

**PROCEEDINGS**  
of the  
**WORLD POPULATION CONFERENCE**

Rome, 31 August—10 September 1954

**Summary Report**



**UNITED NATIONS**  
**DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS**  
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## PREFACE

The World Population Conference was held in Rome from 31 August to 10 September 1954, under the auspices of the United Nations with the close collaboration of the International Union for the Scientific Study of Population, the Food and Agriculture Organization of the United Nations, the International Bank for Reconstruction and Development, the International Labour Organisation, the United Nations Educational, Scientific and Cultural Organization, and the World Health Organization. The Conference was authorized by resolution 435 (XIV) of the Economic and Social Council, which stipulated that its purpose should be an exchange of views and experience among experts on questions relevant to population.

The publication of the Proceedings of the Conference has been made possible by a grant to the United Nations from the International Union for the Scientific Study of Population. The Proceedings are published in seven volumes arranged as follows:

### SUMMARY REPORT

#### PAPERS: VOLUME I

- Meeting 2. Mortality trends, with special attention to areas of lower mortality
- Meeting 4. Mortality trends, with special attention to areas of higher mortality
- Meeting 6. Fertility trends, with special attention to areas of lower fertility
- Meeting 8. Fertility trends, with special attention to areas of higher fertility

#### PAPERS: VOLUME II

- Meeting 10. International migration, with special attention to areas of emigration
- Meeting 12. International migration, with special attention to areas of immigration
- Meeting 17. Population distribution and internal migration, with special attention to highly industrialized countries
- Meeting 19. Population distribution and internal migration, with special attention to countries in process of industrialization
- Meeting 11. Legislation, administrative programmes, and services relevant to population, with special attention to the evaluation of their effect

#### PAPERS: VOLUME III

- Meeting 13. Methods of making population projections
- Meeting 14. Prospects for future population changes
- Meeting 16. Variations in age composition, with special attention to effects of declining fertility and mortality

- Meeting 18. Economic and social consequences of aging of population
- Meeting 29. Recruitment and training of personnel for demographic research and teaching

#### PAPERS: VOLUME IV

- Meeting 3. Evaluation of quality of demographic statistics
- Meeting 5. Techniques of demographic measurement and analysis
- Meeting 9. Concepts and definitions in demographic statistics
- Meeting 27. Miscellaneous new contributions to demography

#### PAPERS: VOLUME V

- Meeting 20. Demographic aspects of economic and social development. I. Population in relation to the development of non-biological resources
- Meeting 22. Demographic aspects of economic and social development. II. Population in relation to the development of agriculture
- Meeting 24. Demographic aspects of economic and social development. III. Population in relation to capital formation, investment and employment
- Meeting 26. Demographic aspects of economic and social development. IV. Interrelations of population, economic development, and social change (with special reference to planning social and economic development programmes for under-developed countries)

#### PAPERS: VOLUME VI

- Meeting 7. Contributions to demography through new census inquiries
- Meeting 15. Problems and methods in demographic studies of preliterate peoples
- Meeting 21. Design and control of demographic field studies
- Meeting 23. Relation of population changes to the distribution of genetic factors
- Meeting 25. Methods of research on relations between intelligence and fertility
- Meeting 28. Social aspects of population changes, with special attention to inter-disciplinary studies

The Summary Report is composed of three parts as follows:

- I. Organization of the Conference
- II. Programme of Meetings
- III. Summary Reports of Meetings

In addition to outlining the organization of the Conference, Part I traces briefly the events which led up to the convening of the Conference. Part II furnishes the formal details of each of the Conference's thirty-two meetings, i.e., the names of the organizer and chairman, rapporteur and the various discussants; the topics discussed; and the titles of the papers contributed (arranged alphabetically by author). Part III contains summaries of the discussion at each of the meetings, prepared by a specially-

appointed rapporteur. Finally, there are two annexes at the end of the volume, listing (1) the officers of the Conference and the members of its various committees; and (2) the participants and contributors.

Each of the volumes of papers consists of the texts of the various communications received for the meetings listed under it; these papers have been reproduced, generally in the form in which they were received, by photo-offset process.

## I. ORGANIZATION OF THE CONFERENCE

The World Population Conference which was held in 1954 was the first scientific conference on the problems of population to be held under the auspices of the United Nations. It was a major inter-disciplinary meeting attended by more than 450 experts in a wide range of scientific fields relevant to the investigation of population trends, the factors influencing them, and their consequences.

### AUTHORIZATION OF THE CONFERENCE

A proposal that the United Nations should call a world conference on population was first presented to the United Nations Population Commission by the Director-General of the United Nations Educational, Scientific and Cultural Organization, in 1948.<sup>1</sup> In 1951 the Secretary-General called the attention of the Population Commission to a similar proposal sent by the International Union for the Scientific Study of Population and the Commission recommended that the views of Governments, specialized agencies and non-governmental organizations with respect to the holding of such a conference should be ascertained.<sup>2</sup> A canvass of Governments and of interested organizations and agencies revealed a strong sentiment in favour of a scientific conference on this subject to be held under the auspices of the United Nations. Accordingly, the Economic and Social Council, in 1952, adopted a resolution approving the holding of the World Population Conference in 1954.<sup>3</sup> The Conference was convened in Rome upon the invitation of the Government of Italy and in view of a substantial contribution towards the expenses of the Conference received from this Government.

### COLLABORATING ORGANIZATIONS

The resolution of the Economic and Social Council provided that the Conference was to be convened by the United Nations with the close collaboration of the interested specialized agencies and of the International Union for the Scientific Study of Population. This non-governmental organization, together with the specialized agencies mentioned in the Preface, shared with the United Nations in the planning of the Conference, the provision of facilities, the preparation of documents, the scientific discussions, and the financing of the project.

### PREPARATORY COMMITTEE

The Secretary-General was assisted in the preparations for the Conference by a Preparatory Committee consisting of representatives of the collaborating organizations and experts nominated by the International Union for the Scientific Study of Population, the Inter-

national Statistical Institute and the Inter-American Statistical Institute.<sup>4</sup> The Committee held three meetings, the first in Geneva from 17 to 19 November 1952, the second in Rome from 14 to 16 September 1953, and the third in Rome on 27 and 28 August 1954. During the intervals between the meetings the members of the Committee were asked to give advice from time to time by mail. A sub-committee of the Preparatory Committee collaborated closely with the Secretariat throughout the period of preparations, on matters relating to the organization of the Conference and the programme.

### ARRANGEMENT OF THE PROGRAMME

Upon the advice of the Preparatory Committee, the Secretary-General established a programme for the Conference which consisted — in addition to the opening and closing sessions — of 28 topical meetings and two summary discussions, the latter covering "Outlook for world population growth and distribution" and "Economic and social implications of population trends". The topics and the sequence of the meetings are listed below in the section headed "The Programme of the Conference".

The meetings were of three hours' duration, with the exception of the closing ceremonies, which were confined to a half-hour period. Prior to the opening meeting the Italian Government had invited the participants to the Capitol (Campidoglio) where the Conference was welcomed on behalf of the Government and the City of Rome.

The topical discussion meetings (2-29) were arranged in two series, one bearing even and the other odd numbers, and scheduled so that an odd and an even-numbered meeting were held simultaneously each morning and each afternoon. So far as possible, topics of general interest, such as trends of mortality and fertility, migration, future population prospects, economic and social consequences of population changes, etc., were included in the even-numbered series, and topics of interest primarily to specialists, such as evaluation of the quality of demographic statistics, techniques of demographic analysis, etc., were placed in the odd-numbered series. Some exceptions, however, were unavoidable.

### ORGANIZATION OF TOPICAL MEETINGS

For each meeting a qualified scientist was selected, with the advice of the Preparatory Committee, to act as organizer. It was the responsibility of the organizer, subject to the agreement of the Preparatory Committee, to make arrangements for the programme of his meeting, including the selection of individuals who would be invited to prepare papers and to act as discussants upon various aspects of the topic. The Prepara-

<sup>1</sup>United Nations, Population Commission, *Report of the Third Session* (document E/805), para. 29. 1948.

<sup>2</sup>United Nations, Population Commission, *Report of the Sixth Session* (document E/1989), paras. 46-51. 1951.

<sup>3</sup>Resolution 435 (XIV) of 10 June 1952.

<sup>4</sup>Full list of members of the Preparatory Committee can be found on page 185 of this volume.

tory Committee and the Secretariat endeavoured to assist the organizers in obtaining the co-operation of highly qualified individuals on the broadest possible geographical basis, to take part in their programmes.

#### SUMMARY DISCUSSIONS AND REPORTS

Since it was stipulated in the afore-mentioned resolution of the Economic and Social Council that the sole purpose of the Conference was to be an exchange of views and experience, no resolutions were considered at the meetings. However, arrangements were made in consultation with the organizer of each meeting, to appoint from among the participants a rapporteur who was charged with the responsibility of preparing a concise summary of the main points brought out both in the discussion and the written communications. The rapporteurs were advised to make the summary, not in the form of a report of each individual's statements, but as an integrated topical résumé showing the major points of agreement and disagreement. It was not feasible to call for the adoption of the rapporteurs' summaries by the Conference and they therefore remain solely the personal responsibility of the rapporteurs. Their statements should be accepted as representing the essence of the discussion in the various meetings. The summaries prepared by the rapporteurs for the various meetings are presented in subsequent sections of this volume.

The results of the discussions on several related topics of general interest were brought up for review in meetings 30 and 31, at the end of the Conference. The programmes of these meetings also were arranged by individual organizers selected with the advice of the Preparatory Committee. The discussion of each topic reviewed in these meetings was introduced by the rapporteur of one of the relevant topical meetings. The rapporteurs were requested on this occasion not only to state some of the principal findings of the papers and discussions at the relevant meetings, but also to add their comments on the significance of the findings and the points on which further research was needed. Summary reports of these two meetings also are included in this volume.

#### ATTENDANCE

The Economic and Social Council requested the Secretary-General to invite to the Conference, in their individual capacity, experts nominated by (1) Governments, (2) the interested specialized agencies, and (3) international non-governmental scientific organizations concerned; and in addition to invite a small number of experts with a scientific interest in population questions. A total of 644 experts were invited to attend the Conference, of whom 86 were nominated by Governments, 63 by specialized agencies, 386 by international non-governmental scientific organizations, and 109 invited as individual experts by the Secretary-General. In the letters of invitation it was made clear that each person was expected to participate in his own individual capacity as an expert and not as the representative of a Government or an organization. Of the number invited, 455 experts attended the Conference.

#### WRITTEN COMMUNICATIONS

Each participant was invited to submit a written communication on a subject related to population. Upon

the recommendation of the Preparatory Committee, such contributions were limited to approximately 2,500 words. The communications were reproduced and distributed so far as possible prior to and during the Conference to those participants who requested copies. Altogether 411 papers were received, some of them from persons who were not able to attend the Conference personally. These communications are presented in volumes I to VI of the present Proceedings in the original language and, generally, in the original form in which they were submitted, together with short summaries in English and French.

#### FINANCES

Under the terms of the resolution of the Economic and Social Council authorizing the Conference, the cost to the United Nations, over and above what could be absorbed in its regular budget, was limited to \$24,000. This sum was used to defray the costs of necessary temporary assistance and of travel of staff to the Conference site.

The Government of Italy contributed \$25,000, of which \$19,749.34 was used to defray costs at the site of the Conference and the remainder to meet a part of the expenses of publishing the Proceedings. A contribution of £100 from the Government of Uganda was also utilized for the latter purpose.

The Food and Agriculture Organization provided physical facilities for the Conference at its headquarters in Rome, partly on a reimbursable basis and partly as a contribution to the costs. The International Labour Organisation contributed \$3,000 to the United Nations to help meet Conference costs, including \$1,000 toward the expenses of publication of the Proceedings. The International Bank for Reconstruction and Development made \$3,000 available through the International Union for the Scientific Study of Population, and UNESCO assisted in meeting the travel expenses of some participants. In addition, all the co-operating specialized agencies made staff available to assist in the planning and preparation of documents as well as to participate in the discussions at the Conference.

The collaboration of the International Union for the Scientific Study of Population in providing financial support, as well as in stimulating the interest of scientists, was a primary factor in the success of the Conference. Funds for this purpose were obtained, through the activity of a special Finance Committee, from private sources in France, Italy and the United States and from the Governments of Brazil and India. Its assistance toward the expenses of scientists attending the Conference was largely responsible for the high competence and broad geographical distribution of the participants. The Union has also provided the major share of the funds needed for the publication of the Proceedings of the Conference.

#### SOCIAL ACTIVITIES

The Hospitality Committee consisting of prominent Italian citizens and scientists had made arrangements for various social activities for the participants of the Conference. The Committee received generous contributions for this purpose from the Bank of Italy, the Institute of Life Insurance and several other sources.

## II. PROGRAMME OF MEETINGS

### Meeting 1

#### OPENING SESSION

### Meeting 2

#### MORTALITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF LOWER MORTALITY

ORGANIZER AND CHAIRMAN: Louis I. Dublin (United States)

RAPPORTEUR: Mortimer Spiegelman (United States)

DISCUSSANTS: M. J. Aubenque, P. J. N. Delaporte, H. F. Dorn, F. Fajfr, M. L. Febvay, L. Hersch, G. Heubeck, S. C. Ledermann, M. Lindhardt, W. P. D. Logan, I. M. Moriyama, R. J. Myers, M. Pascua, S. Peller, A. Sauvy, M. Spiegelman, L. Tabah, V. G. Valaoras J. Villar Salinas, P. de Woff

#### TOPICS FOR DISCUSSION:

1. Recent trends in general mortality
2. Mortality from specific causes of death
3. Mortality in midlife and later
4. Foetal and infant mortality
5. Social class variations in mortality
6. Prospective trends of mortality

#### CONTRIBUTED PAPERS:

Maurice J. AUBENQUE	Observations on the basic concept of cause of death statistics and its practical consequences
José BARRAL SOUTO	Survival indices for some Argentine regions in 1947
Czechoslovakia, NATIONAL OFFICE OF STATISTICS	The infant and neo-natal mortality in Czechoslovakia
Pierre J. N. DELAPORTE	Changes in mortality trends in Europe during and after the Second World War
F. Enriques de SALAMANCA and J. TAMARIT	Mortality due to cancer in relationship to age
P. de WOLFF and J. MEERDINK	Mortality rates in Amsterdam according to profession
Harold F. DORN	Prospective mortality trends in areas of lower death rates
Karl FREUDENBERG	Mortality trends by age groups in Germany during the past 80 years
J. GABRIEL	Past and present trends of the death rate in Belgium
Karl-Gustav HAGSTROEM	Measuring and forecasting the trend of mortality
C. Horace HAMILTON	Mortality differentials and trends in North Carolina
Sully C. LEDERMANN	Mortality according to causes as related to the alcoholization of the population
Marie LINDHARDT	The changes in the importance of certain causes of death in the Scandinavian countries
W. P. D. LOGAN	Social class variations in mortality
Iwao M. MORIYAMA	Recent mortality trends in areas of low mortality
J. N. MORRIS, J. A. HEADY and C. DALY	Social and biological factors in infant mortality — England and Wales, 1949-1950
M. PASCUA	Recent mortality trends in areas of lower death rates
Mortimer SPIEGELMAN	An international comparison of mortality rates at the older ages
Léon TABAH and Jean SUTTER	Mortality and aging: a biometric study. Allometric correlation between various causes of death
Vasilios VALAORAS	Foetal, peri-natal and infant mortality
Jesús VILLAR SALINAS	The trend of mortality in Spain

## Meeting 3

## EVALUATION OF QUALITY OF DEMOGRAPHIC STATISTICS

ORGANIZER AND CHAIRMAN: Pierre Depoid (France)

RAPPORTEUR: Pierpaolo Luzzatto Fegiz (Italy)

DISCUSSANTS: B. Benjamin, J. A. Bourdon, C. Chandrasekaran, P. Depoid, A. M. N. El Shafei, G. Frumkin, D. V. Glass, S. P. Jain, Kyaw Khine, D. Kirk, K. B. Madhava, G. Mortara, H. S. Shryock, Jr. P. Vincent

## TOPICS FOR DISCUSSION:

1. The general problem
2. The limits of standardization
3. Demographic statistics in under-developed countries
4. Methods of testing the quality of statistics

## CONTRIBUTED PAPERS:

Edith ADAMS	A comparison of recent census statistics on the economically active population
R. BACHI	On the accuracy of demographic statistics in Palestine and Israel
B. BENJAMIN and N. H. CARRIER	An evaluation of the quality of demographic statistics in England and Wales
Ajit DAS GUPTA	Accuracy index of census age distributions
Orêncio Longino de ARRUDA GOMES	Comments on the accuracy of population censuses and statistics on population changes in Brazil
G. FRUMKIN	Appraisal of the quality of demographic statistics
William N. HURWITZ and Leon PRITZKER	The 1950 census of population of the United States: Accuracy of statistics and reliability of methods
S. P. JAIN	A note on the nature and quality of Indian demographic statistics
Konrad KRIEGER	Evaluation of quality of demographic statistics
Forrest E. LINDER	Adherence of national censuses to international recommendations
W. Parker MAULDIN	Comments on possible national and international standards for the determination and indication of degree of accuracy of demographic statistics
Erich MICHALUP	The enumeration of age
Yuzo MORITA	On the accuracy of demographic statistics of Japan
Joaquim José PAES MORAES	Note on the sex-ratio of births
UNITED NATIONS POPULATION DIVISION	Some attempts to measure the accuracy of international population statistics
UNITED NATIONS STATISTICAL OFFICE, Demographic and Social Statistics Branch	The availability of data from population censuses taken in or around 1950
P. VINCENT	A method proposed in the USSR for evaluating the quality of demographic statistics

## Meeting 4

## MORTALITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF HIGHER MORTALITY

ORGANIZER AND CHAIRMAN: Kizhakke C. K. E. Raja (India)

RAPPORTEUR: Shital Prasad Jain (India)

DISCUSSANTS: M. C. Balfour, I. Bogdan, O. Cabello Gonzales, S. Chandrasekhar, C. Chandrasekaran, R. A. Debré, M. de Silva, G. Frumkin, B. Gil, M. V. M. Herchenroder, N. H. Eissa, S. P. Jain, J. L. Janer, C. J. Martin, M. Pascua, M. Pizzi, M. K. Razzak, H. Romero, T. V. Ryabushkin, H. H. Sonnabend, V. G. Valoras

TOPICS FOR DISCUSSION :

1. General mortality
2. Infant and child mortality
3. Factors affecting mortality trends
  - (a) Public health measures and sanitation
  - (b) Food supply and nutrition
  - (c) Economic and social conditions
4. Recent and prospective trends in mortality as they affect population growth

CONTRIBUTED PAPERS :

Arne BARKHUUS	Non-European general and infant mortality in the non-self-governing territories in Africa south of the Sahara
S. CHANDRASEKHAR	Infant mortality in India, 1901-1951
Marcos Vinicius DA ROCHA	The death rate in Brazil
David Montague DE SILVA	Public health and sanitation measures as factors affecting mortality trends in Ceylon
S. P. JAIN	Mortality trends in India
José L. JANER	Public health and sanitation measures as factors affecting mortality trends
M. JUNGALWALLA	Mortality trends in Indonesia
Girgis Abdo MARZOUK	Some data on fertility and mortality in the Sudan
E. J. PAMPANA	Effect of malaria control on birth and death-rates
M. PASCUA	Brief summary of recent mortality trends in areas of higher death-rates
Hernan ROMERO and Ernesto MEDINA	Latin America as a demographic laboratory
Satya SWAROOP	On infant and childhood mortality in areas of higher death-rates: levels and trends: influence of changes on expectation of life

Meeting 5

TECHNIQUES OF DEMOGRAPHIC MEASUREMENT AND ANALYSIS

ORGANIZER AND CHAIRMAN: Louis Henry (France)

RAPPORTEUR: Louis Henry (France)

DISCUSSANTS: J. A. Bourdon, J. Bourgeois-Pichat, P. R. Cox, M. Croze, P. J. N. Delaporte, L. J. Ducoff, J. C. Elizaga, V. F. J. Fallon, G. Fürst, P. O. L. George, J. Hajnal-Konyi, P. M. Hauser, K. Horstmann, J. C. Koop, G. Lasorsa, C. J. Martin, W. E. Moore, G. A. Myburgh, N. B. Ryder, J. R. H. Shaul, W. Taylor, C. Tietze, P. K. Whelpton

TOPICS FOR DISCUSSION :

1. Measurement of economic density
2. Measurement of fertility in countries where birth registration is non-existent or incomplete
3. Problems encountered in measuring and analysing fertility

CONTRIBUTED PAPERS :

Jean BOURGEOIS-PICHAT	Measurement of the fertility of human populations
W. BRASS	The estimation of total fertility rates from data for primitive communities
P. R. COX	A short survey of recent developments in the statistical analysis of fertility and population growth
Czechoslovakia, NATIONAL OFFICE OF STATISTICS	Registration and statistical analysis of birth data in Czechoslovakia
Juan C. ELIZAGA	Methods of measuring "actual" fertility in population
Pierre O. L. GEORGE	A method of calculating the economic density of a population
Margaret Jarman HAGOOD	Exploration of techniques for measuring economic density of population
Kurt HORSTMANN and F. HAGE	Age specific or duration specific marital fertility rates
Hannes HYRENIUS	Reproduction and replacement rates
Ivo LAH	A contribution to the calculation of fertility tables on the basis of population censuses
Giovanni LASORSA	Observations on fertility and the rate of reproduction
C. J. MARTIN	A method of measuring fertility in under-developed countries where birth registration is non-existent or defective
Giorgio MORTARA	On the measurement of fertility in populations lacking reliable birth registration

C. A. L. MYBURGH	A method of estimating the net reproduction rate from returns of the total number of children ever born and the number of these still living, with particular reference to the Negroid races of Africa
N. B. RYDER	The comparative relevance of cohort aggregation and of increased specificity in the determination of the trend in fertility
Wallis TAYLOR	The nuptial cohort method in the measurement of fertility
Christopher TIETZE	Impact of age at marriage on various measures of fertility
P. K. WHELPTON	Using cohort tables to evaluate changes in the timing of births and on increase in the size of completed families as causes of the post-war "baby boom" in the United States

### Meeting 6

#### FERTILITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF LOWER FERTILITY

ORGANIZER: T. van den Brink (Netherlands)

CHAIRMAN: P. Philip J. Idenburg (Netherlands)

RAPORTEURS: Jan Godefroy (Netherlands) and Eugene Grebenik (United Kingdom)

DISCUSSANTS: I. Bogdan, J. A. Bourdon, G. Frumkin, P. M. J. Gasc, P. C. Glick, L. G. Henry, C. V. Kiser, S. Koller, M. D. McCarthy, H. V. Muhsam, A. Polman, P. K. Whelpton

#### TOPICS FOR DISCUSSION:

1. General survey of fertility trends in areas of lower fertility
2. Is there a gradual levelling of the differences observed thus far in fertility between separate population groups?
3. Spacing of children
4. Human infertility, its incidence and aetiology
5. Attempts to measure the desired size of family
6. Prospective trends of fertility in areas of low fertility

#### CONTRIBUTED PAPERS:

Kjeld BJERKE	The birth rates of the rural and urban population in Denmark, Finland, Norway and Sweden during the 1940's
Czechoslovakia, NATIONAL OFFICE OF STATISTICS	Registration of the weight and length of new-born infants in Czechoslovakia
R. M. DINKEL	Some observations on methodology in differential fertility research
Maurice L. FEBVAY	Are the existing fertility differentials between the various population groups tending to be reduced?
Halvor GILLE	Recent fertility trends in countries with low fertility
R. C. GILLIGAN	Differential fertility, Australia. Is there a gradual levelling of the differences observed thus far in fertility between separate population groups?
J. GODEFROY	Future trends of fertility in some European countries
E. GREBENIK	Measurement of desired family size
Sjoerd GROENMAN	The opinion of women about the size of their family
S. KOLLER and H. LÖWE	Is there a gradual levelling of differences observed thus far in fertility between separate population groups in Germany?
Siegfried KOLLER	The spacing of children
M. D. MCCARTHY	Irish fertility statistics, 1841-1946
Henry S. SHRYOCK, Jacob S. SIEGEL and Calvin L. BEALE	Future trend of fertility in the United States
Abraham STONE	Biological factors influencing human fertility
T. VAN DEN BRINK	Levelling of differential fertility trends in the Netherlands
Charles F. WESTOFF	Differential fertility trends in the United States since 1900
P. K. WHELPTON	Using cohort tables to evaluate changes in the timing of births and on increase in the size of completed families as causes of the post-war "baby boom" in the United States (See also meeting 5)



## Meeting 7

## CONTRIBUTIONS TO DEMOGRAPHY THROUGH NEW CENSUS INQUIRIES

ORGANIZER AND CHAIRMAN: Alberto Arca Parro (Peru)

RAPPORTEUR: Conrad Taeuber (United States)

DISCUSSANTS: O. Cabello González, C. L. Dedrick, F. E. Linder, R. Luna Vegas, C. A. Miro, T. H. Montenegro, I. U. Pisarev, S. R. Sen, A. M. N. el Shafei, K. Williams

## TOPICS FOR DISCUSSION:

1. The spread of census taking
2. The increasing scope of census inquiries
3. Reflecting conditions and change
4. Census data and current statistics
5. Making census data more useful

## CONTRIBUTED PAPERS:

G. DESFOUR	Uses of census in countries under development
Hasan M. HUSEIN	Contributions to demography through new census inquiries
Wilburg JIMÉNEZ CASTRO	Certain applications of the population census of Costa Rica to the development of governmental programmes
Kyaw KHINE	Some observations in census-taking in Burma
E. MESAROS	Certain methods of observations of demographic phenomena in the People's Republic of Romania
Jorge PANDO GUTIÉRREZ	Practical results of the population census in Bolivia
Mohammad YUSUF	Population of Pakistan and its characteristics

## Meeting 8

## FERTILITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF HIGHER FERTILITY

ORGANIZER AND CHAIRMAN: Hanna Rizk (Egypt)

RAPPORTEUR: Kanagaratnam Williams (United Nations Food and Agriculture Organization)

DISCUSSANTS:<sup>1</sup> C. Chandrasekaran, H. M. Husein, G. W. Roberts, I. B. Taeuber, D. Vogelnik

## TOPICS FOR DISCUSSION:

1. Brief summary of levels and trends of fertility in areas of higher fertility
2. Recent and prospective future trends in fertility and associated factors in selected areas of higher fertility
3. Differences in fertility of urban and rural populations and various economic and social groups
4. Social and cultural factors affecting fertility in areas of higher fertility
5. Influence of economic development and related social changes upon fertility
6. Studies of the influence of changes in specific conditions, including anti-natal practices, upon fertility in areas of higher fertility
7. Prospective future fertility trends in areas of higher fertility

## CONTRIBUTED PAPERS:

V. BREBANT	Fertility trends in the Belgian Congo
Jacques BREIL	Attempt to determine the level and trends of fertility among Moslems in Algeria
Alceu Vicente de CARVALHO	Some aspects of birth rates in Brazil
C. CHANDRASEKARAN	Fertility trends in India
Clellan S. FORD	Fertility control in under-developed areas
M. V. M. HERCHENRODER	The high fertility in the population of Mauritius in recent years

<sup>1</sup> This list includes the "nominated" discussants only. The full list of participants in the discussion from the floor was not available at the time of printing of these Proceedings.

Tatsuo HONDA	Extent of diffusion of fertility control in Japan
R. Raja INDRA	Fertility trends in Ceylon
S. P. JAIN	Indian fertility — trends and patterns
M. K. H. KHAN and M. ZIA-UD-DIN	Effect of malaria on the birth rate in the Punjab Province (Pakistan)
Yoshio KOYA	Present situation of family planning among farmers and coal mine workers in Japan
Jules Le ROUZIC	Investigation into African and Madagascan births in maternity hospitals
Nanming LIU	The fertility of the population of Taiwan
Haruo MIZUSHIMA	The fertility trend in Japan
MINORU MURAMATSU	Summary of the preliminary report of a survey of health and demographic aspects of induced abortion in Japan
E. J. PAMPANA	Effect of malaria control on birth and death rates (See also meeting 4)
G. W. ROBERTS	Cultural factors in fertility in the British Caribbean
Abraham STONE	Present day family planning techniques
J. Mayone STYCOS	The pattern of birth control of Puerto Rico
YOU Poh Seng	Fertility and the increase of population in Singapore
Mohammed ZIA-UD-DIN	Relation between fertility and economic conditions in the Punjab Province (Pakistan)

### Meeting 9

#### CONCEPTS AND DEFINITIONS IN DEMOGRAPHIC STATISTICS

ORGANIZER AND CHAIRMAN: Paul Vincent (France)

VICE-CHAIRMAN: Francis Blanchard (International Labour Office)

RAPPORTEUR: Paul Vincent (France)

DISCUSSANTS: S. Agapitidis, D. J. Bogue, W. D. Borrie, J. A. Bourdon, J. Breil, M. Croze, D. de Andrade, Jr., P. de Wolff, A. Dufrasne, M. L. Febvay, G. Fürst, R. García-Frías, P. O. L. George, P. C. Glick, P. M. Hauser, K. Horstmann, X. Lannes, M. Macura, J. Meerdink, W. E. Moore, M. C. Rochefort, H. S. Shryock, Jr., L. Thirring

#### TOPICS FOR DISCUSSION:

1. The concepts of resident population and present population
2. The concept of agglomeration
3. The various types of marital status
4. The concepts of occupational activity and dependence on a branch of activity

#### CONTRIBUTED PAPERS:

Inger ALSING	The resident population and the population temporarily present
Kjeld BJERKE and T. HJORTKJAER	Concept of labour force statistics
Donald J. BOGUE	Value of an international system of clarification by regions and subdivisions of regions in the preparation and analysis of demographic statistics
Olaf BOUSTEDT	Urban population, urban areas and the problem of dominance in West-German statistics
Jacques BREIL	Marital status of French Moslems in Algeria
Marcel BRICHLER	The concepts of present and resident population in French statistics historical background and future prospects
B. N. DAVIES	Current population surveys
Ovidio de ANDRADE, Jr.	Distribution of the Brazilian population by marital status
P. de WOLFF and J. MEERDINK	Possibilities for population statistics, specified according to wards, in a large Dutch municipality
Louis J. DUCOFF	Measurement of population dependent on agriculture in the United States
Hope T. ELDRIDGE	Urban theory and concepts in relation to the definition of urban agglomerations
Norbert FALZON	Notes on the comparability of marital status data obtained from population censuses
M. FEBVAY	Agricultural population and economically active agricultural population — economically active and economically inactive population classified by social-occupational category (Proposals for the 1954 French census)

L. M. FEERY	Conurbations in England and Wales
Elydia FORT DE ORTIZ	Observations on the concept and measurement of under-employment with an example from Puerto Rico
G. FRUMKIN	Note on population registers
Gerhard FÜRST	The individual as producer, income receiver and consumer
GARCÍA-FRÍAS and O. Alexander DE MORAES	Determination of the economically active population for the purpose of international comparability
Pierre GEORGE	The urban ward concept as applied to demographic and statistical research
G. GOUDSWAARD and J. SCHMITZ	Notes on the concepts of "City" and of "agglomeration"
Kurt HORSTMANN	Difficulties in analysing the number of married women in the Federal Republic of Germany
Germano JARDIM	Marital status statistics in Brazilian censuses
Omer A. LEMIEUX	Analysis of marital status statistics in some recent censuses
Ricardo LUNA-VEGAS	Notes regarding the improvement of census standards on the economically active population
Milos MACURA	The definition of the urban agglomeration and its influence upon urban population volume
Wilbert E. MOORE	A preliminary functional classification of activities
Giorgio MORTARA	Note on the definition of the economically active population
J. W. NIXON	The concept of population dependent on different economic activities
Ayanori OKASAKI	<i>De facto</i> marriage, legal marriage and matrimonial statistics in Japan
I. U. PISAREV	Organization, notions and determinations of demographic statistics in the USSR
Jean PORTE	Introduction of a system for defining agglomerations in French demographic statistics
Michel ROCHEFORT	The occupational structure of Alsatian towns and the effects of economic centralization on its recent development
J. R. L. SCHNEIDER	Alternative population concepts
J. R. H. SHAUL	Notes on the application in Africa of the concepts of <i>de facto</i> and <i>de jure</i> population, of the urban population and of the economically active population
Henry S. SHRYOCK, Jr.	The concepts of <i>de facto</i> and <i>de jure</i> population: the experience in censuses of the United States
UNITED NATIONS STATISTICAL OFFICE, Demographic and Social Statistics Branch	The formulation of questions on economic characteristics in population censuses (a preliminary study of the schedules used in forty countries: 1950-1953)
T. VAN DEN BRINK	Population registers and their significance for demographic statistics
Paul E. VINCENT	The Soviet solution of the conflict "present population" versus "resident population"

### Meeting 10

#### INTERNATIONAL MIGRATION, WITH SPECIAL ATTENTION TO AREAS OF EMIGRATION

ORGANIZER AND CHAIRMAN: Francis Blanchard (International Labour Office)

RAPPORTEUR: Attilio Oblath (International Labour Office)

DISCUSSANTS: J. A. Alexander, A. Angelopoulos, W. D. Borrie, J. A. Bourdon, S. Chandrasekhar, F. Edding, G. Falchi, P. O. L. George, E. A. Hogan, R. L. Hubbell, J. Isaac, D. Kirk, X. Lannes, G. Parenti, R. Rochefort, Y. Shimojo, L. Sundaram

#### TOPICS FOR DISCUSSION:

1. Effects of emigration on the growth and structure of the total and economically active population of selected countries of emigration
2. Effects of emigration on the economic situation of the population of selected countries of emigration
3. Conditions influencing emigration needs and possibilities in selected countries of emigration

#### CONTRIBUTED PAPERS:

Gunther O. K. BEIJER and C. A. VAN DEN BELD Effects of migration on the economic situation of the population of selected European countries of emigration

F. EDDING	Conditions influencing needs and possibilities of emigration with special reference to the problem of refugees and expellees in Germany
G. FALCHI	International migration as a means of improving the world distribution of population and of relieving demographic pressure
E. A. HOGAN	Population trends in Scotland with particular reference to emigration
INTER-GOVERNMENTAL COMMITTEE FOR EURO- PEAN MIGRATION	International migration: the experience and contribution of the Inter-governmental Committee for European Migration
INTERNATIONAL LABOUR ORGANISATION	Survey of post-war European migration
Julius ISAAC	Conditions influencing needs and possibilities of emigration in selected European countries
Dudley KIRK	A survey of recent overseas migration in relation to population pressure in Europe
Xavier LANNES	Africa as a possible area for the settlement of European immigrants
Attilio OBLATH	Observations on the emigration needs and possibilities of certain European countries
Chia-Lin PAN	Effects of recent and possible future migration on the population of Argentina, Brazil, Italy and India
G. PARENTI and P. F. BANDETTINI	Effects of emigration on the growth and structure of total population and population of reproductive age (with reference to European countries of emigration)
Malcolm J. PROUDFOOT	Demographic aspects of migration in the Caribbean
ROBERT ROCHEFORT	A positive approach towards Europe's surplus populations
H. F. ROSSETTI	Problems of attaining a better distribution of population between the countries of Western Europe
Clarence SENIOR	Puerto Rican migration: spontaneous and organized
Yasumaro SHIMOJO	Redistribution of the population of the world with special attention to Japan
Lanka SUNDARAM	Effects of emigration on the economic situation of the populations of selected Asian countries of emigration (with reference to India)
UNITED NATIONS OFFICE OF HIGH COMMISSIONER FOR REFUGEES	Resettlement of refugees and development of emigration (1945-1953)
UNITED NATIONS POPULA- TION DIVISION	A survey of intercontinental migration in the post-war period
G. H. L. ZEEGERS	Some sociographic aspects of emigration from the Netherlands

### Meeting 11

#### LEGISLATION, ADMINISTRATIVE PROGRAMMES, AND SERVICES RELEVANT TO POPULATION, WITH SPECIAL ATTENTION TO THE EVALUATION OF THEIR EFFECT

ORGANIZER AND CHAIRMAN: David V. Glass (United Kingdom)

RAPPORTEUR: Eugene Grebenik (United Kingdom)

DISCUSSANTS: J. Backer, J. Bourgeois-Pichat, G. Inghe, Y. Koya, W. P. D. Logan, M. Mod, S. Peller, K. C. K. E. Raja, G. W. Roberts, T. V. Ryabushkin, A. Sauvy, J. J. Spengler, I. B. Taeuber, D. Vogelink, C. M. Watson

#### TOPICS FOR DISCUSSION:

1. On what basis, and in respect of what criteria, are general population policies formulated?
2. How far is demographic research used, and how far could it be used, in recommending specific population measures?
3. How far is demographic research used, and how far could it be used, to ascertain the effectiveness of general or specific population measures?

