellaneous schools. The number of pupils in these schools is over 320,000, 20% of the total number of students in the country, while the number of schools in Tokyo is 14% that of the country as a whole. (See Table 11, Appendix B).

Everyone will surely agree that Tokyo is unparalleled both for variety of educational facilities and for the correlative convenience of study. It is easy to see that the influx of people to make use of such educational

*1 Supplemental Census Investigation, page 842.

facilities is never small, and that at the same time how great is the number of those leaving for all parts of the country after receiving their education in Tokyo.

(2) Not only the educational institutions mentioned in the previous item but all types of public offices, banking companies, factories, shops, etc., as well are contributing vocational education. In other words, although persons who have completed this training are assigned to country billets and branches, there are undoubtedly some, who attracted by the prestige of Tokyo and of the large Tokyo managerial associations, and progressive management, come from the country to gain polish and acquire professional knowledge and techniques. Moreover, Tokyo, even more than Osaka, is the focal point of productive Japan, and it is the base where industrial warriors go forth and return. Tokyo is, in various senses, a sort of Mecca and Medina for our people. May this fact not be a cogent cause which has given rise to a zig-zag flow in population renewal.

(3) The above has been indicated as a compelling cause for the characteristic concentration of the population lossin the lower age groups and the zig-zag characteristic of the population turnover, but the following is one interpretation of the size and characteristics of the population turnover. That is, the "non-resident townspeople". The expression, "non-resident townspeople" is hardly adequate, but we use it to signify those people who, while making a living in Tokyo and possessing some urban privileges, escape the burden of city taxes because their legal residences are elsewhere. These so-called "non-resident townspeople" are in direct contrast to the rural exodus and may instead be referred to as the urban exodus. This phenomenon inevitably developed mainly as a concomitant of the deterioration of city life environiment and furthered by the speed-up in transportation facilities from the city. It is incontestable that as Tokyo develops as an industrial city, to that extent its qualifications as a place for people to reside are diminished. While its population figure is claimed to be the second highest in the world, there are not enough facilities to arrest or correct the accelerated rise of unduly constricted and unwholesome living environiment which develops as a result of the above; and an increase in the urban exodus is natural. This phenomenon has been fairly perceptible since the earthquake disaster. The development of suburban towns quickened as a result and city

areas as well were extended. The tendency to escape from urban environment gradually became marked in proportion to the increase in population. Transportation facilities also have kept pace. Government lines, such as the Chuō Line, Yokosuka Line, Atami Line, Omiya, Chiba Line, etc., were speeded up. The acceleration of these transportation facilities in turn acted as an inducement, and it is an indisputable fact that it finally caused an increase in "nonresident townspeople" recently in Tokyo. Furthermore, the flight of townspeople to the distant suburbs may well be regarded as one cause of the high rate of efflux in the population renewal as well as the characteristic concentration of productive age groups in the efflux population.

The above has simply been an indication of relatively cogent factors in the special position and situation of Tokyo. It would be possible to list more general social, economic, and psychological causes but that is not necessary. The following are reflections on how the population phenomenon of Tokyo is affected by population renewal.

Since a population renewal is simply a regeneration of the population, it is natural that it should have the effect of altering the internal composition of the population. This being the case, what direction does this take in Tokyo. As we have seen, the rural element is predominant in the population renewal, and the repetition of the process of renewal simply amounts to an accumulation of the ordinary legal rights of Tokyoites by the rural people. The so-called "True Tokyoite" class gradually falls off both in blood and ideology and thins out more and more. Another effect of the population renewal on population phenomena appears in reproduction. As is readily apparent from Diagram 7 the composition of the population born in Tokyo reveals a surprising concentration of young people, and off-hand, this would seem to indicate vigor of the Tokyo-born population and increasing productive power. However, it has already been demonstrated that actually this is contributed by the rural population. In other words, assuming there were no population renewal, the present Tokyo birth rate could not be maintained and it may be asserted that it is maintained by the influx from the country. Thus it is possible to prevent a fall in the birth rate as long as the population continues.

The effect of this renewal on the death rate is extremely noticeable.

The increase in population due to the aforesaid nature of the population is largely based on the increase in the low age group class. In general, the death rate is lower in the low age groups than in the other classes. In the past as well, a steep decline in the death rate was caused as the city rapidly expanded. Superficially this impresses one as being entirely due to the improvement of sanitary conditions. Of course, there probably was a progressive improvement of sanitary conditions, but one must not overlook the automatic effect of reducing the death rate that was brought about by the increase of the low age groups. As long as population renewals continue in the future as in the past, it would seem that this fall in the death rate will be maintained. Table 12 (Appendix B) is an attempt to show the actual data relative to the above.

In the large cities of Europe and America the birth rate continues to fall year after year and has reached a point at which there is no more room to decrease. It is customary for the natural increase to fall off gradually. However, the metropolis of Tokyo, as stated, has shown almost no decline in the birth rate, and since the death rate has fallen markedly, the rate of natural increase has risen surprisingly, as compared to former years. If this active population renewal is continued in the future, a successive diminution of the natural increase such as is seen in the cities of America and Europe is out of the question in Tokyo.

The above summarizes a few of the factors which affect the phenomenon of population renewal, but since changes of the composition of the population cannot fail to have an effect upon social and cultural relationships, we cannot ignore them. In conclusion, we shall try to make a few observations from the sociological point of view. Frequent movements of population, besides establishing a large number of areas of social contact, also curtail the time of such contact, and thus perforce give rise to a tendency toward laxity due to which social-relationships cannot be intimate. This fact, creating an urban society in which different characteristics are fused, finally causes integration and restraint to be dulled, and, nourishing the rise of new methods and a spirit of escape from the fetters of tradition, produces the advantage of training in close competion. However, it also brings about contempt for rules, and gives rise to the practice of the principle of the

survival of the fittest, and vitiating the qualities of social sacrifice and cooperation, advances individualism and social advantage. Furthermore, when the instability of an urban populace becomes marked, it moves, both within the city and outside, in the direction of the decrease of affection for a particular place. Thus, in the end it also brings about the malady of homelessness (Heimatslosigkeit).

It also brings about a lack of affection toward the city, invites the deterioration of public morals and lays the foundation for brewing of social unrest. However, on the other hand the fact that ceaseless circulation and interchange between city and country is embodied in population renewal makes the content of the culture rich, and gives it polish. Through the interchange of population, the people of the provinces, who are the possessors of the kindly spirit of tradition, are poured into the variegated culture of the city when they flow into the capital in large numbers, and the constituents of the culture are manifestly enriched by their simplicity and qualities of endurance. The culture of the provinces of the country is here fused into a harmonious whole. In addition, the myriad people of the city, who have received the baptism of a brilliant culture in the capital, gradually make the culture of the provinces homogeneous and raise it to a common level when they return to the provinces. Thus, the renewal of population, more directly than news and the cinema, is the medium of cultural flow between the capital and the provinces, broadens the sphere of homogeneous culture, and fosters the leveling of the culture.

Population renewal has, in addition to the above, profoundly affected production, economy, and finance. Putting a discussion of these off till another day, I lay down my pen for this time.

(14 February 1939)

- The End -

APPENDIX A

Diagrams:

