INTRODUCTION

Basic concepts and definitions

The geographic or spatial mobility of a population is a topic of direct interest to the student of human affairs because of its effects upon the distribution of the population and because of its interaction with other demographic forces as well as with other aspects of social and economic change and differentiation.

The movement of population in space is a multifarious phenomenon in which the distance of moves may vary from a few yards to many miles, and in which the duration of stay at destination may vary from a few hours to many years. A considerable part of this movement is incidental to carrying on the activities of daily life—commuting to and from the place of work, shopping, visiting, travel for business or pleasure, to name only a few. These types of mobility are of interest in their own right, and statistics concerning them are useful for many analytical purposes. They are, however, to be distinguished from the type of mobility that involves a sustained or permanent sojourn in the place of destination. It is this latter type of mobility that is envisaged by the concept, *migration*. The essential character of migration is thus that it involves a change in place of abode, or place of "usual" residence—a taking-up of life in a new or different place.

This restriction on the concept of migration eliminates certain other types of spatial mobility that are commonly referred to as "migration" but that, in the interest of scientific precision, should be listed under different categories. These types include nomadism, the movement of population groups that have no fixed place of residence, and the seasonal movements of persons who live in two or more places during the course of a year.

Within the framework of even this restricted concept of migration, there are a number of subsidiary conceptual and procedural problems. Change of residence or residential mobility, like mobility in general, varies along a distance continuum. Highly localized moves—from one apartment to another in the same building, from one house to another in the same neighbourhood or town—are clearly forms of mobility that should not be considered migrations. Indeed, the use of the term "place" in the above definition indicates that such short moves are not so considered. One cannot give this term a wholly precise meaning, but perhaps its intention becomes clearer when the word "locality" is substituted for "place". Locality is itself a somewhat indefinite term, but at least it serves to indicate that migration is conceived as involving a change of *milieu* along with the change of dwelling unit. Since neither change of locality nor change of *milieu* is readily amenable to objective measurement, the more measurable characteristic, distance, is an acceptable substitute. We are thus led to the position that only moves of some reasonable minimum distance should qualify as migrations. If all moves could be classified by distance moved, the minimum could be varied as circumstances dictated, or—and this would be preferable—the distance distribution could be studied in relation to other relevant variables such as origin, destination, duration of stay etc. In practice, the data on residential mobility are seldom recorded in terms of, or directly convertible to, distances spanned. The analyst is forced to deal with approximations thereto; these are at best only rough estimates for broad and overlapping categories of distance.

With exact information on points of origin and points of destination, the tabulation of moves by distance covered would be obtainable. But even under the most favourable conditions, such as those offered by a continuous population register, it is a difficult and laborious process to produce this kind of detail. Under conventional statistical conditions that customarily prevail—the census or the survey—results are necessarily tabulated for the administrative or political units into which the country is divided, and origins and destinations are not specified below this level. A migration is then operationally defined as a change of residence from one civil division to another, and the volume of migration is to a considerable degree a function of the size of areas chosen for compilation. Thus, if the class of areal units chosen is the minor civil division (county, commune, city etc.) a greater proportion of residential mobility will emerge as migration than if the unit chosen is the major civil division (state, province etc.). With either choice, a number of very short moves (e.g., from points close to the boundary of one division to points immediately across the boundary in an adjacent division) will be counted as migration, and a number of longer moves (e.g., from one end of a division to another) will not be so counted. Given that civil divisions of the same class vary widely in size, shape and length of border, it is at once apparent that this criterion for identifying migrants lacks uniformity. It behoves the analyst to exercise caution when he undertakes comparisons of internal mobility either between countries or between the component areas of a single country. It is, of course, desirable that the units be as small as possible. They can then be consolidated for larger units as occasion requires. Also, various combinations of geographic detail are possible, with, for example, small area detail for areas of destination being cross-classified with broader areas of origin.

This problem of comparability of data for areal units of varying size and character is one that nearly always arises in spatial research of whatever kind; it is particularly acute perhaps in migration research. Examples of ap-

proaches to solutions may be found in the works of Hägerstrand and Bachi.[1]

The definitions given below are intended to be applicable to whatever kind of data are being analysed, but they reflect to some degree the compromises that have to be made between the ideal and the feasible in the real world of empirical research. They are intended to be a set of basic terms that should facilitate communication and exchange of knowledge regarding the phenomena with which they deal. These definitions are generally consistent with those given in the *Multilingual Demographic Dictionary*, published by the United Nations.[2] They differ in that they are focused primarily upon the terminology of internal migration and introduce a number of elaborations and refinements.