#### CONTRIBUTED PAPERS:

D. CECCALDI	The role of research in the selection and application of a family and population policy
J. W. B. DOUGLAS	The possible contribution of socio-medical research with reference to measures for reducing morbidity and mortality in Britain
Halvor GILLE	Demographic aspects of Scandinavian family welfare policy

Louis HENRY	Trends of the birth rate in France
Gunnar INGHE	The characteristics of the abortion clientèle
E. MESAROS	Certain relations between legislation and demographic phenomena
Sigismund PELLER	Socio-medical research and the testing of policies for reducing mortality
E. RAIN	The basis and principles of French family and population policy
S. WAHLUND	Experiences from Indian family planning studies

### Meeting 12

#### INTERNATIONAL MIGRATION, WITH SPECIAL ATTENTION TO AREAS OF IMMIGRATION

ORGANIZER AND CHAIRMAN: Wilfred D. Borrie (Australia)

RAPPORTEUR: William J. Gibbons (United States)

DISCUSSANTS: A. Arca-Parró, W. D. Borrie, H. Bunle, S. Chandrasekhar, D. C. Corbett, F. Edding, M. Escobar, G. Falchi, M. Foyaca de la Concha, P. O. L. George, B. Gil, C. Gini, A. Girard, L. Guelfi, R. Heberle, M. V. M. Herchenroder, M. Lacroix, X. Lannes, M. J. Proudfoot, R. Rochefort, S. R. Sen, B. Thomas, H. Wander

#### TOPICS FOR DISCUSSION:

1. The effects of immigration, with special reference to the post-war years, on growth and structure of population in the receiving countries
2. The achievements and objectives of recent and current immigration plans with particular reference to economic aspects of assimilation
3. Recent experiences of, and the prospects for, the absorption of immigrants with particular reference to non-economic aspects of assimilation
4. Immigration as a means of improving the distribution of world population and relieving population pressures

#### CONTRIBUTED PAPERS:

Robert BLANC	"European" settlement in French overseas territories
W. D. BORRIE and K. JUPP	The economic demography of immigration to Australia
Henri BUNLE	Immigration in France since 1945
D. C. CORBETT	The economic objectives and achievements of immigration policy in Canada since 1946
Manuel DIÉGUES, Jr.	Experiences and prospects of the cultural assimilation of the immigrants in Brazil
G. FALCHI	International migration as method to ameliorate the distribution of world population and alleviate population pressure (See also meeting 10)
Rev. William J. GIBBONS, S. J.	Immigration outlook — The Americas
Benjamin GIL	The man-power contribution of immigration into Israel
Corrado GINI	The physical assimilation of the descendants of immigrants
Mlle Lucrèce GUELFY	Present aspects of the immigration of European labour into the Territories of the French Union
Oscar HANDLIN	Cultural adjustment in the United States, 1945-1952
George W. HILL	Achievements and objectives of recent and current immigration plans in Latin America with particular reference to economic factors
E. P. HUTCHINSON	The changing composition of the foreign-born population of the United States, 1920-1950
INTERNATIONAL LABOUR OFFICE	Survey of European post-war migration
Seichi IZUMI	Acculturation among the Japanese agricultural immigrants in Brazil
Chia-Lin PAN	Effects of recent and possible future migration on the population of Argentina, Brazil, Italy and India (See also meeting 10)
H. M. PHILLIPS	Immigration as a means of improving the distribution of world population
UNITED NATIONS POPULA- TION DIVISION	A survey of intercontinental migration in the post-war period (See also meeting 10)
Hilde WANDER	Some problems associated with the absorption of refugee immigrants in Western Europe with particular reference to Western Germany

## Meeting 13

## METHODS OF MAKING POPULATION PROJECTIONS

ORGANIZER AND CHAIRMAN: Leo Waldemar Törnqvist (Finland)

RAPPORTEUR: Hannes Hyrenius (Sweden)

DISCUSSANTS: L. H. J. Angenot, B. Benjamin, P. R. Cox, P. Depoid, G. Fougstedt, G. Frumkin, P. C. Glick, J. V. Grauman, J. Hajnal-Konyi, L. Henry, H. V. Muhsam, R. J. Myers, H. M. Phillips, J. S. Siegel, S. Somogyi, W. Taylor, L. W. Törnqvist, P. E. Vincent

## TOPICS FOR DISCUSSION:

1. Population projections for countries with only moderate amounts of statistics
2. Projections for countries with low or fluctuating birth rates
3. International comparability of population projections
4. Projections for specific purposes
5. Projections for cities and small territorial units
6. The accuracy of population forecasts

## CONTRIBUTED PAPERS:

L. H. J. ANGENOT	Regional population projecting in the Netherlands
G. FOUGSTEDT	Projections for segments of a population
John V. GRAUMAN	Towards a general methodology of population projections, by sex and age, for countries with only moderate amounts of statistics
John HAJNAL	The prospect for population forecasts
Louis HENRY	Birth projections following a disturbance in the birth rate
Hannes HYRENIUS	Population forecasts for cities and local areas
Vicente MILLS	A logarithmic polynomial for predictions of population growth
H. V. MUHSAM	The international comparability of population forecasts
Robert J. MYERS	Comparison of population projections with actual data
Jacob S. SIEGEL	Some aspects of the methodology of population forecasts for geographic subdivisions of countries
Paul E. VINCENT	Forecasts relating to the Moslem population of Algeria — Method of preparation, comparison with the results of a later census

## Meeting 14

## PROSPECTS FOR FUTURE POPULATION CHANGES

ORGANIZER: Yuzo Morita (Japan)

CHAIRMAN: Harold F. Dorn (United States)

RAPPORTEUR: Irene B. Taeuber (United States)

DISCUSSANTS: R. Bachi, I. Bogdan, M. Boldrini, W. D. Borrie, J. A. Bourdon, A. Dufrasne, J. D. Durand, G. Frumkin, M. V. M. Herchenroder, B. Minc, T. V. Ryabushkin, A. Sauvy, H. S. Shryock, N. V. Sovani, M. Tachi, P.-Y. Tsao, P. K. Whelpton, S. Widjojo

## TOPICS FOR DISCUSSION:

1. The growth of world population: 1650-1950
2. Growth patterns: a typology of population change
3. The United Nations estimates of future populations: 1950-1980
4. The future populations of major regions: 1950-1980
5. The future population of the world: 1950-1980

## CONTRIBUTED PAPERS:

Julie E. BACKER	Future population prospects in the Scandinavian countries
L. T. BADENHORST	Prospects for future population changes in South Africa

R. A. GOPALASWAMI	Chapter V. The Prospect—1981. A-Future growth of population (Reprint from "Census of India, 1951, Volume I. India. Part I-A-Report", pp. 177-191)
Kurt HORSTMANN	Population forecast for the Federal Republic of Germany
Nathan KEYFITZ	Indonesia's population prospects
João Lyra MADEIRA	Future population trends in Brazil
T. E. SMITH	Prospects for future population change in Malaya
Minoru TACHI	An estimate of future population of Japan
Warren S. THOMPSON	Future population prospects in the United States
UNITED NATIONS POPULATION DIVISION	Past and future population of the world and its continents
UNITED NATIONS POPULATION DIVISION	Framework for future population estimates, 1950-1980

### Meeting 15

#### PROBLEMS AND METHODS IN DEMOGRAPHIC STUDIES OF PRELITERATE PEOPLES

ORGANIZER AND CHAIRMAN: Clyde James Mitchell (Northern Rhodesia)

RAPPORTEUR: Victor Neesen (Ruanda-Urundi)

DISCUSSANTS: G. Aguirre Beltrán, V. F. Brebant, K. A. Busia, S. de Lestapis, M. Fortes, R. García Frías, J. F. Goldthorpe, A. R. Holmberg, F. Lorimer, D. N. Majumdar, C. J. Martin, L. Massé, E. Mesaros, V. Mills, H. V. Muhsam, V. Neesen, J. R. H. Shaul, H. H. Sonnabend, W. F. Wertheim

#### TOPICS FOR DISCUSSION:

1. Census and field work procedures
2. Adaptation of concepts
3. Appropriate methods of analysis
4. The interrelation of demographic and cultural factors

#### CONTRIBUTED PAPERS:

Gonzalo Aguirre BELTRÁN	Problems and methods in the study of population in Central America
Raymond FIRTH	Census and sociology in a primitive island community (Tikopia)
J. E. GOLDTHORPE	Population trends and family size in Uganda (See also meeting 28)
F. M. KEESING	Population patterns in stable societies
Frank LORIMER	Notes on aims and methods in demographic studies of preliterate societies
D. N. MAJUMDAR	Some trends of tribal and caste demography
Louis MASSÉ	Socio-demographic investigations and sample surveys in urban areas of French West Africa
Stephen W. REED	Cultural dynamics and demographic change in preliterate societies
J. R. H. SHAUL	Co-ordinating the statistical work of research institutes and official statistical offices
H. H. SONNABEND	Demographic notes on the development of backward territories
W. F. WERTHEIM	The forty per cent test — a useful demographic technique

### Meeting 16

#### VARIATIONS IN AGE COMPOSITION, WITH SPECIAL ATTENTION TO EFFECTS OF DECLINING FERTILITY AND MORTALITY

ORGANIZER AND RAPPORTEUR: Giorgio Mortara (Brazil)

CHAIRMAN: Benedetto Barberi (Italy)

DISCUSSANTS: J. Berent, J. Bourgeois-Pichat, A. de Vita, L. Féraud, G. Lasorsa, L. Lenti, H. Mizushima, G. A. Marzouk, G. Mortara, R. J. Myers, N. B. Ryder, J. L. Sadie, W. Winkler

## TOPICS FOR DISCUSSION:

1. Age composition of the population, in general. Analysis of its dependence on fertility, mortality and migration. Influences of war and other exceptional factors
2. Age composition in the different sections of the same population (various regions, urban and rural areas, ethnical groups, etc.)
3. Variations in the age structure and their repercussions on the size of the potential labour force. Replacement rates for the active age groups
4. Composition of the population past middle age, by sex, marital status, family relationship, economic activity, dependency, etc., and its relation to the aging of populations

## CONTRIBUTED PAPERS:

Eligio ALVES	Age composition of the Brazilian population and of its various sections
Jerzy BERENT	Aging of population: future trends
Ernst P. BILLETER	On a measure of population age distribution
BRAZIL, LABORATORY OF THE NATIONAL STATIS- TICAL COUNCIL	Study of the average duration of the economically active life
Pierre DEPOID	Composition of the French population by age
Agostino DE VITA	Observations on the composition of population by marital status and economic activity with regard to age
Lucien FÉRAUD	On aging of population
ITALY, CENTRAL INSTITUTE OF STATISTICS	Note on the statistics of the age composition of some populations
Giovanni LASORSA	Schemes for projections of the economically active population
Libero LENTI	Comparisons between age distribution of stationary, stable and real population
H. LE NEVEU	Regional and ethnic differences in the age composition of Canada's population
A. OCCHIUTO	Some aspects of the age and sex composition of the Italian population
J. L. SADIE	Differential aging in South Africa
Miguel SAURA DEL CAMPO	Demography and productivity
Stefano SOMOGYI	Variations in the composition by age of the population and components of population change
UNITED NATIONS POPULA- TION DIVISION	Age structure and labour supply
UNITED NATIONS POPULA- TION DIVISION	Factors affecting the size of the economically active population
Wilhelm WINKLER	Irregular influences on the age distribution of a population
Robert Morse WOODBURY	Demographic changes in age and occupation, with special reference to the United States, 1910 to 1950

## Meeting 17

## POPULATION DISTRIBUTION AND INTERNAL MIGRATION, WITH SPECIAL ATTENTION TO HIGHLY INDUSTRIALIZED COUNTRIES

ORGANIZER AND CHAIRMAN: Kurt Horstmann (Germany)

RAPPORTEUR: Siegfried Koller (Germany)

DISCUSSANTS: R. Bachi, G. O. K. Beijer, J. A. Bourdon, L. Chevalier, D. C. Corbett, M. Croze, E. T. de Barros, A. Dufrasne, R. Dugrand, V. F. J. Fallon, R. Heberle, E. W. Hofstee, Kyaw Khine, C. R. Mertens, S. Mihara, K. V. Müller, R. Rochefort, D. S. Thomas, B. Thomas

## TOPICS FOR DISCUSSION:

1. The volume of internal migration in different countries and its influence on population development, distribution and density
2. Changes in the composition of the population with reference to age, sex, religion, intelligence and other characteristics due to the selective effects of migration
3. Internal migration and economic development
4. The relations between internal migration and international migration, and the balance of advantages and disadvantages

## CONTRIBUTED PAPERS:

Jean BOURDON	The drift from the countryside and its causes
Hans HARMSEN	Is the number and size of the large cities in the Federal Republic of Germany increasing or decreasing?



Rudolf HEBERLE	Migration mobility: theoretical aspects and problems of measurement
E. W. HOFSTEE	Some preliminary conclusions concerning internal migration of families and individual males and individual females in the Netherlands based on new statistical data
Kurt HORSTMANN	Internal migration in the Federal Republic of Germany
Everett S. LEE	Measures of migration in the study of population redistribution in the United States, 1870-1950
Rev. C. R. MERTENS, S.J.	Territorial distribution of the Belgian population — changes occurred between 1930 and 1947
Shinichi MIHARA	Internal migration in Japan
Ann Ratner MILLER	Trends in labour force participation rates, United States, 1890-1950: analysis of state rates in their relation to migration and population growth
K. V. MÜLLER	The selective effects of internal migration
Shigeo NOJIRI	The true nature of development of industrialization and internal migration in Japan
Brinley THOMAS	The changing pattern of internal migration in Great Britain, 1921-1951
Dorothy Swaine THOMAS	Some aspects of a study of population redistribution and economic growth in the United States, 1870-1950

### Meeting 18

#### ECONOMIC AND SOCIAL CONSEQUENCES OF AGING OF POPULATION

ORGANIZER AND CHAIRMAN: Alfred Sauvy (France)

RAPPORTEUR: Jean Daric (France)

DISCUSSANTS: J. E. Backer, B. Benjamin, J. Berent, J. Bourgeois-Pichat, J. Daric, P. J. N. Delaporte, J. E. van Dierendonck, J. Doublet, F. Fajfr, V. F. J. Fallon, L. Féraud, M. V. M. Herchenroder, L. Hersch, G. Heubeck, G. Inghe, M. Lacroix, H. Laugier, R. J. Myers, S. Peller, J. L. Sadie, A. Sauvy, A. T. Welford, W. Winkler

#### TOPICS FOR DISCUSSION:

1. The economic and financial aspects of the aging of the population. Increase in the burden on the community caused by an increase in the proportion of older persons. The repercussions of the aging of the population on the pensions problem. Need for extending the working life of older persons
2. Problems raised by the employment of older persons. Changes of capacity with age. The vocational skills of older persons. The necessity of distinguishing between chronological age and biological age
3. The psychological, cultural and social needs of older persons who are economically inactive
4. Aging of the population and its effects on the social and political institutions of the countries concerned

#### CONTRIBUTED PAPERS:

Julie E. BACKER	Socio-economic problems imposed by the aging of the population in Norway
René CLEMENS	Contemporary aging of the population in Belgium
Jean DARIC	A recent survey of the employment of older workers in France
Jacques DOUBLET	Population growth and financing of old-age insurance
M. M. P. GOLDSCHMIDT-CLERMONT	Unemployment among aged persons in relation to their engagement and dismissal
Gunnar INGHE	Changes in the socio-psychological situation of the aged
INTERNATIONAL LABOUR OFFICE	Aging of the population and social security
Henri LAUGIER	Biological versus chronological age
J. L. SADIE	"Discrimination against older workers" in perspective
T. Lynn SMITH	The aging of the population and the rise of retirement towns and cities in the United States
A. T. WELFORD	Changes of capacity with age and their relation to employability
Sir Harold WILES	The work of the national advisory committee on the employment of older men and women (Great Britain)

## Meeting 19

## POPULATION DISTRIBUTION AND INTERNAL MIGRATION, WITH SPECIAL ATTENTION TO COUNTRIES IN PROCESS OF INDUSTRIALIZATION

ORGANIZER AND CHAIRMAN: Marcello Boldrini (Italy)

RAPPORTEUR: Bernardo Colombo (Italy)

DISCUSSANTS: A. Arca Parró, D. J. Bogue, J. A. Bourdon, C. Chandrasekaran, A. G. Casis, A. Constanzo, J. A. Encinas del Pando, R. Espinosa Olvera, M. Foyaca de la Concha, P. O. L. George, A. van der Goot, W. Jiménez Castro, M. Lacroix, L. Maroi, W. E. Moore, V. Nath, C. L. Pan, W. F. Wertheim

## TOPICS FOR DISCUSSION:

1. The relation of internal migration to the economic and social development of countries in process of industrialization:
  - (a) General trends and types of movements
  - (b) Migration of agricultural population to new farming areas
  - (c) Economic aspects of migration from rural to urban areas
  - (d) Social problems
2. Implications of the results of studies on internal migration in industrialized countries, for research relevant to countries in process of industrialization
3. Problems in the development of statistics and research on internal migration in countries in process of industrialization

## CONTRIBUTED PAPERS:

George W. BARCLAY	Urban growth and population re-distribution in the Far East
Ernani Thimóteo DE BARROS	Study of internal migration in Brazil
José Francisco DE CAMARGO	The demographic, social and economic importance of urbanisation in Brazil
Mario CAPPIERI	The Mediterraneans in connexion with the prehistoric populations and Indian migration
Kingsley DAVIS	Internal migration and urbanization in relation to economic development
René ESPINOSA OLVERA	Internal migration in Mexico, 1940-1949
Noel P. GIST	Selective migration in urban South India
Isidoro-Franco MARIANI	Internal migrations among the upper classes
E. MESAROS	Certain aspects of internal migration in the People's Republic of Romania
Vishwambhar NATH	Urbanization in India with special reference to city growth

## Meeting 20

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. I. POPULATION IN RELATION TO THE DEVELOPMENT OF NON-BIOLOGICAL RESOURCES

ORGANIZER AND RAPPORTEUR: Frank W. Notestein (United States)

CHAIRMAN: Gunnar Myrdal (United Nations)

DISCUSSANTS: E. A. Ackerman, A. Angelopoulos, A. Arca Parró, I. Bogdan, M. Ezekiel, J. Fourastié, F. Friedensburg, F. Hilgerdt, I. I. Kuzminov, H. Haugier, S. May, C. R. Mertens, E. G. Morteef, T. V. Ryabushkin, A. Sauvy, S. Zuckerman

## TOPICS FOR DISCUSSION:

1. Energy
2. Non-fuel minerals and creatable resources
3. Problems of utilization and trade

## CONTRIBUTED PAPERS:

Jean L. AUBERT	Population and the utilization of hydro-electric power
Farrington DANIELS	Population in relation to the development of solar energy

Nathaniel B. GUYOL	Population and energy resources
Folke HILGERDT	Uses and limitation of international trade in overcoming inequalities in world distribution of population and resources
Walter ISARD and Vincent WHITNEY	Population in relation to nuclear energy potentials
M. S. KRISHNAN and K. JACOB	Population in relation to the development of non-fuel mineral resources
Stacy MAY	The outlook for industrial raw materials demand in 1980 and its relation to economic development
E. F. SCHUMACHER	Population in relation to the development of energy from coal
William Taylor THOM, Jr.	Population in relation to the development of energy from oil and gas
S. ZUCKERMAN	Population in relation to creatable non-biological resources

### Meeting 21

#### DESIGN AND CONTROL OF DEMOGRAPHIC FIELD STUDIES

ORGANIZER AND CHAIRMAN: Roberto Bachi (Israel)

RAPPORTEUR: Helmut V. Muhsam (Israel)

DISCUSSANTS: J. A. Bourdon, G. Frumkin, P. M. Hauser, C. J. Martin, S. Peller, F. Rosenfeld, W. F. Wertheim

#### TOPICS FOR DISCUSSION:

1. The use of population samples (or other demographic field studies) for estimating the level of, and differentials in, fertility and mortality in territories or localities where birth and death registrations are lacking or seriously deficient
2. Methods for studying demographic characteristics, levels, trends and differentials in fertility, mortality, etc., of certain sections of populations for which no data can be directly obtained through censuses and birth and death statistics
3. Field studies of factors affecting demographic behaviour, or interrelationships of demographic, biological, psychological, economic and social factors
4. Bias in systematic population samples

#### CONTRIBUTED PAPERS:

C. CHANDRASEKARAN	Use of household samples in the United Nations — Government of India population study in the Mysore State
Rev. William J. GIBBONS, S. J.	Some sources for demographic analysis of church adherents
Alain GIRARD	Psychological aspects of demographic investigation
E. GREBENIK	Demographic fieldwork in Great Britain since the war
Millard HANSEN	A sociological field study of fertility in Puerto Rico
A. J. JAFFE	Demographic analysis in the absence of official census and vital statistics
Nathan KEYFITZ	A field study in population
Clyde V. KISER	Methodological lessons of the Indianapolis fertility study
J. C. KOOP	Investigations to ascertain age-specific fertility rates of certain Burman populations and some related methodological problems
D. B. LAHIRI	On the question of bias in systematic sampling in population censuses
P. C. MAHALANOBIS and Agit DAS GUPTA	The use of sample surveys in demographic studies in India
Louis MASS	Socio-demographic enquiries and sampling in urban zones of French West Africa (See also meeting 15)
A. M. MORGANTINI	Some preliminary results of 1953 survey on Somali population
J. R. H. SHAUL	Some problems of sampling African population characteristics

## Meeting 22

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. II. POPULATION IN RELATION TO THE DEVELOPMENT OF AGRICULTURE

ORGANIZER AND RAPPORTEUR: P. L. Sherman (United Nations Food and Agriculture Organization)

CHAIRMAN: Herbert Broadley (United Nations Food and Agriculture Organization)

DISCUSSANTS: P. G. H. Barter, I. Bogdan, A. Bonné, J. A. Bourdon, C. G. Clark, M. Ezekiel, V. F. J. Fallon, H. Flores de la Peña, P. O. L. George, G. A. Goldsmith, H. M. Husein, J. Kingston, C. J. Martin, G. A. Marzouk, K. Mihailovic, E. G. Mortelev, B. Minc, S. Nojiri, J. Pando Gutiérrez, W. H. Pawley, K. K. P. N. Rao, L. B. Rist, T. V. Ryabushkin, R. G. Snider, L. D. Stamp, T. H. Strong, C. F. Tæuber, H. O. A. Wold

## TOPICS FOR DISCUSSION:

1. Potentialities
2. Agricultural productivity
3. Evolution of agriculture
4. Rural overpopulation
5. Capital investment and industrialization
6. Resistance to change
7. Agricultural incomes and size of agricultural population
8. Economic demand and trade

## CONTRIBUTED PAPERS:

- |                                      |   |
|--------------------------------------|---|
| P. G. H. BARTER                      | Fundamental factors affecting the stage and status of agricultural development  |
| M. CEPEDA                            | Population, food and agriculture: the present situation and future prospects  |
| Colin CLARK                          | What constitutes rural over-population?   |
| Peter DOSSING                        | Population changes in Danish agriculture, 1870-1953   |
| Castro FERRAGUT                      | Certain characteristics of agricultural development in Cuba   |
| HORACIO FLORES DE LA<br>PENA         | Population growth, agricultural development and economic development in Mexico  |
| Grace A. GOLDSMITH                   | Nutritional aspects of food supply problems in relation to population needs   |
| Hasan M. HUSEIN                      | Population in relation to the development of agriculture in Egypt   |
| L. JUREEN and H. O. A.<br>WOLD       | The regional forecasting of food demand   |
| Charles E. KELLOGG                   | How shall we discover our agricultural resources?   |
| Jorge KINGSTON                       | Some demographic and economic characteristics of rural areas in Brazil  |
| Kosta MIHAILOVIC                     | Agricultural over-population and the methods of solving the problem in Yugoslavia   |
| Shigeo NOJIRI                        | The agricultural over-population problem in Japan   |
| W. H. PAWLEY <i>et al.</i>           | Possibilities of increasing the supply of food and agricultural products by exploitation of new areas and increasing yields |
| K. K. P. N. RAO and C. J.<br>AMARAL  | Population and food requirements  |
| José Mariano RÍOS                    | Population trends and agricultural development in Puerto Rico   |
| P. SARTORIUS                         | Forest resources and population   |
| S. R. SEN                            | The problem of population and agricultural productivity in India  |
| Robert G. SNIDER                     | The interest of the Conservation Foundation in Population Problems  |
| L. Dudley STAMP                      | The world land use survey in relation to population pressure  |
| T. H. STRONG                         | Australian population in relation to agricultural development and resources   |
| Conrad TÆUBER                        | The organization of agriculture and population change   |
| Egbert DE VIRES and<br>Oscar ZAGLITZ | Capital investment and its effect on agricultural production and demand for agricultural products                           |

## Meeting 23

## RELATION OF POPULATION CHANGES TO THE DISTRIBUTION OF GENETIC FACTORS

ORGANIZER, CHAIRMAN AND RAPPORTEUR: Frederic Osborn (United States)

DISCUSSANTS: M. J. Aubenque, I. Bogdan, J. A. Böök, K. Evang, H. F. Falls, L. Gedda, T. Kemp, D. Kirk, Y. Koya, M. Lacroix, A. P. Léon, M. Lerner, H. Nachtsheim, S. Peller, J. A. F. Roberts, A. Sauvy, T. Sjögren, J. A. Sutter, C. Stern, S. G. W. Wahlund

## TOPICS FOR DISCUSSION:

1. The prevalence of genetically based disease and defect
2. The mechanism of gene frequency alterations
3. Various factors which influence the distribution of gene frequencies
4. The need for objective data and critical research

## CONTRIBUTED PAPERS:

I. BOGDAN	Experimental biological data on the so-called redistribution of genes in the population
Robert C. COOK	Detection of carriers of recessive genes
Harold F. FALLS and James V. NEEL	The detection of carriers of "recessive" genes
Tanemoto FURUHATA	Hereditary influence of block group factors on the population problem
Luigi GEDDA	The study of twins
Tage KEMP	Prevalence of genetically based physical and mental deficiencies and the frequency of related genes (Information available on various population groups and methods of investigation)
Ken'ichi KISHIMOTO	The effects of inbreeding in the distribution of mental disease and deficiency
Yusaku KOMATU	Probability investigation on population genetics
Alberto P. LEÓN	Prevalence of genetically based physical and mental deficiencies and the frequency of related genes
Ei MATSUNAGO	Intra-uterine selection by the ABO incompatibility of mothers and foetus
Thomas MCKEOWN	Effect of age composition, age of mother, order of birth and environmental influences, on the prevalence of genetically based physical and mental defects and deficiencies
Hans NACHTSHEIM	Mutation rate and mutagenic factors, selection pressure and contra-selection in their effects on frequency and distribution of deleterious genes in human populations
L. S. PENROSE	Short and long term influences of various factors on the frequency of genes which affect the characteristics of population
L. D. SANGHVI	Genetic diversity in the people of India
J. P. SCOTT and J. L. FULLER	Experimental investigation of hereditary difference in learning ability in mammalian populations
Torsten SJÖGREN	Probable trends in the distribution of genes affecting the characteristics of the population
Curt STERN	Research needed
Jean SUTTER and Léon TABAH	The break-up of isolates and its genetic consequences in two French Departments

## Meeting 24

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. III. POPULATION IN RELATION TO CAPITAL FORMATION, INVESTMENT AND EMPLOYMENT

ORGANIZER AND CHAIRMAN: Leonard B. Rist (International Bank for Reconstruction and Development)

RAPPORTEUR: Romeo Dalla-Chiesa (International Bank for Reconstruction and Development)

DISCUSSANTS: S. W. Anderson, K. Bjerke, J. Bourgeois-Pichat, C. G. Clark, A. Molinari, K. N. Raj, A. Sauvy, J. J. Spengler, J. R. N. Stone, A. Vegas Pérez

## TOPICS FOR DISCUSSION:

1. Interrelations among economic variables in a growing economy
2. Population structure as a factor in the problem of economic development
3. Practical implications for public policy

## CONTRIBUTED PAPERS:

Samuel W. ANDERSON	Population growth and capital requirements in under-developed countries
Frank LORIMER	A statement of problems concerning population and economic development
A. MOLINARI	Relation between possibilities of employment and population growth in under-developed countries
Raúl PREBISCH	The relationship between population growth, capital formation and employment opportunities in under-developed countries
K. N. RAJ	Relations between population growth and capital formation and employment opportunities in densely populated under-developed countries
Alfred SAUVY	The effect of technical progress and investments on employment
H. W. SINGER	Population and economic development
J. J. SPENGLER	Capital requirements and population growth in under-developed countries
John Richard N. STONE	Misery and bliss
Angel VEGAS PÉREZ	The problem of population and of capital formation in the under-developed countries

## Meeting 25

## METHODS OF RESEARCH ON RELATIONS BETWEEN INTELLIGENCE AND FERTILITY

ORGANIZER AND CHAIRMAN: John A. Fraser Roberts (United Kingdom)

RAPPORTEUR: Hilde T. Himmelweit (United Kingdom)

DISCUSSANTS: A. Anastasi, C. P. Blacker, J. A. Böök, S. Chandrasekhar, R. C. Cook, C. Darwin, P. de Wolff, N. N. Foote, M. Fraccaro, D. V. Glass, A. J. Jaffe, T. Kemp, C. V. Kiser, O. Klineberg, L. Livi, J. Maxwell, J. Meerdink, H. V. Muhsam, K. V. Müller, F. H. Osborn, C. Stern, J. A. Sutter, W. Winkler

## CONTRIBUTED PAPERS:

Anne ANASTASI	Tested intelligence and family size: methodological and interpretive problems
I. BOGDAN	Relationships between fertility and factors which may influence it, such as social and economic conditions
Pieter DE WOLFF and J. MEERDINK	Intelligence in Amsterdam in connexion with data of a demographic and sociological nature
James MAXWELL	Intelligence, fertility and the future: a report on the 1947 Scottish mental survey
Jean SUTTER	Differential fertility and its effects on the intelligence level of a population
Philip E. VERNON	The use of intelligence tests in population studies

## Meeting 26

DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. IV. INTERRELATIONS OF POPULATION, ECONOMIC DEVELOPMENT, AND SOCIAL CHANGE (WITH SPECIAL REFERENCE TO PLANNING SOCIAL AND ECONOMIC DEVELOPMENT PROGRAMMES FOR UNDER-DEVELOPED COUNTRIES)

ORGANIZER AND CHAIRMAN: Hla Maung (Burma)

RAPPORTEUR: Philip M. Hauser (United States)

DISCUSSANTS: A. Bonné, J. D. Durand, W. W. Eason, J. Fourastié, G. Frumkin, P. M. Hauser, H. M. Husein, M. Macura, W. P. Mauldin, J. Mertens de Wilmars, B. Minc, F. W. Notestein, T. V. Ryabushkin, A. Sauvy, A. van der Goot, M. de Vergottini, W. F. Wertheim

TOPICS FOR DISCUSSION:

1. Gaps in knowledge about population and economic and social development, with special reference to the less developed countries
2. Case studies of the interrelationship between population, economic development and social change
3. Demographic research and the formulation of economic and social development programmes

CONTRIBUTED PAPERS:

Horace BELSHAW	Population growth and levels of consumption in New Zealand. Some comparisons with Asian countries
I. BOGDAN	The relation between social and economic development and demographic factors in the People's Republic of Romania
Alfred BONNÉ	Population growth and economic growth in the Middle East
Warren W. EASON	Population growth and economic development in the USSR
Philip M. HAUSER	Population statistics and research in planning economic development
Simon KUZNETS	Under-developed countries and the pre-industrial phase in the advanced countries: an attempt at comparison
Frank LORIMER	A statement of problems concerning population and economic development (See also meeting 24)
Brónislaw MINC	Fundamental changes in the natural increase of the population of Poland
Tokijiro MINOGUCHI	Interrelation of population, economic and social changes
Teodoro MOSCOSO and Britton HARRIS	Demographic research and the formulation of development programmes
Frank W. NOTESTEIN	Report on the conference on gaps in existing knowledge of the relationships between population trends and economic and social conditions
T. V. RYABUSHKIN	Social aspects of population structure and movement
Conrad TAEUBER and Herman MILLER	Demographic aspects of the American economic transition, 1790-1870
UNITED NATIONS, ECO- NOMIC COMMISSION FOR ASIA AND THE FAR EAST	Needed demographic research for economic and social development in Asia
UNITED NATIONS POPULA- TION DIVISION	Population trends and the standard of living in the under-developed countries

Meeting 27

MISCELLANEOUS NEW CONTRIBUTIONS TO DEMOGRAPHY

ORGANIZER AND CHAIRMAN: Livio Livi (Italy)

RAPPORTEUR: Giuseppe de Meo (Italy)

DISCUSSANTS: C. A. Anderson, J. A. Bourdon, M. J. Bowman, P. R. Cox, P. J. N. Delaporte, G. de Meo, N. Federici, L. Féraud, G. Galeotti, P. M. S. Gasc, P. O. L. George, J. V. Grauman, B. Liu, K. B. Madhava, E. Mesaros, I. U. Pisarev, T. Salvemini

TOPICS FOR DISCUSSION:

1. Methodological contributions relating to life tables
2. Studies on education and literacy of populations
3. Studies on ecological and economic characteristics of populations
4. Questions relating to the organization of demographic statistics

CONTRIBUTED PAPERS:

C. Arnold ANDERSON and Mary Jean BOWMAN	Educational distributions and attainment norms in the United States
I. BOGDAN	On the evolutionary trends of certain demographic phenomena in Romania
Gaston BOUTHOU	Equilibrium between demographic factors and its relation to social structure
Raymond DUGRAND	Study of land owned by town dwellers
Paul GASC	Some observations on family distribution according to the number and age of children
B. A. LIU	Measuring progress of literacy in the general population
C. M. Alves MARTINS	A sociometric approach of human ecology
R. RISSER	Note on methods of analytical representation for life expectancy and mortality tables of the populations of countries or territories

R. RISSE	Historical and technical note on interpolation formulae for life expectancy tables of small groups
Hans WIESLER	A simple method of constructing abridged mortality tables

### Meeting 28

#### SOCIAL ASPECTS OF POPULATION CHANGES, WITH SPECIAL ATTENTION TO INTER-DISCIPLINARY STUDIES

ORGANIZER AND CHAIRMAN: Alva Myrdal (United Nations Educational, Scientific and Cultural Organization)

RAPPORTEUR: Frank Lorimer (United States)

DISCUSSANTS: J. Berent, C. Chandrasekaran, S. de Lestapis, A. G. Donnithorne, K. Evang, N. N. Foote, M. Fortes, J. Fourastié, P. C. Glick, S. Groenman, O. Klineberg, F. Lorimer, E. Mesaros, H. V. Muhsam, T. V. Ryabushkin, A. Sauvy, H. W. Schelsky, Y. Talmon-Garber, J. E. van Dierendonck, E. von Hofsten

#### TOPICS FOR DISCUSSION:

1. Traditional family patterns in different cultures
2. The impact of changes in economic and social conditions on the family, with special attention to areas in process of industrialization
3. The changing Western family
4. Special research problems and techniques

#### CONTRIBUTED PAPERS:

I. BOGDAN	Certain aspects of the role of the women in society and of demographic phenomena
Rev. Père DE LESTAPIS, S. J.	Psychological conditions for prosperity in population of a high growth potential
Nelson N. FOOTE	Recent changes in marriage patterns in the U.S.A. with particular reference to changes in women's role
Yonina Talmon GARBER	Family structure in co-operative and communal settlements in Israel
Paul C. GLICK	The life cycle of the family
Max GLUCKMAN	African systems of succession in relation to marital stability
J. E. GOLDTHORPE	Population trends and family size in Uganda
Hilma GRANQVIST	The Arab family
Sjoerd GROENMAN	The opinion of women about the size of their family (See also meeting 6)
Sjoerd GROENMAN	Persistence of high fertility in an industrialized population
Erland VON HOFSTEN	The cost of a child: alternative solutions
Alessandro LEHNER	Social mobility in relation to the size of the family
Kanetaro NOMURA	The population growth and the development of the family system in Japan
B. S. PLATT	The problem of improving the feeding of malnourished communities: the care of mothers and children as a first step toward a solution
Stephen W. REED	Cultural dynamics and demographic change in preliterate societies (See also meeting 15)
Helmut SCHELSKY	Gains and losses in the functions of the family
Rhona SOFER	Family problems in a society of early industrialization
N. V. SOVANI	Some aspects of the family in West Maharashtra
Jean STOETZEL	Attitudes and the present population situation, the ideal family size
J. Mayone STYCOS, Kurt BACK and Reuben HILL	Problems of communication between mates on matters relating to family limitation

### Meeting 29

#### RECRUITMENT AND TRAINING OF PERSONNEL FOR DEMOGRAPHIC RESEARCH AND TEACHING

ORGANIZER AND CHAIRMAN: Tulo H. Montenegro (Brazil)

RAPPORTEUR: Octavio Cabello Gonzales (United Nations Secretariat)

DISCUSSANTS: O. Cabello, C. L. Dedrick, C. E. Dieulefait, G. Goudswaard



## TOPICS FOR DISCUSSION :

1. Fields and forms of training for demographic analysis
2. International Co-operation in training for demographic analysis
3. Needs for inclusion of demographic training in training projects in other related fields

## CONTRIBUTED PAPERS:

Harry ALPERT	The role of the United States National Science Foundation in the training of personnel for demographic research
Octavio CABELLO	Hiring and training of personnel for research, teaching and production of demographic statistics in Latin America
A. J. JAFFE	Forms of training in techniques of demographic analysis
George F. MAIR	Forms of training for demographic research and teaching
Frank S. MORRISON	Training in vital and health statistics to meet immediate and long-range needs of less advanced countries
Hernán ROMERO	Training of personnel for demographic research and teaching
José ROS-JIMENO	Professional training in demographic research and instruction
Calvin F. SCHMID	Suggestions for improving training and professional standards of demographers
UNITED NATIONS POPULATION DIVISION	International measures for training in demography

## Meeting 30

## OUTLOOK FOR WORLD POPULATION GROWTH AND DISTRIBUTION

ORGANIZER AND CHAIRMAN: Pascal K. Whelpton (United States)

DISCUSSANTS: M. Spiegelman (Rapporteur of Meeting 2), W. P. D. Logan, S. Szulc, S. P. Jain (Rapporteur of Meeting 4), O. Cabello Gonzales, E. Grebenik (Rapporteur of Meeting 6), J. Bourgeois-Pichat, K. Williams (Rapporteur of Meeting 8), C. Chandrasekaran, G. Mortara (Rapporteur of Meeting 16), A. Sauvy, J. A. Böök, H. V. Muhsam, A. Oblath (Rapporteur of Meeting 10), H. F. Rossetti, W. J. Gibbons (Rapporteur of Meeting 12), W. D. Borrie, I. B. Taeuber (Rapporteur of Meeting 14), L. W. Törnqvist, L. T. Badenhorst, G. Frumkin, I. U. Pisarev, I. Bogdan

## TOPICS FOR DISCUSSION :

1. Mortality
2. Fertility
3. Structure of population
4. Migration
5. Future population trends

## Meeting 31

## ECONOMIC AND SOCIAL IMPLICATIONS OF POPULATION TRENDS

ORGANIZER AND CHAIRMAN: Dolfe Vogelnik (Yugoslavia)

DISCUSSANTS: P. L. Sherman (Rapporteur of Meeting 22) F. W. Notestein (Rapporteur of Meeting 20), R. Dalla-Chiesa (Rapporteur of Meeting 24), S. Koller (Rapporteur of Meeting 17), J. Daric (Rapporteur of Meeting 18), F. Lorimmer (Rapporteur of Meeting 28), E. Grebenik (Rapporteur of Meeting 11), Y. Koya, N. V. Sovani, P. M. Hauser (Rapporteur of Meeting 26), A. Myrdal, D. V. Glass, T. V. Ryabushkin, B. Minc, F. Janouch, V. F. J. Fallon, A. Arca Parró, A. Sauvy

## TOPICS FOR DISCUSSION :

1. Agricultural resources and population trends
2. Non-biological resources and population trends
3. Capital formation, investment and employment and population trends
4. Internal migration and population trends
5. Aging of the population
6. Social aspects of population trends, with reference to the patterns of family life
7. Legislation, administrative programmes and services relevant to population
8. General discussion of interrelationships of population trends and economic and social factors

## Meeting 32

## CLOSING OF THE CONFERENCE

### III. SUMMARY REPORTS OF MEETINGS

#### *Meeting 1*

#### OPENING SESSION

#### Report on the meeting prepared by the United Nations Secretariat

The first plenary meeting of the World Population Conference was opened on behalf of the Secretary-General of the United Nations, by Mr. Guillaume Georges-Picot, Assistant Secretary-General for the Departments of Economic Affairs and Social Affairs. This and all subsequent meetings were held at the headquarters of the Food and Agriculture Organization of the United Nations, in Rome.