Diagram No.1 POPULATION RENEWAL

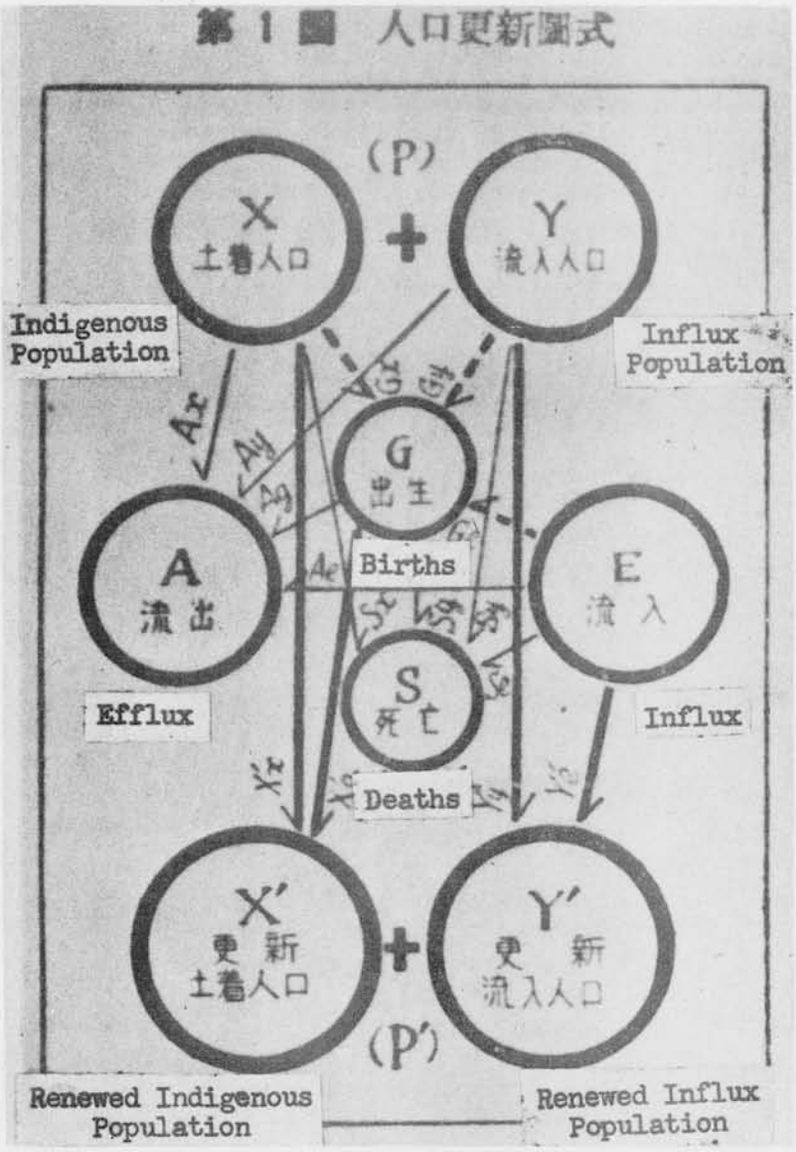
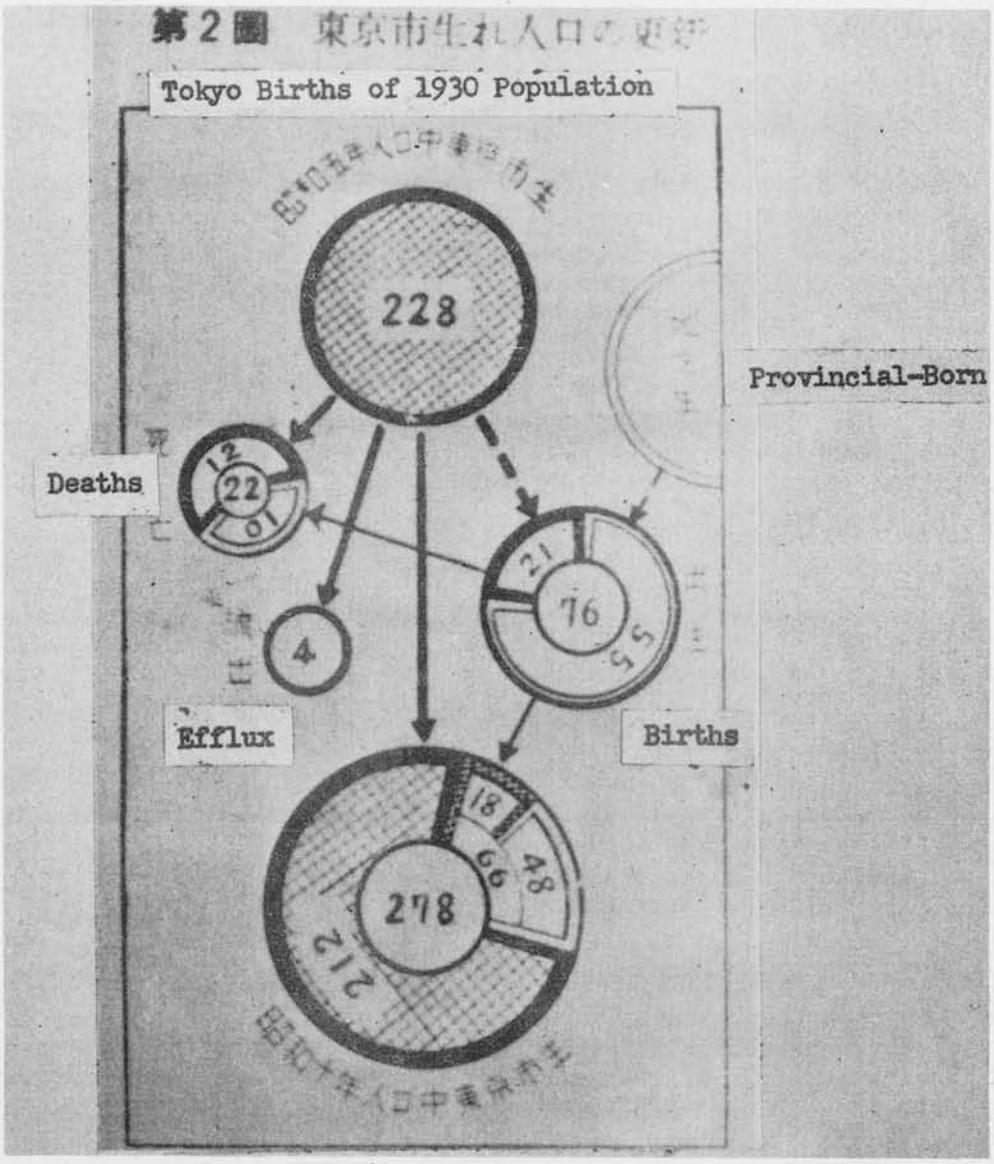