Migration interval

Migration occurs more or less continuously over time. In order to study its incidence, data have to be compiled with reference to specified periods of time. The interval may be definite, e.g., one year, five years, ten years, the intercensal period, or it may be indefinite, e.g., the lifetime of the population alive at a given date. When the data refer to a definite interval, we may say that they measure *fixed-term* or *period* migration, and thus distinguish them from data on *lifetime* migration or data based on place of last residence that lack a definite time reference.

Migrant and migration

A migration is defined as a move from one migration-defining area to another (or a move of some specified minimum distance) that was made during a given migration interval and that involved a change of residence. A migrant is a person who has changed his usual place of residence from one migration-defining area to another (or who moved some specified minimum distance) at least once during the migration interval. Persons who moved during the interval and died before its end should, strictly speaking, be counted as migrants and their moves should be counted as migrations. However, since information on migration is usually obtained after the end of the interval and with reference to persons still living at that time, both the number and the moves of migrants who died in the interim are likely to be excluded.

For a given migration interval, the number of migrants is rarely, if ever, as large as the number of migrations. Unless the interval is very short (a day, or perhaps a week) some persons are certain to move more than once. In general, the longer the migration interval the more the count of migrants will understate the amount of migration. Conversely, the shorter the migration interval, the more nearly the count of migrants will approach the number of migrations.

Area of origin (departure)

For migration, the area (or place) from which a move is made is the area of origin. For migrants, the area of origin may be either (*a*) the area of residence at the beginning of the migration interval, or (*b*) the area of residence from which the last move was made. The particular way in which the area of origin is defined will depend upon the nature of the information available to the analyst.

Area of destination (arrival)

For migration, the area in which a move terminates is the area of destination. For migrants, the area of destination is the area of residence at the end of the migration interval.

Migration streams

Strictly defined, a migration stream is the total number of moves made during a given migration interval that have a common area of origin and a common area of destination. In practice, it is usually a body of migrants having a common area of origin and a common area of destination.

Data on migrations, or migrants, can be cross-classified by area of origin and area of destination to form a matrix of $n(n-1)$ streams, or a set of $\frac{n(n-1)}{2}$ pairs of streams, each pair representing movements in opposite directions. Thus, if the migration stream from area i to area j is represented by the symbol M_{ij}, the opposing stream is represented by M_{ji}. The larger of any such pair of streams is designated as the *stream* or the *dominant stream* and the smaller as the *counterstream* or the *reverse stream.* The sum of the two members of a pair of streams is called *gross interchange.*

Lifetime migrant and lifetime migration

A person whose area of residence at the census or survey date differs from his area of birth is a lifetime migrant. The number of such persons in a population is commonly referred to as "lifetime migration". This number is, however, a gross understatement of both the amount of migration that has occurred during the lifetime of the living population and of the number of persons who have migrated. It excludes all moves that intervened between departure from the area of birth and arrival in the area of residence as reported at the census date, and it does not count as migrants persons who moved away from and subsequently returned to their areas of birth. Furthermore, it necessarily takes no account of the migration of persons who died before the census date.

[1] Torsten Hägerstrand, "Migration and area; survey of a sample of Swedish migration fields and hypothetical considerations on their genesis", in David Hannerberg, Torsten Hägerstrand and Bruno Odeving (ed.), *Migration in Sweden*, (Lund Studies in Geography, Ser. B., Human Geography, No. 13, (Lund, Royal University of Lund, 1957), pp. 27-158; Roberto Bachi, "Statistical analysis of geographical series", *Bulletin de l'Institut international de la statistique*, Stockholm, 1958, Tome 36, Livraison 2, pp. 229-240.

[2] *Population Studies, No. 29* (United Nations publication, Sales No.: 58.XIII.4). The English and French versions appeared in 1958, the Spanish in 1959, and the Russian in 1964. The *Dictionary* has also been published in at least eleven other languages by various organizations.

When the required information is available, the count of lifetime migrants can be enlarged by the inclusion of persons who have returned to their areas of birth. The result will be the number who have ever migrated and a lifetime migrant is then defined as a person who has ever lived outside his area of birth.

In-migrant and in-migration

Every move is an out-migration with respect to the area of origin and an in-migration with respect to the area of destination. Every migrant is an out-migrant with respect to the area of departure and an in-migrant with respect to the area of arrival. An in-migrant is thus a person who enters a migration-defining area by crossing its boundary from some point outside the area, but within the same country. He is to be distinguished from an "immigrant" who is an international migrant entering the area from a place outside the country.