Just before this opening session, the participants in the Conference had attended an inaugural meeting at the Campidoglio in Rome, upon the invitation of the Pro-Sindaco of Rome and the Chairman of the Preparatory Committee for the Conference. The programme of the inaugural meeting included welcoming speeches by Mr. Giorgio Andreoli, the Pro-Sindaco; Mr. P. K. Whelpton, the Chairman of the Preparatory Committee; Mr. G. Georges-Picot, and Mr. F. Dominedo, Under-Secretary of State in the Italian Ministry of Foreign Affairs. These speeches were followed by an address by Mr. Umberto Tupini, Minister without Portfolio, including a message of welcome from the President of the Italian Republic.

In opening meeting 1, Mr. Georges-Picot made the following statement:

"The Secretary-General of the United Nations, Mr. Dag Hammarskjöld, who to his great regret is unable himself to be in Rome, has requested me to open this World Population Conference on his behalf. As I said earlier at the inaugural session at the Capitol, the present Conference is the first to be held since the end of the war, and also the first to be held under the auspices of the United Nations.

"In accordance with the wish of the Economic and Social Council, the World Population Conference is to be devoted to an exchange of views and to a pooling of the experience gained by the most eminent demographers and the principal experts in various other fields on which the items on the Conference agenda have a bearing. Although the participants have been invited on the nomination of the governments, the specialized agencies and private scientific organizations, those who take part in the debates will all speak in their own name and on their own responsibility. I am convinced that this absolute freedom of expression will help to enliven the debates, and that the five hundred participants from the seventy countries here represented will not leave this city without having increased their knowledge of population problems.

"We hope, however, that that will not be the only result of the Conference, for, while it is always interesting for experts to be able to compare views

and supplement their knowledge, it is considerably more important, in the case of population problems, to correct the erroneous beliefs held by the general public and, in particular, to enlighten governments and parliaments whose legislative action affects the evolution of such problems. That is an idea by which my predecessor at the head of the United Nations Department for Social Affairs, Mr. Henri Laugier—whom most of you know and whom I am glad to welcome here—set special store in his efforts to promote action by the United Nations in the study of population problems, in collaboration with Professor Notestein, the international authority whose enlightened advice was very valuable to us, Professor Whelpton, former Director of the Population Division who supervised the preparation of the present Conference, and Mr. John Durand who assisted him in that task and who is at present Acting Director of the Division. Furthermore, although it has been agreed that the Conference would pass no resolutions, the results of your discussions will be submitted to the Population Commission, to the interested United Nations services, to the specialized agencies and to governments who will welcome with keen interest the views of such highly qualified experts as yourselves on the various demographic problems and their interrelationship with the economic and social problems, the solution of which is a prerequisite for a better future for the entire world. You may be sure that all those whose business is the direction of policy, whether on the national or on the international plane, will follow your discussions with very great attention. I had further proof of that the other day when I spoke to the representatives of the principal parliaments of the world, at the opening of the 43rd Inter-Parliamentary Conference in Vienna, of the programme and aims of the World Population Conference.

"It will not, however, suffice for the proceedings of your Conference to have effect among population experts or in the political world; they must also—and this is, I believe, another idea cherished by that dynamic predecessor of mine, Mr. Henri Laugier—produce a reverberation in circles devoted to scientific research.

"Before the First World War, technical progress made possible the absorption of the ever bigger and bigger population increases in Europe brought about by successive falls in the death rates. The subsequent drop in the birth rate finally enabled Europe to approach a new equilibrium between births and deaths at a much higher level of population. Today,

another scientific and technical revolution seems needed in order to permit the absorption of the surplus population created in the under-developed regions, where two-thirds of mankind live, by advances in public health and the fall in mortality, occurrences which have not been followed by any equivalent advance in the economic realm. Thus, the situation in which we find ourselves constitutes one of the greatest challenges that has ever faced the world. You know what its terms are.

"In 1750, the earth's inhabitants numbered about 700 million. In 1850 the figure was 1,200 million. Today it is about 2,500 million; that is to say, the increase in the number of inhabitants has been greater in the past century than the total increase during all the previous centuries since man first appeared on earth. The population has more than doubled in a century, and if the present tendency is maintained, there will be a similar rise, but this time within a single generation, so that about 1980, the population of the world will probably be more than 3,500 million. During that time, a gradual improvement in the standard of living can only be achieved if production grows faster than population. But the rate of population growth is highest in those areas which, economically speaking are the most severely handicapped.

"Those are the terms of the challenge with which we are faced, to that challenge the generation which has penetrated the secrets of the atom should be capable of finding a constructive reply.

"Studies by experts, the communication of knowledge to governments and public opinion, vigilance on the part of research workers, the disciplining of minds and hearts, without which no action can, generally speaking, be effective, those are the conditions for a constructive solution of the grave problems, the terms of which it is the duty of this Conference to define and spread abroad.

"It is because I am convinced of this crying need that I conclude by extending to you, at the opening of this Conference, on behalf of the Secretary-General of the United Nations, my most heartfelt wishes for the success of your proceedings."

Mr. Georges-Picot then called the attention of the participants to the draft rules of procedure for the Conference,<sup>1</sup> which had been proposed by the Preparatory Committee and circulated among the participants before the meeting. No objections being raised, these rules were considered as adopted.

Before calling for the nomination of officers for the Conference, Mr. Georges-Picot presented Mr. J. D. Durand, Acting Director of the Population Division, United Nations Department of Social Affairs, who had been named by the Secretary-General as Secretary of the Conference. He then gave the floor to Mr. P. Depoid, Secretary of the Preparatory Committee, who presented the following nominations on behalf of the Committee:

**Chairman:** Professor L. Hersch, President of the International Union for the Scientific Study of Population.

**Vice-Chairmen:** Prof. P. K. Whelpton, Chairman of the Preparatory Committee,

Prof. D. Vogel'nik, Chairman of the United Nations Population Commission,

Prof. L. Livi, Member of the Preparatory Committee,

Dr. K. C. K. E. Raja, Member of the Preparatory Committee.

Upon the motion of Mr. G. Mortara, these nominees were unanimously elected.

Professor Hersch, taking the Chair, made the following statement:

"May I first express my profound gratitude for the honour you have done me in asking me to preside over the work of the Conference.

"I am perfectly aware of the fact that the honour is not intended for me personally. I count for little among the many illustrious men who have assembled for this Conference from the various countries of the world. My election is naturally only a reflection of your desire to pay a tribute to the International Union for the Scientific Study of Population, as well as an expression of your interest in the problems of population, the study of which it is the aim of the Union to promote. I therefore see in this a happy augury for the success of the Conference. It is mainly for that reason that I accept my election with pleasure and gratitude.

"This is not the first international conference to deal with population problems; it is, however, somewhat different from the earlier ones. The first conference, comparatively modest in scope, was held in 1927 in Geneva on the initiative of Mrs. Sanger, who had hoped that it would prove a scientific weapon for the furtherance of birth control, of which she was an advocate; but that conference did not fulfil her hopes, since it refused to be a vehicle of any form of propaganda, and directed its work primarily towards the scientific investigation of demographic phenomena. Another international population conference was organized on more strictly scientific lines in 1931, here in Rome, by the "Italian Committee for the Study of Population Problems", founded and directed by the great Italian statistician and demographer, Mr. Corrado Gini; the records of that conference were subsequently published in ten fat volumes. I shall say nothing of the conference held in Berlin at the time of the National-Socialist régime; I personally did not attend it. The last conference on scientific research into problems of population was that held in Paris in 1937; it was organized by the eminent French demographer, Mr. Alfred Landry, at that time President (and now honorary President) of the International Union for the Scientific Study of Population; the proceedings of that conference were also published in eight volumes. Last year, the French National Institute for Demographic Studies, directed by our friend Alfred Sauvy, organized in Paris a series of European research meetings on population problems. If we leave out of account these European research meetings, which, as their name shows, were geographically restricted, and concerned chiefly with practical problems, our present conference is being held after a long interval of seventeen years, interrupted by the Second World War, and in very different circumstances demographically, economically, politically and socially.

<sup>1</sup> See document E/Conf.13/PC/3 Annex B.

"The major problem on which the attention of most demographers and of a considerable portion of the educated public was focused at the time of the preceding conferences, was that of the extremely heavy fall in the birth rate of the populations of the Western countries, which were failing to maintain the number of their inhabitants of reproductive age and had consequently become to all intents and purposes declining populations. The great problem which today haunts the minds, particularly of statesmen, and not only in the West but perhaps even more so in the East and Far East, is that of the extraordinarily rapid increase in the populations of the economically under-developed countries, especially those of Asia. The economically backward Asian countries, with a population of a thousand million or even more and a high birth-rate, the like of which has been for centuries unknown in the West, are coming into ever closer contact with Western civilization, and more especially with the progress achieved in medicine and public health, which is effecting a considerable reduction in their death rate; the natural increase of their population is gaining in speed and intensity at an unprecedented rate, and may thus frustrate their governments' efforts to alleviate the poverty of those peoples, a poverty of which the West has no notion, by the enhancement of the national economic resources. The outcome is a state of permanent poverty, a state all the more intolerable to the peoples concerned as they become more fully aware of the gulf between their poverty and the material standards of the Western peoples. The consequence is an increasing urge to emigrate to lands better favoured by nature and civilization, and the spread of social unrest within the countries themselves. The situation in certain Western countries, although less catastrophic, is nevertheless also serious. The problem of population, which, already before the Second World War, had become a serious internal problem in most Western countries, has today grown to be a worldwide, international and social problem threatening world peace and civilization. And besides this, the gravest problem of all, we have other population problems, in themselves perhaps not so serious, but nevertheless of importance.

"Governments and social organizations appeal to demographers for guidance for future action. In particular they require information about surveys and experiments carried out in other countries, particularly in the more advanced countries which have progressed further than their own in the dual decline of the death- and of the birth-rate; others require information regarding the effectiveness of the various methods of countering fertility decline, or the demographic, economic and social consequences of the prolongation of the length of human life which is so conspicuous a feature of our era. Others, again, need enlightenment as to the effects of internal migration, mass emigration abroad or the immigration of various categories of foreign labour, etc. with a view to ensuring a more rational and more effective policy in those spheres, and so on, not to speak of information affecting more specifically medicine or public health, such as ways of countering infant mortality, mortality due to certain contagious diseases, etc. To put it briefly,

political and social action is seeking the co-operation of the science of demography.

"Again, the actual advances achieved in demographic knowledge have brought to the fore new scientific problems the solution of which calls for wider, more varied and more detailed surveys of the peoples of mankind, surveys that can only be conducted by government bodies and big social organizations, or with their co-operation. At the same time, the extension of demographic surveys to many new countries and the specialization of demographic research according to the nature of the phenomena observed (population structures and movements, births, deaths, marriages, divorces, internal and international migrations, etc.) and according to the points of view of the investigators (points of view which are purely demographic, economic, medical, legal, moral, social, etc.) are giving rise to a more and more pressing call for the integration of all this scattered body of knowledge. Such a development is well beyond the capacity of individual investigators and it, too, can only be carried out by organized bodies.

"Collaboration between science and action is, then, being sought in the demographic field and will probably be increasingly sought in future. It is this type of collaboration which is the main distinguishing feature of the present conference as compared with previous population conferences. This conference has not been organized either by the International Union for the Scientific Study of Population or by the United Nations acting independently. It has been convened, in accordance with the Economic and Social Council's resolution of 10 June 1952, under the auspices of the United Nations in close collaboration with the International Union for the Scientific Study of Population and the United Nations specialized agencies interested in population problems.

"But there are all sorts of collaboration. Horseman and horse, for example, collaborate. The horseman feeds his horse and the horse is subjugated by its rider; it not only carries him on its back; it also lets its rider guide it wherever he wants to go. That is not the sort of collaboration to be aimed at between action and science, nor is it what the United Nations and the International Union on Population had in mind in organizing the present conference. Collaboration between science and action can only be really fruitful if both sides are aware of their respective capacities and limits, and if, in consequence, there is mutual respect for each other's obligations and rights.

"Now, every science has its limits, and beyond those limits it must hold its tongue. Even the most splendid science can only give what it actually has to offer. And demography, in terms of positive scientific achievement, is as yet very far from being the most splendid science. The men of action and the social organizations, even the most worthy of respect, would be doing violence to science, they would be forcing it to smuggle in totally unscientific wares under the label of science, if they were to compel it to make statements on matters outside the bounds of its realm and, even worse, to dictate to it what it should say either within or without those limits. Any attempt on the part of our science to

overstep the boundaries of its real competence, or to dictate to the men of action the course to be followed in the infinitely complex conditions of practical life, would create illusions as to the true extent of our present knowledge, illusions that would soon recoil on the science of demography itself; it would be laying far too heavy a responsibility on the frail shoulders of demography. Knowing the limits of our knowledge, we demographers can make no pretention to the role of sophocrats. The most we can say is: these are the demographic facts and the way they developed in certain historical circumstances; this is the present position, and this is the way it will evolve provided present conditions continue; these are the approximate results, with an extremely variable degree of probability, of certain changes, not very numerous, however, in present conditions. This knowledge and half-knowledge we can and should make available to the men of action, and it is for them to decide what use to make of it, to chance their arm and to take the risks inherent in their choice; and on them must fall the responsibility for their action.

"In saying that, I am far from seeking to minimize the usefulness of demographic knowledge. I shall probably be the last to do so. For one thing, knowledge, even if only approximate, even if completely relative, is still preferable to crass ignorance. For another, demographic surveys have been carried out all over the world on so vast a scale and in such diverse conditions that, if correctly analysed, they can undoubtedly offer a number of useful lessons, even for concrete political and social action. I wanted, however, to emphasize certain needful reservations in order to draw attention to the limits of the hopes which the science of population can reasonably hold out and to those of the services which may be asked of it without forcing it to be untrue to itself.

"But, if the Conference is required to render services to the world of action, it must not on that account neglect the main aim of any scientific Conference, which is to contribute to the advancement of science. By putting demographers of different languages and from almost all the main countries in the world in direct touch with one another, by restoring relations interrupted by the war, by bringing together, as far as possible, scientists cut off from each other by iron and other curtains, by mistrust or the passions of the herd, by assembling specialists of different schools but all concerned in one way or another with demographic phenomena and problems, by enabling them all to compare in free discussions, their observations, experience, ideas and analyses, the Conference will be fostering the integration of demographic research, which has become so highly specialized and is geographically so widely dispersed. From this pooling of ideas may spring new ideas, new truths. The very deficiencies in our present knowledge and in our research methods which may be brought to light may also help to suggest new fields and new methods of research.

"We shall therefore not lend ourselves to political, religious or other propaganda; we shall confine ourselves strictly to the scientific examination of facts and ideas. We shall not even pass any resolutions: scientific truths are not adopted or rejected by a

majority of votes; where knowledge is concerned, the individual may be right and all the world be wrong; indeed, even unanimity may be mistaken. And, by maintaining a strictly scientific attitude to facts and ideas, we will be contributing not only to the progress of our knowledge but also shedding clearer light on the road to be followed in the realm of action. We shall also be remaining within the framework so wisely assigned to our conference by the United Nations Economic and Social Council, which, in voting for the convening of the Conference, prescribed that it should be 'devoted solely to the exchange of ideas and experience on population matters among experts in the field concerned'.

"May this Conference fulfil to the utmost the high hopes we all place in it; may it help towards the achievement and diffusion of a little more light, a little more prosperity and a little more mutual understanding in the tormented world which we live in."

The Chairman then called upon Mr. Whelpton for a report from the Preparatory Committee on the arrangements for the Conference. Mr. Whelpton made the following statement:

"The Preparatory Committee was appointed by the Secretary-General of the United Nations in accordance with the resolution of the Economic and Social Council. The members of the Committee were: Mr. L. Hersch, Mr. F. Lorimer, and Mr. P. Depoid, International Union for the Scientific Study of Population; Mr. H. Jacoby, Mr. P. L. Sherman, and Mr. F. N. Fitz Gerald, Food and Agriculture Organization; Mr. L. B. Rist, International Bank for Reconstruction and Development; Mr. R. M. Woodbury and Mr. R. Downing, International Labour Organisation; Mrs. Alva Myrdal and Mr. B. A. Liu, United Nations Educational, Scientific and Cultural Organization; Dr. M. Pascua and Mr. M. Pizzi, World Health Organization; and the following individual experts: Dr. D. V. Glass, Mr. G. Goudswaard, Dr. L. I. Dublin, Mr. H. Rizk, Mr. L. Livi, Dr. G. Mortara, Dr. K. C. K. E. Raja, Mr. A. Sauvy, and Mr. P. K. Whelpton. Mr. Whelpton served as Chairman and Mr. Depoid as Secretary of the Committee. Mr. John Durand and Mr. W. Brand represented the Secretary-General at the meetings of the Committee.

"The function of the Preparatory Committee as stated in the Council's resolution was to assist the Secretary-General in formulating an agenda for the Conference and in making other necessary arrangements.

"In carrying out its advisory duties the Committee held three meetings, in Geneva in November 1952, in Rome in September 1953, and again in Rome in August 1954. A sub-committee on organization was appointed at the first meeting of the Committee as a working group to advise the Secretary-General between the meetings of the Committee. Members of this sub-committee, which had a heavy working load, were: Messrs. J. D. Durand, D. V. Glass, G. Goudswaard, F. Lorimer, G. Mortara, and A. Sauvy.

"An important part of the travel required in connexion with the meetings of the Committee was paid from contributions secured by the International Union for the Scientific Study of Population.

"The results of the work of the Preparatory Committee and the sub-committee on organization are reflected in the documents which have been distributed, namely, the programme of the Conference (and its addenda), the organization of the Conference, the list of nominees for the officers of the Conference, and the provisional rules of procedure. The primary responsibility for the preparation of the programme, of course, has not rested with the Preparatory Committee, but with the staff of the United Nations and the organizers of the various

substantive meetings. The Committee has striven, however, to make suggestions and recommendations regarding the topics for the substantive meetings, the organizers of these meetings, and the discussants of the various sub-topics. The Committee hopes that its activities have been helpful to the United Nations, and that it has contributed in an important degree to the anticipated success of the Conference."

After certain announcements by the Secretary, the Chairman declared the meeting closed.

## Meeting 2

### MORTALITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF LOWER MORTALITY

Report on the meeting prepared by Mr. M. Spiegelman, Rapporteur

#### INTRODUCTION

There is general agreement that the areas of lower death rates include principally the countries of Western Europe and the English-speaking countries elsewhere. It will be convenient to survey the mortality situation in these countries of lower death rates under the following topical headings:

1. Recent trends in general mortality,
2. Mortality from specific causes of death,
3. Mortality in midlife and later,
4. Foetal and infant mortality,
5. Social class variations in mortality,
6. Prospective trends of mortality.

It is not too many decades since the countries now recording the lower death rates experienced many of the mortality characteristics of those areas currently showing high death rates, as described in meeting 4. For these areas with current high death rates, the pattern of mortality now recorded in countries with lower death rates provides not only a goal for achievement but also a basis for understanding the demographic consequences of these changes.

#### 1. RECENT TRENDS IN GENERAL MORTALITY

Within the areas of low mortality, the death rates range widely, with the best records usual in the Scandinavian countries and the Netherlands, and the poorest records in southern Europe. A study of the trends of crude death rates from 1930 to 1950 in these countries of low mortality shows some distinct patterns. For most of the countries under survey, the trend of crude death rates was downward or stationary prior to the Second World War, but during the war period, practically every country experienced an increase in mortality. However, the post-war period is showing a resumption of the pre-war trend for most countries.

The most favourable mortality records, in the early 1930's, were found in Australia and New Zealand, but the crude death rate in these countries took a definite upturn later in that decade which is only partially explained by the increasing proportions of aged in their populations. In 1950, both Australia and New Zealand had higher crude death rates than in 1933; however,

the more recent age-specific death rates were lower in New Zealand in each instance, and at each age period except 65 years and over than in Australia. The crude death rates for the United States and Canada follow a closely parallel course, the rates for Canada being the lower of the two. Although both countries experienced a slight interruption in the downward trend of their crude death rates in the mid-1930's, the record for improvement was soon resumed.

The Scandinavian countries and the Netherlands experienced, in general, reductions in their crude death rates in the decade prior to the Second World War, but, with the possible exception of Sweden, each of them underwent a setback during the war years. However, the post-war record for these countries indicates a continuation of pre-war trends.

In the instances of England and Wales and of Scotland, the pre-war decade was a period of rising crude death rates, with a wartime peak in 1940 and an all-time low in 1948. Although the next two years saw higher rates, they were under those of the pre-war period. Among the other European countries, France, Belgium, Switzerland and Italy recorded downward trends in their crude death rates in the pre-war decade. During the war years, France and Belgium experienced peaks in mortality in both 1940 and 1944, but Italy had only a gradual increase to a peak in the latter year. Among the countries with crude death rates of 15 or more per 1,000 in 1930-1934 and subsequent marked reductions, the declines by 1952 amounted to 51 per cent for Japan, 46 per cent for Ceylon, 42 per cent for Spain, and about 30 per cent for Italy, Finland and Portugal.

There was a general lessening in the rate of decline in mortality with advance in age, and also a more rapid decline of female than male mortality. At the advanced ages, the relative mortality declines have been only moderate in some countries, and absent in others. With the reductions in age-specific death rates in countries of low mortality, there has been a decrease in the variation of death rates among them. However, despite these mortality changes, there has been no substantial change in the ranking of the countries according to the level of their age-specific death rates from about 1930 to 1950. Generation changes in mortality were also traced. That is, the death rates at

ages 25-44 years about 1930 were compared with those of the same generation at ages 45-64 years two decades later in 1950; a similar comparison was made for those at ages 45-64 years about 1930 who reached ages 65-84 years in 1950. In each country, generation mortality for males rises more rapidly than that for females with advance in age from late maturity to midlife. However, for most countries, there is very little difference between the sexes in the rate of rise in generation mortality from midlife to old age. There is a tendency for the rate of rise in generation mortality with advance in age to be relatively more rapid where the initial death rates are low. A point of particular interest is that the average lifetime computed from generation mortality improves less rapidly than that computed from current mortality.

*Contributors and discussants:* Messrs. P. J. N. Delaporte, I. M. Moriyama, M. Pasqua, M. Spiegelman, J. Villar Salinas.

## 2. MORTALITY FROM SPECIFIC CAUSES OF DEATH

Cause of death statistics should properly be based upon medical information and must fit into a logical scheme of classification of medical terminology. Improvement in the preparation and use of cause of death statistics is helped by observance of international agreements, such as the recommendations of the World Health Organization.

Several contributors traced the course of death rates from the principal causes in describing mortality developments in their countries. Thus, in the three Scandinavian countries, the trend of mortality was examined for a number of causes of death for which the diagnosis was considered reasonably uniform for the thirty-year period from 1921 to 1950. It was found that both for pulmonary tuberculosis and for tuberculous meningitis the death rates declined sharply. Decreases were also noted for acute and chronic nephritis. Among the malignancies, mortality from cancer of the stomach recorded a steady decline, but cancer of the breast showed a rather considerable mortality increase in these countries, the rise for uterine cancer being more gradual. For cancer of the lung, which was traced from 1931 to 1950, the increase in mortality was very rapid. Among the other findings noted is a marked rise in mortality from ulcer of the stomach among males in Denmark, and a rather steady increase in the relative importance of fatal accidents and suicide among the causes of death in each of the three Scandinavian countries as a result of the control of many diseases by medical means. Among the three countries, the suicide rate is highest in Denmark, but Norway and Sweden have the poorer accident records. In each of the three countries, mortality from heart disease declined at ages 25-44 years for both males and females; at ages 45-54 years, only males in Denmark showed a rise.

The alcoholism problem alleged in France led to intensive study of its relation to mortality. This was effected in two ways: first, by comparing the time trend of mortality from several causes of death and of the excess mortality among males with that of consumption of wine and other alcoholic beverages; second, by studying the correlation between the leading causes of death in the 90 departments of France. The findings indicated that excessive alcoholism seems to

have an important influence upon mortality after age 35, particularly in the case of pulmonary tuberculosis and also probably for some types of cancer. The study also suggested that in France the higher mortality of males may be closely related to excessive alcoholism.

The death rates in Germany, specific for age and sex, were compared for 1871-1881 and for 1949-1951. The mortality trends in that country were found to be similar to those of other countries of central and northern Europe. In Germany, reductions in mortality from 1892-1894 to 1951 have been most rapid for gastritis and enteritis during the first two years of life, for the acute infectious diseases of childhood, and for tuberculosis. There was very little decrease in infant deaths from endogenous causes and from congenital malformations. The advanced age groups in Germany showed little reduction in mortality from diseases of the circulatory system, tumors, and senility.

In 1901-1905, the crude average annual death rate for Spain was 26.1 per 1,000 population, well above that of most other countries of Western Europe. In contrast, the rate for 1953 was only 9.5 per 1,000, a level comparable to that of the most favoured countries. The decline in Spain was very appreciable after 1942, following the civil war and the ensuing period of adjustment. The trend of mortality from the infectious conditions was very much like that in the other countries. Recorded mortality from the circulatory diseases and cancer in Spain is lower than in the more developed countries.

The trend of death rates from the major causes of death in countries of low mortality may be summarized as follows. As already indicated, there have been marked reductions in mortality from tuberculosis and from pneumonia and influenza. Cancer mortality among females has declined for many countries, but the recorded rate among males has risen, perhaps due to advances in diagnostic techniques and an extension of their availability. Of particular significance in the decline of diabetes mortality are advances in early recognition and treatment. In most countries, cardiovascular-renal mortality has decreased at ages 25-44 years. For these conditions, the death rates among males at ages 45-64 years generally rose, but for females the rates declined; after age 65, the increasing proportion of population at the extreme old ages contributes to the mortality rises. Many of the degenerative and other chronic conditions typical of midlife and later have their beginnings in earlier years, and their origins may be either environmental or genetic or both. A better understanding of these problems requires an adequate body of morbidity data.

*Contributors and discussants:* Messrs. M. J. Aubenque, K. O. Freudenberg, J. Gabriel, S. C. Ledermann, M. Spiegelman, J. Villar Salinas and Miss M. Lindhardt.

## 3. MORTALITY IN MIDLIFE AND LATER

Some of the characteristics and trends of mortality in midlife and later have already been described in earlier paragraphs. In most discussions of mortality reductions, improvements from one time to another have been stated in relative terms, that is, the decreases in mortality during a period have been presented as percentages of the initial rates. This has given the picture of relatively greater improvements at the younger ages than at the older ages. However, sight



must not be lost of the fact that the absolute reductions in mortality rates, that is, the differences in these rates from one time to the next, tend to rise with advance in age. It is the latter that is used in estimating the number of lives saved during any year from premature death by mortality reductions. Such information has its own value in demographic analysis and is also pertinent in the study of public health accomplishments.

As a consequence of the decline in mortality at the younger ages, it was stated that the death rate curve tends to follow a simple exponential law, as suggested by Gompertz, because the constant introduced by Makeham to allow for deaths due to infectious diseases is gradually disappearing. By dividing the death rate into two components—endogenous and exogenous—in the case of seven countries, it was possible to develop an exponential formula for the biological element. Although the latter is not to be regarded as invariable, it has been less affected by improvements in sanitation than the exogenous element. If the death rate reflected only the endogenous element, it was inferred that its level would decline only slightly and not vary greatly from one country to another. For many endogenous causes of death, the form of the mortality curve follows a simple exponential law beginning with some higher age. A question was raised whether a comparison of observed values with those derived from a fitted exponential curve should not be based upon the absolute numbers rather than the logarithms of these numbers.

*Contributors and discussants:* Messrs. L. Hersch, M. Spiegelman, J. A. Sutter, L. Tabah.

#### 4. FOETAL AND INFANT MORTALITY

At least one out of every five pregnancies throughout the world is terminated as a foetal death and the net effect of the reproductive wastage amounts to the loss of about one-third of all conceptions. Infant mortality is declining in almost all countries of the world as a result of the control of the medical causes of death. However, the causation of foetal and perinatal mortality (foetal deaths plus deaths in the first month of life) is of a different nature, not being entirely amenable to control by progress in the medical sciences. It was asserted that the perinatal period should include, at most, deaths within the first week of life in addition to foetal deaths. The basis for this statement is that mortality during the second, third, and fourth weeks is governed by the same factors influencing health, sickness, and death during the remainder of the first year.

Biological, physiological, social and economic factors appear to be heavily associated with this early wastage of life, although the nature and relative importance of these factors have not as yet been adequately explored. A reduction of foetal and perinatal mortality similar to the reduction of infant mortality which has occurred during the last fifty years would permit the maintenance of the present rate of growth of the world's population with about one-quarter fewer pregnancies.

By combining information from the birth certificate with that from the death certificate for infants, it becomes possible to obtain an insight into both the social and biological factors bearing on infant mortality. Some results of such a study of social and biological

factors in infant mortality in England and Wales in 1949-1950 were presented. It is first demonstrated that, since near the beginning of the century, neonatal mortality (deaths in the first month of life) has moved downward very gradually, while post-neonatal mortality (deaths in the first year of life after the first month) showed a striking decrease. This achievement has been due in large measure to improved infant feeding and to the reduction in mortality from infectious diseases. However, differences in foetal and infant mortality rates between the social classes in England and Wales have remained proportionately unchanged between 1939 and 1949, notwithstanding the levelling of classes with regard to nutrition during the intervening war. A wide range of post-neonatal mortality was observed among the social classes, the rate for the class at the bottom of the scale being four times that of the most favourably situated class.

For a given parity, the foetal death rate was found to increase steadily with the age of the mother, whereas the post-neonatal rate decreased with age up to the late 1930's. For a given age group, the foetal death rate drops sharply between first and second births, and then rises steadily with parity; on the other hand, the post-neonatal mortality rate increases steadily with parity from first births onwards. Standardizing the rates for age of mother and parity had little effect on the social class gradients of the foetal, neonatal, and post-neonatal rates. From further consideration of the data on hand, it appears that, in modern England and Wales, there are at least three sets of factors whose actions on the foetal and infant mortality rates are to a large degree independent from each other. These factors are social class, age-parity, and geographic region of birth. There are also other factors present, such as advances in medical treatment and changes in the incidence of disease, but these did not enter into the present investigation.

Another indication provided by the study in England and Wales is that the risk of post-neonatal death from infection is greater in the larger family, in contrast with deaths from congenital defects. This is a problem of particular importance among young mothers.

*Contributors and discussants:* Messrs. F. Fajfr, M. L. Febvay, J. R. N. Morris, J. A. Heady, C. Daly, S. Peller, V. G. Valaoras.

#### 5. SOCIAL CLASS VARIATIONS IN MORTALITY

Before entering into an account of a recently completed analysis of social class variations in mortality in England and Wales, it was explained that every occupation in the country, of which there are many thousands, is assignable to one or the other of 586 occupational unit groups according to a prescribed classification system operating in 1950. In turn, these 586 occupational groups are each assigned to one or the other of five social classes on the basis of predominant characteristics of the majority of persons in the unit group. The general implication is that the classes so composed will reflect the differing social make-up and environment normally associated with persons within that occupational category.

The recent study of social class mortality in England and Wales deals with deaths in 1950 related to the 1 per cent sample results of the 1951 census. It constitutes a preliminary study to the full analysis which



will cover deaths during 1949-1953. In the studies of 1921-1923 and 1930-1932, there was an uninterrupted upward gradient of mortality from Social Class I (professional) to Social Class V (unskilled workers), but the 1950 gradient was much less regular, the lowest ratios being given by Social Classes II and IV. Before attempting to explain this departure in the 1950 gradient, it was considered advisable to await more comprehensive figures.

In 1930-1932, the mortality of married women was analysed according to their husband's occupation. By this means, it was possible to distinguish between mortality risks that were primarily of occupational origin and those arising rather from the socio-economic environments in which people in various kinds of occupations tend to live. In 1950, the social class mortality gradient for married women also became less regular than it was in 1930-1932, but only Social Class II was out of step; the others increased from Social Classes I to V.

For men aged 20-64, the steeply rising gradient in mortality from respiratory tuberculosis from Social Class I to V seen in 1921-1923 and 1930-1932 has been repeated in 1950, but with less regularity. In the case of cancer of the stomach, at ages 20-64 both men and married women show a regular gradient of increasing mortality in each of the last three studies. The 1950 figures for cancer of the lung for men at ages 20-64 seem to suggest a rising gradient from Social Class I to V, but there are no similar signs among married women. Mortality from cancer of the breast displays a very definite gradient downwards from Social Class I to V for married women, but that from cancer of the cervix shows an opposite tendency. The much higher fertility of Social Classes IV and V over I and II may go a long way in explaining these mortality patterns, for it is known that mortality from cancer of the breast is lower and from cancer of the cervix is higher among women who have borne children than those who have not. Better diagnosis in Social Class I may be an explanation for the downward gradient of mortality from leukemia from Social Class I to V.

In 1950, mortality from coronary heart disease for men and for elderly women was decidedly higher in Social Classes I and II than in IV and V, but for some reason the ratios for women aged 20-64 runs in the opposite direction. The male pattern of gradient may be due to differences in dietary habits and physical activity. The mortality ratios for myocardial degeneration are lowest in Social Class I and increase to Social Class V.