Diagram No.2 TOKYO-BORN POPULATION RENEWAL



Tokyo Births of 1935 Population

Diagram No.3 PROVINCIAL-BORN POPULATION RENEWAL

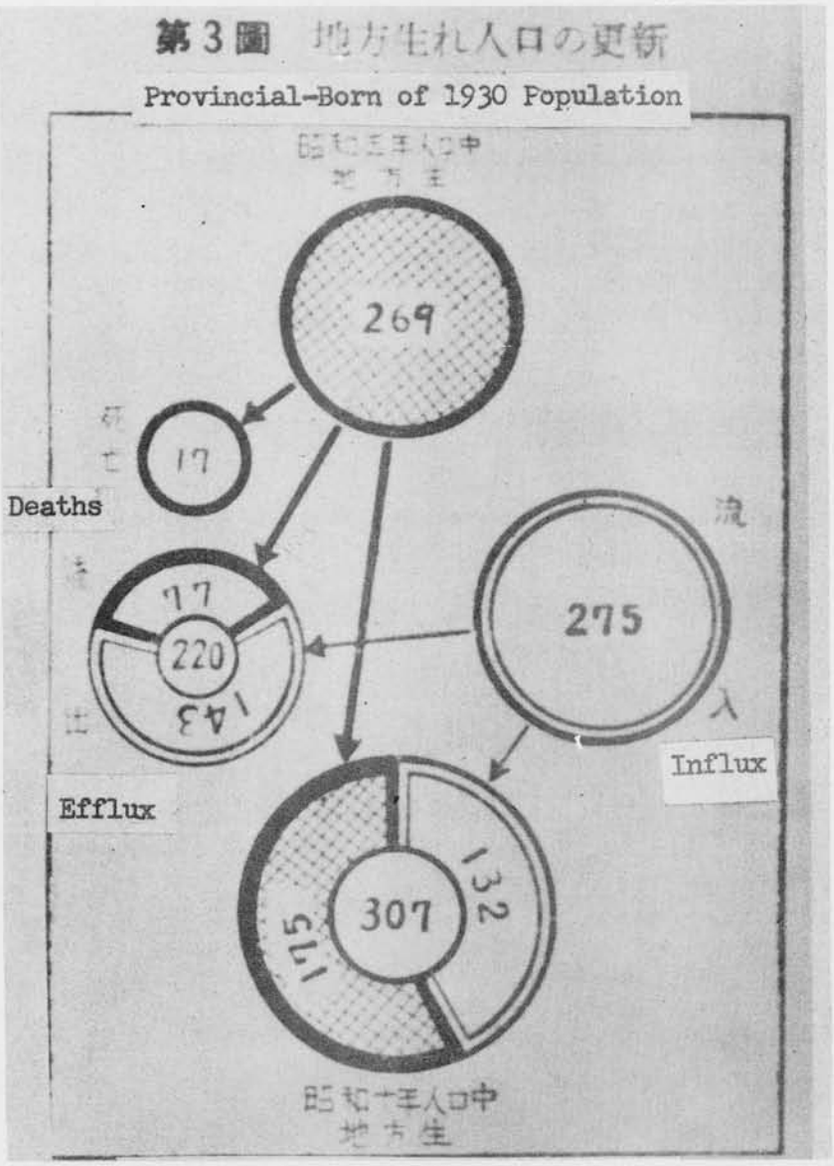
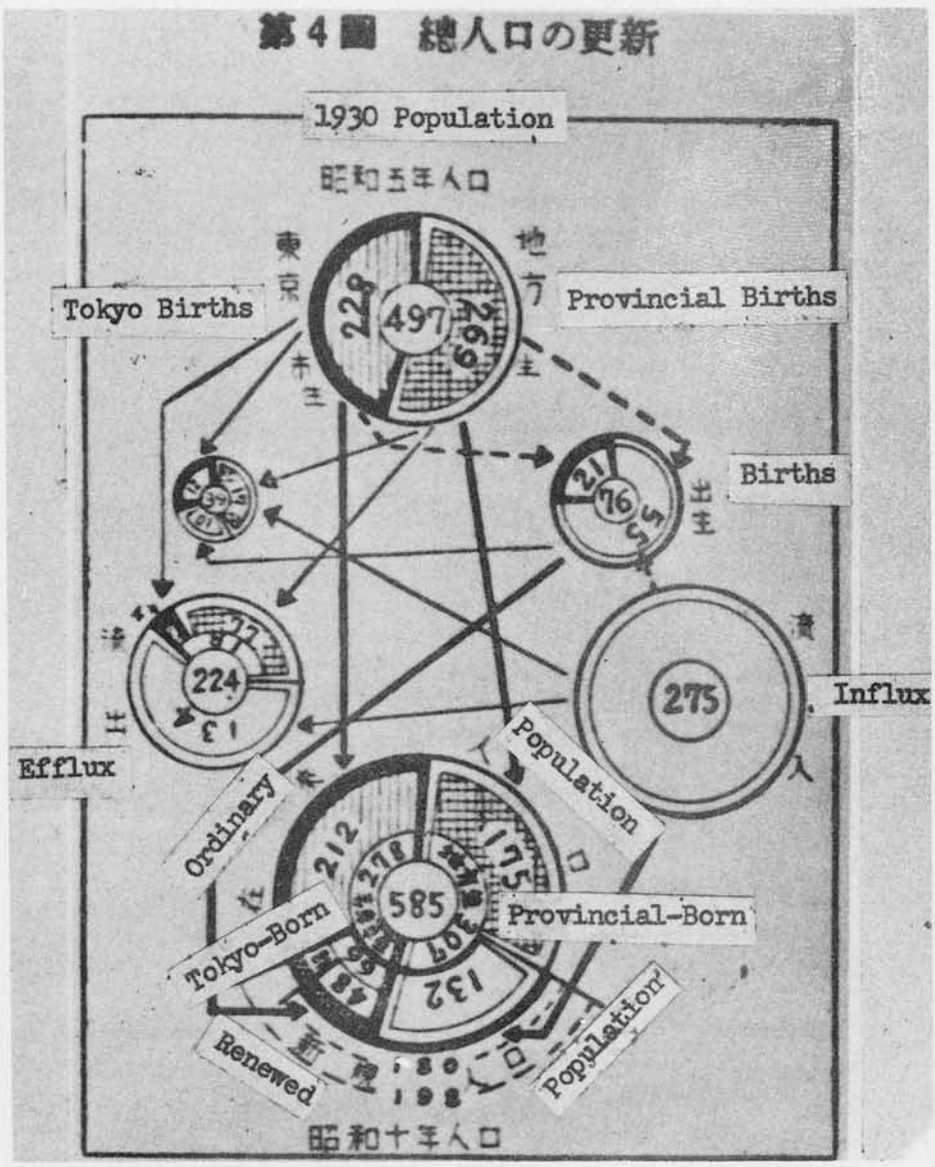
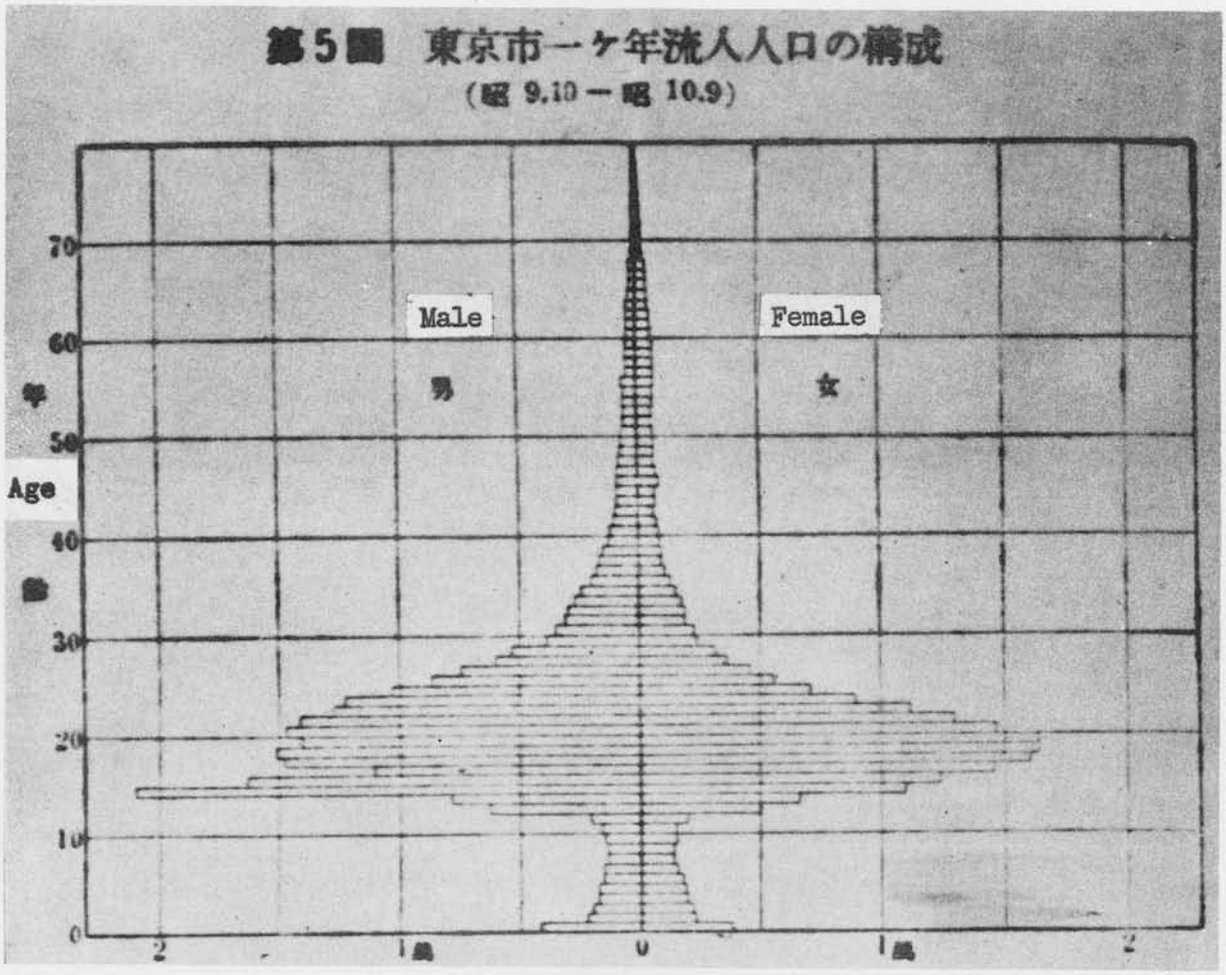