The number of in-migrants for a migration interval is likely to be less than the number of in-migrations during the same interval as the same person may make more than one in-migration during that period. But regardless of how many in-moves and out-moves he makes during a migration interval, an in-migrant will count as such only if he is living in the area of destination at the end of the interval or if he dies in that area before the end of the interval.

Out-migrant and out-migration

An out-migrant is a person who departs from a migration-defining area by crossing its boundary to a point outside it, but within the same country. He is to be distinguished from an "emigrant" who is an international migrant, departing to another country by crossing an international boundary.

For a given area, the number of out-migrants for a migration interval is likely to be less than the number of out-migrations during the same period, as the same person may make more than one out-migration during that period. As above, regardless of how many out-moves and in-moves he makes during a migration interval, an out-migrant will count as such only if he is living outside the area of origin at the end of the interval or if he dies outside it before the end of the interval.

Gross and net migration

Data that refer to all moves or all migrants, within the specific definition of migration that is being applied, are concerned with *gross migration*. With respect to a given area, the sum of in-migration and out-migration, or of in-migrants and out-migrants, is *turnover*. The term *net migration* refers to the balance of movements in opposing directions. With reference to a specific area, it is the difference between in-migration and out-migration. If in-migration exceeds out-migration, the net gain to the area is classifiable as *net in-migration* and takes a positive sign. In the opposite case, there has been *net out-migration*, which takes a negative sign.

Net migration is equal to the net number of migrants because the difference between in-migrants and in-migration is equal to the difference between out-migrants and out-migration. This is true, however, only if (*a*) the moves of persons who died are included in the migration count and migrants who died are included in the migrant count or (*b*) such moves and such migrants are excluded from the respective counts. Of course, the results of (*a*) will not be the same as the results of (*b*). The former gives the balance due to all migration; the latter gives the balance due to the migration of persons who survived to the end of the interval.

When differences are struck between streams and counterstreams for individual pairs of streams, the balances are *net streams*. The algebraic sum of net streams for a given area is equal to net migration for that area.

PRINCIPAL SOURCES OF DATA

Censuses, population registers and sample surveys are the main source of information on internal migration.

Censuses

Census data have been and still are the major source of information on internal migration in most countries of the world. Until the time when more countries are able to set up efficient systems of population registration, it is likely that censuses will remain the best source of such information. The census data on internal migration are obtained directly by including a question on migration, and indirectly through estimation procedures that use data presumably obtained for other purposes. The usual direct questions on internal migration have to do with: place of birth; place of last residence; duration of residence in the place of enumeration; place of residence on a specific date before the census.

On the basis of the answers to any of these questions, the total population in an area may be classified into two groups: *migrants* and *non-migrants*. As has already been indicated, the criterion for such classification will depend upon the nature of the inquiry. Thus, migrants may be those who are enumerated in a place different from their place of birth, or those whose place of last residence is different from the place of enumeration, or those who resided in the place of enumeration for a period that is less than their age or those who resided x years ago in a place different from their place of residence at the time of the census.

Indirect information on internal migration can be obtained by comparison of total population counts for component areas in two censuses. The difference between the population counts at two censuses gives a measure of the total population change in an area. If this total change cannot be accounted for by births and deaths alone, the balance is attributable to migration. An estimate of net migration for the area is obtained by subtracting natural increase from the total change. Correspondingly, areal

estimates of net intercensal migration can be obtained from the sex-age distributions of two successive censuses.

Surveys

Periodic sample surveys have become an important source of demographic information in many countries; and in a few countries these surveys have been used to collect direct information on internal migration. Where there is no system of population registration, sample surveys provide a means of obtaining current information during the post-censal period. The potential uses of sample surveys for providing migration statistics is enormous. In general, major emphasis in such surveys has been placed on obtaining materials on internal migration that will supplement the information gained from national censuses.

Both censuses and surveys represent a *retrospective* approach to the measurement of migration. That is, they deal with the past behaviour of the population enumerated in the inquiry. The results therefore refer to the migration of only those who survived to the date of inquiry.

Population registers

The practice of recording changes of residence exists in some countries. Where such registrations are made on a routine basis covering the whole country and where these records are used to prepare statistics on population movements, the registration system is potentially an excellent source of data for the study of internal migration. Although, at the present time, there are several countries where accurate statistics on internal migration are obtainable from population registers, published data on internal migration are meagre, being largely confined to the volume of in-migration and out-migration for component areas. The importance of population registers as a source of data on internal migration lies not so much in its widespread use at the present time as in its future potentialities.

In the following chapters, the nature of the data that are available from censuses, the methods of utilizing them for migration analysis, and their accuracy and adequacy are discussed. In addition, some uses of data for migration analysis from population registers and sample surveys are indicated in annexes I and II, respectively.