Bronchitis gives the steepest and most uniform mortality gradient of all, with mortality at ages 20-64 roughly five times higher in Social Class V than in Social Class I. Very similar is the pattern of mortality from pneumonia. For men, mortality from diabetes mellitus is highest in Social Class I and declines towards Social Class V; the gradient runs in the opposite direction for women.

Very small differences in mortality were found among the social classes in Amsterdam during 1947-1952, in contrast to the situation observed elsewhere. However, mortality for the total group of men at ages 15-64 in Amsterdam is already very low compared with other countries. This lack of social class variation

in mortality may be attributed to the prevailing favourable level of social and medical care in Amsterdam.

There is room for amplification in studies of mortality according to socio-economic class since there are many variables influencing mortality within each social class. According to Mr. A. Sauvy, the term "social class" mortality is very vague and it is necessary to distinguish the principal influencing factors, namely: knowledge of the individual and of his parents in matters of hygiene, the will to live and take care of one's self, income, the level of social and public health measures by the community and the quality of medical care. Sauvy states that the first, second, and fourth factors are of greater significance than the others.

*Contributors and discussants:* Messrs. W. P. D. Logan, J. Meerdink, A. Sauvy, P. de Wolff.

## 6. PROSPECTIVE TRENDS OF MORTALITY

Consideration of prospective trends of mortality is important for several phases of social and economic planning. For insurance companies, the prospective course of mortality affects the costs of life insurance and, more important, of annuities.

A method for forecasting mortality for Sweden was described. First, a graph was prepared of the age-specific mortality curves for Sweden at successive periods; reflecting reductions in death rates, the curve for each period lies under that for the period preceding. With this succession of curves, it was possible to trace generation mortality curves by connecting points on the period curves that relate to a specified generation characterized by its year of birth. These generation mortality curves can be makehamized only from a higher age than the period mortality curves. The force of mortality of a specific generation may be represented as a sum of two functions, one consisting of a makehamized branch which contains the principal component of mortality, and the other consisting of a decreasing function which represents mortality from infections and disappears in the middle ages. For the purpose of extrapolating mortality, Swedish actuaries have analysed trends of mortality from specific causes of death with a view towards rational predictions for the various diseases. A mathematical method of extrapolation described uses a classification of the causes of death into a double dichotomy. The first classification is into variable causes (those likely to be influenced by therapeutics and standard of living) and constant or eventually increasing causes of death; each of these classes was further divided into a disposition category (which were treated by a special method) and a non-disposition category. The extrapolated mortality values for the different causes of death were added to yield total mortality, and the results were presented both as period and generation mortality curves.

Mr. H. F. Dorn stated that the future trend in mortality rates will be affected not only by new advances in the therapy and prevention of specific diseases but also by the rapidity with which the potential benefits of present knowledge are made available to the entire population. Both of these are governed by the social and economic conditions under which any population group exists. As a basis for his mortality projections for the United States, a preference was expressed for limiting the survey of past trends to 10

or 15 years, paying particular attention to the ages of late adult life. In the earlier years, the major factors contributing to the decrease in death rates have been largely in the fields of preventive medicine, public health measures, and a general rise in the standard of living. Unlike the past, the major factor in bringing about large decreases in mortality in the future will be advances in medicine and surgery. Furthermore, mortality during the early years of life now is so low that even a continuation of the prevailing annual rates of decrease will have only a slight effect upon the average longevity of the total population of the United States.

Since accidents, cancer, and the cardiovascular-renal diseases account for three-fourths of all deaths at ages 50 and over, Mr. Dorn studied the trend, since 1936, of the age-sex-race specific death rates from these three categories and the residual category of all other causes. The average annual rates of change for these four categories and also for mortality from all causes were projected to obtain two independent estimates of age-sex-race specific death rates for 1960 and 1970. Inconsistencies in the results obtained by extrapolating and summing the four categories and by extrapolating mortality from all causes combined were eliminated. The estimated increase in expectation of life at birth between 1950 and 1970 for each of the four sex-race groups in the United States is considerably less than that occurring during the 20 years prior to 1950. For 1970, the expectation of life at birth was almost 70 years for white males, over 76 years for white females, 67 years for non-white males, and over 71 years for non-white females.

*Contributors and discussants:* Messrs. H. F. Dorn, K.-G. Hagstroem, R. J. Myers.

### CONCLUSIONS

The great reductions in mortality in areas of lower death rates have been achieved very largely through control of the infectious diseases which have benefited principally the ages before midlife. As a result, the focus of attention in these areas has shifted to the

degenerative and chronic diseases which, although prevalent at all ages, are associated mostly with later life. This shift of emphasis has brought to the foreground the need for intensive study of the environmental and genetic factors leading to the onset of such conditions and of the morbidity and mortality experience among these impaired lives. Studies in these fields are of the cohort or longitudinal type, in which a large number of lives is kept under observation for a period of years; they require careful planning and a long-range point of view. These studies are generally localized or made on selected segments of the population. Their number is very small in relation to the many unsolved problems in the epidemiology of chronic disease.

Although the areas of lower death rates have established some remarkably favourable mortality records, it is normal to find significant social-economic and geographic mortality differentials within individual countries. Reduction of such differentials depends not only upon greater availability of medical and public health services in the segments of population with the poorer mortality, but also upon improvements in their standard of living. Within each country, as among countries, the mortality record for the most favoured segment of the population sets the goal for the rest of the nation.

The mortality trends in countries with lower death rates have played a significant part in both the growth of their populations and the changes in their age and sex structure. Equally significant are the trends in fertility and, in some instances, the flow of migration. However, this experience cannot serve as an indicator, without modification, of the probable course of events in areas now with high death rates. In these areas, as Mr. S. Swaroop points out in his paper submitted at meeting 4, the declines in mortality may be more precipitous than was the case in the areas of current low death rates and, moreover, the age and sex differentials in the declines may be different. Such differentials must be considered before drawing demographic inferences by analogy from areas of lower death rates to those of higher death rates.

## Meeting 3

### EVALUATION OF QUALITY OF DEMOGRAPHIC STATISTICS

#### Report on the meeting prepared by Mr. P. Luzzatto Fegiz, Rapporteur

#### 1. THE GENERAL PROBLEM

Population censuses have been taken in many countries since 1950. The nature of the results which were known on 30 June 1954 is indicated in the paper prepared by the United Nations Statistical Office.

The papers submitted at the meeting show that studies of the accuracy of population statistics have also been greatly developed during recent years. The first studies of this kind were made in the late nineteenth and early twentieth century in Australia (New South Wales-Knibbs), Scotland (Dunlop) and Germany.

At the time of the 1940 censuses important studies in this field were made in the United States of

America, Canada, Brazil and Switzerland. As Mr. P. Depoid pointed out at the Conference at New Delhi in 1951, the International Statistical Institute decided to set up a commission in co-operation with the International Union for the Scientific Study of Population to organize a survey of the studies of this kind already undertaken. The results of the survey have not yet been published, but the findings, as regards the checking of the quality of censuses, are as follows:

(a) Countries with population registers, such as Belgium, the Netherlands, Sweden and Norway, check their censuses by comparison with the registers.

(b) Many investigations, in particular sample checks to evaluate the quality of data, have been carried out in recent years.

In addition to the studies mentioned in the papers submitted, reference should be made to studies carried out in Canada, Switzerland and Yugoslavia. In France, a sample survey to check the accuracy of the results will be undertaken shortly following the census taken in May 1954.

## 2. THE LIMITS OF STANDARDIZATION

It is dangerous to carry standardization too far in the tabulation and presentation of statistical data.

As Mr. G. Frumkin pointed out, unusable data will continue to be unusable even if they are accompanied by notes, references and figures referring to a code of some kind. In certain cases they are not worth reproducing. Errors in data can sometimes be better detected by appropriate analysis than through the use of standardized questionnaires.

The shortcomings of data are often concealed by the use of averages or larger groupings (for example, a continent). The fact that errors cancel out may give the wrong impression that the situation is satisfactorily known. For example, a census may contain both duplications and omissions, or the migratory movements may happen to cancel out.

If instructions and questions are standardized on the Western model they are not applicable in some under-developed countries. The dead weight of primitive conditions in these countries defies any schedules drawn up according to Western concepts. Backward countries must not be asked to provide what they cannot supply. Methods must be adapted to the mentality of the populations concerned and the over-use of letters, questionnaires, etc., must be avoided. A personal interview, adapted to local conditions and the population groups concerned, is better than standardized circular letters.

## 3. DEMOGRAPHIC STATISTICS IN THE UNDER-DEVELOPED COUNTRIES

In this connexion Mr. S. P. Jain remarked that the economically under-developed countries are also under-developed from the statistical point of view. They are, however, the countries of the greatest importance from the point of view of future world population growth. They include approximately two-thirds of the world's population and their demographic potential is very high owing to the steady decline in mortality rates which is not accompanied by a corresponding fall in the birth-rate.

The methods and definitions for the tabulation of demographic statistics recommended by international organizations cannot be used in the under-developed countries because of the shortage of trained staff as well as the absence of the institutions or the social conditions which make it possible to obtain accurate results in the developed countries. Thus, for example, mortality statistics by cause of death and age are necessarily inaccurate in the under-developed countries if they are presented in the internationally accepted manner, as, owing to the shortage of medical staff, doctors are not required to issue death certificates and most people do not know their exact age. Messrs. S. P. Jain, K. B. Madhava, G. Mortara and other participants therefore emphasized that in international recommendations the type of statistics proposed, the

definitions adopted and the classifications to be used in tabulation (in particular, the definition of age groups) must be adapted to the needs of the under-developed countries, bearing in mind the special conditions in these countries in regard to these various problems, in order to produce results which can be compared, at least in their global form, with the results published by the more advanced countries.

If, for example (as Mr. J. A. Bourdon pointed out) the population of one region is inflated as a result of systematic errors, while the figures for births are accurate, it will immediately be apparent that the birth rates are improbably low in comparison with those of other regions which are similar from the economic and social points of view.

## 4. METHODS OF TESTING THE QUALITY OF STATISTICS

The methods used in various countries to check the quality of demographic statistics were described in particular by Messrs. G. Frumkin, D. V. Glass, F. Linder, W. P. Mauldin and P. Vincent.

Referring in general, during the discussion, to the comments of the authors of papers, Mr. Glass suggested that preference should be given to accuracy tests capable of indicating how the particular error in question could be avoided. He added that in several countries the quality of statistics could be improved by the use of data relating to social insurance or other fields in which reliable demographic information is needed for administrative purposes.

In the papers submitted and in the course of the discussion several participants emphasized that there are limits to the applicability of any method, however sound, when there is no means of obtaining reliable basic data.

If, as is the case with certain tribes in Burma (statement by Mr. Kyaw Khine) most members of the population group do not know their correct age, a census could be taken two or three times over using increasingly competent personnel without producing any improvement in the exactness of average age, which is unknown and cannot be determined.

Further, even in cases where verification by means of sample surveys carried out by selected staff may produce more reliable results than those of the original census, there is still the difficulty of finding workers of really better qualification than those employed in the first census (Mr. Kyaw Khine).

In an advanced country, if incorrect replies are given deliberately by the persons interrogated (for example, because they are afraid of being taxed), mere repetition of the inquiry will not produce better results.

As Mr. B. Benjamin pointed out, progress in the organization of demographic statistics generally leads to a quantitative but not a qualitative improvement in the figures. The number of houses and families omitted tends to be reduced, but it does not follow that the accuracy of replies concerning age, profession, etc., also improves.

However, the verification of results by sampling procedures is generally to be recommended, especially if study of the preliminary results reveals certain causes of error.

The discussion on methods of reducing errors suggests the conclusion that the first step must be to organize the census operations in such a way as to reduce avoidable errors, e.g., by clearly establishing the boundaries of the areas allocated to enumerators.

Consideration must also be given to the enlightenment of the public to ensure that citizens give accurate information, in their own interest. Better organization of the registration of births and more widespread education also tend to reduce the frequency of unintentional errors (Mr. Mortara).

#### CONCLUSIONS

With reference to the conclusions in the paper by Mr. W. P. Mauldin, it is felt that the views of the

participants can be correctly summarized by expressing the hope that:

(1) Studies will be undertaken in each country on the incompleteness and inaccuracy of demographic statistics and on the causes of these deficiencies;

(2) National statistical services will include in their publications of census results and statistics of births, marriages and deaths: (a) the crude data; (b) the methods used to appraise their accuracy; (c) the findings of these investigations;

(3) The specialized agencies will endeavour to improve the codes they use in their publications relating to estimates of total population, the accuracy of census results and the value of statistics of births, marriages and deaths.

### Meeting 4

## MORTALITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF HIGHER MORTALITY

### Report on the meeting prepared by Mr. S. P. Jain, Rapporteur

#### INTRODUCTION

Mortality trends are of major significance in a review of the outlook for world population growth. In meeting 2 these trends were discussed for the areas of relatively low death rates, whereas meeting 4 was devoted to the areas of higher death rates. In view of the lack of reliable and detailed statistics on mortality in these countries it was necessary first to define these areas, and to gain some idea of their mortality levels and of past trends. Secondly, attention was to be given to infant and child mortality, which accounts for nearly 40 per cent of all mortality in these areas. Thirdly, the factors affecting mortality trends were to be analysed in order to obtain a perspective of the possible future trends. It was also necessary to refer to the sources of knowledge about mortality levels, trends, and the factors affecting them and to suggest ways and means of improving information.

Pointing out that the areas of higher death rates account for nearly two-thirds of world population, the Chairman, Mr. K. C. K. E. Raja, announced that the discussion would be divided into the following topics:

1. General mortality,
2. Infant and child mortality,
3. Factors affecting mortality trends:
  - (a) Public health measures and sanitation,
  - (b) Food supply and nutrition,
  - (c) Economic and social conditions,
4. Recent and prospective trends in mortality as they affect population growth.

#### 1. GENERAL MORTALITY

This topic was introduced by Mr. M. Pascua.

If the areas which had a general death rate of 20 per 1,000 or more during 1935-1939 are designated as territories of high mortality, it is seen that Asia as a whole (excluding Japan), the areas occupied by non-European races in Africa, most countries of Central and South America and certain countries of south-eastern Europe fall into this category. Of these, the

Asian and African populations have higher mortality levels than those in the other regions mentioned. Registration of vital statistics lacks completeness and accuracy in respect of age and cause of death in all these areas. Even so there is reason to believe that a definite fall in the death rate has taken place in these territories during recent years, as can be seen from the figures given below. The years to which the figures relate are shown in parentheses.

	Crude death rate per 1000 population	
1. Egypt .....	19.3 (1951)	26.9 (1935-39)
2. Mexico .....	15.4 (1953)	23.3 (1935-39)
3. Chile .....	13.2 (1953)	23.7 (1935-39)
4. Ceylon .....	10.9 (1953)	24.5 (1935-39)
5. India .....	15.0 (1953)	22.6 (1935-39)
6. Federation of Malaya ...	11.2 (1952)	22.1 (1935-39)
7. Malta, including Gozo ...	10.7 (1952)	20.3 (1935-39)
8. New Zealand (Maoris) ..	12.3 (1952)	20.0 (1935-39)

It does not seem correct to assume that, in all cases, the extent of deficiency of registration was uniform during the period covered by these figures. At least in the case of India the available evidence appears to be strong for believing that a recent deterioration in registration is responsible for part of the observed reduction in the death rate. Census studies show that the average level of mortality in India during 1941-1950 must have been of the order of 27 per 1,000 as against figures of well over 40 per 1,000 up to 1921, a progressive decline having occurred during the succeeding decades. Similarly, studies in a number of countries based on census data or on limited field surveys support the view that a fall in mortality, and in some cases a substantial fall, has taken place in recent years.

Life tables and age-specific mortality rates, wherever available with a reasonable degree of reliability, also show a fall in the mortality rate for both sexes at all ages.

#### 2. INFANT AND CHILD MORTALITY

This topic was introduced by Mr. V. G. Valaoras.

In most countries of high mortality, deaths among infants account for nearly 20 per cent of the total

deaths at all ages. Deaths among children above one year are responsible, on an average, for another 20 per cent. Countries which have advanced more in public health and sanitation measures have shown relatively higher rates of decline in infant and child mortality than those which have not. Nevertheless, in comparison with what has been accomplished in countries like New Zealand, the United Kingdom and the United States of America, the prevailing rates of child mortality in areas of high death rates continue to be high. In Brazil, the infant mortality rate is estimated to be between 160 and 170 per 1,000 live births; in India, the figure is about the same level and in Indonesia somewhat higher, perhaps 200. Among the non-European races in Africa the rate may be still higher, although the sample census of Southern Rhodesia revealed a rate of 131. It is not known how far incompleteness of recording was responsible for this figure. In Ceylon, the figure was 141 in 1946, but it came down sharply after malaria was controlled and stood at 71 in 1953. In Egypt, the registered infant mortality rate was 251 in 1917, it was 160 in 1931, 150 in 1941, and 129 in 1951.

It is rather unfortunate that the countries experiencing high infant and childhood mortality are precisely those in respect of which data on mortality levels are either lacking or grossly under-estimated.

It is also significant to note that, in countries with high infant mortality, the number of infant deaths after the first month of life remains high. In Egypt it is 81 per cent of the total infant deaths, in Chile and Peru 64 per cent, and in India 55 per cent as compared with 30 per cent in countries with low infant mortality rates. The causes responsible for this great waste of life are the scarcity of medical and sanitary facilities, the low family income, insufficiency of food, and lack of the education that would help mothers to make the best use of available resources. Improvements in environmental and sanitary conditions, better feeding and mothercraft would help to reduce infant mortality after the first month of life.

During the discussion on general mortality and on infant and child deaths, a number of speakers stressed that it is essential to improve vital statistics registration in these areas of high mortality. Their total population is estimated to be about two-thirds of the inhabitants of the world. There is clear evidence of falling death rates in these regions and it seems to be not unlikely that the fall will continue. Such a steady decline in mortality must have its repercussion on the world population problem and a continuous study of the demographic features of these regions of high death rates is therefore desirable. Studies of this nature are not possible without an improvement in the registration of vital statistics. Methods based purely on Western experience might not work in these areas, and a variety of approaches may have to be devised in order to meet the differing conditions of individual countries or territories. The suggestion was put forward that sample censuses might prove useful, but deficiencies in the nature and quality of the information collected, which may arise from the fact that those who are interviewed by the enumerators are unable to supply reasonably correct answers, may materially reduce the value of such censuses. Moreover, sampling methods cannot replace, to a satisfactory extent, vital statistics registration and the

objective should be to establish in these regions systems of such registration, which may be improved in the course of time. Calibrating sample surveys will prove useful as an adjunct to registration when it has been established, even on an imperfect basis.

An attempt by an international organization such as the United Nations or its specialized agency, the World Health Organization, to assess the quality of the vital statistics made available by different countries was put forward as a suggestion for consideration. The need for assisting national Governments, where necessary, to develop improved methods of registration and compilation of vital statistics was also stressed. In view of the widely differing quality of the vital statistics made available from different countries, the question was raised, whether it is appropriate to collect such information on a standard questionnaire for all countries. The view was expressed that it is desirable to explore the possibility of prescribing special standards for under-developed areas.

Messrs. S. Chandrasekhar, G. Frumkin and C. J. Martin, in addition to the authors of relevant papers, took part in the discussion on topics 1 and 2.

### 3. FACTORS AFFECTING MORTALITY TRENDS; PUBLIC HEALTH AND SANITATION MEASURES, FOOD SUPPLY AND NUTRITION, AND ECONOMIC AND SOCIAL CONDITIONS

The above topics were introduced, respectively, by Messrs. D. M. de Silva, C. Chandrasekaran, and H. Romero.

While public health measures and sanitation, food supply and nutrition, and economic and social factors all undoubtedly have their influence on the death rate of a community, they interact on one another and it is their combined effect which expresses itself, over a period of time, in the mortality trend of that community. Provision of adequate health services and improvement of environmental hygiene depend to a large extent on the availability of the necessary funds for expenditure; the raising of the standard of nutrition to a desirable level requires that the community should be able to pay for it, and development of the material and human resources available to it in a manner designed to promote public welfare will be determined to a considerable extent by the social and economic policies which are pursued by that community. It is true that, for short periods, emphasis on one or another of these different groups of factors may produce a fall and even a substantial fall in the death rate, but a sustained low mortality can only result from a comprehensive programme of action to provide, on a permanent basis, certain minima which are essential for a healthy life. These minima include adequate provision for medical care, curative and preventive, a clean and healthy environment to live in, a food supply of proper quality and in sufficient quantity and facilities for recreational and cultural pursuits.

Recent mortality trends in a number of the countries under consideration show that vigorous public health measures can and do bring down the death rate sharply without a marked improvement in the nutrition of the people. Japan and Ceylon are outstanding examples. It is claimed that, in Israel, the significant

reduction in infant mortality which has taken place was due more to public health measures than to social and economic changes. Malaria control has had a striking effect on the total death rate of the community and of infants and children in a number of countries, particularly where the campaign was of an intensive character covering the whole affected population. In Ceylon, the general death rate declined from about 20 to less than 13, in Mauritius from 25 to less than 15, in Sardinia from over 14 to below 10, and in Venezuela from 16 to 14. Similar reductions in infant mortality have also taken place as the result of anti-malaria campaigns. In Mauritius, it dropped from an average of 150 during the period of 1934-1948, before malaria control, to 91 in 1949 and 81 in 1952. In Venezuela, the rate dropped from 110 to 80. In Ceylon, the reduction observed in infant mortality after the malaria control campaign was markedly greater in malarious districts than in others. Decline in malaria mortality is also reported from India, Indonesia, and African territories. In Puerto Rico, 9 per cent of the total deaths were due to malaria in 1933. In 1953, there were only two deaths due to the disease.

Antibiotics, sulpha drugs and other recent therapeutic agents have greatly widened the range of control over sickness and mortality and these have been utilized to varying extents in the different countries to give relief to patients. In addition, prophylactic vaccination against communicable diseases and other preventive measures have been carried out as far as the available resources permitted in individual countries. Maternal and child health programmes are being developed as well as health services for the general community. All these developments have contributed their share to the declining mortality trend of recent years.

In the Soviet Union, it was reported that the mortality rate of 30.2 in 1913 dropped to 22.8 in 1927 and to 8.9 in 1953. This spectacular fall was attributed to the socio-economic policy pursued in that country and to the consequent developments whereby a considerable rise in the standard of living was brought about, an extensive system of medical care was made available to the people in urban areas free of cost, and facilities were provided for their recuperation in rest-homes and sanatoria at greatly reduced rates and even free of charge in some cases. Similarly, in Romania it was claimed that extensive social and economic changes were mainly responsible for the lowered mortality and improved public health of recent years.

The discussants who participated were Messrs. M. C. Balfour, I. Bogdan, O. Cabello Gonzalez, Neffisa H. Eissa, B. Gil, M. V. M. Herchenroder, M. Pizzi, M. K. Razzak, T. V. Ryabushkin, and H. H. Sonnabend.

#### 4. RECENT AND PROSPECTIVE TRENDS IN MORTALITY AS THEY AFFECT POPULATION GROWTH

This topic was introduced by Mr. S. P. Jain.

Although disease, insanitation, want and suffering continue to be outstanding in many parts of the areas with high death rates, there is evidence of a progression of ameliorative measures with the beneficial effect of reducing sickness and mortality. This process may well be expected to gain momentum in the coming years. In the first place, the Governments of the coun-

tries of these areas are increasingly recognizing their responsibility to promote the welfare of the peoples under their charge and are taking measures to this end. In India, for instance, the large irrigation projects that are being executed will increase agricultural productivity by bringing many million acres of new land under cultivation; they will also provide electricity on a large scale to facilitate the development of basic industries essential for the welfare of the country and an extension of cottage industries far into the countryside, in which over 80 per cent of the people live. These measures tend to reinforce the effect of public health measures on the general mortality trend. At the same time, a programme of social action is in progress with emphasis on a permanent improvement of the standards of life of the lower sections of the people, and thus a stable foundation is being provided for the present advance in public health and welfare to consolidate itself and to promote a continuing rise in national well-being. Similar tendencies are in evidence elsewhere also, although the range and effectiveness of the measures that are undertaken vary in different territories. The results so far achieved in Ceylon and other areas by the application of new sanitary measures and control of insect-borne diseases are telling demonstrations of what the future may bring to the areas of high mortality.

International help and co-operation constitute another significant factor in this connexion. The specialized agencies of the United Nations are promoting actively a co-operative effort between the Governments of these countries and themselves in their respective spheres of action. Similarly, the United States bilateral programme of financial and technical assistance to under-developed countries and the Colombo Plan are making available to the regions of high mortality scientific methods of dealing with sickness and disease as well as of improving the standards of life of the people.

Further, the awakened conscience of the civilized nations of the world and the development of communications are making provision for alleviating the effects of large-scale suffering, sickness, and reducing deaths due to disasters such as famines, floods and earthquakes.

In the circumstances, there is room for a reasonable measure of confidence in assuming that the general trend of mortality in these regions of high death rates may definitely be downward in the immediate future. This trend depends of course on the factors promoting it continuing to operate favourably. If internal changes slow down the process of constructive work going on in these countries in the fields of health and social welfare or if they reverse the process altogether, then the expectation of a progressive fall in the death rate will naturally not be borne out. An important factor in this connexion is the continuance of help and guidance from international sources to these under-developed countries, without which at least some of them may find themselves unable to advance for lack of the essential technical advice and supplies.

There are other possible hindrances also to a steady decline of death rates in these regions. Malaria control has played a significant role in producing this decline. The evidence available from Greece suggests that the anophelene mosquito is rapidly developing resistance to DDT and other insecticides which are in use at



present. The situation thus created may well prepare the ground for renewed large-scale outbreaks of the disease especially as the control of malaria in these areas for a number of years must have tended to produce a population largely non-immune to its attack. Unless some other means of interfering effectively with the cycle of infection involving man, the mosquito, and the parasite becomes available in the meantime, the possibility of malaria again becoming a major menace to health in these regions cannot be avoided.

During the meeting frequent reference was made to the acceleration of population growth which the prevailing tendency for a lowering of the mortality rate is promoting. Apart from the significance, from the standpoint of the world as a whole, of a steady growth of numbers affecting about two-thirds of the total population of this earth, it should be remembered that some of the countries with high death rates have a low standard of living and are already densely populated and that measures directed towards a raising of that standard will tend to prove ineffective because of this growth of population.

While, in countries like India and Japan, the stimulus to a steady increase of population as a consequence of the lowered mortality rates may have an adverse effect on national welfare, on the other hand one of the speakers suggested that in Latin American countries, with their large resources and with an insufficient number of people in many cases to exploit to the full such resources, a steady increase in the difference between births and deaths may not create any concern and may indeed be welcomed as a positive help towards national development.

In Puerto Rico, a phenomenal rise in the rate of population growth took place as the result of measures controlling mortality. The situation has been stabilized to some extent by the large-scale migration to the United States which was possible because the inhabitants of Puerto Rico are also citizens of the United States. This emigration, coupled with an extensive programme of industrialization, has helped, it is reported, to lessen the burden of unemployment with its adverse effect on the standard of living and the well-being of the people.

Mr. M. C. Balfour took part in the discussion on this topic.

#### CONCLUSIONS

The conclusions reached by this meeting and the views expressed as to what action may be taken can be summarized as follows:

(a) In recent years there has been a substantial decline in general mortality and particularly in infant and child mortality in almost all areas of higher death rates. The decrease from the level prevailing before the First World War is very considerable and in some cases striking.

(b) In areas of high infant mortality, post-neonatal infant mortality remains high. Improvements in environmental and sanitary conditions, feeding and mothercraft should assist in bringing it down.

(c) In order to gain a better insight into the actual trends of mortality, there is a great need for improving vital statistics registration in practically all the areas. Because of the different conditions in these areas, it is unlikely that the methods based on purely Western

experience will be applicable. A variety of approaches will have to be developed to cover each particular case.

(d) Although sample censuses and surveys are useful in spite of their imperfections under the conditions prevailing in the countries under discussion, sampling methods cannot satisfactorily replace vital statistics registration. The objective should be to establish appropriate registration systems and to strive for their improvement in the course of time. Calibrating sample surveys can serve a useful purpose in conjunction with vital statistics registration when it has been established.

(e) International organizations, such as the United Nations and the World Health Organization, may consider an attempt to evaluate the quality of vital statistics in the different countries.

(f) Assistance should be provided to national Governments, where necessary, to develop better methods of registration and to compile available vital statistics.

(g) The possibility of prescribing definite standards for collecting vital statistics and the adoption of a standard questionnaire for use in areas of higher death rates may be explored in view of the widely differing quality of vital statistics now available in these areas.

(h) There were different views as to the relative roles of public health and sanitation, food supply and nutrition, and economic and social conditions in affecting general and infant and child mortality. Certain countries claim one factor to be more important than others in their case, but the consensus of opinion seems to be that they are interdependent and that it is their combined effect over a period of time which expresses itself in the mortality trend of the community.

(i) Public health measures such as malaria control, prophylactic vaccination, maternal and child health programmes, community health services, and the use of antibiotic sulpha drugs and other recently developed therapeutic agents have all presumably contributed their share to the declining mortality trends but it is clear that they have been utilized in different degrees in the various countries.

(j) Over short periods the action of one or another of the factors mentioned under (h) may produce a considerable fall in the death rate, but in the long run a stable and relatively low mortality can only result from a comprehensive programme designed to provide certain minimum essentials of a healthy life, including adequate provisions for medical care, curative and preventive, a clean and healthy environment, a food supply adequate in quality and quantity, and facilities for recreation and cultural pursuits.

(k) Prospective trends in mortality depend on the development of those measures in the fields of public health, medical services, and general social and economic conditions which are engaging the attention of national Governments. The availability of internal resources, especially financial, and international assistance set a limit to what is possible.

(l) In the immediate future a downward trend in mortality may be reasonably expected in so far as present conditions can be assumed to continue. Some caution was raised against the assumption of a continued decline in mortality as a result of malaria control measures in view of the evidence presented from Greece showing that malaria-bearing mosquitoes may

be developing resistance to the insecticides currently used.

(m) The lowering of mortality levels accelerates the growth of the population and thus puts an extra burden on the nations that are striving to raise their standards of living, unless the growth can be offset by emigration. If emigration on a large enough scale is not possible, continued increase of population may eventually affect the mortality trend. It is not easy to predict the course of such factors in the long run, and

hence the difficulty of making long-range forecasts of mortality trends.

The background papers presented for this meeting by Messrs. A. Barkhuus, S. Chandrasekhar, S. P. Jain, J. L. Janer, M. Jungalwalla, G. A. Marzouk, E. J. Pampana, M. Pascua, M. V. da Rocha, H. Romero, D. M. de Silva, S. Swaroop and V. G. Valaoras give specific illustrations of the points contained in this report.

### Meeting 5

## TECHNIQUES OF DEMOGRAPHIC MEASUREMENT AND ANALYSIS

### Report on the meeting prepared by Mr. L. Henry, Rapporteur

#### INTRODUCTION

The greater the attention given to the effect of population on political and economic questions, the more imperative it is for the methods in demography to be firmly established. The techniques of demographic measurement and analysis therefore cannot be neglected, barren as the subject may appear.

As the entire subject could not be fully dealt with in one meeting, only the following three questions were considered:

1. Measurement of economic density,
2. Measurement of fertility in countries where birth registration is non-existent or incomplete,
3. Problems encountered in measuring and analysing fertility.

#### 1. MEASUREMENT OF ECONOMIC DENSITY

To say that a country is over-populated or under-populated means that there are too many or too few inhabitants in relation to the country's economic possibilities. The situation is somewhat analogous, at least outwardly, to geographic density, i.e., the ratio of human beings to a specified area irrespective of the resources of that area. This usage has led to a further extension of the concept of density. One such derivative measure is economic density, a device whereby the needs of the inhabitants are related to the economic resources of the area in which they live.

Economic density can be measured in an agricultural type of economy where the cultivated or cultivable area is the predominant factor but not in an industrial economy owing to the impossibility of localizing the quantitative potential of production.

In order to cope with this problem, the concept of economic density is replaced by the general level of consumption, which indicates the amount of resources *per capita* rather than the number of inhabitants per unit of productive area.

Although, as was pointed out in the discussion, the general level of consumption could be expressed in terms of *per capita* income, the frequent lack of data of this kind and the difficulty of comparing different currencies make it necessary to devise methods by which the level of consumption can be determined

from non-monetary data, such as the *per capita* consumption of a particular product.

Factor analysis makes it possible on the basis of the partial data to which the analysis is applied, to determine the general level of consumption and to make the index best suited to comparisons in space and time. As, moreover, the results of such a comparison are still valid where the amount of source data is small, this method has the obviously great advantage of being capable of extension to countries or periods for which the available data are sparse.

In the discussion there was, in addition, an exchange of views on the factors and on the nature of the data entering into the factor analysis. Particular stress was laid on the fact that the factor analysis was based on consumption rather than on gross production.

Although the concept of economic density as such was not discussed in detail, reference was made to the difficulty of defining that concept with precision and to the widening gap between that concept and the attempts being made to measure the level of consumption, especially on the national level.

Reference was also made to the problems peculiar to the measurement of economic density in a non-monetary economy, difficulty of evaluating consumption requirements and production.

The participants in the discussion were: Messrs. P. J. N. Delaporte, L. J. Ducoff, G. Fürst, P. O. L. George, P. M. Hauser, and W. E. Moore.

#### 2. MEASUREMENT OF FERTILITY IN COUNTRIES WHERE BIRTH REGISTRATION IS NON-EXISTENT OR INCOMPLETE

These countries are generally those with an expanding population and where the death rate has already decreased and will decrease still further while fertility and natality remain high.<sup>1</sup>

<sup>1</sup>The term "fertility" relates to the behaviour of couples in regard to procreation. When it is said that fertility is increasing, what is meant is that the behaviour of couples in regard to procreation changes in such a way that, *ceteris paribus*, the average number of children per couple increases. The term "natality" relates to births which evidently depend not only on the behaviour of the couples but also on factors relating to marriages, mortality of the spouses, divorces, etc.



The questions to be answered are: What are the present trends in fertility and natality and what will be their future courses? Has that rate decreased? Will there be a rapid decrease soon or is it to be expected that the gap between the decline in the death rate and the decline in the natality will be even greater than in Europe in the nineteenth century? No answer to these questions can be given until the facts are known and, in particular, the fertility and natality of the people in question have been measured.

The subject to which attention was given was the measurement of fertility. When fertility is known, natality can often be estimated. A question raised at the meeting, however, was whether it might not be better to concentrate directly on determining natality, i.e., the birth rate. This problem has not yet been solved.

In countries where there are reliable statistics, the measurement of fertility is based on both censuses and vital statistics.

If vital statistics are non-existent, all information must be derived from censuses or special surveys. If vital statistics exist, but are inadequate, appropriate methods of supplying the deficiencies may also be used.

As fertility is fairly well indicated by the distribution of families by number of children as well as by the age structure of the population, efforts have been made to determine fertility from the following data derived from censuses or surveys: number of children born to women included in the census; ratio of children up to 4 or 9 years of age to women between the ages of 15 and 44 or 49 years respectively.

The average number of children born to women increases with the age of women up to the end of the reproductive period. If the ages are known exactly enough and there is no ground for concern that the number of omissions of children born will increase excessively with the age of the women, the data on women by age and number of children born may be used to calculate a table on fertility by age. Total fertility is then measured directly from the average number of children per woman over 45 or 50 years of age respectively.

As this rate is applied to a fairly long time-period, it is somewhat unsuitable if fertility has changed. There are also other reasons why this rate is less reliable than the average number of children born to younger women, namely:

(1) The greater frequency of omissions among older women and particularly among women of very advanced age. To reduce the errors from this source, the study would have to be restricted to women only slightly above the maximum reproductive age, but this would require a precise determination of that age and would considerably limit the data.

(2) The relatively small number of women over 45 or 50 years of age in small samples makes it inadvisable to limit the inquiry to the average number of children of women who have passed the maximum reproductive age.

Accordingly, methods have been suggested that would enable total fertility to be estimated from the average number of children born to all women of reproductive age. The starting point would be the relations between the observed average number of

children per woman and total fertility; the distribution in the fertility table and the age structure of the total female population.

The applicability of this method is conditional upon the average number of children per woman being correctly estimated and the average or modal age of the fertility table being fairly well established. The fact that these conditions are often difficult to meet has given rise to the idea of proceeding from the average number of children per mother. There will be no exclusion, as is often the case in surveys, of girls or young women; in addition, the average age corresponding to the fertility table can for all practical purposes be eliminated from the ratios. On the other hand, an additional factor, the proportion of women without children at the end of the reproductive period, must be included.

Determining the total fertility rate is more or less equivalent to determining the gross reproduction rate. Calculation of the net reproduction rate requires knowledge of mortality by age. It can, however, be estimated on the basis of the average number of surviving children per woman. In this case the result obtained is less affected by omissions of children than is the gross rate; this is particularly apt to occur where children die at an early age.