Diagram No.4 TOTAL POPULATION RENEWAL



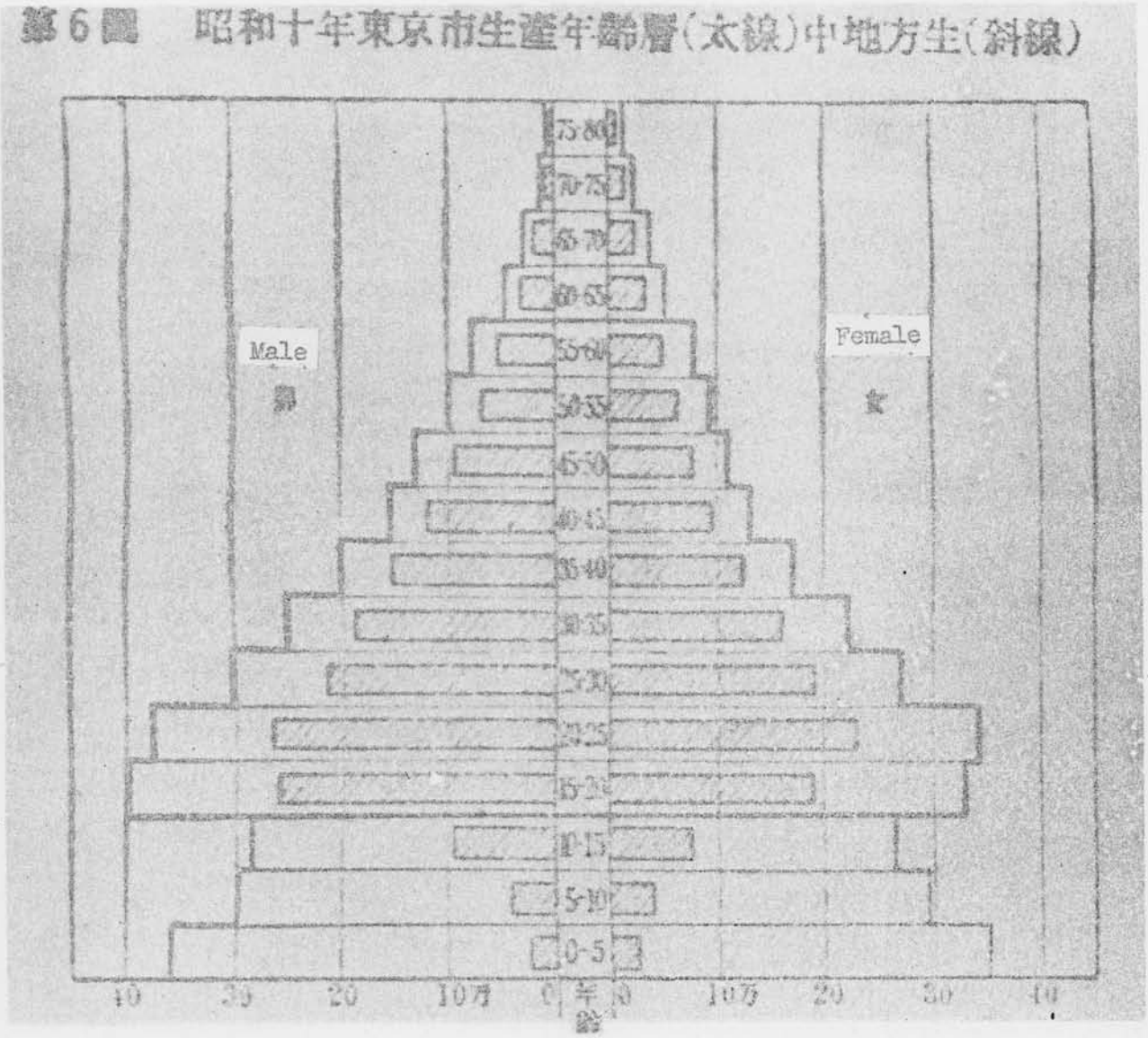
1935 Population

Diagram No.5 COMPOSITION OF TOKYO INFLUX POPULATION FOR A SINGLE YEAR
(October 1934 - September 1935)



Expressed in Units of 10,000

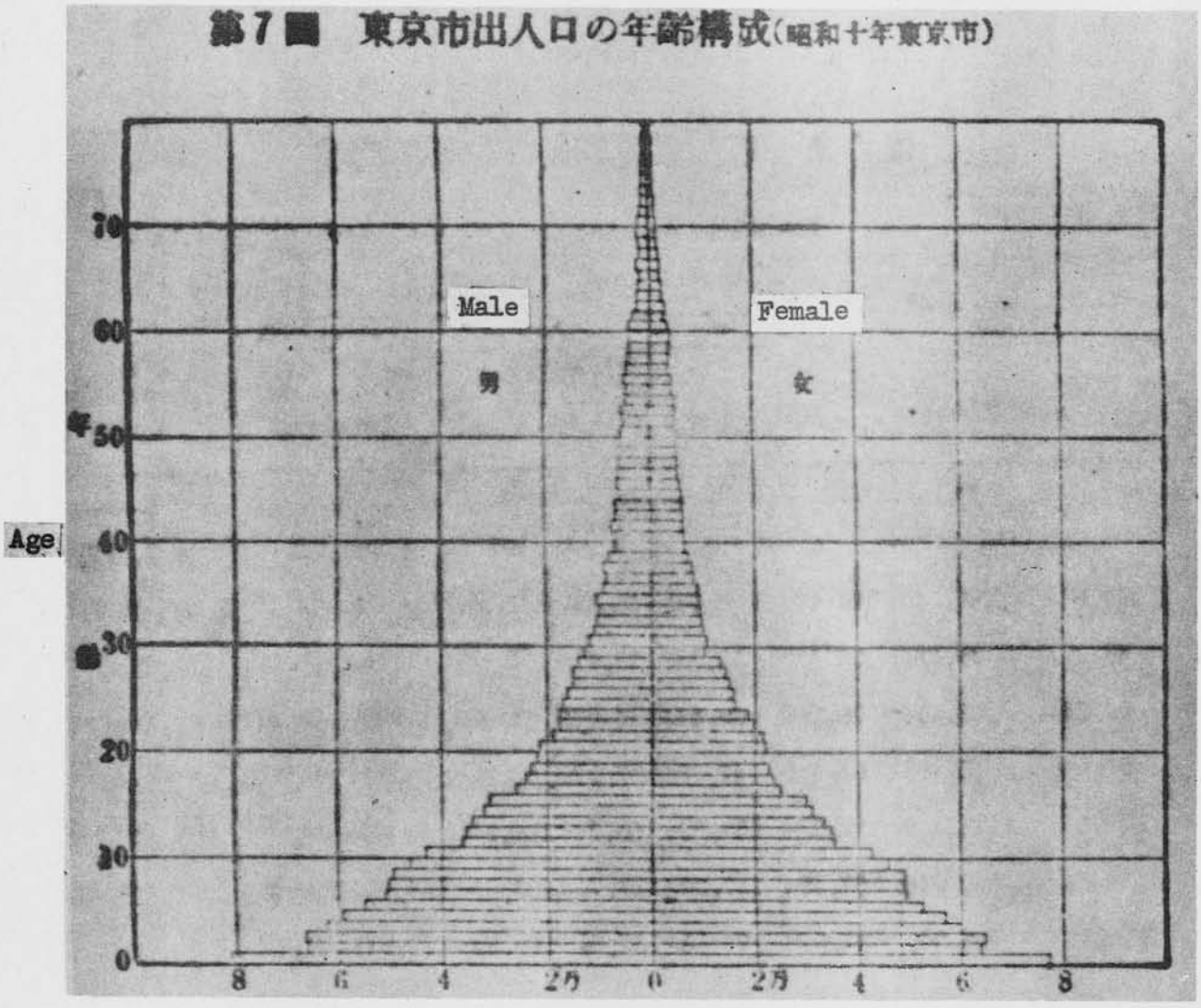
Diagram No. 6 PROVINCIAL-BORN (SLANTING LINES) OF 1935 TOKYO PRODUCTIVE AGE GROUP (HEAVY LINES)