The ratio of the number of children included in the census to the number of women of reproductive age can also be taken as a basis for a study of fertility. This ratio can be used for establishing the total fertility rate only if child mortality data can be determined, but a rather serious error with regard to child mortality will result in an error of merely acceptable proportions as regards the general fertility rate thus determined.

The above methods, which compensate for the inadequacies of birth registration by data derived from censuses or surveys, are concerned with the number of births, but not with the period during which the births occur.

Some surveys, however, are intended to obtain information equivalent to that provided by vital statistics. In such cases each woman is asked to state the number of children she has had during, for example, the preceding 12 months. The results may have to be treated with extreme care, for among some populations periods of time cannot be easily estimated. The errors from this source may be as significant as those due to omissions as, for example, in cases where birth registration exists, but is inadequate.

In both cases, however, the errors will admittedly be independent of the order of birth. On this hypothesis total fertility can be estimated from:

(a) The ratio of first births to total births if the age structure of the female population of productive age is known, at least approximately;

(b) The proportion of childless women at the end of the reproductive period.

This proportion, which is also a factor in calculating total fertility from the average number of children per mother, can be determined only from the replies given by women of ages close to the maximum reproductive age.

The main points discussed were: priority to be given to the various rates (already referred to); value of

data obtained, and methods of checking data; effect of including older women in the surveys; significance and magnitude of variations in the figures for total fertility derived from the replies given, on the one hand, by women aged 15 to 49 years, and, on the other hand, by women aged 50 years or over.

The participants in the discussion were: Messrs. J. A. Bourdon, V. F. J. Fallon, J. C. Koop, C. J. Martin, C. A. Myburgh, J. R. H. Shaul, C. Tietze.

### 3. PROBLEMS ENCOUNTERED IN MEASURING AND ANALYSING FERTILITY

In many countries the birth rate, which was disrupted by the economic crisis and the war, has varied substantially from the trend envisaged before the war. In some countries the birth rate has risen and since the war remained at a level obviously higher than that of twenty years ago; in other countries it appears to have become stable at a level close to that of the pre-war period, but above what would have been expected from a projection of earlier tendencies.

Demographers have shown great interest in these phenomena and have spent considerable efforts trying to separate what is fundamental from what is transitory in the changes observed.

If only bare essentials are considered, two main trends of research can be distinguished:

(a) The introduction of additional factors of analysis;

(b) The study of particular groups over a period of time; this is known as cohort or group analysis (group of persons born, married or giving birth to their *n*th child in the course of a particular year).

Before the war the most common factor considered in fertility analysis was the age of the woman; the purpose was to determine the age structure of the female population. But the structure as regards marital or family status was neglected. Only the time elapsing between the birth of a woman and the year of observation was considered, whereas such phenomena of significance for demographic analysis as marriage or the birth of children and the period elapsing between such phenomena were disregarded despite the bearing which they undoubtedly have on reproductive behaviour.

Now attention is being given to marital or family status, duration of marriage and the length of time since the last birth. Therefore, various new factors have been introduced in fertility analysis.

However, the relevant phenomena, such as marriages or births, recorded by statistics constitute only a small part of the history of each group or cohort; essential elements of that history, such as long periods of separation imposed by the war, the delaying of births for economic reasons and so on, are not taken into account.

In the traditional type of analysis, the observations recorded in a particular year are ordinarily applied to various groups in order to derive an index, such as for example the average number of children per marriage, which is presumed to reflect what would happen in a group, in this case a cohort of marriages, if the entire conjugal life was subject to the same conditions as those prevailing in the year of observation. Only passing attention, however, is given to the influence

which the particular history of each group exerts on the group's behaviour. The indices compiled from the analysis are therefore the outcome of both past and present conditions, and the work of disentangling the various influences is a complicated, difficult and risky undertaking.

It has therefore been proposed that especially as regards the study of tendencies leading to such a final result (for example, the average number of children per marriage), the traditional type of analysis should be rejected in favour of a method which records the events affecting a group over a period of time as they occur. The observations recorded in a particular year would then be combined with those for previous years regarding the same group and not with those for the same year regarding some other group.

Thus, there are ultimately two types of analysis, both of which, however, are based on the same observations. There are, accordingly, common problems relative to the choice of observations to be carried out, that is, the choice of the factors to be introduced into the analysis and the choice of cohorts and of the subdivision of cohorts into groups with similar characteristics.

The purpose of the communications and discussions was to compare the two types of analysis, to consider whether some factors should be preferred to others and to discuss the choice of cohorts and the advantages or disadvantages of subdividing them.

The problems relating to the choice of cohorts was the first topic of discussion, which proceeded from the simple to the complex.

The following three types of cohorts were suggested:

- (1) Persons born in the same year or birth cohorts;
- (2) Couples married in the same year or marriage cohorts;
- (3) Women giving birth to their *n*th child in the same year.

The choice is often determined by the statistics available, but the progress made or contemplated in vital statistics will allow a greater freedom of choice.

The second type (nuptial cohort) seems to be receiving the greatest preference at the present time because it allows the effects of nuptiality to be separated from those of legitimate fertility, which is the primary factor influencing the birth rate.

Some persons feel, however, that such a separation is not in every case essential to cohort analysis and that the first type is adequate, at least in some cases.

The third type, which has been little used so far, is stated by its proponents to enable changes in trend to be observed more quickly than by the second or especially the first type.

Once one of these main types has been chosen, there remain such further questions as: whether in the first type men or women are to be considered; whether in the second type all marriages or only first marriages are to be considered.

In connexion with the choice of the groups to be observed, attention was also given to various combinations of factors which might be contemplated or which have already been used such as marital status, age of the women, and number of children already born.

The question of subdividing the cohorts was considered from the point of view of determining whether such a procedure would improve the analysis or broaden its possibilities.

The particular point at issue is whether there is any advantage in subdividing the nuptial cohorts by the age of the wife at marriage as is often done. This, in effect, represents an effort to determine whether the age of the wife, as the sum of the age at marriage and the duration of marriage, is still an important factor where there is a general limitation of the number of births.

Although it is generally admitted that behaviour and fecundity are affected by age, there is a difference of opinion about the advantage of subdividing nuptial cohorts by the age of the wife at the time of marriage; one side maintains that such a subdivision has more disadvantages than advantages, while the other, stressing the effect of age, favours the subdivision. Further study of this important question seems essential, and the use of mathematical models has been recommended in some quarters.

Although a comparative study of the two types of analysis has shown that there is no opposition to cohort analysis, there is one group of demographers which holds that the traditional methods are still useful for

analysis, while another group expresses the much more positive opinion that all analysis should be based on cohorts of persons born or married during a given period.

Attention was also drawn in some communications and during the discussion to the consequences, where birth control is practised, of the freedom enjoyed by couples to hasten or delay desired births according to circumstances. This freedom in the timing of births may cause the distribution of births to vary widely over a period of time without the average number of children per woman or per marriage being affected. If, as seems to be true of some countries, the number of children in families is becoming stable, variations in timing may become more important as an object of research than trends in completed family size.

One communication dealt with variations in timing in the United States since 1930. The importance of this factor in the past, and especially in the period between the two wars, should be the subject of further research.

The participants in the discussion were: Messrs. J. Bourgeois-Pichat, P. R. Cox, M. Croze, J. C. Elizaga, J. Hajnal-Konyi, K. Horstmann, G. Lasorsa, N. B. Ryder, W. Taylor, C. Tietze, and P. K. Whelpton.

## Meeting 6

### FERTILITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF LOWER FERTILITY

#### Report on the meeting prepared by Mr. J. Godefroy and Mr. E. Grebenik, Rapporteurs

##### INTRODUCTION

This meeting, under the chairmanship of Mr. P. P. J. Idenburg, was devoted to the discussion of fertility trends in areas of lower fertility. These areas were defined to include Northern, Western, Central and Southern Europe, the United States, Canada, Australia and New Zealand. These were the areas in which it was thought in the 1930's that the population was approaching a maximum and that fertility had fallen to levels at which a decline in the total population might be expected in the not too distant future. In most of these countries, however, there has been a recovery in births during the 1940's, and it is important to assess the meaning of fertility trends at the present time.

For the sake of an orderly discussion the subject of this meeting was divided as follows:

1. General survey of fertility trends in areas of lower fertility,
2. Is there a gradual levelling of the differences observed thus far in fertility between separate population groups?
3. Spacing of children,
4. Human infertility, its incidence and aetiology,
5. Attempts to measure the desired size of family,
6. Prospective future trends of fertility in areas of low fertility.

##### 1. GENERAL SURVEY OF FERTILITY TRENDS IN AREAS OF LOWER FERTILITY

Under this topic background papers were presented by Messrs. H. Gille, M. D. McCarthy, P. K. Whelpton and the National Statistical Office of Czechoslovakia.

The general trend of fertility in the areas under consideration was first surveyed. It was pointed out that almost everywhere there is evidence of stabilization of fertility, after a long period of continuous decline. In the late 1940's a spectacular increase in births—the so-called “baby-boom”—took place in many low-fertility countries. Part of that increase could be ascribed to changes in the number of marriages and to the timing of births within marriage. A number of births which were originally postponed on account of the depression and the war were probably made up after peace was restored, and the period of full employment which followed the war may have speeded up the arrival of first children among newly married couples.

It would appear from the data that the secular trend towards a decline in family size has been halted. But even though women married in the middle of the 1940's appear to have borne a slightly larger number of children at equivalent durations of marriage than did women married five to ten years earlier, the evidence for a definite upturn in family size is weak, with the possible exception of France. Fewer marriages are childless, and the average number of chil-

dren among the smaller families has increased somewhat, but large families are becoming both scarcer and smaller. It is, therefore, not possible to make a final judgment about the meaning of recent fertility movements. A longer period of observation and statistics relating to the fertility of more recent marriages are necessary before it will be possible to determine whether the trend towards declining fertility has been reversed or merely halted.

## 2. IS THERE A GRADUAL LEVELLING OF THE DIFFERENCES OBSERVED THUS FAR IN FERTILITY BETWEEN SEPARATE POPULATION GROUPS?

For this topic papers were presented by Messrs. K. Bjerke, R. M. Dinkel, M. L. Febvay, R. C. Gilligan, T. van den Brink, and C. F. Westoff.

From a discussion of general trends the meeting passed on to consider the fertility rates of sub-sections of the population, and the differences between them. The treatment of these subjects has varied greatly both as regards the field covered, and the methods used. The sub-groups studied have been defined in different ways, in some cases by place of residence, in others by occupation, income group, educational status, colour, race or religious affiliation. The results are not always comparable, partly because the sub-groups were differently defined or because the studies related to different periods of time, or because different measures of fertility were used, such as crude birth rates, marital fertility rates, reproduction rates, etc. It is therefore difficult to discern regularities, but it would appear that fertility differences between the rural and the urban sections of the population have diminished nearly everywhere. Fertility differences between occupations have declined in some countries, such as the Netherlands; in Great Britain they appear to have remained stable, whereas in France there are some indications that relative differences between different occupations may even have increased. Where fertility differences have narrowed, the fall in the fertility among the least fertile groups has generally been checked but the sections of the population which previously exhibited high fertility have continued to show a decline.

Comparatively little attention was given to the future of fertility differences. In so far as slight increases in the fertility of the least fertile groups have occurred, differentials may become smaller, but the available data are not sufficient to confirm that such increases are permanent. There are certainly no data to support the belief that with the democratization and increased spread of birth control all fertility differences in the future will disappear, as some writers have suggested. The limitations of a purely statistical approach to the subject were stressed; a proper understanding of existing fertility differences would necessitate a study of the cultural goals prevalent in contemporary society and a proper classification of society into basic social groups. More would have to be known about the motives for family planning.

Although much effort has been devoted to the study of fertility differences, it was felt that some of the data on which these studies were based were not altogether reliable, and it was thought desirable that there should be international consultations regarding

the questions to be asked and the analyses to be performed in the 1960 census programme. International standardization of questions, which might well be achieved through consultation with United Nations agencies, was considered to be most desirable. Future census inquiries on the subject should contain detailed breakdowns of figures and should, if possible, be accompanied by sociological background studies.

The study of inter-group differences in fertility is not only important because of its intrinsic sociological interest, but also may have practical importance in improving methods of population forecasting. If different sections of the population reproduce at different rates and if their numbers are known, the accuracy of projections may well be improved by taking account of these differences, rather than making global forecasts for the population as a whole.

## 3. SPACING OF CHILDREN

Papers were prepared on this topic by Mr. S. Koller and Mr. P. K. Whelpton.

Fertility differences are associated with differences in family building pattern, and studies of differential fertility may be illuminated by information regarding the spacing of births within marriage. As fertility in the low-fertility areas becomes increasingly planned, birth spacing will be influenced to an ever increasing extent by social, economic and psychological factors. But there are some methodological difficulties inherent in the study of birth spacing. In an area in which the distribution of completed families by size is changing, an interpretation of statistics by birth intervals in which families of different sizes are grouped together becomes difficult. In Great Britain, an attempt has been made in the Family Census of 1946 to standardize statistics of birth spacing by the ultimate size of achieved family. When this was done, no great differences were found between different social status categories. Studies of birth spacing are in progress in Germany, and similar inquiries are in prospect in the USA and in France. Such studies may throw valuable light on short-term variations in the number of births, which may be associated with social and economic conditions.

## 4. HUMAN INFERTILITY, ITS INCIDENCE AND AETIOLOGY

Mr. A. Stone presented a background paper on this topic. In areas of low fertility it is important to distinguish voluntary from involuntary infertility, and there was a brief discussion dealing with the biological and medical aspects of the subject. It was emphasized that it is desirable to obtain more information relating to these factors, so that clearer distinctions can be drawn between biological and social infertility. At present there are many gaps in knowledge of the biology of reproduction, and it would be desirable to fill these gaps.

## 5. ATTEMPTS TO MEASURE THE DESIRED SIZE OF FAMILY

Background papers on this topic were prepared by Mr. E. Grebenik and Mr. S. Groenman.

Next to the biological factor, the size of family desired by married couples is of importance. Two

methods by which attempts have been made to measure this variable were discussed. One method is to send a questionnaire to women who are about to marry and to obtain their views on the number of children they desire. The other method proceeds by comparing the fertility of a cohort of women who are known to be practising contraception with that of another group in which it is believed no obstacles are placed in the path of fertility. In a study made by the latter method it was possible on a number of rather arbitrary assumptions to compute estimates of the number of women who desire families of certain sizes. However, the number of assumptions that had to be made tended to reduce the utility of the results. It was pointed out in the meeting that the number of children desired by a married couple does not remain constant, but may change during their marriage, and that it would be necessary to compare the actual reproductive performance of married couples with their intentions at the time of marriage before any conclusions of practical importance could be drawn. The data at present available on the subject are scanty and incomplete and only serve to illuminate the complexity of the problem. But in spite of these difficulties it was felt that the study of desired family size is a fruitful field for further research.

#### 6. PROSPECTIVE FUTURE TRENDS OF FERTILITY IN AREAS OF LOW FERTILITY

The implications of findings reported above on future population development formed the final topic of discussion. On this topic background papers were prepared by Messrs. H. S. Shryock, C. L. Beale and J. S. Siegel and one by Mr. J. Godefroy.

Past population projections in the USA underestimated the trend in fertility. Many factors contributed to such underestimations; the rise in the proportion of married women, the fall in the age at marriage, the higher fertility of marriage and the favourable age structure of the population. Incomes and employment improved as compared with the post-war period, the psychological consequences of war and government policy contributed to earlier marriage and larger families among soldiers and veterans. In

the USA these factors increased births, in spite of greater urbanization, higher education costs, the increased employment of women and the extension of contraceptive information to cover virtually the whole population.

It was considered that long-term fertility trends in the areas studied would change very slowly, if at all. But the extension of family planning might lead to sharp short-term fluctuations in births, as a result of political and economic movements which it is practically impossible to forecast. It was, however, believed that in the not too distant future the birth rate in the USA would not fall below 16 nor rise above 27 per thousand.

Projections made by Organization for European Economic Co-operation experts for 14 European countries have given results which are not dissimilar. It was assumed in these projections that fertility would decline slowly between 1951 and 1971, but the projected rates did not anywhere fall below the lowest rates which occurred in the 1930's. It was believed that that decade was one of exceptionally low fertility and that the experience of the 1930's could be taken to give the likely minimum level of the birth rate in the future, a minimum which could be about 14 per thousand. In a number of smaller countries (Portugal, Ireland, the Netherlands and Denmark), a higher fertility was assumed. These countries account for about 11 per cent of the population of Western Europe. In the discussion, a number of objections were put forward against the details of the assumptions contained in these projections.

Although the areas of low fertility have a well-developed system of vital statistics, it was generally felt that a number of gaps still exist in knowledge of the determinants of fertility in these territories and that considerably more research is needed before useful predictions about any but very short-term movements can be made.

The participants who took part in the discussion were: Messrs. I. Bogdan, J. A. Bourdon, G. Frumkin, P. M. J. Gasc, P. C. Glick, L. G. Henry, C. V. Kiser, S. Koller, M. D. McCarthy, H. V. Muhsahm, A. Polman, and P. K. Whelpton.

### Meeting 7

## CONTRIBUTIONS TO DEMOGRAPHY THROUGH NEW CENSUS INQUIRIES

### Report on the meeting prepared by Mr. C. Taeuber, Rapporteur

This meeting was devoted primarily to the findings of censuses in countries that do not have a long history of census taking. Emphasis was placed on the results of censuses taken during recent years.

#### 1. THE SPREAD OF CENSUS TAKING

The importance of the data from population censuses for demographic study, and for economic and social planning and action, is being increasingly recognized. Since 1946, censuses have been taken in 158 areas, including approximately 1,445 million people, or about 59 per cent of the world's population. Many of the recent censuses provide information for coun-

tries which had not had censuses previously or which had not had a census in many years. There has been great effort in recent years, especially in the underdeveloped countries, to expand the knowledge which is available from census sources.

Particular attention was drawn to the Latin American countries where there has been joint planning in behalf of census taking. All but two of these countries have taken a census since 1947. Before 1950, however, one of the countries in that area of the world had never taken a census, and 13 did not have up-to-date census data. A booklet, *The Story of the 1950 Census of the Americas*, issued by the Interamerican Statis-

tical Institute, describes briefly the organization and scope of the most recent censuses of the American nations.

Taking a census was particularly difficult in some of the under-developed areas. Shortages of trained personnel, an absence of census experience and a lack of appreciation of the needs for and uses of census data, and, sometimes, the form of political and social organization made census taking difficult. Since the Second World War there has been a growing interest in speeding up economic and social development in many countries. The reductions of the death rate and the consequent increase in rates of growth of the population have led to a growing demand for more complete and more accurate information about the population. The assistance of the United Nations and other international organizations has greatly stimulated the interest in census data. In some of the countries which have recently achieved their political sovereignty, the tradition of census taking, which had been carried by the former occupying Power, was of some assistance in getting the work done in a recent year. The development of sampling methods, as applied to large-scale surveys, has provided additional powerful tools for the collection of census data.

## 2. THE INCREASING SCOPE OF CENSUS INQUIRIES

The concept of a population census has been greatly expanded from a simple count of the population to an enumeration which gives a broad picture of the economic and social conditions of the population. In countries which have well-developed statistical systems the census may be relied upon to furnish essential benchmark information, and to complement the materials which are available from various specialized sources. But in countries which do not have comprehensive statistical programmes, the census must also provide the essentials for demographic research, even to providing the basic information concerning births and migration. The basic purpose of many censuses is to provide the information on the numbers of persons entitled to the franchise, or to other civic rights and benefits. The apportionment of representation in the parliament or other governing body is often based directly on the number of persons as reported by the census.

Governmental concern with improvements in literacy, health and the physical well-being of the population has led to the inclusion of inquiries on literacy, educational levels, the presence of physical infirmities, etc.

In one of the censuses for which a report was received, the census gave particular attention to the population engaged in agriculture and that engaged in cottage industries. The latter information was deemed especially important for the programmes for industrial and commercial development which are under official consideration.

Census results also make important contributions to a knowledge of the incomes and levels of living of the population. In many cases the detailed data from the census permit the first approach to a study of the distribution of incomes, and they also provide significant checks on the gross income estimates which have been made for the country. Data on employment and unemployment, as well as on the occupational and

industrial attachment of the population provide essential information for the formulation and execution of programmes for economic and social development.

## 3. REFLECTING CONDITIONS AND CHANGE

Demographic data, in relation to other data, are essential to the formulation and execution of programmes for economic and social development. No programme for the improvement of levels of living can afford to neglect the data on demographic conditions and trends.

A matter of great practical importance is the changing composition of the population in regard to such matters as the relationship of the economically dependent groups to those which provide economic support. An examination of the differences of the age and sex composition among the rural and urban areas may indicate the extent to which the movement of population to cities may have interrupted or altered the normal relations of the different population groups to each other. Migration of individuals to centres of industrial activity may be followed by significant changes in the responsibilities within family groups and thus within the entire social structure. The relatively high ratio of men in cities, which has been shown by many recent censuses, points to stresses which may alter the structure of families and lead to changes in the generally accepted norms of economic support and economic dependency.

Where the presence of special groups whose economic, social or political status differs from that of the majority creates problems for a country, the census data provide a firm basis for whatever action may be deemed to be suitable. Thus the recent census of Pakistan gave particular attention to refugees who had recently come into the country and provided information on the numbers and distribution of the refugees and the conditions under which they were living. Not only did these results indicate the progress that had been made in fitting these individuals into the economy of Pakistan, but they indicated also the problems which lay ahead for these elements in the population as well as for the Government if the assimilation were to be completed rapidly.

The census provides information not only about individuals, but also about the most important groups in the population. Some of the censuses have given particular attention to the family groups, for where family enterprises are the basic units in the economy, it is essential to have information about the numbers, characteristics and activities of family groups in the country.

The concentration of the population in urban areas and the reasons therefor have been of much concern in many countries. The differences between rural and urban areas in the levels of living, in the provision of the amenities, and even in the security of life, have led in many cases to large-scale movements of population to the cities. The census data reflect the extent of these shifts, as well as the differences in the conditions of life between rural and urban areas and thus provide a basis for dealing with the problems which may be created by these population movements.

Changes in the population, which result from changes in birth and death rates, are strikingly reflected in the data from successive censuses. Where



there have been marked reductions in mortality rates, there is need for information concerning the resulting changes in the population. The marked decrease in mortality, especially in infant and childhood mortality, which has occurred in many areas, has had important effects on the numbers of persons in the different age groups. Thus the census results have in many cases indicated a need for revisions of the educational programme because of the rapid increase in the school age population which they made evident. Similarly, the information about changes in the numbers and proportions of older persons has played a major role in planning for economic and industrial development, programmes for the reduction of illiteracy, etc.

Considerable stress was placed on the importance of using the data from recent censuses. Countries which do not have problems of pressure of population on resources may nonetheless face important problems of economic and social development. Yet there is often in official programmes a flagrant disregard for the actual behaviour of the individuals in whose interest the programmes are planned. Instances were cited in which the official policy of the Government is to develop the agriculture of the country, but the census data reveal clearly that there is a continued large-scale drift of population from the land to the cities. Large investments have been made to develop agriculture in parts of one country, even though the available information indicates that some of the proposed developments are consistent neither with the available resources nor with the desires of the people affected, who continue to move to other areas. These instances were not cited as indicating failure of development programmes as such, but rather as indicating the need for the effective use of the data which are available. Had there been appropriate analyses of the data which are available and appropriate use of this information in developing the plans, costly mistakes might have been avoided and the objective of improvement in the conditions of life might have been brought nearer realization. Additional illustrations might have been given. The value of the census data in such cases lies in their objective reflection of the behaviour of the people in the light of efforts being carried on in their behalf. Proper early use of such findings would in many cases have led to more effective programmes; in other instances the appraisal which is provided through the use of census data gives a basis for modification of the programmes to take account of basic demographic trends.

Illustrating the wide variety of governmental uses which has been made of the results of recent censuses, the following were cited:

The modification of the educational system, aid to individual schools, establishment of centres to teach adults, development of programmes for higher educational facilities;

The development of a public health programme, including inspection and enforcement;

The planning of social security programmes;

The establishment of branches of the national bank, in order to serve the needs of the people in the different regions;

Arranging the programme of work of the field offices of a Ministry of Agriculture;

The preparation of actuarial tables for the use of social welfare programmes;

The formulation of studies basic to a land reform programme;

The provision of sanitary water supplies;

The development of programmes to aid the physically handicapped and to reduce the frequency of handicaps.

Attention was also drawn to the many uses of population census data which are outlined in the report on the 1950 Census of the Americas, issued by the Interamerican Statistical Institute.

#### 4. CENSUS DATA AND CURRENT STATISTICS

Among the most important data from a population census are those needed for the proper interpretation of current statistics on births and deaths. Not only does the census provide the essential basis for converting the reported numbers into rates, thus facilitating analysis, but it also provides the detailed data which are indispensable if the more precise tools of demographic analysis are to be applied. Detailed data on the age and sex composition of the population, and on its composition according to ethnic, racial, religious, residence or economic characteristics, are essential to the computation of the more detailed rates and indexes which permit a knowledge of the movements of the population and of their probable consequences. Such detailed data in turn provide the basis for estimates of future development which are sufficiently well founded to be useful in planning by the Government as well as by private persons and groups. The census data often give the best insight upon their own limitations. Where, for example, the people find it difficult to report ages correctly, or deliberately falsify age reports, the census data themselves may often be used to derive the correction factors by which the mistaken reports may be made more useful.

Where current statistics on population changes are lacking or are defective, the results of two successive censuses may provide the basis on which a knowledge of current changes can be developed.

#### 5. MAKING CENSUS DATA MORE USEFUL

The experience with the 1950 census results imposes an important obligation on demographers. The importance of prompt publication of census data in usable form is generally recognized. But demographers have the additional responsibility of seeing that the findings of the census are adequately analysed and that the findings and interpretations are made available in such a form that they are useful to the consumers of such information. If that is done, it is possible to look forward with confidence to the conduct of censuses in 1960. Unless it is done, Governments may withhold their support from a programme of census taking at regular intervals. But unless censuses are taken efficiently and at intervals of not more than ten years, they lose much of their value.

While stressing the importance of demographic data to countries which are engaged in development programmes, it was recognized that such data are among the most widely used official statistics in the highly industrialized countries. Demographic facts are basic to research and action in all realms of human endeavour. The population census is the most important source of demographic data.

There is an urgent need for closer co-ordination of the work of the producers and the users of census data. Demographers should make their needs known well in advance of a census, in order that adequate preparations may be made to provide the data that will be most useful. Since a census is a major undertaking, which is intended to serve many needs, it is essential that the needs within a country be known to the census officials. Census taking is on the threshold of new technical developments which promise to make the data more useful than they have previously been. The use of sampling inquiries as part of a census programme may, for example, be an important step in relieving the respondent of the burden of supplying the large amount of information that is required. Such inquiries make it possible to arrange that certain questions will be asked of only a sample of the population, without any loss of essential information. They may also serve to facilitate the publication of census results much more rapidly than was formerly deemed possible.

It was urged that demographers in the individual countries should review their needs in the light of

the international standards which were developed prior to the 1950 censuses, and thus enhance the effectiveness of the 1960 census programme.

Attention was drawn to the problem of comparability of the results of successive censuses. Unless these results are comparable, the information concerning trends may not be of much value. But changing needs and improved methods may make the maintenance of comparability difficult, if not impossible. It was suggested that by the use of sampling inquiries data comparable with previous censuses may be secured at the same time that the improved census is being taken. The results of such inquiries would provide the necessary linkage of the data.

Papers for this meeting were prepared by Messrs. W. Jiménez Castro, G. V. Desfour, J. Pando Gutiérrez, Hasan M. Husein, Kyaw Khine, E. Mesaros and M. Yusuf. In addition to these authors, the following persons took part in the discussion: Mr. O. Cabello González, Mr. C. L. Dedrick, Mr. F. E. Linder, Mr. R. Luna Vegas, Mrs. C. A. Miro, Mr. T. H. Montenegro, Mr. I. U. Pisarev, Mr. S. R. Sen, Mr. M. N. el Shafei, and Mr. K. Williams.

### Meeting 8

## FERTILITY TRENDS, WITH SPECIAL ATTENTION TO AREAS OF HIGHER FERTILITY

Report on the meeting prepared by Mr. K. Williams, Rapporteur

### INTRODUCTION

The objects of this meeting were to study the underlying causes of high fertility in areas of higher fertility, to examine the changes that are taking place and to see what light these factors throw on the trend of fertility rates in the future. The material before the meeting brought out the exceptional variations in demographic, social and economic characteristics in countries of higher fertility. The underlying causes of high fertility are not the same and, what is more, the trend of fertility rates would appear to move in different directions in different parts of the area. No attempt was made at the meeting to review fertility trends in all major areas of high fertility, but the experience of a number of countries was used for illustrations.

The following topics were selected for discussion:

1. Brief summary of levels and trends of fertility in areas of higher fertility,
2. Recent and prospective future trends in fertility and associated factors in selected areas of higher fertility,
3. Differences in fertility of urban and rural populations and various economic and social groups,
4. Social and cultural factors affecting fertility in areas of higher fertility,
5. Influence of economic development and related social changes upon fertility,
6. Studies of the influence of changes in specific conditions, including anti-natal practices, upon fertility in areas of higher fertility,
7. Prospective future fertility trends in areas of higher fertility.

Since most of the papers submitted dealt with more than one of these topics, each discussant reviewed the position for a selected region, covering all the topics. The discussants for the various regions were as follows:

- South Asia: Mr. C. Chandrasekaran
- Middle East: Mr. H. M. Husein
- Latin America and Caribbean: Mr. G. W. Roberts
- West Pacific: Mrs. I. B. Taeuber
- East Europe: Mr. D. Vogelnik

Because of the large differences in available statistics and knowledge about the factors influencing fertility trends, the points brought out by the papers and in the discussion are presented below largely by country:

### India

Population censuses and a limited number of field studies carried out during the last two decades provide the main source of data on fertility in India. In the 1951 census, questions on fertility were optional, and only a few States in India included these in the census schedule. The child/woman ratio derived from the age-sex-marital status distribution in the census is, therefore, the only index on fertility available on a national basis. This index, particularly when derived from census material, has many limitations. Data from field inquiries have also their limitations. Invariably these inquiries have been conducted as one-time sample studies and have investigated the fertility of cross-sections of the population selected from small geographical areas. These inquiries provided data on differential fertility rather than fertility trends. In view of these limitations, the present discussion of



the fertility trends in India cannot be altogether conclusive.

The difference in fertility between rural and urban population is found to be small in India.

According to the 1951 census, the number of children born to "women who have had at least one child birth and who remain married on the census day" is slightly smaller in the urban than in the rural areas, but the difference is so small that it is probably not significant. In other investigations, including the joint study by the United Nations and the Government of India in Mysore State, no significant difference was found between urban and rural fertility. It would seem that a moderate degree of urbanization does not appear to influence the number of children born to women who have recently completed their reproductive life in a "married" state. According to Mr. K. Davis, "Cities have not yet, as in some other countries, inaugurated a general decline in the birth rate. The rural-urban differentials are certainly present and are correlated with the size of the city, but they have not increased in 50 years."

The possible urban-rural differentials can be examined in relationship to institutional factors which may be influenced by urbanization. In Indian communities, the important factors are: (1) non-remarriage of widows; (2) age of marriage; (3) taboos on sex relations; (4) acceptance and practice of family limitation.

A feature which is peculiar to India is that fertility, as judged by the live births to ever-married women aged 45 years and more, is greater among groups of high social status than among those of low status. The main reasons for this difference are that remarriage of widows is not socially accepted by many higher castes and that the incidence of widowhood is less among the groups of higher economic and social status. The latter factor is presumably due to better living conditions and lower mortality rates in the groups with higher status.

In two field studies in the West Punjab (Pakistan) it was shown that fertility trends are closely connected with economic position, e.g., that minimum fertility was found in the age-group 24-25 of married women among low-income groups while this same age-group showed maximum fertility among higher income classes. It was assumed that this was also a reflection of the difference in the age of marriage of women among different social classes.

The Sarda Act of 1930, which banned marriages of girls under 14 years of age, even if it is not complied with by all sections of the population, gives legal sanction to a growing feeling against child marriages. Several field studies in India have provided data indicating a trend for increase in the age of marriage of women. For instance, the Mysore survey shows that over 40 per cent of women in Bangalore State now marry after completing 18 years. The influence of the increase in the age of marriage on fertility has also been investigated in a number of surveys.

There is some evidence that women married between the ages of 16 and 18 have a somewhat larger number of children than those married younger or those married after 18 years. This is also confirmed by an unpublished report of an inquiry made in 1946/1947 in government health welfare centres in Palestine.

Since the average age at marriage in India is now below 16, an increase in the age of marriage which we can logically expect, may actually result in increased fertility.

Various restrictions governing sex life between husband and wife exist in Indian society. In a rural sample 50 per cent of the men interviewed reported avoidance of sex relations for religious reasons in a total number of days ranging from 2 to 120 per year, and in an urban sample in the same State for periods ranging from 1 to 79 days. In addition, the cultural pattern enforces long periods of abstinence during pregnancy and lactation. In the rural area 80 per cent of persons interviewed reported avoidance for six months or more after childbirth. In the urban sample the period of abstinence seldom exceeded three months. Attention was called to the fact that the average interval between births in India is longer than that which prevailed in European countries before family limitation became wide-spread. Further, the fertility rates for women over 35 years in India are markedly lower than those of European women of similar ages two centuries ago. The reasons for this difference are not precisely known.

A desire to limit family size has been found among both urban and rural populations in India. The wide-spread desire for family planning, however, is not accompanied by adequate knowledge of methods to achieve that end. Attempts at family planning are also confined for the most part to the urban areas. In Calcutta, 38 per cent of the "upper" middle class Hindu women and 13 per cent of the "lower" middle class have attempted family limitation. The Mysore survey showed that 3-8 per cent of women in rural areas and in most of the strata in Bangalore City had practised family limitation, chiefly by means of abstinence.

In view of the extremely limited practice of family limitation in the rural areas, large differences in fertility cannot be expected between various social and economic groups. As pointed out earlier, the number of children born to ever-married women aged 45 years or more is greatest in the groups with high economic and social status, mainly because of the higher incidence of widowhood in the lower status groups. In urban areas there is a significant relationship between fertility and educational status of women. The Mysore study showed that ever-married women of 45 years or more with high school or university education had an average of 3.9 live births compared with 5.5 for women of less education.

As far as the future fertility trends in India are concerned, various factors were mentioned at the meeting which pull in opposite directions. Further improvements in mortality conditions will lessen widowhood rates in the reproductive ages and will tend to increase fertility as in the past. In addition, some liberalization of the ban on widow remarriage might be expected. Indian fertility, which has been governed by a number of institutional codes affecting sex relations, is likely to take an upward swing when observation of these codes becomes less rigid as a consequence of economic and social changes. In particular, the practice of observing prolonged periods of abstinence after each childbirth may become obsolete and the result may be a shortening of the interval between successive children. Among the forces which

may tend to decrease fertility are the increase in the age of marriage and the practice of family limitation. It is uncertain whether national measures designed to satisfy the growing desire for family limitation will be effective in most sections of the Indian population. However, registration data for four major States in India where omissions in birth registration are not more than 15 per cent, gave an indication of a small decline in birth rates recently. This is supported by the decennial birth rates computed on the basis of census data. The Indian birth rate was well above 50 before 1921. It was between 45 and 50 during 1921-1940 and about 40 in 1941-1950. A part of the decline in the birth rate was due to changes in the age distribution of the population.

The most important factor which is going to decide the future trend of Indian fertility is the extent to which family limitation will be practised by the Indian people. On this question the data that were presented to the meeting were extremely meagre. Sample surveys seem to indicate a wide-spread desire on the part of Indian women to restrict their families, but this is accompanied by an equally wide-spread ignorance of the methods of family limitation. The Government of India has initiated measures designed to satisfy a growing desire for family limitation in most sectors of the Indian population. The chief obstacle is the absence of a cheap and effective method which can be practised by the masses. Much research is being done on the "safe period" method as applicable to India. Other lines of research are also being followed. If all this research should produce satisfactory results, one would expect, even if the Government does not take an active part in the propagation of birth control methods, that there would be a decline in the birth rate.

#### *Japan*

Two peculiar features in the trend of Japanese fertility attract particular attention. First, around the middle of the nineteenth century the birth rate was rather low but in the Meiji era (1868-1912) it showed distinctly a rising trend. This continued up to 1920, when the maximum rate of 36 per 1,000 population was recorded. However, evidence was presented to the meeting which indicated that this apparent rise in fertility was to a great extent due to improvements in the completeness of birth registration and to a decline in the practice of infanticide. Second, recently the birth rate has declined drastically, from 33.0 in 1949 to 21.4 in 1953. The decline is attributed partly to the spreading use of contraceptive methods and partly to the large number of induced abortions made legal by the Eugenics Protection Law promulgated in 1948.

The number of legal abortions in 1952 is estimated at 800,000 while illegal abortions could have amounted to another 200,000 to 300,000. Between January and June 1953 there were about 540,000 cases of legal abortion.

Studies on fertility control in Japan show that diffusion of contraception was taking place steadily before the war but in post-war Japan the diffusion has accelerated at a high rate. The degree of acceptability and the effects upon fertility of intensive guidance on family planning among farmers and coal-miners have been tested from time to time in recent studies. It was found possible to make farmers—but to a lesser extent coal-miners—willingly accept the successful practice of

conception control without resorting to induced abortion very extensively. Also, a rather rapid decline in fertility was observed in both groups as a result of the guidance on family planning and this decline continued in the following one-year period during which no further information was submitted to the families.

The abortion legislation has contributed considerably to bringing about the greatest decline in fertility ever recorded in Japan. At the meeting it was pointed out, however, that it was important to replace abortion control by conception control. The method of abortion is an unsatisfactory one, particularly on medical grounds. Further, the effect of induced abortion in lowering the birth rate is not so great as might be expected—a study among married women who had a legal abortion showed that approximately half of them became pregnant at least once within a period of two years after the abortion and half of the women who became pregnant had a second induced abortion. As compared with the frequency of induced abortion, sterilization is only of minor importance in Japan. However, the opinion was expressed that this measure of family limitation will be chosen by an increasing number of women in years to come.

#### *Taiwan*

The fertility of the population of Taiwan is very high. During the first few decades of the twentieth century the birth rate seems to have increased, reaching its maximum around 47 per 1,000 of the population in 1930, but there is evidence of some decline thereafter. The high level of fertility in the Taiwan population is attributable partly to the influence of Confucianism (particularly its emphasis on the duty of perpetuating the family), partly to the tradition of the large families and partly to the high proportion of the agricultural population. Those influences, however, are gradually losing much of their force today. Confucianism is much less widely accepted than in the past, the tradition of large families is disappearing and urbanization is proceeding rapidly. All those factors are apparently bringing about a decline in fertility. Marriage and birth statistics already provide evidence of this but time must elapse and improved statistics be obtained to substantiate a final judgment.

#### *Singapore*

Another area of very high fertility for which data were presented to the Conference is Singapore. In the post-war years the birth rate has been stabilized around 46 and 48 per 1,000 of the population. In the 1920's and the early 1930's the birth rate was at a much lower level because of selected immigration composed mainly of single adult males. However, in recent years immigration in particular of males has been restricted to obtain a more balanced sex ratio. In the future, if there is no large-scale migration and no change in marriage habits, the improved sex ratio in the young age groups will be projected into the child-bearing groups and without any changes in the level of reproductivity the birth rate is bound to increase above the present level.

Some research made on inter-racial fertility rates in the mixed population of Singapore has revealed very interesting facts. The age-specific fertility rates of married Chinese women are found to be much greater than those of Malaysians and Indians. For instance,

the birth rate per 1,000 married women in the age group 15 to 19 was 499 for the Chinese, 139 for Malaysians and 240 for Indians. In the group 20 to 24 it was 939 for Chinese, 286 for Malaysians and 473 for Indians. On the other hand, Chinese women appear to marry much later than Malaysians or Indians, with the result that the net reproduction rates are not so divergent as the age-specific fertility rates would indicate. Similar results were also reported for Mauritius among the Chinese, Indian and indigenous populations.

### *Africa*

From the Middle East region, examples of fertility trends were given for Egypt and Algeria. The high level of fertility in Egypt is due in particular to the following reasons: (1) women marry at an early age, particularly in rural areas; (2) 90 per cent of the population is agricultural, and the farmers believe generally that many children are an asset to them from the point of view of labour. It was stated at the Conference that a growing number of people in Egypt have begun to realize the need for limiting the size of the family, but little is known about scientific methods of birth control. Evidence is available that the practice of induced abortion is rapidly increasing. The Government of Egypt has set up a national commission to study population problems and outline a population policy.

In Algeria, data for some areas seem to indicate that the level of the birth rate among Moslems in recent decades has been above 40 per 1,000 of the population. A number of facts appear to suggest that the high fertility rate of the Moslem population may decline in the future, but it will be a long-term process.

Various data giving an indication of the level of trends of fertility in some other areas of Africa were also presented, e.g., for the Belgian Congo, French Africa, Madagascar, Mauritius, and Northern Rhodesia. The data for Mauritius bring out the fact that a post-war upsurge in the rate of population growth has taken place, which can be attributed to: (1) the increase in the marriage rate (some marriages having been postponed because of the war); (2) the relative prosperity experienced since the war, and (3) the decline in the death rate as a result of a malaria eradication campaign.

It was also pointed out that for several reasons the disappearance of polygamy in Africa may well result in an increase of fertility.

### *Eastern Europe and Soviet Union*

As far as the Eastern European countries are concerned, it was pointed out by contributors from some of these countries that the birth rate has risen in recent years. The economic and social revolution which has taken place was said to have been an important factor in the upward trend of fertility. In the Soviet Union, however, there seems to be some indication that fertility has declined in the war and post-war period. The economic and social development of this country, like that of many other countries, seems to have brought about not merely a fall in mortality but also a decline in fertility.

### *Latin America*

A study of the cultural factors in fertility in the British Caribbean territories indicated the importance

of taking into account in fertility studies in that area the numerical imbalance between the sexes and the various types of family unions which exist.

In Puerto Rico a series of studies have been made with the purpose of obtaining information on the extent to which the people have had experience with birth control methods. Over half of the families in the sample practised some kind of birth control at some point in their marriage. Twenty per cent of the sample had already been sterilized. However, the effects upon fertility are not so great as one might expect. Often a woman is not sterilized until she has had a number of pregnancies. Other methods of birth control are often abandoned or used inefficiently. There seems to be a great interest in limiting the family size; it was found that women in nearly all groups believed that the ideal family size was three children. The reasons for the low degree of efficiency with which the methods of birth control are used appear to have rather little to do with the question of availability of methods or religion. Important factors seem to be fear that the use of contraceptives will have harmful consequences for health, and faulty communication between husband and wife.

With reference to Brazil, the influence of certain social and economic factors on the differences in fertility among various racial and occupational groups was considered at the meeting. It was found that the differences in fertility among the major racial groups are mainly due to social factors, whereas the influence of physical and biological factors is rather insignificant. Analysis of male fertility data by occupation showed the contrast between the very high birth rate of rural populations and the relatively low birth rate of urban populations.

### EFFECT OF MALARIA CONTROL ON FERTILITY

Data on the effect of malaria control on birth and death rates were presented to the Conference on the basis of the experience in the following areas: Cyprus, Sardinia, Mauritius, British Guiana, Venezuela and Ceylon. It is clear that mortality has declined as a result of malaria control in these areas but it is difficult to draw any conclusions about the effect upon fertility. There is evidence that in two of the territories, Cyprus and Sardinia, malaria control did not increase birth rates; in Ceylon the increase was not very marked, while in British Guiana, Mauritius and Venezuela birth rates were distinctly higher after malaria had been controlled than before.

In Pakistan it was shown that over the period 1920-1950 there was a marked decrease in the birth rate in the year following one in which an epidemic of malaria had occurred.

### PRESENT-DAY FAMILY-PLANNING TECHNIQUES

All the family planning methods now in use depend upon preventing the sperm cell from meeting the egg cell primarily by preventing sperm from entering the uterus. At present new lines of research are being followed in an effort to develop methods that will influence some of the other essential steps in the physiology of reproduction, namely, sperm or egg formation, fertilization or nidation. In the course of many experimental studies it has been found that

through the administration of various hormones or other chemical substances it may be possible to suppress temporarily the production of either spermatozoa or ova. It may also be possible to inhibit the process of fertilization, that is, the union of the sperm and the egg. Other substances prevent the implementation of the fertile egg in the uterus. Animal experiments have shown fairly promising results, but the value of these measures for human application still remains to be determined.

#### LACK OF STATISTICS

One of the chief obstacles in the way of making any reasoned judgment regarding the trend of fertility rates in the high-fertility regions, is the lack of reliable vital statistics. However, it was noted that there are exceptions. For instance, very reliable vital statistics are available for Ceylon. An island-wide sample survey to test the completeness of birth and death registration revealed that 88.1 per cent of all births in Ceylon, and 96.8 per cent of all births in urban areas, were registered. Also, 88.6 per cent of all deaths and 94.7 per cent of all urban deaths were registered.

It cannot be held that the explanation for this is simply that Ceylon, being a small country, is being better administered than others or that the literacy rate is high. Much further research on the reasons which prompt persons to register their vital events in the context of the social structure of the country, the degree of enforcement of sanctions prescribed by law and other factors, should be undertaken in order to make use of this experience for the improvement of registration of vital events elsewhere. It should be remembered in this connexion that the registration system was introduced into Ceylon by the British about the same time as it was introduced into several neighbouring countries.

It is deplorable that on such an important matter which affects nations so vitally there should in many cases be so much room for doubt. The birth rate, in many countries at least, is already high enough to be alarming. If, as some of the evidence appears to indicate, there is likely to be a further rise in fertility in some of the countries concerned, it would seem a very urgent matter indeed at least to see that the statistics which can measure fertility trends are put on a sound basis.

It would therefore appear to be advisable to set up some form of institution for the scientific study of the various factors underlying fertility in regions where fertility is high, which could, in the first instance, study the question why registration is unsatisfactory in some regions and quite satisfactory in others.

The problem is, however, extremely urgent. Improvement of national registration systems is a long-term process and cannot be expected to go very far within the next few years. The data presented to the meeting on sample surveys are extremely hopeful, and it would seem that improvement and expansion of these surveys might possibly be the solution that we are looking for.

#### CONCLUSIONS

The meeting has clearly indicated the need for more wide-spread research in the areas of high fertility on all aspects of fertility—statistical, social, psychological, and economic. It is difficult to forecast the future trends in fertility. What appears probable is that if existing conditions prevail there is likely, in some countries at least, to be an increase in fertility rates in the absence of any conscious limitation of the family. To what extent family limitation will be practised in the future is the most difficult question to answer.

### Meeting 9

#### CONCEPTS AND DEFINITIONS IN DEMOGRAPHIC STATISTICS

##### Report on the meeting prepared by Mr. P. E. Vincent, Rapporteur

#### INTRODUCTION

The preparation of demographic statistics involves generally the distribution of the persons enumerated over several different categories. The value of statistics and their usefulness for research purposes accordingly depend at least as much on the relevance and quality of the classification established as on the accuracy of the basic enumeration. This reflection shows that it matters greatly how the classification table is conceived and how its categories are defined.

In that connexion, the participants in the Conference had been asked to consider four topics:

1. The concepts of resident population and present population,
2. The concept of agglomeration,
3. The various types of marital status,
4. The concepts of occupational activity and dependence on a branch of activity.

#### 1. THE CONCEPTS OF RESIDENT POPULATION AND PRESENT POPULATION

Papers on this subject had been prepared by Miss I. Alsing, Mr. M. Brichler, Mr. T. van den Brink, Mr. G. Frumkin, Mr. J. R. L. Schneider, Mr. H. S. Shryock, Jr. and Mr. P. E. Vincent. The papers by Mr. I. U. Pisarev and Mr. J. R. H. Shaul also touched on the subject. Mr. M. Croze, opening the debate, gave a general introduction to the papers.

Wishing to enhance the accuracy of enumeration, statisticians have tried to delineate the physiognomy of the population at a particular moment: it is this delineation in place and time which is expressed by the term "present population" (i.e., present at the time of the census); another current term is "*de facto* population".

The term "resident population", on the other hand, denotes the population habitually living in a particular territory. What is known as *de jure* population—a

term which describes the inhabitants by reference to their legal domicile—may be considered as an approximation of resident population, the more so since "legal domicile" is frequently coterminous with "habitual residence".

From the theoretical point of view, and both for administrative and for scientific purposes the resident population is preferable to the present population. From the practical point of view, the enumeration of the present population is sometimes easier and hence more accurate. Hence it has become the common practice to enumerate the present population and to treat it as an approximation of the resident population.

But, in view of the increasing mobility of populations, this approximation is becoming less and less satisfactory; for that matter, it has never been so satisfactory at the local level. To remedy these shortcomings one solution is to take a census of the population *in situ* and to use the data relating to place of residence, collected at the time of the enumeration of the present population, for the purpose of reconstituting the resident population.

Those supporting direct enumeration of the resident population, however, are not convinced of the wisdom of taking a census of the present population. They argue that the people concerned find a census taken at their habitual place of residence more natural. Furthermore, persons who are absent abroad are omitted from the census of the present population.

Under these circumstances, the best method would appear to be to take a simultaneous census of both resident and present populations, and to compare the results. But because it is difficult to make such a comparison in detail, only statistical comparisons are usually made. By means of checks controlling the census operations, it seems possible to obtain, at less cost, data equivalent to those yielded by a detailed comparison.

A "population register", while not making the census operations unnecessary, makes it easier to arrange for such checks.

The solutions adopted depend on the procedure used for enumeration. Only if the population itself is asked to fill in the census papers, can the census of the present population effectively take place at a particular moment. If the printed forms are filled in by the census officer, the census operations are inevitably spread over a certain period and rules have to be made to determine in what locality a particular person is to be counted as "present" for census purposes. By a judicious choice of these rules the term "present" can be given an elastic meaning.

Recent developments in census methods reflect such a trend away from the strict theoretical notions formerly current; the line of demarcation, once so clearly drawn, between present and resident population, is becoming blurred. Perhaps the day is not far off when statisticians can employ kindred methods likely to yield comparable results in different countries.

It would be premature, however, to expect such a standardization of methods at the international level. As has been pointed out, the choice of the method depends on the procedure adopted; and that procedure itself depends on the circumstances (which vary greatly according to country) peculiar to the popula-

tion enumerated. Such circumstances include: standard of education, density, habitat, etc.

Mr. M. Croze, Mr. A. Dufresne and Mr. M. L. Febvay took part in the debate.

## 2. THE CONCEPT OF AGGLOMERATION

Mrs. H. T. Eldridge and Mr. D. J. Bogue, Mr. O. Boustedt, Mr. L. M. Feery, Mr. P. George, Mr. G. Goudswaard and Mr. J. Schmitz, Mr. M. Macura, Mr. J. Porte, Mr. M. C. Rochefort, Mr. P. de Wolff and Mr. J. Meerdink had prepared papers on this subject. The papers prepared by Mr. I. U. Pisarev and Mr. J. R. H. Shaul also touched on the subject. Mr. D. J. Bogue, opening the debate, gave a general introduction to the papers.

Four questions received particular attention:

- (a) The delimitation of agglomerations,
- (b) Their classification according to type,
- (c) The analysis of their functions,
- (d) The analysis of their internal structure.

It is unlikely that any one method for the delimitation of agglomerations will be universally acceptable. The reason is that an agglomeration may be considered from several angles—economic, sociological, demographic—and the picture varies according to the point of view. In this way, the agglomeration comes to be regarded as an amalgam of different agglomerations superimposed on each other, the formation of which is traceable to historical, geographical and other influences.

It was said, however, that the study of agglomerations should begin with an objective definition of the agglomeration as a purely topographical phenomenon, this definition to be entirely divorced from any preconceived notion concerning the other possible characteristics of agglomerations. This promising approach has the disadvantage, however, that in practice it does not produce the desired result: it has been proved by experience that in particular circumstances any objective method of delimitation can be fallible.

On the other hand, satisfactory approximations can apparently be obtained at the national level by empirical methods. Would these same methods yield relatively comparable results at the international level? All attempts to establish international comparisons between large agglomerations have in fact so far produced only disappointing results.

Several methods of classifying agglomerations according to type were suggested. It is generally admitted that industrial districts which are not strictly urban in character must be distinguished both from towns proper and from rural districts. It was also considered desirable to distinguish the genuine "large agglomeration", having an obviously identifiable and predominant centre, from those organic groups in which each constituent agglomeration preserves so large a degree of social and functional independence that it remains an elementary unit with a balanced urban life. Preferably, the term "conurbation" should be reserved for such organic groups in contradistinction to the large "town aggregates" of the type first mentioned.

It seems to be generally admitted that for the purpose of classifying agglomerations according to type a number of criteria have to be applied simultaneously

(e.g., what proportion of the working population is employed in agriculture, in industry, in tertiary production; what is the absolute size of these fractions of the population).

In some countries, these criteria have been used for the purpose of an administrative classification of agglomerations. Where such a classification has been in existence for so long that it adequately reflects reality, the problem of the distribution of the population over the various types of agglomeration is greatly simplified for the demographic statistician.

But in most countries, the active administrative subdivision seriously hampers such a rational classification. The most inconvenient situation occurs where the administrative unit greatly overlaps that of the agglomeration: as statistics are usually established on the basis of the administrative unit, any study at the level of the agglomeration then becomes impossible.

The sequel to the analysis of the function performed by agglomerations and to the study of their zones of influence is the treatment of urban centres against the broader background of the region and its subdivisions. In particular, it was emphasized that settlement has to be studied in relation to the environment. It is noteworthy that urban centres are often situated on the boundaries between natural regions whose demarcation lines obey purely geographical considerations.

At the international level, it is the practical methods of delimiting comparable regions which represent the principal difficulty. Many different methods are used, sometimes even in the same country, because each answers a specific purpose; the results vary widely according to the method employed. With a view to achieving some degree of homogeneity in statistics at the international level, it was suggested that the tests of homogeneity now in use should be replaced by the test of gravitation towards economic centres.

From the structural point of view, an agglomeration often appears as a heterogeneous whole containing sharply differentiated districts and areas with distinctive characteristics. It is generally agreed that analytical studies which take the district or area as their basis should be developed, for only by means of such studies can demographers inquire more searchingly into social phenomena.

Such studies are much easier where the administrative subdivision of towns is in keeping with their fundamental structure. But even where this is not the case (and this is still by far the commonest situation), it is yet not absolutely impossible to establish statistics on the basis of scientifically delimited subdivisions.

The preparation of such statistics would make it possible at the same time to classify agglomerations correctly according to type, in cases where such a classification is at the moment unrealizable. It is accordingly most desirable that the statistical services everywhere should resolutely adopt the course described.

Messrs. W. D. Borrie, J. A. Bourdon, P. O. L. George, K. Horstmann, M. Macura, M. C. Rochefort, L. Thirring, and P. de Wolff took part in the discussion.

### 3. THE VARIOUS TYPES OF MARITAL STATUS

Mr. O. de Andrade, Jr., Mr. J. Breil, Mr. N. F. Falzon, Mr. K. Horstmann, Mr. G. G. Jardim, Mr.

O. A. Lemieux and Mr. A. Okasaki had prepared papers on this subject. Mr. J. Breil, opening the debate, gave a general introduction to the papers.

Demographic statistics first came into being in countries of Christian culture, where strict monogamy prevailed and where the types of marital status were clearly differentiated. Hence the classic division of the population into: single, married, and widowed.

To these categories have been added "divorced" and "judicially separated", in countries where divorce and separation are admitted by law.

These traditional categories have proved inadequate; the demographer wants to get closer to reality. If the fundamental distinction between legitimate fertility and illegitimate fertility is to be truly useful, it must be based on data relating to *de facto* rather than on data relating to *de jure* situations. Similarly, nuptiality cannot be studied without reference to custom and usage, in so far as these do not coincide with the law.

In most European countries and in the United States, the problem is how to allow for consensual unions and *de facto* separations. In addition, in troubled times, unions may terminate owing to the absence of one of the parties; such events must also be taken into account.

In certain South American countries, the number of purely religious marriages is so large that the statistics based on civil marriages do not lend themselves to an analysis of nuptiality and fertility by reference to matrimonial status.

In Moslem countries marriage is essentially a private contract, which is not usually solemnized by any civil or religious ceremony. It is legalized by a declaration before the administrative authority. Furthermore, in these countries there is a greater variety of marital status than in the Christian countries owing to the practice of polygamy and to the existence of a special form of dissolution of marriage which is legally "repudiation" and in fact an act of rebellion of the woman.

In Japan, a long period often elapses between the *de facto* marriage and its legalization by declaration to the registrar.

All these examples show that statistics based on marital status were, and often still are, very unsuitable material for studies of nuptiality and fertility in many countries.

Progress has been reported recently, but much remains to be done before any degree of comparability in statistics according to marital status is likely to be attained at the international level. The lack of comparability may be due either to the form of the questionnaires or to the presentation of the results.

While the questionnaire must of course conform to local usage and legislation, it seems possible to determine almost everywhere, in respect of any given person, whether he is legally married; whether he is married not according to the law but only in consequence of some religious or possibly private ceremony; whether he is living in a consensual union; and whether, if the person in question is living apart from his spouse, the separation is *de jure* or *de facto*.

Columns corresponding to these categories could with advantage replace those now in use in the presentation of statistics, for some of the column head-



ings now used, for example, "Widowed, divorced or separated", are often quite meaningless.

Nevertheless, some fundamental and at present apparently insoluble problems remain: a consensual union cannot be treated on a par with marriage; the discontinuance of such a union—an almost undefinable event—cannot be treated on a par with divorce; the very notion of legitimate fertility loses part of its meaning in societies where the conjugal ties are relaxed. We must also consider adapting our methods of studying nuptiality to these new situations.

Mr. P. C. Glick took part in the discussion.

#### 4. THE CONCEPTS OF OCCUPATIONAL ACTIVITY AND DEPENDENCE ON A BRANCH OF ACTIVITY

Mr. K. Bjerke and Mr. T. Hjortkjaer, Mr. B. N. Davies, Mr. L. J. Ducoff, Mr. M. L. Febvay, Mrs. E. Fort de Ortiz, Mr. G. Fürst, Mr. R. García Frías and Mr. O. A. de Moraes, Mr. R. Luna Vegas, Mr. W. E. Moore, Mr. G. Mortara, Mr. J. Nixon and the Demographic and Social Statistics Branch of the United Nations Statistical Office had prepared papers on this subject. The papers of Mr. I. U. Pisarev and Mr. J. R. H. Shaul also touched on the subject. Mr. X. Lannes, opening the discussion, gave a general introduction to the papers.

Great difficulties are encountered in depicting faithfully the social-occupational structure of a population in demographic statistics. The difficulties, which are both theoretical and practical, can be partially overcome if certain concepts are sharpened or revised, and methods changed accordingly.

One initial difficulty is bound up with the idea of activity itself. Because the terminology used is imperfect, the definitions adopted assume considerable importance. For example, to exclude housewives from what is known as "the economically active population", as is the current practice, represents a virtual misuse of terms for surely housework has an "economic" value.

On the other hand, the expression "occupationally active population" is equally open to criticism, for housework demands skill which is at least comparable to that required in many "occupations".

Nor does the traditional content of "active population" coincide with the aggregate of the individuals who are engaged in some "gainful" activity, i.e., an activity which produces goods or services that "generate monetary exchanges". If it did, then those persons who carry on an occupational activity for the sole benefit of a closed family economy would have to be excluded. Quite possibly, incidentally, that section of the population which remains untouched by the flow of exchanges of the general economy ought to be treated as a separate category, at least in the under-developed countries where it constitutes a large proportion of the total population.

As the part played by the household (as the basic "economic" unit) in production, in the distribution of income and in consumption is analysed, a clearer idea takes shape of what is meant by "active population". The notion of *dependence* emerges—some members of the household being in a dependent position with respect to others, who are the breadwinners and in receipt of income.

It is perceived, in consequence, that the population traditionally described as "active" consists essentially of "non-dependents". This observation is strikingly illustrated if we go so far as to classify typically "inactive" persons (e.g., persons living on income from capital) among the "active population".

By means of the test of "economic dependence on another" every person, whether active or not, can be classified in the economic system (if necessary, through the person on whom he is dependent for his livelihood). Hence, the notion of "dependence on a branch of activity", which makes it possible to determine the fraction of the population which is dependent for its livelihood on some particular sector of the economy.

Still, the classification of "dependants" presents some difficulties, as does that of certain "non-dependants" (retired persons, pensioners). The most delicate case is that of households where husband and wife work in two different branches of economic activity. The conventional method of grouping dependants with the head of the household tends to minimize the proportion of dependants in the sectors where large numbers of women are employed. It would doubtless be better in this common case to distribute the dependants between the two branches.

Even so far as the "active" population, in the current sense of the term, is concerned, the statistical methods at present in use are not entirely satisfactory. The results may vary noticeably according to whether they refer to "usual activity" or to "actual activity" at the time of the census; this is particularly true in cases where the object is to estimate the number of unemployed workers. Furthermore, the concept of "usual activity" is hard to define, while that of "actual activity" at a specified moment must in practice be modified to refer to a period of a certain duration, and must be associated with a minimum time spent at work during that period.

The most delicate problems occur in the determination of the group known as "unemployed workers". Should this group include persons temporarily laid off by their firms? They are at present unemployed, but they have kept their posts (their employment?) in the firm. Similarly, the question of the treatment of seasonal workers must also be considered.

From a study of the concept of *under-employment* it becomes evident likewise that it is unsatisfactory to treat as "unemployed" solely those persons who are actively seeking employment. Many potential workers (young persons, married women, aged persons) abandon the quest for employment when the prospects are discouraging.

Lastly, the analysis of the social-occupational structure of the population is complicated by the many points of view to be taken into consideration. For the purpose of determining a person's position in the socio-economic system it will accordingly be necessary to have the following data:

##### *For dependants*

(a) Possibility of classifying them as: unemployed workers, housewives, students, retired persons, pensioners (war pensioners and victims of industrial accident), persons incapacitated for other reasons (invalids), dependants not included in the categories mentioned (children, aged relatives, etc.);

(b) Particulars of the person or institution on whom they are dependent; and if they are dependent on a person (head of a household), particulars of his social-occupational category, his status (as employer, employee), the industry in which he is employed, his degree of kinship with the dependant.

For non-dependants (including dependants in the category of "unemployed workers"):

(a) Social-occupational category, on the basis of occupational qualifications;

(b) Status, i.e., whether employer, worker on own account, employee, unpaid family worker;

(c) Employment: branch of economic activity (in the case of employed workers); particulars of circumstances (in the case of unemployed workers).

With the aid of these data it would be possible (it was said) to classify the population as a whole, and without a classification of the population as a whole it would be impossible to solve satisfactorily the problems which arise both in the study of what is known as the "active" and in the study of what is known as the "inactive" population; in particular, it was emphasized that the statistics relating to the "inactive" population would have to be developed.

The classification in question should distinguish between the following categories:

(a) The "occupationally active" population.

(b) The "unpaid family worker", constituting a special group of the "economically active" population.

(c) The "housewives" (members of the family of the head of the household who are engaged primarily in domestic duties); these may be included either in the "active" or in the "inactive" population, according to statistical needs.

(d) The other persons "dependent on the economically active population" (the person on whom they are

dependent being in category (a); these would form the principal group of the inactive population and would include pupils of the various types of educational establishments (including vocational training schools).

(e) Persons "living on income other than income from employment", a distinction being drawn according to whether the income is traceable to some previous activity (e.g., retired persons) or has its origin in the financial circumstances of the person concerned. These groups of "inactive" persons may possibly be included in the "economically active" population.

(f) "Dependent" persons who are dependent for their support on members of category (e); this category can lend itself to treatment parallel to that of category (d).

(g) Persons "dependent upon the public authorities".

(h) Persons "not declared" and the like.

In this respect, it seems possible to achieve a certain consistency and a certain comparability of statistics at the international level. But this does not imply a standardization of the form of questionnaires which, though most desirable, can hardly be contemplated at this stage. Similarly, specific questions, including the question of age limits, minimum period of employment, the advisability of adopting a special definition of "household" as an economic unit (as distinct from the census "household"?), should be left to the discretion of the statistical services directly concerned.

Messrs. S. Agapitidis, O. de Andrade, G. Fürst, R. García Frías, P. M. Hauser, J. Meerdink, W. E. Moore, H. S. Shryock and L. Thirring took part in the debate.

## Meeting 10

### INTERNATIONAL MIGRATION, WITH SPECIAL ATTENTION TO AREAS OF EMIGRATION

#### Report on the meeting prepared by Mr. A. Oblath, Rapporteur

##### INTRODUCTION

The Conference devoted its tenth and twelfth meetings to consideration of the contribution that international migration has made and can make to a better distribution of the world population. The main purpose of the study was to analyse the effects of international migration on the demographic and economic situation of countries of emigration and immigration.

The present report deals with the work of the tenth meeting which was particularly concerned with migration problems from the point of view of countries of emigration. The work of the twelfth meeting which considered the same problems with special reference to countries of immigration, is summarized in the report on that meeting prepared by its Rapporteur, Rev. William G. Gibbons. Both reports should be considered in the light of the conclusions reached by the Conference in its consideration of other matters which directly or indirectly affect problems of international migration. This applies in particular to the

Conference's discussion of questions concerning population growth and economic development in so far as they relate to countries which are normally considered to be countries of emigration or immigration.<sup>1</sup>

The following subjects were discussed in connexion with problems of international migration considered from the point of view of the countries of emigration:

1. Effects of emigration on the growth and structure of the total and economically active population of selected countries of emigration,
2. Effects of emigration on the economic situation of the population of selected countries of emigration,
3. Conditions influencing emigration needs and possibilities in selected countries of emigration.

The meeting based its discussions on the documents prepared by the United Nations, the International Labour Office, the Office of the United Nations High Commissioner for Refugees, and the Inter-govern-

<sup>1</sup> See in particular the reports on meetings 14, 22, 24 and 26.



mental Committee for European Migration, and on a large number of scientific papers submitted by various experts on the subject.

#### 1. EFFECTS OF EMIGRATION ON THE GROWTH AND STRUCTURE OF THE TOTAL AND ECONOMICALLY ACTIVE POPULATION OF SELECTED COUNTRIES OF EMIGRATION

Mr. G. Parenti presented a summary of the papers submitted by Messrs. E. A. Hogan, Chia-Lin Pan, G. Parenti and P. Bandettini, M. J. Proudfoot, and G. H. Zeegers.

Estimates have been made of the degree to which emigration would affect the structure and growth of the population, and also of the rate of emigration necessary to keep the number of men in working ages constant.

With respect to the first of these estimates, owing to the absence or inadequacy of statistics on the structural characteristics of emigration and the lack of suitable figures on demographic developments in countries of emigration it has been possible only to analyse the mechanism by which such effects are produced and to prepare hypothetical estimates. In this connexion the authors distinguish between primary and secondary effects. The primary effects are due to an immediate loss of population because the emigrants are eliminated from the population earlier than would otherwise be the case under the mortality governing the expectation of life of their generations. Such effects have immediate consequences; the loss of population for the countries of emigration gradually diminishes over a period and is reduced to zero at the time when the emigrants would in any case have been eliminated from the population. If a constant flow of migration is assumed, the younger the migrants and the greater their expectation of life, the greater the resulting loss of population. The secondary effects are due to loss of the emigrants' children, who will be born elsewhere. These effects are cumulative in the sense that they continue indefinitely. The greater the number of young people among the emigrants and the higher the fertility rates of the emigrants, the greater the loss of population.

On the basis of an examination of the normal structural characteristics of emigration from certain European countries since the beginning of the century (Ireland, Italy, the Netherlands, Spain and the United Kingdom), it was concluded that a movement of this kind could not have caused significant changes in the age structure of the population, particularly in the population of reproductive age.

The observations have been confirmed by calculations made for certain European countries on the basis of population projections for the period 1951-1971. The population loss of Ireland, Italy, the Netherlands and Portugal resulting from emigration is, it is considered, greater than the actual number of emigrants, but the change in the relative size of the economically active population is very small; here the effects of emigration are less pronounced than those due to changes in mortality and fertility rates. Other authors would have arrived at somewhat different conclusions, but such information was not submitted to the Conference.

Lastly the authors considered whether emigration had more indirect effects by altering the fertility and mortality rates of the population of the country of emigration; their conclusion was that although such effects may have occurred in the past, they can be ignored at the present time without undue danger of distorting calculations of the structure and size of the future population, at least in the short run.

On the other hand, estimates based on the same population projections for 1951-1971, and relating to the volume of emigration necessary to keep the number of men in working ages constant, showed that in the case of Italy 170,000 males would have to emigrate annually between 1951 and 1960 and that for India annual emigration would have to exceed 2,500,000, or 40 times the rate in the 1921-1937 period. In the case of Italy emigration on this scale might reduce the disequilibrium in the labour market but would bring about an aging of the labour force. In India, however, the age structure of the population of working age would not change appreciably; a movement of this kind would result in a relative increase in the burden of youth dependency accounted for by persons under 15 years of age.

It was also considered whether the effects of emigration on the structure and size of the population of the countries of emigration might not be different if there was limitation of the number of births in the population concerned. The view is held that the population of the United Kingdom, for example, would not be substantially greater at the present time if no emigration had taken place during the nineteenth century. On the other hand, in a country such as India, where there is no limitation of the number of births, emigration results in a real reduction in the size of the population.

During the discussion it was pointed out that these secondary effects might also be affected by the distribution of the emigrants by occupation as fertility rates are higher in some occupational categories than in others: emigration from rural areas, where fertility is generally high, would have greater effects than emigration from urban areas where fertility is lower. The extent to which emigration is localized in a particular region of a country, and demographic and economic conditions in that region might also have an important bearing on the growth and structure of the population. Finally it was noted that the crude death rate in Scotland, which had contributed heavily to emigration, was higher than in England; this was mainly due to the fact that the majority of the emigrants were young. In some regions, particularly the Highlands, a decline in fertility coupled with this emigration of young people has resulted in a very marked aging of the population. However, even in this case the relative size of the economically active population has not been substantially affected, and the position is not always clear and easily determined. In some cases emigrants move to other parts of their own country before emigrating: internal migration precedes emigration and the migrants are uprooted from their places of origin before proceeding abroad.

Messrs. W. D. Borrie, J. A. Bourdon, S. Chandrasekhar, E. A. Hogan and L. Sundaram took part in the discussion.

## 2. EFFECTS OF EMIGRATION ON THE ECONOMIC SITUATION OF THE POPULATION OF SELECTED COUNTRIES OF EMIGRATION

Mr. D. Kirk presented a summary of the papers submitted by G. O. K. Beijer and C. A. Van den Beld, Mr. D. Kirk, Mr. L. Sundaram and Mr. C. Senior.

The effects of emigration on the growth and structure of total population and of the economically active population of a country may also have an economic effect on the levels of living of the population of the country. The considerations discussed above are therefore important in evaluating the effects of a flow of migration on the economic situation of a country.

As a number of scientific papers show, real *per capita* income has risen in certain cases (Puerto Rico); in others the most obvious effects are the inflow of capital in the form of remittances of savings by emigrants (Puerto Rico, India, where, however, this flow is tending to decrease and disappear as a result of restrictions imposed by the countries of immigration on the export of capital or the weakening of ties between emigrants and their countries of origin). The effects of emigration on the economic situation of the country of origin have also been deduced from the extent to which emigration helps to reduce population pressure. In a paper on overseas migration in relation to population pressure in Europe, it was noted that emigration to overseas countries has contributed to European economic recovery although emigration can only be considered a safety valve for the population pressure of certain countries and cannot serve as a total substitute for other factors such as capital investment, increased trade and a better internal distribution of population within Europe. In the countries of southern Europe in particular (with the exception of Greece), overseas emigration since the war has continued to be an important outlet for surplus man-power. In Italy, overseas emigration since the war has absorbed one-fifth of the natural increase of population; it has been an important, although not a decisive factor, in reducing population pressure. Italy has also been helped by emigration to other European countries. In Portugal overseas emigration has absorbed one-quarter of the natural increase, whereas in Spain it has absorbed only one-tenth of the population increase. In Greece, overseas emigration has not been a decisive factor in solving the problems of agricultural underemployment or the increase in the labour force. In the United Kingdom emigration has been at a higher level (30 per cent of the natural increase of the population), but its effects on the national economy have been counter-balanced by immigration from other European countries. In the Netherlands, emigration to overseas countries has compensated for the effects of large-scale repatriation of Netherlands citizens from Indonesia. In the case of the Federal Republic of Germany, overseas emigration has helped to solve the problem of the non-German refugees, but the inflow of refugees and expellees has been much greater than the number of persons leaving the country. This phenomenon has, moreover, been accompanied by a steady increase in per capita income. The demographic disequilibrium in some eastern European countries has been reduced since the war by the territorial changes resulting from the war, industrialization and mass transfers of population. According to the papers deal-

ing with the situation in India and Japan, the volume of emigration from these countries during recent decades has been so small and the natural increase of the population so rapid that population pressure has not been reduced. In India, in particular, the levels of living of the population and the employment situation have improved in some areas, but the country's general economic situation has not been substantially affected.