Age

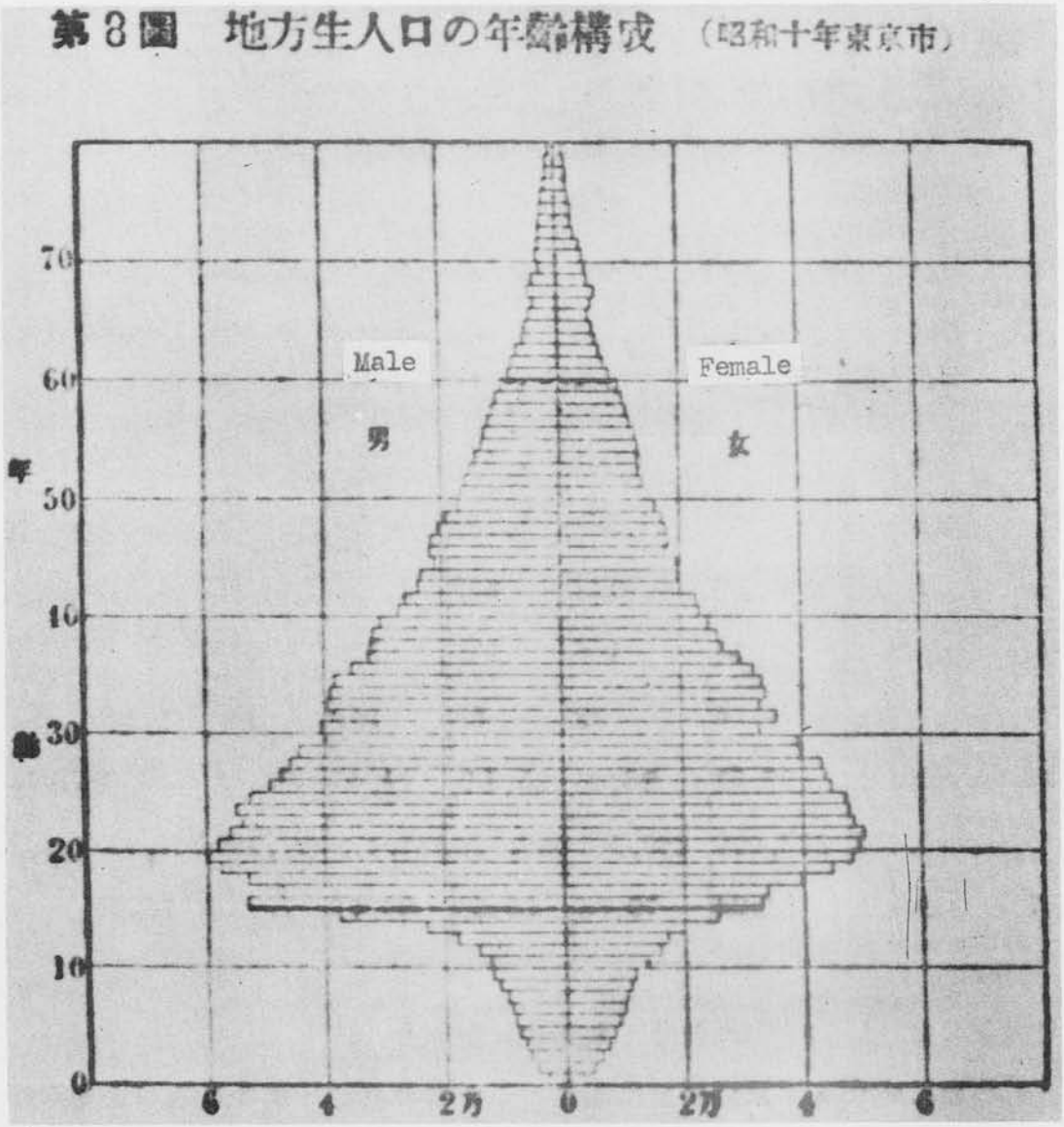
Expressed in Units of 10,000

Diagram No.7 AGE COMPOSITION OF TOKYO-BORN POPULATION (TOKYO-SHI,1935)



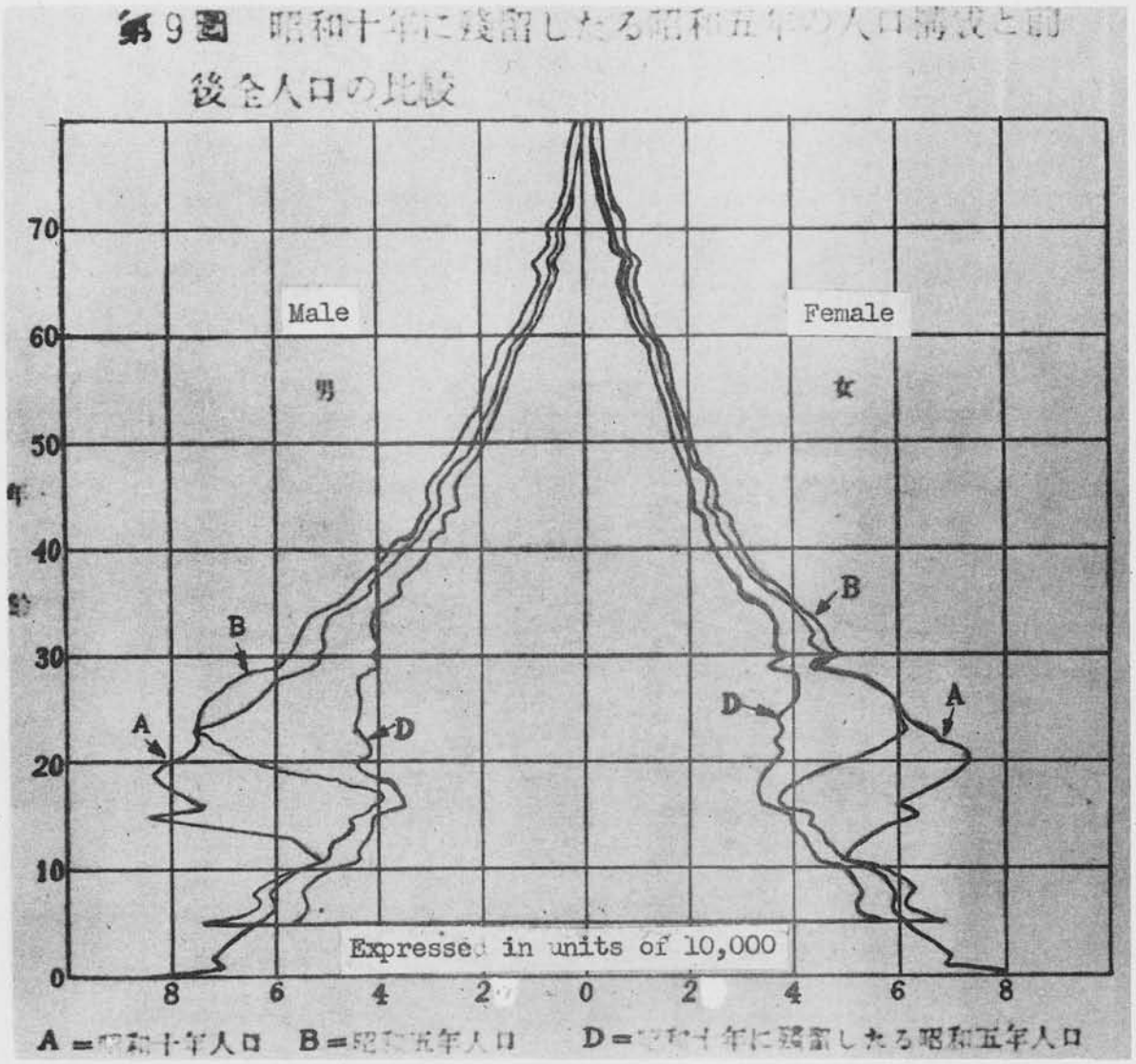
Expressed in Units of 10,000

Diagram No.8 AGE COMPOSITION OF PROVINCIAL-BORN POPULATION (TOKYO-SHI,1935)



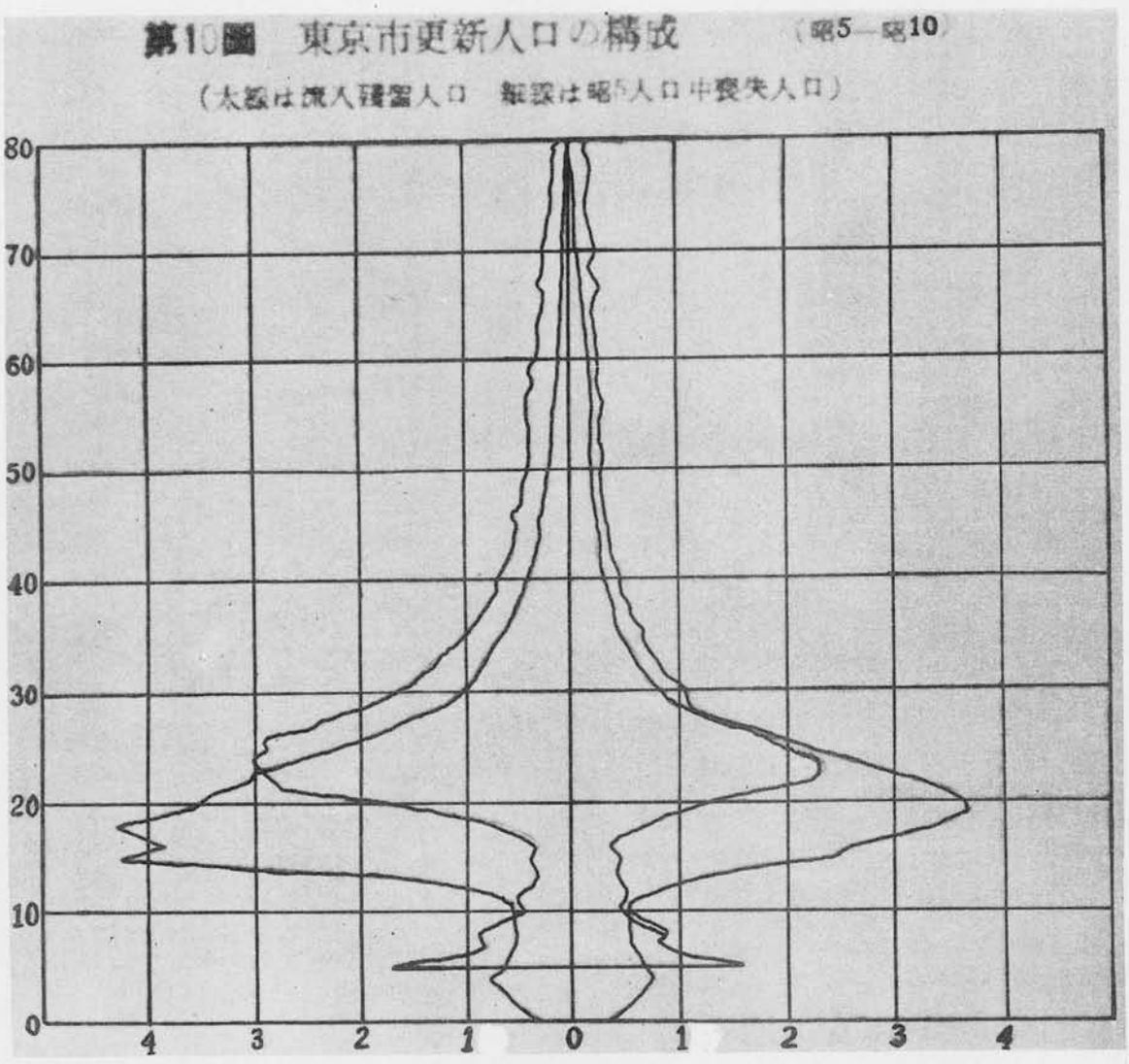
Expressed in Units of 10,000

Diagram No.9 COMPOSITION OF THE RESIDUE OF 1930 POPULATION IN 1935 AND A COMPARISON OF TOTAL POPULATION BEFORE AND AFTER



A= 1935 Population B= 1930 Population D= 1935 Residue of 1930 Population

Diagram No.10 COMPOSITION OF RENEWED TOKYO POPULATION (1930-1935)
(Heavy lines indicate residual influx population.
Fine lines indicate population loss of 1930 population.)



Expressed in Units of 10,000

APPENDIX B

Tables

TABLE I

Computation of Births in Tokyo-Shi, 1930-1935

AGE (Year of Birth)	A Number Taken from 1935 Census	B 1935 Death Rate (Tokyo-Shi Survey)	C Survivorship Rate through 1935	D=A÷C Computed Number of Births	E Number of Births According to Statistics Bureau Survey
0 (1935)	158,252	0.085698	0.914802	173,085	159,927
1 (1934)	130,520	0.035677	0.878625	148,550	139,468
2 (1933)	131,965	0.018549	0.860076	153,434	148,964
3 (1932)	124,121	0.014338	0.845738	146,761	?
4 (1931)	118,098	0.011026	0.834712	141,484	?
TOTAL	662,956			763,314	

TABLE II

Deaths in Tokyo-Shi, 1931-1935

Year	Tokyo-Shi Survey	Statistics Bureau Survey
1931	76,111	?
1932	71,096	?
1933	82,349	78,225
1934	79,826	75,967
1935	78,074	74,464
TOTAL	387,456	

TABLE III

Mortality Rate of Infants Born 1930-1935
(Basic figures taken from Tokyo-Shi Survey)

Age	1933	1934	1935	1936	1937	Five Year Average	Cumulative Total
0	15,829	14,515	14,034	13,562	13,821	14,352	14,352 (Deaths of Infants Born in 1935)
1	5,711	4,801	4,951	4,030	4,760	4,851	19,203 (Deaths of Infants Born in 1934)
2	2,776	2,454	2,646	2,115	2,583	2,515	21,718 (Deaths of Infants Born in 1933)
3	2,048	1,839	1,958	1,876	1,916	1,927	23,645 (Deaths of Infants Born in 1932)
4	1,509	1,264	1,456	1,290	1,526	1,409	25,054 (Deaths of Infants Born in 1931)
TOTAL							103,972

TABLE IV

COMPUTATION OF RENEWAL OF TOKYO POPULATION, 1930-1935

A. Computation of Inflow and Outflow

a) Computation of inflow

Source	Amount of inflow	Remarks
Births	760,000 (21.6%)	Births from Tokyo-born --210,000 (27.7%) Births from provincial-born -- 550,000 (72.3%)
Influx	2,750,000 (78.4%)	Influx per year ---------- 550,000
Total	3,510,000 (100.0%)	Average per year ---------- 702,000

b) Computation of outflow

Source	Amount of outflow	Remarks
Deaths	390,000 (14.8%)	Deaths of Tokyo-born -- 120,000 (30.7%) Deaths of provincial-born -- 170,000 (43.5%) Infant mortality ------ 100,000 (25.8%) (1930-1935)
Efflux	2,240,000 (85.2%)	Efflux of 1930 population - 810,000 (36.1%) Tokyo-born, 4; Provincial-born, 4) Efflux of influx-population -- 1,430,000 (1930-1935) (63.9%)
Total	2,630,000 (100.0%)	Average per year ---------- 526,000

c) Computation of balance

	Inflow	Outflow	Excess at inflow	Average per year
Natural Variation	760,000	390,000	370,000	74,000
Social Variation	2,750,000	2,240,000	510,000	102,000
Total	3,510,000	2,630,000	880,000	176,000

B. Computation of Gain and Loss.

a) Computation of loss (Based on 1930)

	1930	1935	Loss	Reasons for Loss	
				Death	Efflux
Tokyo-born	2,280,000 (100.0%)	2,120,000 (93.0%)	160,000 (7.0%)	120,000 (41%)	40,000 (5%)
Provincial-born	2,690,000 (100.0%)	1,750,000 (65.0%)	940,000 (35.0%)	170,000 (59%)	770,000 (95%)
Total	4,970,000 (100.0%)	3,870,000 (77.9%)	1,100,000 (22.1%)	290,000 (100.0%)	810,000 (100.0%)

b) Computation of gain (Based on 1935)

	1930	1935	Gain	Source of Gain	
				Residents of Tokyo	Provincials
Tokyo-born	2,120,000 (54.7%)	2,780,000 (47.5%)	660,000 (100.0%)	180,000 (27.2%)	480,000 (72.8%)
Provincial-born	1,750,000 (45.3%)	3,070,000 (52.5%)	1,320,000 (100.0%)	0 (0.0%)	1,320,000 (100.0%)
Total	3,870,000 (100%)	5,850,000 (100%)	1,980,000 (100.0%)	180,000 (9.1%)	1,800,000 (90.9%)

c) Gain differential table

	1930	1935	Gain Differential	Percentage of Gain Over 1930
Tokyo-born	2,280,000 (47.5%)	2,780,000 (47.5%)	500,000 (56.8%)	21.9%
Provincial-born	2,690,000 (52.5%)	3,070,000 (52.5%)	380,000 (43.2%)	14.1%
Total	4,970,000 (100.0%)	5,850,000 (100.0%)	880,000 (100.0%)	17.7%

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d) Net gain table

	Gain	Loss	Net Gain	Percentage of Net Gain over 1930
Tokyo-born	180,000 (9.1%)	160,000 (14.5%)	20,000 (22.3%)	0.9%
Provincial-born	1,800,000 (90.9%)	940,000 (85.5%)	860,000 (97.7%)	31.9%
Total	1,980,000 (100.0%)	1,100,000 (100.0%)	880,000 (100.0%)	17.7%