With regard to demographic theory, a contribution to knowledge of the effects of emigration on the economic situation of the country concerned was made in a paper which analyses methods of establishing these effects. In this analysis structural economic equilibrium was considered as a factor characterizing the economic situation of a country. The criterion of structural equilibrium is the full absorption of productive agents at a "reasonable" level of labour productivity, accompanied by equilibrium in the balance of payments based on "reasonable" export prices. According to the authors the economic effects of emigration can be deduced from the functional relationship between the size of the working population and real *per capita* income. In determining this relationship, certain tendencies (the propensity to develop fundamental science, to apply science to economic ends, to accept innovations, to seek material advance, to consume and to have children) tending to increase or decrease the structural disequilibrium of the economy must also be investigated. By relating these tendencies to the increase in the economically active population and external migration respectively it can be determined whether emigration contributes to the maintenance of structural equilibrium and to what extent it influences real *per capita* income. Estimates made for a number of European countries show that emigration since the Second World War seems to have had economically favourable effects in Ireland, Italy and the Netherlands. In the authors' opinion, this new method of analysis has not yet been sufficiently developed to make it possible to estimate to what extent emigration increases the prosperity of the country of emigration. Other factors which may affect the volume and structure of emigration and the structural equilibrium of the economy must be taken into consideration in the practical application of this concept. Detailed study of the various sectors of the country's economy is also considered necessary, since there may be a surplus of man-power in some sectors and a shortage in others; the geographical distribution of the labour force within a country should also be taken into account.

The discussion of the various papers showed clearly that, generally speaking, knowledge of the economic effects of emigration on the countries of origin is still based on very rudimentary information and more often on conjecture. Further studies in this field should be undertaken. It was pointed out that in order to have a clearer picture of the effects of emigration on the economic and social situation of a country it would be necessary to analyse the country's economic and social evolution and the distribution of the emigrants by occupations, and to determine the causes and circumstances of the emigration, the social groups it affects, and the regions in which it originates. It was, however, argued that the economic and demographic effects of overseas migration is less marked

in the countries of origin than in the countries of destination, mainly because the emigration generally absorbs only a small percentage of the natural increase of population and a small fraction of the inhabitants of the country of departure whereas in some countries of reception, immigration is much more important relative to natural population growth.

Messrs. W. D. Borrie, J. A. Bourdon, S. Chandra-sekhar, P. O. L. George and L. Sundaram took part in the discussion.

### 3. CONDITIONS INFLUENCING EMIGRATION NEEDS AND POSSIBILITIES IN SELECTED COUNTRIES OF EMIGRATION

Mr. X. Lannes presented a summary of the papers received from Messrs. F. Edding, G. Falchi, J. Isaac, X. Lannes, A. Oblath, R. Rochefort, H. F. Rossetti and Y. Shimojo.

In the principal Asian and European countries of emigration, the rate of emigration has fallen short of the level indicated in certain scientific communications as representing emigration needs. The case of India was mentioned at the beginning of this report. In Japan the present rate of economic development is barely sufficient to absorb 360,000 of the 750,000 persons for whom employment must be found every year but only 23,000 people emigrated in 1933, the highest emigration rate for the last 30 years. With regard to Europe, it was felt that the programmes being carried out in Greece would not lessen the need for emigration; to secure equilibrium in the employment market within 12 years, Greece would need an additional migration movement more than twice as large as the present emigration. More precise estimates have been made for other European countries on the basis of the theoretical formula mentioned in connexion with the previous topic. Since that method can be used to estimate the effects of emigration on the real income per head of the population of a country, it can also be used conversely to calculate the rate of emigration necessary to produce an optimum position with regard to real income per head. The desirable rate of emigration would be the difference between the size of the active population required for a maximum real income per head at the end of a given period and the expected size of the same population.

During the discussion of this new concept it was pointed out that the econometric models are capable of improvement and that it is difficult to apply them in practice, since the desirable rate of emigration depends on a number of extremely variable factors. In any event, other criteria must be taken into consideration and adapted to each particular case. While some of them cannot be calculated mathematically, they nevertheless have a great influence on the desire and even the need to emigrate. Psychological, social and political factors are particularly important.

The importance of these factors was emphasized on more than one occasion during the discussion and in a number of papers. One paper pointed out that in practice population pressure is a psycho-social concept as well as an economic concept; it does not exist unless it is recognized by potential migrants. Mention was also made of the fact that the desire or the need to emigrate is not necessarily engendered by economic

distress, unemployment or underemployment, the impossibility of maintaining levels of living without emigrating, the prospect of better conditions in another country, or particular political circumstances arising from a change in political conditions. The desire to emigrate is further determined by the real opportunities of improving living conditions, the knowledge of such opportunities and the means to take advantage of them. The importance of social and psychological factors is underlined by the fact that the most over-populated areas of a country where the rate of population increase continues to be high are not always the areas from which emigration is heaviest. It is even found, as in the case of the Netherlands, that in areas where population pressure is very heavy, the social structure is so rigid that emigration tends to be discouraged. It is considered that in this case the geographical mobility of the labour force might be stimulated by industrialization.

It was emphasized both in the written papers and in the statements that emigration needs cannot be established on a uniform basis applicable to all cases; they vary in intensity and characteristics from country to country and from one section of the population to another. The problem of population pressure is primarily regional rather than international and even national rather than regional. In certain cases, such as the Netherlands, it is a question of counteracting a very high rate of natural increase. Elsewhere, as in Italy, the disequilibrium in the employment market is due to causes which were operative in the past but which are not always demographic in character, and there is a downward trend in the birth rate. In several European countries, special conditions still prevail owing to the presence of refugees and expelled whose future is still undecided, and special measures are urgently needed. There are as many different solutions to the problems of population pressure as there are diverse demographic, economic and social conditions in the countries of emigration.

In this connexion it was argued that, as far as Europe is concerned, the problem would be more easily solved if the negative approach to the question of population pressure, namely that the surplus population was an evil which the countries of immigration must remedy, were replaced by a positive approach and a liberal attitude. Instead of stressing the dangers of population pressure in Europe, the contribution that surplus population has made and can still make, through migration, to the populating of other countries or continents should be emphasized, and population growth should be shown as a factor contributing to better social justice through increased production and a better distribution of the world's resources.

It was also pointed out that a return to pre-1914 conditions with regard to the mobility of labour within Europe would, after a period of transition and adaptation, make possible an increase in the real income per head of the European population as a whole. The arguments in favour of relaxing the regulations and formalities concerning the immigration and employment of foreign workers would seem to be strengthened by the fact the certain European countries of immigration could absorb far more foreign workers than they are now seeking.

With regard to the Asian countries, the experts from India and Japan drew the Conference's attention

to the need for applying the principles of the Declaration of Human Rights and giving all peoples access to the natural resources of the world, in order to avoid political and social tension.

Nevertheless, the motion of emigration needs, irrespective of the nature and intensity of those needs, would remain purely theoretical, if it were not correlated with the real possibilities of emigration. They also vary, being determined not only by the factors in the countries of departure encouraging emigration, to which reference has already been made, but also and primarily by the quantity and quality of the immigration opportunities offered by the countries of reception. As stated earlier, the rate of international migration in the past has been well below the emigration needs of certain countries. It was stressed that, even now, immigration possibilities are limited by economic, social, cultural and political factors and by the fact that the persons who are able and willing to emigrate have not always the necessary qualifications for admission to or employment in the countries of reception.

In existing circumstances, emigration can therefore provide only a very limited answer to the population problem. Other measures are being considered.

The Conference was informed that in Japan, where it was difficult to intensify economic development because of the impossibility of increasing international trade and where there were certain peculiar impediments to emigration, attempts were being made, as a long-term policy, to popularize methods of limiting births.

In other countries attempts are being made to combat unemployment and under-employment by economic development. The Conference was told of the action to that effect taken by India, Greece and Italy. In India, the natural increase of the population, unemployment and disguised unemployment and the inadequacy of food supplies give rise to particularly serious problems, while, at the same time, there is unlikely to be an adequate rate of emigration; efforts to remedy the economic and social situation are based on the five-year plan for economic development which was initiated more than two years ago; further programmes are necessary and are being drawn up.

The situation in Greece has been mentioned above. In the case of Italy, estimates were made (in a paper presented to the Conference) with regard to the possibility of securing equilibrium in the labour market in the course of a twelve-year period by more intense economic development and, simultaneously, emigration; assuming that all the financial, economic and social requirements (i.e., investments, foreign financial aid, expansion of trade, vocational training, etc.) on which the success of these programmes depend are met, equilibrium could be secured by about 1963, provided that there was also a more emphatic downward trend in the natural increase of the population. On this hypothesis, the rate of emigration could be reduced to approximately 50,000 to 60,000 persons a year. With regard to these figures, the view was expressed that a higher rate of emigration would be necessary, first because it appeared, from other estimates, that in the next few years the national economy would be capable of absorbing only the natural increase of the population and, secondly, because the

absorption by emigration of the backlog constituted by surplus man-power could not be staggered over too long a period.

Some participants felt that the recent example of the Federal Republic of Germany which has been able to absorb 10 million refugees, and Greece, where in 1923 1,500,000 people from Asia Minor were productively absorbed, proved that there were considerable additional opportunities for employment in the countries of emigration themselves. The integration of surplus man-power into the national economy seemed to them the best answer. There is always the risk that the number of outlets abroad will be reduced, and it is not always in the interests of the countries of emigration to export their skilled workers or at least the most active elements of the population, who are increasingly sought by the countries of immigration. The domestic economic development measures of the countries of emigration might yield satisfactory results, particularly if they took the form of long-term economic development programmes involving large-scale investments and were carried out in countries like Greece or Italy, which are not fully developed from the economic point of view and where unexploited resources exist as well as a large unemployed or under-employed labour force.

Economic development, however, does not exclude emigration. It was pointed out that emigration can even promote economic development, provided that it involves a whole section of the population and not only the most active elements; otherwise, the inactive population would be proportionately greater, and the country would have to support increased dependency burdens.

Lastly, the possibilities of solving population problems either by absorption of additional numbers into the national economy or by emigration must be considered in the light of future population trends and the real possibilities of economic development in the countries of emigration as well as immigration. In particular, the availability of capital necessary for exploiting undeveloped resources is a prerequisite not only for reducing emigration needs but also for increasing immigration possibilities. The flow of capital to both categories of countries presupposes a favourable international situation and, even more important, active international co-operation. The demographic aspects of economic development and capital investment, which were discussed at other meetings of the Conference, are therefore of particular interest and direct importance in the solution of the population problems discussed in this report.

Messrs. J. A. Alexander, A. Angelopoulos, F. Edding, G. Falchi, P. O. L. George, R. L. Hubbell, J. Isaac, R. Rochefort, Y. Shimojo and L. Sundaram took part in the discussion.

#### CONCLUSIONS

The Conference did not try to reach any conclusions at the end of the discussion on international migration with special attention to areas of emigration. Hence, this report will merely emphasize some of the lessons to be learned from the discussions.

First, much, and undoubtedly very complex, research remains to be done in order to analyse system-

atically, if not scientifically, the effects of emigration on population trends and structure and the economic situation in the countries of emigration. Interesting proposals and methods of analysis were put forward and discussed. It is to be hoped that, in view of these discussions, more detailed research will be undertaken on the phenomena related to emigration.

Secondly, it is clear that emigration has substantially helped to alleviate the population pressure in certain European countries. The same has not been and is not true of Asia. As far as Europe is concerned, it seems probable that a sustained rate of emigration accompanied by a decline in the rate of natural increase of the population and increased employment opportunities as the result of economic development programmes will lead to a gradual reduction

in the population pressure in certain countries. In Asia, on the other hand, the rate of emigration in recent years has been very limited. Even where emigration has been relatively heavy it seems to have had little effect in reducing the population pressure in the countries of emigration. For this reason and because the birth rate in many Asian countries is still extremely high, the gap between these countries' needs and their resources may well increase. The population projections for certain Asian countries do not indicate that any appreciable change is likely in the future.

In conclusion, it should be emphasized that the discussions on this question were closely linked to the discussions the Conference had on other matters and in particular the discussions on population trends and economic development.

### Meeting 11

## LEGISLATION, ADMINISTRATIVE PROGRAMMES, AND SERVICES RELEVANT TO POPULATION, WITH SPECIAL ATTENTION TO THE EVALUATION OF THEIR EFFECT

Report on the meeting prepared by Mr. E. Grebenik, Rapporteur

### INTRODUCTION

The increased interest which has lately been shown in population problems has had the effect of making Governments population-conscious and some of them have taken action designed directly or indirectly to affect the rate of growth of their populations. The study of these policies, and the assessment of their effect is an important part of the demographer's work, and in the present meeting some of the important topics connected with population policy were discussed.

The study and assessment of general population policies in the immediate past was an obvious starting point. The topic was put into the form of a question: "On what basis and in respect of what criteria are general population policies formulated?" The question of criteria immediately leads to the second main point: "How far is demographic research used, and how far could it be used in recommending specific population measures?" And this point, in turn, closely lines up with the third main topic: "How far is demographic research used, and how far could it be used to ascertain the effectiveness of general or specific population measures?"

Clearly these questions are important and relevant to demographic research. They relate to the status of demography and of demographers and to the practical utility of a good deal of the research work in progress. It is not always easy to keep the discussion of each topic rigidly separate from that of all the others, but in the present report an attempt will be made to deal with them in broadly separate compartments.

#### 1. ON WHAT BASIS, AND IN RESPECT OF WHAT CRITERIA, ARE GENERAL POPULATION POLICIES FORMULATED?

Governments may wish to influence the rate of population growth in different ways; in some of those countries in which fertility was low, attempts have in general been made to stimulate it. On the other hand, some countries which suffered from an exces-

sive rate of growth have recently made attempts to reduce this rate to more manageable proportions.

In the low-fertility areas only a few countries have adopted policies explicitly designed to raise the number of births. But most European countries, and a number of countries overseas have pursued certain social policies which in one way or another may have important effects on population. Thus, family allowances are paid in a number of countries, but in many of them they are designed less to increase the number of births than to compensate parents of young children for some of the additional costs that they are bound to incur in rearing them and thus to reduce the inequalities in the standard of life between families of different sizes. Rebates in direct taxation based on the number of children fulfil much the same purpose. Moreover, a good many of the social services which are provided in kind, such as free education, subsidized meals for school children, better maternity and child welfare services, and schemes to assist mothers with free layettes, also help in this connexion. A great many countries both in Western and in Eastern Europe have adopted one or another of these schemes as part of their general social policy. Most of them are designed as measures of general social welfare, though sometimes they were expressly adopted as part of the struggle to reduce the mortality of mothers and young children and may thus be said to have a demographic content.

In most of the areas in which these measures have been adopted there have only been relatively limited reductions in the inequalities in the standard of life between families of different sizes. Only in France has the allowance system developed to such an extent that the allowances form an appreciable part of a family's total income, but even there the costs of rearing children are not fully covered by the allowance.

Although there is considerable similarity between the policies of different countries where it is desired to reduce inequalities in living standards, the attitudes

towards another aspect of population policy show a good deal of variation. This aspect is the attitude towards family planning and abortion. It was made quite clear by the Swedish Royal Commission which reported on the population problem that it desired not an increase in the number of births at any price, but only an increase in the number of "desired" children. The right of the individual parent to be able to control the number of his or her children, whilst at the same time leading a normal married life, was considered axiomatic. It follows from this attitude that no obstacle should be placed in the path of dissemination of contraceptive knowledge, but that all citizens should be able to have access, if they desired it, to means of contraception. The Swedish attitude was shared by that of the other Scandinavian Governments, and its general point of view was also accepted by the Royal Commission on Population which was set up in Great Britain during the 1940's.

Together with this attitude regarding family limitation goes a more tolerant view of abortion. In many countries this operation is legal only provided it is undertaken with the *bona fide* intention of saving the life of the mother. In Scandinavia abortions may be performed when there is grave risk to the life or health of the mother, and this phrase is liberally interpreted. Thus, in Denmark and Sweden induced abortion may be performed if the life or health of the mother would be seriously impaired by the birth of a child due to, for example, chronic malnutrition, frequent childbearing, attempted suicide and mental depression. The philosophy behind this is partly that the community is not primarily interested in more children but in more *wanted* children and partly the recognition of the fact that illegal abortion is extremely difficult to control and that the damage to the health of the mother is likely to be much greater when the operation is performed by an unskilled person under unsuitable conditions.

The attitude of France to this problem is different. Although naturally the French regard it as desirable that the number of *wanted* children should increase, they do not regard this as a necessary part of their policy. No official encouragement is given to the dissemination of birth control information, and the sale of certain contraceptive devices is illegal. Abortion is severely condemned and persistent attempts are made to reduce the number of illegal abortions.

It appeared in the discussion that the policy of the Communist countries in that respect was not dissimilar to that of France. Whilst attempts were made to reduce inequalities in living standards of families due to differences in the number of children and a campaign was waged for a reduction in maternal and infant mortality, abortion and contraception were discouraged, and it was not clear to what extent contraceptive appliances could be freely sold.

As regards the criteria on which a population policy was based, these were made explicit only in France and Sweden. France was, of course, the first European country to experience a decline in her birth rate. In her case the fear that her military strength would decline relatively to that of her neighbours played an important part in formulating a strongly pro-natalist population policy. Moreover, the changing age structure of her population would have led to an unduly high ratio of dependants to the working population

unless speedy measures were taken to restore fertility. France is probably the only country in which there exists a specific body of legislation, the Code de la Famille, which deals specifically with population policy.

It should not be thought that the desire for an increased natality was entirely motivated by fears of a decline in military and economic strength. There was also the belief that there was something of value in the national culture and the way of life which had evolved from the past and that a declining population would imply that the contribution made by France to the world would diminish. Similar considerations animated the Swedish Royal Commission. It is probably true that it would be extremely difficult for an official body to recommend a decrease in the population of its own country. Factors of national pride and prestige will make such a recommendation almost impossible. The British Royal Commission, for instance, when faced with the problem of setting up criteria for desired population growth stressed what they called the "imponderable" social factors which they felt would make a decline disadvantageous, even if it could be demonstrated that a decline would be desirable on purely economic grounds.

The position is very different in areas of rapid population growth. Here the problem is that of reducing a rate of growth which is too large, and which forms an obstacle to the economic development of the areas concerned. Recent advances in medical knowledge have led to rapid reductions in the rate of mortality and have thereby set off a considerable increase in growth. It is politically and morally impossible to reduce this rate of growth by checking the decline in mortality which is still high in comparison with the rates of Western countries. For that reason fertility control is the solution that will have to be adopted. In this field, developments in India and Japan were particularly discussed.

The Indian Government was supporting an extensive research programme in the field of population. Part of this research consisted of field surveys designed to obtain more accurate data on births and deaths, and to study certain qualitative aspects of the population. In addition attempts were made to design contraceptives which would be efficient and acceptable under the conditions prevailing in India. Experimental studies of the rhythm or "safe period" method of contraception were in progress, both in an urban and in a rural group, but the results had been disappointing in that the method was not generally acceptable and did not appear to have produced a significant reduction in fertility. In general the impression was given that although research was being vigorously pursued in India the stage at which research findings could be translated into policy had not yet been reached.

In Japan the position was slightly more advanced. The Government had greatly extended the grounds on which abortion could be lawfully performed, and the number of induced abortions had grown to large proportions. Studies were therefore instituted to discover to what extent family planning could be diffused among the poorer sections of Japanese population, both in the towns and the villages. These studies had shown the existence of considerable demand on the part of the population for instruction in birth control methods, and in the test areas, considerable reductions



in the birth rate had been achieved. It remained to attempt to apply the methods which had proved successful on a local scale to the country as a whole. The Japanese Government and public opinion realized the seriousness of the problem of an excessive rate of growth, and the necessity of taking policy measures to meet it.

This account of the discussion on the bases underlying population policy would not be complete without recording the opinions expressed by delegates from the Communist countries, who believed that present rates of growth were not excessive and could be coped with and who were for that reason opposed to restrictionist policies. In their countries, they pointed out, no restrictionist policies were pursued even though birth rates were high in comparison with Western Europe.

## 2. HOW FAR IS DEMOGRAPHIC RESEARCH USED, AND HOW FAR COULD IT BE USED, IN RECOMMENDING SPECIFIC POPULATION MEASURES?

Only two countries, France and Japan, have research institutes whose work is specifically devoted to the study of population problems, and who are consulted by their Governments on the formulation of population policy. As has been shown in the first section, there has been great concern in both these areas with population problems, albeit for different reasons. In both areas, the institutes' research findings have played a considerable part in the formulation of population policy.

In other countries the contribution of demographic research to population policy has been less direct, though not necessarily less important. Social research has shown up some of the problems which needed attention. For instance, the programme of family allowances in Great Britain, which was instituted less for demographic reasons than on the grounds of social justice owed much to the social surveys taken in the 1930's which showed that poverty was particularly concentrated among families with young children, and which demonstrated that a comparatively low allowance would lift many of them above the level of primary poverty.

Again, research, particularly in the field bordering on social medicine, where a greater measure of experimental control may be exercised than is possible in purely social surveys, will be valuable in establishing certain associations on the basis of which policies can be formulated. Thus, relations between infant or maternal mortality or a high incidence of premature births on one hand, and certain social factors on the other, have made possible a great deal of progress in the reduction of mortality. Demographic research has been used rather less in the formulation of measures designed to stimulate fertility. Indeed, in many cases such policies have been based on a trial and error method. Although, the association of fertility and social conditions has been studied by many writers, it would be idle to pretend that the relationship is sufficiently well understood to enable detailed policy measures to be based on these studies. The reason springs from the fact that whilst there is general agreement both on the part of society as a whole and the individual members regarding the desirability of reducing mortality, the attitude towards fertility is more ambivalent, as the satisfaction obtained from having children must be balanced against the costs incurred in rearing and educating them. Attempts to

stimulate birth rates by equalizing living standards of families of different sizes are based on *a priori* reasoning, and have not in any case been taken very far anywhere with the possible exception of France.

Demographic research has other parts to play in the formulation of general social policy. Social policy measures in the field of housing, town planning and education must be influenced by demographic considerations, and it is important that the implications of population movements should be taken into account in this field. The view was also expressed that it was one of the functions of demographers to create an informed public opinion on the subject of population and population movements.

## 3. HOW FAR IS DEMOGRAPHIC RESEARCH USED, AND HOW FAR COULD IT BE USED, TO ASCERTAIN THE EFFECTIVENESS OF GENERAL OR SPECIFIC POPULATION MEASURES?

We have seen that some of the policies that have been adopted have been based on *a priori* reasoning, and it is therefore all the more important to be able to measure the effect of specific measures and to understand the impact of such measures on population movements.

It was felt that it was easier to study the effect of measures designed to reduce mortality and fertility than to be certain of the efficiency of measures which are designed to stimulate fertility. But even in this field there are difficulties. The general secular trend of the death rate is downward, and it is not always obvious whether a reduction in mortality is due to a specific measure that has been taken, or whether it is merely a random deviation from a secular trend. There are cases where there is a strong presumption of a connexion as, for instance, the reduction of the death rate in Ceylon by one-third within one year after some intensive DDT spraying. Again, the order of magnitude of the decline in fertility reported in Japanese villages after birth control propaganda teams had visited them would lead to the belief that these visits had been effective; but these are exceptional cases. This difficulty is not, of course, peculiar to demography, but applies to all forms of social research.

It is in general easier to demonstrate the ineffectiveness of a particular policy than to show that it has had the desired effects. For instance, the rise in the birth rate of France coincided with the adoption of vigorous measures of population policy, but in the absence of a detailed examination of the motives which led couples to increase the number of their children the connexion between the two events must remain unproven, particularly as similar rises in fertility occurred in other areas in which very different policies or no policies at all were pursued. The fallacy of *post hoc ergo propter hoc* would have to be avoided. There was agreement that much more detailed information would have to be collected and analyzed before the impact of specific measures on fertility could be accurately assessed.

The following members of the Conference were among those participating in the discussion: Mr. J. E. Backer, Mr. J. Bourgeois-Pichat, Mr. G. Inghe, Mr. Y. Koya, Mr. W. P. D. Logan, Miss M. Mod, Dr. S. Peller, Mr. K. C. K. E. Raja, Mr. G. W. Roberts, Mr. T. V. Ryabushkin, Mr. A. Sauvy, Mr. J. J. Spengler, Mrs. I. B. Tauerber, Mrs. C. M. Watson

*Meeting 12***INTERNATIONAL MIGRATION, WITH SPECIAL ATTENTION TO AREAS OF IMMIGRATION****Report on the meeting prepared by Rev. W. J. Gibbons, Rapporteur**

## INTRODUCTION

This meeting was in effect the complement of meeting 10, in which international migration was considered with special attention to the areas of emigration. Meeting 12, on the other hand, gave consideration to international migration from the standpoint of areas of immigration. The following topics were discussed:

(1) The effects of immigration, with special reference to the post-war years, on growth and structure of population in the receiving countries,

(2) The achievements and objectives of recent and current immigration plans with particular reference to economic aspects of assimilation,

(3) Recent experiences of, and the prospects for, the absorption of immigrants with particular reference to non-economic aspects of assimilation,

(4) Immigration as a means of improving the distribution of the world population and relieving population pressures.

The meeting took as its basis for discussion the documentation prepared by the United Nations Population Division and the International Labour Office, as well as a number of scientific papers presented by specialists in their respective fields. As the subject was broad, it was not possible to take all aspects into account. Nevertheless, the selected geographical areas covered by the papers served to illustrate typical problems within each topic discussed.

#### 1. THE EFFECTS OF IMMIGRATION, WITH SPECIAL REFERENCE TO THE POST-WAR YEARS, ON GROWTH AND STRUCTURE OF POPULATION IN THE RECEIVING COUNTRIES

Mr. M. Lacroix introduced the topic, drawing attention to important points in the papers of Messrs. R. Blanc, W. D. Borrie and K. Jupp, Benjamin Gil, E. P. Hutchinson, Chia-Lin Pan, and Miss L. Guelfi.

It was felt necessary, in order to obtain results having some general validity and predictive value, to distinguish between the indirect and direct effects of immigration. Indirect effects, on a very long-term scale of time, raise important and difficult problems which have yet to be adequately studied. The authors of individual papers had concentrated their attention upon the direct effects. In regard to these, there are two aspects to be considered: (1) the primary effect of the addition of the immigrants themselves, and (2) the secondary effects of the addition of the descendants of the immigrants.

Detailed study of even the direct effects of immigration has in some instances been rendered difficult because of the absence of relevant statistics, or because existing data evidently were incomplete or in a form not suitable for comparison. Nevertheless, simple graphic models could be made to assess the direct effect of immigration under various simple hypotheses as to volume, duration, and composition of the immigrant stream and the structure and growth char-

acteristics of the population in the immigration countries. These would help to understand better certain aspects of the absorptive capacity. It is clear, for example, that immigration has at times had an important effect upon the proportion of workers to dependants in the population.

Immigration has affected the demographic and economic structure of the population of France after the First World War and of Western Germany between 1945 and the present. In both cases the absorption of immigrants occurred when the age distribution of the population had been greatly upset by the effects of war and contributed particularly in the case of France to the smoothing out of the "dents" in the age pyramid.

In Argentina, since the end of the Second World War economic factors have led to a rapid influx of immigrants of highly selective age composition which has had a marked effect upon the population structure. This also has been the case to some extent in Venezuela following the rapid economic expansion made possible by the exploitation of oil resources.

A somewhat different situation exists in Australia. The entry of immigrants with a disproportionately large number in the economically-active ages 15-49 has helped to sustain the labour force. Without immigration, the ratio of the labour force to the population presumably would have declined because of the rapid fall in the birth rate after 1928. Nevertheless, in the course of time the effect of immigration on the size of the population and on its age and sex distribution probably will be less substantial than might be imagined. Immigration will increase appreciably the size of the population, but the ratio of breadwinners to dependants will not be greatly altered. This likely outcome can be explained simply by the tendency for the ratio of breadwinners among Australian immigrants to be not greatly higher than the corresponding ratio in the world population.

The effect of immigration upon the structure of Canada's population has not been substantial, and does not appear likely to be so in the future, although in the long run immigration will add considerably to the total growth of population. An important difference between Canada and Australia is that there is a much larger outflow from Canada than from Australia, because of its geographical, political and cultural proximity to the United States.

The importance of emigration from a country or area as an aid to the absorption of large numbers of immigrants into the same area is illustrated in the post-war history of Israel. Between 1948 and 1952, some 700,000 Jews moved into the territory while some 600,000 Arabs left it. The experience also illustrates the possibility of absorbing large numbers of immigrants when there is a will to do so, as may be the case in times of emergency, even in a country in which resources are limited and in which the climate and other factors differ greatly from those of the sending countries.



A temporary period of very large immigration (such as some countries have experienced since the war) followed by a number of years of small immigration, is a cause of increase in the average age of population. This tendency has been observed in the analysis of United States data following cessation of a high rate of immigration prior to 1929. The foreign-born now are predominantly a middle-aged to elderly element in the population.

When considering the effects of immigration upon growth and structure of the economically active population, it is necessary above all, to bear in mind the size of the immigrant flow in relation to that of the existing population, as well as the age and sex composition of both.

It may be added that an important part can be played by temporary migration, particularly between contiguous countries or territories. Temporary migration has been significant not only among European countries, but also between Canada and the United States, and between other American countries, such as Venezuela and Colombia. It has also been important in equatorial Africa. Such temporary migration associated with the construction of capital works (e.g., irrigation or hydro-electric projects) frequently can lay the basis for a high rate of absorption of permanent immigrants, as well as help in imparting skills to the local labour force. Such questions lead to the discussion of economic aspects of immigration which is the second topic of discussion.

Messrs. W. D. Borrie, H. Bunle, B. Gil, and Miss L. Guelfi took part in the discussion.

## 2. THE ACHIEVEMENTS AND OBJECTIVES OF RECENT AND CURRENT IMMIGRATION PLANS WITH PARTICULAR REFERENCE TO ECONOMIC ASPECTS OF ASSIMILATION

Mr. D. C. Corbett introduced the topic and presented a résumé of his own paper and those of Mr. H. Bunle, Mr. G. W. Hill, and Miss H. Wander.

For the post-war period two types of immigration need to be distinguished: (1) refugee resettlement, which has formed a substantial part of the intake of a number of countries, such as Canada, the United States, Australia, and the major movement into such areas as Western Germany; (2) the more normal voluntary movement of people, many of them assisted by Governments. The rate of immigration of the latter type has been for the most part determined by the national interests of the receiving countries, with the economic factor often playing an important role in deciding what constitutes the national interest.

In Western Germany, primary recipient of the post-war European refugee movement, the heavy inflow imposed immediate strains on the economic structure, but in the long run may bring some advantages by providing a substantial labour force to replace war casualties. There remains, nevertheless, the appreciable task of adjusting those refugees who have not migrated elsewhere, to the types of employment offered by the West Germany economy. An example of this is the attempt to strengthen agricultural activity, employing for this purpose refugees from Eastern Germany.

In reconstructing the West German economy while absorbing the immigrants, the guiding norms came to

be a maximum of free play for individual initiative and reliance on expanded foreign trade. However, laws and regulations were of necessity instituted which would ensure the immigrants equal chances of participation in economic growth, as well as suitable housing and job opportunity. Despite certain contradictory elements in these policies and the inevitable tensions between natives and newcomers, economic integration of immigrants has proceeded better than anticipated. More recently it has been accompanied by rising levels of living. Yet the 25 per cent increase in population since 1939 in this territory can be attributed almost exclusively to in-migration.

In France, where post-war immigration was of a more normal type, those admitted were carefully selected to fit into the economic pattern, not only of the country as a whole but also of particular *départements*. Immigrants were sought for those types of work in which the labour force proved to be deficient. There was also a desire to achieve a better balance in the age structure of the population, for the proportion of old persons was thought to have risen too high in recent years. Furthermore, France has laid stress on family immigration, as being more stable and with better prospects that the children at least will be easily absorbed into the national economy and culture.

In Australia, approximately one-half of the post-war immigrants have been state-assisted, having been selected in relation to particular types of occupations in which labour was known to be in short supply. Subsequent shifts in patterns of occupation, however, have not necessarily occasioned undue concern, since it is recognized that such transfers are part of the normal mobility of the labour force, and of accompanying economic changes.

Venezuela, until near the close of the Second World War, was unaffected by any special influence of immigration. The subsequent development of the petroleum industry and the trend toward urbanization and industrialization proved a stimulus to immigration. The Government, moreover, wanted to assist in refugee resettlement. At first it was felt desirable to place immigrants in the agricultural sector of the economy in order to fill shortages in farm labour. The more recently adopted policy, however, favours freer immigration so far as job allocations are concerned. During the past decade the country has expanded in wealth and people more rapidly than at any time in its history. The post-war immigration played a decisive role in this development.

It is difficult to assess precisely the effects of immigration upon the economic structure of the receiving countries. Clearly, great strains have been imposed in the cases of Germany and Israel, where some temporary lowering of the levels of living occurred during the absorption of the large numbers involved. Housing conditions were especially affected. In Canada, on the other hand, the economic strains seem to have been slight. In that country two important influences may be at work: the ability of immigrants to move freely in the labour market, and the opportunity of Canadians to migrate, if necessary, to the United States for suitable employment. Moreover, it appears that the occupational distribution of immigrants differs only slightly from that of the whole labour force, and that most immigrants are integrated successfully into the economy.

By contrast, in Australia, where there was less flexibility in the economic situation, the success of the immigration schemes has been due principally to the relatively high price of primary exports in the post-war period. This permitted an expanding import of capital goods necessary for the fulfilment of plans for internal economic development. The fulfilment of these plans was also made easier by dollar loans. Nevertheless, the Australian economy appears to be much more vulnerable than that of Canada. Australia's ability to absorb continuously a large number of immigrants depends on the maintenance of high prices for her exports or substantial borrowing from overseas.

The importance of capital movements in relation to the maintenance of a high level of immigration was also discussed. In this regard it would seem that Canada in particular, and to some extent the Latin American countries as well, because of their association with the dollar world, are in a more favourable position than Australia and other members of the British Commonwealth, or for that matter than Israel and French Equatorial Africa. Undoubtedly, the large outflow of capital from the United Kingdom in the nineteenth century played a major part in the permanent migration of people from Europe to the new lands overseas.

The discussion of these economic aspects raised further questions as to the methods by which the immigrants can most easily be absorbed into the economic structure of receiving countries. As already indicated, France in particular and to some extent Australia and certain countries of Latin America, have attempted to fit immigrants into particular occupations in which skilled or semi-skilled man-power presumably is deficient. Canada and the United States, by contrast, have relied considerably upon freedom of choice on the part of the immigrant. No positive conclusions as to the merits of either system appear to be justified in the present state of our knowledge, yet it is probably desirable that after entry into a country immigrants should not be held rigidly to the occupations for which they may have been recruited.

The experience of Israel shows the extent to which immigrants can be retrained to fit satisfactorily into the economic structure of the receiving country. That of France and Australia indicates that while immigrants may have been selected initially for certain occupations of low marginal productivity, nevertheless substantial mobility is possible for them in situations of relatively full employment. However, the degree of mobility in these countries and elsewhere appears to depend not only upon economic factors, but also upon social and cultural conditions and interactions.

Messrs. A. Arca-Parró, H. Bunle, D. C. Corbett and M. Escobar, and Miss H. Wander, took part in the discussion.

### 3. RECENT EXPERIENCES OF, AND THE PROSPECTS FOR, THE ABSORPTION OF IMMIGRANTS WITH PARTICULAR REFERENCE TO NON-ECONOMIC ASPECTS OF ASSIMILATION

Mr. A. Girard introduced the topic and commented on the papers of Messrs. M. Diégués Jr., C. Gini, O. Handlin and S. Izumi.

In regard to the non-economic aspects of assimilation three important factors should be emphasized. First, each country of immigration presents a particular social and cultural environment which may be related to or influenced by economic forces. Second, the scale of difference between the social and cultural structures of the sending and receiving countries will have an important bearing on the degree of assimilation required of the immigrant. Third, the degree of difference may be less between an immigrant-receiving country beyond Europe on the one hand and the sending country within Europe on the other, than between sending and receiving countries both within Europe.

In the last-mentioned case, attitudes are strongly influenced by historical conditions and institutional practices which may render the social structures less flexible than those of the more recently settled countries overseas. Furthermore, the overseas countries have been accustomed since their foundation to receive immigrants, whereas in most countries of Europe immigration is less a part of historical tradition, at least in modern times.

Essential to social and cultural assimilation is the economic absorption of the immigrant. This is a relatively simple problem under reasonably normal economic conditions. But while the immigrant may be absorbed economically, and may even become naturalized, there remain complex psychological questions such as emotional attachments to country of origin, or difficulties in understanding the institutions of the adopted country. Such obstacles will seldom be overcome satisfactorily by the first generation. Relatively complete assimilation does not as a rule occur until the second generation.

Appreciative understanding by both immigrants and native populations of these psychological difficulties to be overcome can aid in hastening assimilation. On the other hand, undue stress upon difference may have the effect of providing some groups with weapons to use against other groups regarded as different from themselves. Thus antagonisms will be intensified rather than alleviated with consequent slowing down of adjustment.

Attention was also given to the question of physical assimilation. Some researches in Italy suggest that the attenuation of physical differences between groups as a result of environmental factors, while taking several generations to effect, may in some instances be achieved more rapidly than attenuation of cultural differences. It was not felt, however, that in the present state of knowledge, generally applicable conclusions could be formulated with precision.