C. Total Settlement.

	Total Loss	Total Gain	All-Over Change	Repeated Figures	True Change
Tokyo-born	260,000 (9.8%)	760,000 (21.6%)	1,020,000 (16.6%)	100,000	920,000 (19.9%)
Provincial-born	2,370,000 (90.2%)	2,750,000 (78.4%)	5,120,000 (83.4%)	1,430,000	3,690,000 (80.1%)
Total	2,630,000 (100.0%)	3,510,000 (100.0%)	6,140,000 (100.0%)	1,530,000	4,610,000 (100.0%)
Yearly Average	530,000	700,000	1,230,000	---	920,000

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TABLE V

Population Entering and Remaining During the Year October 1934 - September 1935

Age	Total	Male	Female
Totals	500,954	267,144	233,810
0 -	24,241	12,053	12,188
5 -	15,146	7,465	7,681
10 -	65,828	39,664	26,164
15 -	147,457	71,339	76,118
20 -	119,293	64,121	55,172
25 -	50,983	31,393	19,590
30 -	24,235	14,633	9,602
35 -	13,936	8,416	5,520
40 -	9,356	5,316	4,040
45 -	7,948	4,131	3,817
50 -	6,253	2,777	3,476
55 -	5,919	2,322	3,597
60 -	4,307	1,495	2,812
65 -	3,081	982	2,099
70 -	1,734	639	1,095
75 -	786	265	521
80 -	333	103	230
85 -	76	27	49
90 -	42	3	39
15-30	317,733	166,853	150,880
15-60	385,380	204,448	180,933
	Percent of Total		
15-30	63.43	62.46	64.53
15-60	76.93	76.53	77.39
Average Age	21.7	21.50	21.94

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TABLE VI

Position of Influx Population in Tokyo Productive Age Population in 1935

Age	1930 Population						Percentages of Each Sex in the Total Number			
	Total Number		Tokyo-born		Provincial born		Tokyo-born		Provincial born	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	5,848,917		2,775,130		3,073,787		47.45		52.55	
Total	3,051,237	2,797,680	1,397,876	1,377,254	1,653,361	1,420,426	45.81	49.23	54.19	50.77
0-4	362,240	351,239	337,550	327,241	24,690	23,998	93.18	93.17	6.82	6.83
5-9	303,352	296,260	260,687	254,564	42,665	41,696	85.94	85.93	14.06	14.07
10-14	286,032	265,462	191,754	187,966	94,278	77,496	67.04	70.81	32.96	29.19
15-19	398,595	328,300	140,164	136,574	258,431	191,726	35.16	41.60	64.84	58.40
20-24	375,490	342,328	109,577	111,923	265,913	230,405	29.18	32.69	70.82	67.31
25-29	302,618	271,983	84,866	79,469	217,752	192,514	28.04	29.22	71.96	70.78
30-34	251,979	219,484	62,713	57,678	189,266	161,806	24,89	26.28	75.11	73.72
35-39	202,518	169,816	49,286	45,034	153,232	124,782	24.34	26.52	75.66	73.48
40-44	156,851	130,458	39,453	36,331	117,398	94,127	25.15	27.85	74.85	72.15
45-49	130,151	112,229	34,330	33,372	95,821	78,857	26.38	29.74	73.62	70.26
50-54	99,464	93,546	28,465	29,992	70,999	63,554	28.62	32.06	71.38	67.94
55-59	77,538	78,801	24,525	27,219	53,013	51,582	31,68	34.54	68.37	65.46
60-64	48,268	53,831	14,961	18,185	33,307	35,646	31.00	33.78	69.00	66.22
65-69	29,620	39,182	9,668	14,112	19,952	25,070	32.64	36.02	67.36	63.98
70-74	16,123	23,951	5,803	9,336	10,320	14,615	35.99	38.98	64.01	61.02
75-79	7,263	13,078	2,802	5,264	4,461	7,814	38.58	40.25	61.42	50.75
80-84	2,545	5,815	1,035	2,261	1,510	3,554	40.67	38.88	59.33	61.12
85-89	522	1,588	211	607	311	981	40.42	38.22	59.58	61.78
over 90	68	329	26	126	42	203	38.24	38.30	61.76	61.70
	3,742,149		1,130,971		2,611,278					
15-59	1,995,204	1,746,945	573,379	557,592	1,421,825	1,189,353	28.74	31.92	71.26	68.08
Percentage of total 15-59	65.39	62.44	41.02	40.49	86.00	83.73				

TABLE VII

Age Composition of Renewed Tokyo Population
E = Y'e + (Ae + Se) A + S = (Ae + Se) + (A x + Sx)

Age	(1) E Total Influx Population 1930-1935		(2) Ye Residue of 1930-1935 Influx Population		(3) Ae + Se Loss of 1930-1935 Influx Population		(4) Ax + Sx Loss of 1930 Population From 1930-1935		(5) A + S Total Loss of Population 1930-1935	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total	2,750,000		1,318,898		1,431,102		1,098,768		2,529,870	
--	1,464,843	1,285,157	706,109	612,789	758,734	672,368	623,455	475,313	1,382,189	1,147,681
0-4	45,207	44,783	28,189	27,342	17,018	17,441	---	---	7,018	17,441
5-9	45,881	48,077	29,860	29,444	16,021	18,633	51,279	50,447	67,300	69,080
10-14	95,659	76,097	63,429	47,884	32,230	28,213	21,616	23,130	53,846	51,343
15-19	372,552	323,199	206,004	154,596	166,548	168,603	29,365	30,277	195,913	198,880
20-24	379,147	380,416	157,394	157,228	221,753	223,188	134,403	100,408	356,156	323,596
25-29	244,607	175,940	87,549	76,086	157,058	99,854	124,588	77,709	281,646	177,563
30-34	107,360	67,491	46,753	34,126	60,607	33,365	71,220	45,329	131,827	78,694
35-39	58,818	38,596	27,620	20,454	31,198	18,142	43,090	29,049	74,288	47,191
40-44	35,218	24,872	17,718	14,175	17,500	10,697	30,418	21,018	47,918	31,715
45-49	24,814	21,242	13,443	11,863	11,371	9,379	24,645	15,735	36,016	25,114
50-54	17,904	19,495	9,652	10,716	8,252	8,779	20,527	14,196	28,739	22,975
55-59	13,735	19,535	7,487	10,063	6,248	9,472	19,494	13,765	25,742	23,237
60-64	9,877	17,595	4,904	7,647	4,973	9,948	15,866	12,192	20,839	22,140
65-69	6,542	13,059	3,145	5,627	3,397	7,432	13,343	11,973	16,740	19,405
70-74	4,229	8,123	1,789	3,041	2,440	5,082	10,226	10,124	12,666	15,206
75-79	2,076	3,840	819	1,579	1,257	2,261	7,468	9,126	8,725	11,387
80-84	934	1,936	297	713	637	1,243	4,069	6,445	4,706	7,688
85-89	224	545	51	166	173	379	1,453	3,200	1,626	3,579
over 90	59	296	6	39	53	257	385	1,190	438	1,447
Average Age	22.50	23.95	22.52	23.46	25.12	24.46	30.81	30.89	27.52	27.34
15-59	1,254,155	1,070,786	573,620	489,307	680,535	581,479	497,750	347,486	1,178,285	928,965
Percentage of Total 15-59	85.62	83.32	81.24	79.85	89.69	86.48	79.84	73.11	85.25	80.94

(Note) In this table the 1930 population is shown at 1935 age levels. Since the 100,000 deaths of persons born since 1930 should be included in total population loss, actual figures should be 2,630,000.

TABLE VIII

Age Composition of Renewed Tokyo Population

$P' = Y'e + (X'x + Y'y)$

Age	(1) P' Population 1935		(2) Y'e Residual Transient Population From 1930-1935		(3) X'x + X'y Population in 1930 that remained in 1935	
	Male	Female	Male	Female	Male	Female
	5,848,917		1,318,898		3,872,071	
Total Number	3,051,237	2,797,680	706,109	612,789	2,011,077	1,860,994
0-4	362,240	351,239	28,189	27,342	*(334,051)	(323,897)
5-9	303,352	296,260	29,860	29,444	273,492	266,816
10-14	286,032	265,462	63,429	47,884	222,603	217,578
15-19	393,595	328,300	206,004	154,596	192,591	173,704
20-24	375,490	342,328	157,394	157,228	218,096	185,100
25-29	302,618	271,983	87,549	76,086	215,069	195,897
30-34	251,979	219,484	46,753	34,126	205,226	185,358
35-39	202,518	169,816	27,620	20,454	174,898	149,362
40-44	156,861	130,458	17,718	14,175	139,133	116,283
45-49	130,151	112,229	13,443	11,863	116,708	100,366
50-54	99,464	93,546	9,652	10,716	89,812	82,830
55-59	77,538	78,801	7,487	10,063	70,051	68,938
60-64	48,268	53,831	4,904	7,647	43,364	46,184
65-69	29,620	39,182	3,145	5,627	26,475	33,555
70-74	16,123	23,951	1,789	3,041	14,334	20,910
75-79	7,263	13,078	819	1,579	6,444	11,499
80-84	2,545	5,815	297	713	2,248	5,102
85-89	522	1,588	51	166	471	1,422
90-	68	329	6	39	62	290
15-59	1,995,204	1,746,945	573,620	439,307	1,421,584	1,257,638
Of the total 15-59	65.39%	62.44	81.24	79.85	70.69	67.58
Age in 1930 15-59					1,272,357	1,130,118
Of the total 15-59					63.27	60.73

(Note) * Those between ages of 0 to 5 are excluded from the population in 1930 since they were born after 1930.

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TABLE IX

Age Composition of Renewed Tokyo Population

$P = (X'x + Y'y) + (Ax + Ay + Sx + Sy)$

AGE	(1) P		(2) X'x + X'y		(3) Ax + Ay + Sx + Sy	
	1930 Population		Residue of 1930 Population in 1935		Population Loss of 1930 Population from 1930 to 1935	
	Male	Female	Male	Female	Male	Female
	4,970,839		3,872,071		1,098,768	
Total	2,634,532	2,336,307	*2,011,077	1,860,994	623,455	475,313
0-4	---	---	(334,051)	(323,897)	---	---
5-9	324,771	317,263	273,492	266,816	51,279	50,447
10-14	244,219	240,708	222,603	217,578	21,616	23,130
15-19	221,956	203,981	192,591	173,704	29,365	30,277
20-24	352,499	285,508	218,096	185,100	134,403	100,408
25-29	339,657	273,606	215,096	195,897	124,588	77,769
30-34	276,446	230,687	205,226	185,358	71,220	45,329
35-39	217,988	178,411	174,898	149,362	43,090	29,049
40-44	169,551	137,301	139,133	116,283	30,418	21,018
45-49	141,353	116,101	116,708	100,366	24,645	15,735
50-54	110,339	97,026	89,812	82,830	20,527	14,196
55-59	89,545	82,503	70,051	68,738	19,494	13,765
60-64	59,230	58,376	43,364	46,184	15,866	12,192
65-69	39,818	45,528	26,475	33,555	13,343	11,973
70-74	24,560	31,034	14,334	20,910	10,226	10,124
75-79	13,912	20,625	6,444	11,499	7,468	9,126
80-84	6,317	11,547	2,248	5,102	4,069	6,445
85-89	1,924	4,622	471	1,422	1,453	3,200
90-	447	1,480	62	290	385	1,190
15-59	1,919,334	1,605,124	1,421,584	1,257,638	497,750	347,486
Per 100 of total 15-19	72.85	68.70	70.69	67.58	79.84	73.11
1930 Age 15-19	1,756,608	1,459,519	1,272,357	1,130,118	484,251	329,401
Per 100 of total 15-19	66.68	62.47	63.27	60.73	77.67	69.30

(Note) In this table the 1930 population is shown at 1935 age levels.

* The 0-4 age group excepts from 1930 population births since 1930.

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TABLE X

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Percentages of Population Renewal in Tokyo from 1930 to 1935 According to Sex

AGE	(a) Residue of the Five Year Influx Population per 100 1935 Population		(b) 1935 Residue Population per 100 1930 Population		(c) Population loss per 100 1930 Population by 1935		(d) Residue Population of the Five Year Total Influx Population		(e) Population Loss in Contrast to the Five Year Total Influx Population (1935 Age)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	22.55		77.90		22.10		0.479		a) 0.920	
Total	23.14	21.90	76.34	79.66	23.66	20.34	0.482	0.477	b) 0.944	0.893
0-4	7.78	7.78	--	--	--	--	0.624	0.611	c) 0.376	0.389
5-9	9.84	9.94	84.21	84.10	15.79	15.90	0.651	0.612	1.467	1.437
10-14	22.18	18.04	91.15	90.39	8.85	9.61	0.663	0.629	0.563	0.675
15-19	51.68	47.09	86.77	85.16	13.23	14.84	0.553	0.478	0.526	0.615
20-24	41.92	45.93	61.87	64.83	38.13	35.17	0.415	0.413	0.939	0.851
25-29	28.93	27.98	63.32	71.60	36.68	28.40	0.358	0.432	1.151	1.009
30-34	18.55	15.55	74.24	80.35	25.76	19.65	0.435	0.506	1.228	1.166
35-39	13.64	12.04	80.23	83.72	19.77	16.28	0.470	0.530	1.263	1.223
40-44	11.30	10.87	82.06	84.69	17.94	15.31	0.503	0.570	1.361	1.275
45-49	10.33	10.57	82.56	86.45	17.44	13.55	0.542	0.558	1.451	1.182
50-54	9.70	11.46	81.40	85.37	18.60	14.63	0.539	0.550	1.607	1.179
55-59	9.66	12.77	78.23	83.32	21.77	16.68	0.545	0.515	1.874	1.190
60-64	10.16	14.21	73.21	79.11	26.79	20.89	0.497	0.435	2.110	1.258
65-69	10.62	14.36	66.49	73.70	33.51	26.30	0.481	0.431	2.559	1.486
70-74	11.10	12.70	58.36	67.38	41.64	32.62	0.423	0.374	2.99	1.872
75-79	11.28	12.07	46.32	55.75	53.68	44.25	0.395	0.411	4.203	2.965
80-84	11.67	12.26	35.57	44.18	64.41	55.82	0.318	0.365	5.039	3.930
85-89	9.77	10.45	24.48	30.77	75.52	69.23	0.228	0.305	7.259	6.567
90-	8.82	11.85	13.87	19.59	86.13	80.41	0.102	0.132	7.424	4.889
15-59	28.25	28.01	74.07	78.35	25.93	21.65	0.457	0.457	0.939	0.868

(Note) As explained in the note of Table VII, since there were about 100,000 deaths of persons born after 1930 not recorded in column 5 of the said table, in column (c) of this chart, a) should be 0.956; b) Males 0.978, Females 0.932; c) Males 1.477, Females 1.506.

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TABLE XI

The Position of Tokyo with Respect to Educational Institutions (1935)

	All Japan*[1]		Tokyo*[2]		Tokyo Percentage of Japan Total	
	Schools	Students	Schools	Students	Schools	Students
CHŪ-GAKKŌ (middle schools)	557	340,109	61	37,028	11.0	10.9
Higher women's schools	794	412,126	74	46,926	9.3	11.4
Normal schools	102	29,825	3	1,661	2.9	5.5
Vocational schools	1250	396,968	137	59,537	11.0	15.0
Miscellaneous schools	1912	240,800	308	73,522	16.1	30.5
KŌTŌ-GAKKŌ (higher schools)	32	15,429	4	3,140	12.5	20.4
Technical colleges	177	96,929	72	52,165	40.7	53.8
Higher normal schools	4	2,658	2	1,589	50.0	58.8
Universities	45	71,607	22	46,625	48.9	65.1
Total	4,873	1,606,451	683	322,193	14.1	20.1

(Note) *1 According to Education Ministry Statistics Summary for 1935.
*2 According to Tokyo City Statistics Chart No. 33.

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TABLE XII

The Rise and Fall in the Tokyo-Shi Birth Rate and Death Rate

DATE	BIRTH RATE	DEATH RATE
1907-11	25.69	18.06
1911-15	27.81	19.88
1916-20	26.62	22.19
1921-25	26.43	20.22
1926-30	28.22	16.01
1931	27.12	14.81
1932	26.33	13.38
1933	24.54	14.98
1934	22.05	14.05
1935	24.58	13.29

(Note) Figures after 1926 are for the area of Greater Tokyo.

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