Discussion then turned to specific instances of immigrant assimilation. In Brazil, for example, Japanese agricultural immigrants apparently have over some decades adjusted themselves successfully to the Brazilian cultural pattern. Almost all the younger generation have availed themselves of formal Brazilian education. As regards language, members of the older generation tend to use Japanese within the family circle, but the children for the most part speak Portuguese and Japanese-Portuguese among themselves, and Japanese-Portuguese to their parents. The elders born in Japan seem to have nostalgic memories, though these tend to diminish once they decide to settle down permanently in Brazil. The Japanese-Brazilians, on

the other hand, have no memories of Japan, and manifest no desire to leave Brazil. In this respect a wide gap exists between the two groups. For their part, the Japanese immigrants brought to Brazil a versatile, intensive method of farming which they have preserved and spread, to the benefit of the economy.

As regards Brazilian immigrants generally, up to recent years no particular settlement plan has existed, nor was a special effort made to ensure assimilation. Consequently cultural adjustment has varied with the region and the group, and shows many different aspects. It has been found that when immigrants come into daily contact with Brazilians, the period required for assimilation tends to be shorter. Significant differences in rates of assimilation are noted among the various immigrant groups. Cultural and religious traditions, social status, economic level, linguistic and national background, all these factors are influential.

Venezuela's experience with substantial immigration, chiefly since 1941 has involved newcomers principally from Europe, largely of Latin culture. Increasingly, these European immigrants seek naturalization, which may be taken as a sign of progress in assimilation. Colombians and North Americans also have immigrated in substantial numbers, and have manifested their ability to adjust to the Venezuelan cultural environment.

The United States has had considerable post-war experience with immigration. Not only have many thousands of Puerto Ricans, already citizens, come to the mainland, but between 1946 and 1952 some 1,300,000 aliens entered the country for permanent residence. It is probably too early to draw definite conclusions regarding their assimilation. Nevertheless, it does appear to be progressing with relative ease and success. Among the factors contributing to the adjustment have been the limited size of the immigrant group in relation to the total population, the control and supervision exercised over the immigration, and the active assistance given to newcomers by relatives, friends and agencies interested in their welfare. The rather widespread conviction that the United States should play a significant role in refugee resettlement also contributed to mutual adjustment between the immigrant and resident groups.

The experience of North African workers in France also has been instructive. A number of these workers, for the most part Moslems, have taken advantage of their right to seek jobs in France. Among the factors tending to slow down adjustment have been discrimination in employment, because of cultural or racial differences, the unskilled status of most workers, and inadequate recreational and social facilities for the migrants coming from a widely different background. Most North Africans coming to France have been males, but adjustment has not necessarily been hastened among those who brought their families. However when the migrants mixed more freely with the local population, and especially when they intermarried, adjustment was found to be more rapid.

It was suggested that instead of comparing the immigrants and local population as if they were homogeneous groups with respect to the characteristics considered, it would be more fruitful to study the frequency and intensity distribution of these characteristics in both groups and more carefully delineate

the areas of overlap and difference of these distributions. Moreover, it would be well to bear in mind when making demographic analyses of assimilation, that in a number of areas earlier immigrants and descendants of immigrants are to be found among the resident population.

In summary, complete assimilation has to be measured in terms of generations rather than in terms of years. Nevertheless, in the initial stages of the immigrant's residence in his new country the stresses of a cultural and psychological character to which he inevitably is exposed will be lessened by flexibility in the social structure of the receiving country. This will permit social and economic mobility by the migrant, thus enabling him to attain a status commensurate with his qualifications and past experience. Assimilation is not a one-way process. Where tensions exist they may have their origins in attitudes of both the immigrants and the resident population.

Messrs. M. Escobar, P. O. L. George, C. Gini and M. Lacroix took part in the discussion.

#### 4. IMMIGRATION AS A MEANS OF IMPROVING THE DISTRIBUTION OF WORLD POPULATION AND RELIEVING POPULATION PRESSURES

Mr. H. M. Phillips introduced the topic, summarizing his own paper and those of Messrs. G. Falchi and W. Gibbons and X. Lannes.

The volume of world migration is determined in the last analysis by two facts: the availability of emigrants and the absorptive capacity of immigration countries. In view of existing pressures on presently developed resources in some areas of the world, the supply of emigrants may be taken for granted. What is of great importance in effecting international migration is the *de facto* absorptive capacity of the receiving countries. Therefore to be profitable, discussion of migration as a means of improving the distribution of world population must centre around the problem of absorptive capacity.

There are two points worthy of note. First, the existence of immigration outlets does not necessarily result in actual reduction of population in the sending country. The population may continue to grow, or perhaps remain stationary. Second, the rate of natural increase in some emigration countries may in fact be higher than prospective or conceivable rates of emigration or absorption.

Nevertheless, in certain instances migration can help relieve strains in economies experiencing chronic underemployment of serious proportions. Such is the case when emigration drains off young adults of marriageable age, or those newly married, thus occasioning a decline in marriage and birth rates in the area of emigration. Even though not accomplishing this goal, emigration of a substantial volume may provide a "breathing space" during which a weak economy can reallocate its resources and achieve higher levels of employment.

It was stressed in the discussion, however, that unless the economy of the sending country actually does expand, with all that this implies as regards capital investment and application of skills and initiative, emigration is not likely to resolve a "surplus" manpower problem. To do so, it would have to continue in

such volume that other problems might arise, such as unbalance in age distribution, weakening of the future labour force, and an unduly large proportion of dependants in the very young and old age brackets. Further discussion brought out that in certain areas of the world there does seem to exist a situation where population growth is not particularly rapid, yet under-employment persists despite maximum utilization of resources in the light of present technical knowledge.

Over time international migration has contributed significantly to effective economic exploitation of under-developed areas when they lacked man-power, or man-power with particular skills, in relation to potentially rich resources. Thus it aided in achieving greater productivity in foodstuffs, raw materials, and manufactured products, which were made available for domestic consumption and foreign markets. Within recent generations this has been the case in the United States, and still is in Australia and comparable areas. Despite the absolute increase of numbers following directly upon immigration, the addition to the labour force was of such a kind as to permit rising levels of living despite a proportional increase in consumer demand.

The fact was touched upon that certain areas of the world are unexploited, or at least not exploited to full capacity, though possessing potentially rich resources. In an economic-demographic sense such areas seem to constitute a natural complement to other areas where man-power remains underemployed, because it is in excess supply in relation to existing resources. Transfers of man-power, through voluntary migration, presumably would result in a resource allocation more beneficial to all concerned. Through wise adjustment, it was pointed out, global and regional output could be made to rise. For this, however, mutual planning and continuing co-operation would be requisite. Moreover, in addition to the movement of man-power and skills, there would have to be freer flow of capital and of raw materials and manufactured products in international trade.

Attention was drawn to the possibility that undue emphasis upon emigration of "surplus" man-power might give rise to the formulation of new *Lebensraum* theories. Unqualified stress upon the reallocation of factors of production, it was pointed out, could result in minimization of other important social, cultural and political considerations. Even in economic terms, the problems of the receiving countries should be given careful attention, so that their legitimate interests would be taken into account at the same time as those of emigration areas.

Absorptive capacity of potential receiving areas was the main topic of discussion in this portion of the meeting. As already indicated, this capacity has four main aspects: economic, social, cultural and political, some of which overlap. Immigration prospects therefore should never be assessed in the light of economic absorptive capacity alone. To do so would be to accept implicitly as adequate the economic interpretation of human history and conduct.

Economic absorptive capacity, which is nevertheless of prime importance, implies a rate of migration which is not likely to dislocate seriously the economy of the receiving country. Reduction of income following such dislocations as may occur will be relatively small and of tolerable proportions.

As already indicated, immigration can and does under favourable circumstances contribute in the receiving countries to economic development and the raising of national income. Yet shifts in factors of production within the country, increased mechanization, improved education, or greater investment, might under some circumstances be equally or more successful in achieving the same results. In such a situation the decision to receive immigrants in substantial number presumably would be guided by considerations broader in scope than the securing of additional man-power for an expansion of the national economy.

Generally, however, national income can be expected to rise following immigration where (a) it meets demands for labour or entrepreneurs not being supplied from internal sources; (b) this demand is in the more critical sectors of the economy and is not unduly inflationary; (c) capital formation (including that for which the migrants themselves are responsible) is sufficient to sustain the activity it generates; (d) the entry of the immigrants into the economy does not set off dislocations which may counteract (a), (b) and (c). Dislocations are most apt to occur where the balance of payments is precarious, pressure on public utilities is already high, a serious time-lag exists between the entrance of the immigrants into the consumer market and their effective participation in expanded production.

Social absorptive capacity relates to the extent to which a country can absorb immigrants without too drastic disturbances of the levels of living of its citizens. In practice this means "without visible reduction" of such levels. Immigration countries today are more sensitive on this point than they were in the nineteenth century. Nor are the immigrants themselves any longer prepared to undergo the rigours of earlier pioneers, especially when they have social security benefits in their country of origin. However, in the case of emigration countries with very low levels of living the situation may be different. Prospective emigrants from those countries look forward even to relatively low incomes in the immigration country as an improvement over their present condition.

Cultural absorptive capacity is the extent to which a country can integrate foreign-born persons into its way of life and aspirations. Many factors are here involved, including the size of the immigrant flow relative to resident population, its ethnic or national origin, and the existence of suitable facilities to aid assimilation.

Political absorptive capacity has both internal and external aspects. At times nations are willing to receive immigrants even in excess of their economic and social absorptive capacity, because of political and humanitarian considerations. Reasons of national prestige, of national security, or of a sense of affinity between the immigrants and influential indigenous groups are responsible for such behaviour. There may also be considerations of other types: the desire to aid refugees, common citizenship rules as in the British Commonwealth, and population transfers occasioned by wars.

There are several additional points to note as regards economic absorptive capacity. The immigrant is a special type of "import" (in the sense of the capital invested in his upbringing and education), inasmuch as no charge is levied by the exporting country. The capital value of an immigrant of 18 years of age has been estimated by some as of the order of \$10,000.

This would represent the probable cost of rearing and educating him during childhood and youth. Others question the possibility of determining capital value in such precise terms, perhaps drawing attention to the countervailing fact that some expense is incurred in receiving and establishing the immigrant, especially when retraining is required. On net balance, however, the advantage seems to lie with the receiving country.

It was pointed out in the discussion that population increase consequent to immigration, other things being equal, carries with it economic stimuli in the developing economies. Moreover, the availability of immigrant skills, especially if accompanied by social mobility, plays a special role in breaking bottlenecks or developing important new lines of production.

One or more of the above-mentioned factors limiting absorptive capacity today are operating in a number of immigration countries. In New Zealand, for example, the primary limitation seems to be concern about possible reductions in levels of living. In Australia the immediately operative factors are cultural and economic. In the United States current factors limiting immigrants are presumably cultural and political, especially since economic growth and capacity to absorb additional man-power continue despite an occasional economic setback.

In the case of Latin America the limiting factors affecting absorptive capacity are more complex. Argentina's concern is almost exclusively economic. It suffers from inflationary pressures, maldistribution of its labour force, and urban concentration of immigrants. The terms of trade have not been entirely favourable in the post-war period. Capital formation is not sufficiently rapid. Yet with an improvement of economic conditions, Argentina would have an absorptive capacity for substantially more immigrants than it is now receiving.

Brazil, and practically all Latin American countries except Venezuela, suffer from lack of capital formation. But Brazil has additional limiting factors of an economic character, for example insufficiency of lines of communication with the hinterland, areas in which serious persistent or recurring droughts are experienced and the considerable internal migration from north to south. Nevertheless, as economic conditions become more favourable, immigration, as well as internal migration, presumably will play an important role in the development of Brazil's rich resources of land and minerals, notably in Goias and Parana. The same may be said of the Llanos of Colombia, the Esmeralda region of Ecuador, the rural areas of Paraguay, the unused lands of Chile, and the extensive under-populated lowlands of Bolivia.

So far as economic conditions are concerned, two countries of the Western Hemisphere besides the United States are in a specially favourable position for receiving immigrants, namely Canada and Venezuela. There are, however, social and cultural limitations upon Canada's absorptive capacity, while in Venezuela there are institutional obstacles to be overcome. In this latter country, experience with immigration in significant volume dates back only a decade or so. It can be anticipated that the favourable trade balance, the expanding economy, and the desire to develop resources will be reflected in a constructive immigration policy.

It was noted that as regards much of Central America and the Caribbean islands, severe limitations on economic absorptive capacity preclude for all practical purposes immigration on a substantial scale. What immigration occurs in this region is more likely to be of a selective character rather than involve mass movements. It will have as its goal the importation of special skills and abilities. Cuba, the largest island in the region, may be an exception at least for the present. Apart from this, however, the Caribbean islands generally are heavily populated in relation to agricultural resources. Availability of non-agricultural employment is conditioned by geographical isolation, lack of raw materials for industry, and great dependence on trade for markets and needed capital. Because of its special relationship to the United States, Puerto Rico is in a different position from the other islands. Yet in the post-war years it has sent thousands of its inhabitants to the mainland of the United States. While technically, due to common citizenship, this constitutes internal migration, it has certain characteristics of international migration. In any case it places a proportionate burden on the absorptive capacity of the mainland which has to be taken into account.

The resources and absorptive capacity of Africa were discussed briefly. Recognition was given to the fact that within that continent there exists a considerable potential for economic development and for productive employment of a substantially larger population. As such development occurs, significant movements of man-power can be anticipated both within and between the various political subdivisions. A limited number of immigrants, perhaps on a temporary basis, may be coming from Europe in cases where their skills have a special contribution to make. But it was felt that with one or two exceptions any large-scale immigration from the European continent is likely to encounter cultural and political obstacles for the moment in the receiving areas.

The discussion brought out that international migration and resettlement remain the principal hope for unemployed or unintegrated individuals in certain situations. An example would be a percentage of the expellees, refugees and escapees in Western Germany. Unfortunately, those not yet integrated often also lack the essential qualities needed to resettle successfully abroad. Moreover, supply and demand conditions in negotiations regarding international migration are often wrongly appraised. It was observed in this connexion that sometimes receiving areas state themselves unable to attract the type of immigrants they want, but that over time they may accrue benefits from having absorbed the types of immigrants who were prepared to come.

Not all areas experiencing serious underemployment of man-power can look to international migration as a primary source of relief. India, for example, with its large area and potentially rich resources of continental proportions, places primary emphasis on re-allocation of the factors of production, on internal migration, on expansion of agricultural production and on modernization and diversification of the economy in general. However, smaller areas burdened with chronic underemployment, particularly insular areas remote from markets and having rather limited markets

of their own, may not have either the room or resources for a successful approach in this direction.

At times there has been, and almost certainly there will continue to be, a dichotomy of interests between the receiving and sending countries. Except in times of crisis, when refugee movements tend to sweep over national boundaries, it is the absorptive capacity of the receiving countries which is likely to be the most important factor determining the direction and rate of flow of migrants. Whether this should be so is another question; harmonizing the differences between emigration needs and immigration requirements remains one of the difficult problems of our times.

In conclusion, it appears that the rate at which immigrant countries are prepared to receive settlers, or are able to do so with due consideration for the

maintenance of their economic standards is noticeably less than the pressures for emigration in areas having "surplus" man-power. Immigration can indeed be an important factor reducing economic, social and political tensions, but a related and even more important question is the efficient use of the resources of all countries and regions, or of the world as a whole. This rather than the movement of people as such is the crucial problem of great and densely populated areas like India and China, and even of Western Europe. This problem has been amply discussed in other sessions of the conference.

Messrs. S. Chandrasekhar, F. Edding, M. Foyaca de la Concha, M. V. M. Herchenroder, M. J. Proudfoot, R. Rochefort, S. R. Sen, and B. Thomas took part in the discussion.

### Meeting 13

## METHODS OF MAKING POPULATION PROJECTIONS

### Report on the meeting prepared by Mr. H. Hyrenius, Rapporteur

#### INTRODUCTION

One of the practical aims of demographic science is to predict the future trend of population. This is an exceedingly difficult problem, for no simple laws can be applied to changes in human society. On the other hand, it is an important problem. If the future changes of the population can be foreseen within a reasonable range of error, they can be taken into account in important public policy decisions, and in various aspects of economic and social planning. In many cases the lack of reliable estimates of future population is a serious handicap to rational determination of policies and planning of action.

The need for future population estimates or "projections" is becoming recognized for an increasing number of purposes. At the same time it is noted that numerous population projections have been very much in error. As a consequence, attitudes towards the use of various types of population projections are often critical, sometimes negative. Since the results of population forecasts depend largely on the methods of projection used, a special meeting of the World Population Conference was devoted to the methodological problems of population projections. This meeting was not intended primarily for consideration of the results obtained from population projections, since another meeting (number 14) was devoted to future population prospects.

The following six topics were selected for discussion:

1. Population projections for countries with only moderate amounts of statistics,
2. Projections for countries with low or fluctuating birth rates,
3. International comparability of population projections,
4. Projections for specific purposes,
5. Projections for cities and small territorial units,
6. The accuracy of population forecasts.

Because of the close relationships between the various problems, many of the papers presented were concerned with two or more of the six topics listed. The contents of the basic papers and the main points brought forward during the discussion are summarized below.

#### 1. POPULATION PROJECTIONS FOR COUNTRIES WITH ONLY MODERATE AMOUNTS OF STATISTICS

Population forecasts are made frequently in technically advanced countries where accurate and detailed statistics abound. They are rarely made for "underdeveloped" countries where, as a rule, statistical services are far less adequate. Nevertheless, a country in process of economic and social development needs population forecasts to indicate goals for development as well as to ascertain the available human resources. Forecasting methods used in countries with abundant statistics are not directly applicable where statistics are few and poor.

One paper at this meeting reviewed the possible types of methods and described the methods adopted by the United Nations. Forecasts can be made by extrapolation of population totals, by "component" projections using *ad hoc* estimated parameters,<sup>1</sup> and by "component" projections in which the parameters are derived from a generalized scheme. Component projections are better than extrapolated totals, both because of greater usefulness and more predictive value. It may be noted here that in many of the countries whose statistics are fragmentary birth rates are high and fairly constant; the chief hazard of component projections, i.e., a possible misinterpretation of the fertility trend, is consequently reduced.

<sup>1</sup>A "component" projection is one in which each individual age-cohort (i.e., the number of persons born in the same year, or group of years, and hence of the same age at any given time) is carried forward from one date to another on the basis of assumed mortality rates of each age group, additional future birth-cohorts being inserted on the basis of assumed rates of fertility. The assumed mortality and fertility rates are the "parameters" of such a projection.



A projection of the Algerian population described in a paper presented by Mr. P. E. Vincent is one good example of a component projection with *ad hoc* estimated parameters. Old life tables of Italy and Spain, found to conform reasonably well with Algerian male mortality in the middle span of life, were adopted as the basis for the projection. Fertility was estimated from numbers of persons aged 5 to 9 years, account being taken of mortality from birth to these ages. Census data on population by sex and age were adjusted by some estimating procedures. The resulting projection can be regarded as entirely successful, as compared with more recent census results.

*Ad hoc* estimates of parameters may not be equally successful if comparable data for some other country are not found or their applicability cannot be verified. A generalized scheme of mortality assumptions can in many cases remedy this shortcoming, can eliminate some of the arbitrariness in the selection of a life table, and tends to enhance international comparability. By combining the past mortality trends of many countries, a reasonable model can be established, consisting of a series of theoretical life tables which can be taken to represent a normal sequence in the improvement of mortality over a period of time. If data exist, the future course of each age-specific mortality rate can then be traced. If not, some simple criteria often indicate which theoretical life table probably represents most nearly the current situation with subsequent tables in the series representing expected future conditions. Some misjudgment of true mortality rates will not seriously affect the reliability of forecasts. The prediction of the future course of fertility, however, poses problems which have not yet been solved. Hence, in making population projections for many countries of Latin America, the United Nations has had to use rather arbitrary alternative assumptions of future trends in birth rates. The system of consecutive life tables, developed by the United Nations, has been found entirely suitable for population projections for many countries.

## 2. PROJECTIONS FOR COUNTRIES WITH LOW OR FLUCTUATING BIRTH RATES

Many population forecasts have erred severely with respect to the number of estimated births. This has happened particularly in countries where birth rates were very low in the 1930's but relatively high in the 1940's. By contrast, no serious errors of this kind are expected to result in countries where birth rates are high and fairly constant. Because of their failure to foresee this extraordinary development of the birth rate, the confidence of demographers in their ability to predict future population has waned. Confidence can be partly restored if it is believed that new methods of fertility analysis will avoid the errors made in earlier forecasts.

It has been usual to define fertility in terms of age-specific birth rates. In countries where family limitation is wide-spread, however, the age at which women give birth can be postponed in response to disturbing factors, such as wars or economic depressions, and it can change with changes in their propensity to marry at given ages. More refined methods of fertility analysis may then be used to eliminate the disturbances in age-specific birth rates. These methods, and possibly

others, yet to be developed, are probably better than age-specific birth rates for estimating future births—except that the ages of women also are a limiting factor of the possible numbers of birth. Which method should be selected in forecasting will depend on its general relevance, its ease of application, and the availability of suitable statistics.

It has further been suggested to use data of the type collected through opinion polls, regarding the desired size of family. For this purpose a sample of couples might be asked at the time of their marriage, how many children they would want under various circumstances. If some of these couples were then followed up systematically, with suitable statistical controls, regarding changes in their desires and actual behaviour, the resulting data would enable demographers to improve their future estimates of fertility.

## 3. INTERNATIONAL COMPARABILITY OF POPULATION PROJECTIONS

For use in international studies, it is important that population forecasts be internationally comparable. The terms of trade between two nations, for example, are apt to change in the future if their populations grow at different rates. Most population projections have been made at the national level and by divergent methods. Mr. F. W. Notestein's projections for the populations of European countries<sup>2</sup> and projections recently made at the United Nations for Latin American countries<sup>3</sup> are international attempts at making comparable projections by uniform methods. Recent projections for European countries under the auspices of the Organization for European Economic Co-operation,<sup>4</sup> on the other hand, have been made by the best methods available in each country. For the purpose of international studies it is important to establish the criteria by which population projections for various countries may be regarded as comparable or not. In this connexion, two aspects of comparability must be borne in mind: on the one hand, forecasts made for the populations of several countries should be additive, i.e., comparable in the sense that their sum can be reasonably regarded as a forecast of their combined population; on the other hand, it should also be possible to make significant comparisons of the rates of population growth implied in the several forecasts.

Forecasts are comparable if the population is similarly defined and if they can be regarded as reasonably reliable. The actual accuracy of a forecast cannot, of course, be foreseen; hence, reliability is an "intuitive" concept. This has often found expression in the form of "high" and "low" estimates, indicating certain limits within which future population is believed most likely to be contained. Intuitively it is possible to select "high" and "low" estimates uniformly in such fashion that the possibility that actual future population will either exceed the "high" or fall short of the "low" estimate always appears to be equally small. If the limiting estimates of all forecasts represent ranges corresponding to the same "intuitive" confidence interval, the

<sup>2</sup> F. Notestein and others, *The Future Population of Europe and the Soviet Union*, League of Nations, Geneva, 1944.

<sup>3</sup> *Future Population Estimates by Sex and Age*, Report I. *The Population of Central America (including Mexico)*, 1950-1980. New York, 1954, and Report II. *The Population of South America, 1950-1980* (in preparation).

<sup>4</sup> See OEEC document series MO(53)32.

forecasts will be internationally comparable, regardless of the methods by which they have been derived or their degree of refinement.

Population projections are sometimes made for theoretical purposes other than actual forecasting. In that case analogy of methods is essential if comparability of results is to be achieved. The same is true if theoretical conclusions, other than mere population totals, are to be drawn from any such projections. Additivity is irrelevant to the comparability of theoretical projections.

#### 4. PROJECTIONS FOR SPECIFIC PURPOSES

Population projections can be made for purposes other than forecasting. They may serve to illustrate the consequences of an assumed hypothetical trend, or of various interpretations of a given observed trend; a paper presented by M. Henry shows alternative projections of future births resulting from different methods of analysing the recent trend of French fertility. Projections can also be made to ascertain the number of births, or of migrants, which will be required during a certain period to provide some predetermined population figure; as suggested in Mr. G. Fougstedt's paper, a projection can lead to an estimate of the numbers of transfers from rural to urban occupations required to attain some given goal of economic development. The methodology of theoretical projections and of actual forecasts, however, is identical.

Forecasts have often selected several alternative but plausible trends to determine reasonable limits for estimates of probable future population. The results were presented as "high" and "low" estimates. By combining the reasonable alternatives for each of the component trends, a large number of future estimates can be obtained. Recent experience has not favoured the use of alternative estimates since the rise of birth rates in many cases surpassed even the "high" expectations. The dilemma of alternative estimates can be partly avoided by using a single mortality assumption together with a wide range of fertility assumptions; this procedure results in single future estimates for age groups already living at the time of forecasting and a wide band of alternative estimates only for the age-cohorts yet to be born.

Forecasters have sometimes questioned whether the same methods are appropriate for short-range and long-range forecasts. The contributed papers throw some light on this problem. Future estimates of survivors from the current population, by the "component" method, are much more accurate than future estimates of persons not yet born. In the course of time, the latter persons constitute an increasing proportion of the total population. Hence, over the long period, the "component" method may lose much of its advantage over the "mathematical" method.<sup>5</sup> For the purpose of long-range forecasts, therefore, a review of existing mathematical methods remains pertinent.<sup>6</sup>

The methods most appropriate for long-range and short-range forecasts should also differ in view of the

<sup>5</sup> I.e., the extrapolation of the trend in the figure for total population.

<sup>6</sup> The mathematical method also appears appropriate where available information does not permit a more analytical approach, as in the case of estimates of future population of the world and its continents prepared by the United Nations.

usually more urgent demand for short-range forecasts. The suggestion was made that frequent simple guesses of future population, which can be readily revised and brought up to date, would meet the demand for short-range forecasts. The "method of guessing" obviously requires careful consideration by intelligent and experienced persons.

Account must be taken of the increasing specialization in the demand for future population estimates. Not only figures of total population, but estimates for individual age groups, economically active population, and various other population components are increasingly required. The "component" method is adequate for forecasts relating to age groups. Other methods are necessary in making future estimates for a population segment. The ratio method (where the forecast of the segment is derived from that for the total population) is appropriate under certain conditions; under different conditions it is preferable to make an independent forecast for each segment prior to a forecast of the total population. Forecasts for segments have to take into account not only the births and deaths but also the transfers of population from one segment to another. In the case of births from "mixed marriages" (i.e., where fathers and mothers are not of the same population segment), the proper assignment of the children to the segment with which they will presumably be associated creates another problem. Mr. Fougstedt's paper describes some methods appropriate for dealing with this problem.

#### 5. PROJECTIONS FOR CITIES AND SMALL TERRITORIAL UNITS

Special problems arise in the case of population forecasts for cities or minor divisions of a country because of the relatively great importance of migratory movements within the country's borders. Since such internal migration is largely motivated by economic reasons, the problem cannot be solved by demographic forecasting methods alone; the prospects of economic change in each locality must be taken into account to make it possible to estimate the future volume of migration. The migratory movement is, however, not entirely dominated by economic and social development; the demographic trends of the hinterland, from which the migrants originate, must likewise be taken into consideration. Hence, economic prediction and demographic projection must be combined into one system in order to determine the most probable future population changes.

As stated in the paper presented by Mr. H. Hyrenius, forecasting is more difficult for small cities, or cities mainly dependent on one branch of industry, than for large cities with a varied economy. For a given city, in-migration will depend not only on the objectively measurable development of certain industries but also on a variety of intangible factors.

Studies have shown that certain industries are "primary" in the sense that they act as population magnets, while other industries are "secondary" in so far as these merely serve the needs of the population which the "primary" industries have attracted.<sup>7</sup> Further

<sup>7</sup> This distinction between industries has been made for the purpose of population forecasts. It should not be confused with the division of a national economy into its "primary", "secondary" and "tertiary" sectors often made by economists for an entirely different purpose.



studies are necessary to establish the predictive value of various economic indicators, and to find the most relevant types of statistical data. From the predicted development of the "primary" industries, the economically active population therein can be estimated and, subsequently, the active population in the "secondary" industries. The non-active population as well as the necessary migration can then be estimated. The demographic trends of the hinterland should be examined, and the amount of migration, estimated on the basis of economic considerations only, can then be modified accordingly. To obtain good local or regional forecasts, there is a need for a framework of regional or national projections, a study of the responsiveness of population movements to various features of economic and social change, and knowledge of the economic development which is expected by local industrialists, city planners and economists. The co-operation of various experts is required. To be useful, forecasts should be frequently revised.

It was pointed out that, in forecasting for local areas, economic projections are often difficult to make, and that they may be an unsatisfactory basis for population projections. Sometimes one may, on the other hand, use housing development as a good basis, particularly where housing shortage is a limiting factor.

A procedure used in the Netherlands was described in the paper by Mr. L. H. J. Angenot. A national committee for regional forecasts was established in that country. The first task of the committee was to demarcate the areas within the national territory for which the most useful forecasts could be made. The definition of forecasting areas was preceded by a study of past relationships of population growth to demographic trends as well as economic changes. Areas were then delimited in such a fashion that they should be, as far as possible, either economically independent or demographically homogeneous, depending on whether the economic or the demographic factors had been the most decisive. The committee then made preliminary projections for each area by purely demographic methods, consonant with the population forecast for the entire country. The preliminary projections were submitted to the local authorities for modification in the light of all existing local knowledge concerning prospective changes in employment conditions. At a later stage, the area forecasts, as modified by the local authorities, ought to be reconciled with the national forecast. This procedure for making regional forecasts is admittedly not applicable to countries where statistics are less detailed and local economic and social research less advanced than in the Netherlands.

#### 6. THE ACCURACY OF POPULATION FORECASTS

Accuracy is probably the chief objective of forecasts. In fact, all contributed papers were concerned to some extent with the problem of accuracy.

Interest in this problem is heightened by the experience of the 1940's when birth rates of many countries rose in an unforeseen and, perhaps unforeseeable, manner, thereby upsetting most previous calculations. Confidence in population forecasts was consequently diminished and demographers were compelled to review the method at their disposal.

The accuracy of forecasts by the "mathematical" method (extrapolation of population totals) was compared with that of forecasts by the "component" method (computation of survivors for each age group). In addition to greater general usefulness, forecasts by the latter method have the advantage that the results can be checked for each age group separately. Forecasts for most age groups already living at the base date were found to be quite accurate, those for persons at advanced ages less so, and those for children born after the base date revealed the greatest errors.

Because of greater accuracy of forecasts for at least some components, the "component" method is preferable and probably more accurate than the "mathematical" method. An analogous conclusion is reached by Mr. Fougstedt in his paper, where it is pointed out that the sum of forecasts for several segments (such as, e.g., racial or religious groups) may be more accurate than a single forecast for the total population.

A re-examination of forecasts in the light of later census results was recommended by several authors and speakers. Census results may, however, also be in error. Furthermore, retrospective study of a forecast can lead only to limited conclusions, since it can no longer be determined how much of relevant knowledge already existed at the time when the forecast was made; the details of methods and adjustments are also often unknown at the later date.

No forecasting method can be relied upon for accuracy of results because any method may suddenly become irrelevant as new events occur or new trends emerge. Improved methods of fertility analysis might have averted some of the errors in recent forecasts; but only now, with the hindsight of this experience, has it become possible to recognize the crudeness of the fertility measures previously used. Not only should a forecast be accurate; it should be up-to-date and readily available whenever required. Simple guesses, quickly computed and easily revised, can often be more useful than the results of detailed, time-consuming procedures, which soon become obsolete. Forecasters should concentrate more on a careful appraisal of all relevant trends and a study of practical methods by which these can be grasped, than on painstaking computations. They should also endeavour to develop shortcut methods suitable for ready application.

#### CONCLUSIONS

Experience has indicated that—except by sheer coincidence—a perfectly accurate population forecast can never be made because the infinity of factors affecting population trends can never be fully known. Therefore, the ideal remains to derive from past observations a function from which the most probable future development can be inferred. In addition, it is desirable to foresee the probability of an error of a given magnitude by which even the best possible forecast can be affected. Population forecasts, if translated into such a scheme of probabilities, can provide a reference system showing us *when there is good reason to be surprised*.

The usefulness of population forecasting—despite its hazards and uncertainties—may be elucidated by quoting Keynes' definition of probability. Probability

depends on current knowledge, and the probable is the hypothesis on which it is rational to base our actions. Viewed in this light, forecasting is useful and necessary even though we have good reason for doubting that an absolutely accurate forecast can ever be made.

It was suggested by the Chairman that professors of statistics draw the attention of their students to the fact that the question of the accuracy of population forecasts seems to be a very promising and useful subject for doctoral theses, especially if the problem is attacked with modern statistical tools such as the theory of stochastic processes and time series analysis of variance; and by thoroughly studying the whole set of population forecasts made, with attention to such attributes as may have influenced their accuracy.

A summary was given of an examination of numerous forecasts for various countries by analogous methods undertaken by the Secretariat of the United Nations, in the light of more recent information; the attempt was made to ascertain what proportion of the total error of a forecast must be ascribed to the estimate of each parameter (errors in estimated base population, births, deaths and migration). But since there is no generally accepted measure for determining the degree of agreement between forecast and actual development the problem of how to compare the accuracy of various forecasts remains unsolved.

In the case of local forecasts, the desirability of using methods involving analysis of economic prospects was stressed by several participants and some specific problems concerning certain local areas were presented. It was pointed out that these "economic" methods may be hazardous in the case of areas dominated by industries sensitive to business cycles.

It was repeatedly stressed during the meeting that there is great need to educate the public in what can and cannot be expected of a forecast and why forecasting is important. A forecast can be made, e.g., in

order to warn the authorities of what might happen and thereby stimulate counter-measures which might avert the expected course of events. Forecasts, therefore, may be most useful even if subsequent events do not conform to them.

Economists, town-planners, administrators of education, etc., often request demographers to supply them with one single "best" forecast. Such consumers of forecasts should realize how hard it is for the demographer, if he is conscientious, to comply with such a request. At the same time, they should become accustomed to think in terms of modern decision theory, in which the merits of alternative courses of action are weighed in terms of the probability of the various benefits and risks which might result. This approach to action, where future numbers of population are involved, is only possible if demographers present alternative—high and low—forecasts in a form suitable for the given purpose. If a whole series of estimates is available, the choice of a practical plan can be economically determined by a "cost and risk" function.

A study of results of various forecasting methods by the United States Bureau of the Census<sup>8</sup> was cited in which the prospects for improvement of population forecasts were assessed as "only mildly favourable". The present meeting likewise concluded on a note of guarded optimism.

The following persons took part in the discussion at this meeting: Messrs. L. H. J. Angenot, B. Benjamin, P. R. Cox, P. Depoid, G. Fougstedt, G. Frumkin, P. C. Glick, J. V. Grauman, J. Hajnal-Konyi, L. Henry, H. V. Muhsam, R. J. Myers, H. M. Phillips, J. S. Siegel, S. Somogyi, W. Taylor, L. W. Törnqvist, and P. E. Vincent.

<sup>8</sup>United States Bureau of the Census, "Projections of the Population by States, 1955 and 1960", *Current Population Reports*, Series P-25, No. 56, 27 January 1952.

## Meeting 14

### PROSPECTS FOR FUTURE POPULATION CHANGES

#### Report on the meeting prepared by Mrs. I. B. Taeuber, Rapporteur

##### INTRODUCTION

One of the most critical tasks of demography is the estimation of future population changes. The meeting considering this subject stood appropriately at the middle of the Conference. Preceding meetings considered the separate components of growth—mortality, fertility and migration. Subsequent meetings dealt with the economic and social aspects of future population changes.

The task of this meeting was as hazardous as it was critical. We know little even of the present population in great areas of the world. Past attempts at prediction in areas with excellent censuses and vital statistics have been notable more for their deficiencies than for their achievements. If prediction is impossible, why then do we attempt to survey the prospects for the future? The answer is that, as scientists, we cannot

evade our responsibilities as world citizens. Admitting the great reaches of ignorance, there is still considerable knowledge of mortality, of fertility, of migration, and of their interrelations in major regions of the world. And even though prediction is not possible, we can analyse alternative possibilities for population growth in the coming decades. We have only to make the generally reasonable and highly probable assumption that the future will be an ordered evolution from the recent past and the present. As basic data become more plentiful and more adequate and knowledge of the dynamic interrelations of mortality, fertility, and economic and social factors increases, new estimates of future populations can be made. In one sense, we proceed by successive approximations to projections that have predictive validity. In a deeper sense, we illustrate the size and structure of the future populations implicit in a continuation of present trends.

## 1. THE GROWTH OF WORLD POPULATION: 1650-1950

There is very limited information on the growth of human populations from the time of the earliest paleolithic cultures to the period of European demographic expansion in the seventeenth century. Growth appears to have been very slow for the world as a whole and the major regions. Periods of increase followed economic developments such as the transition from gathering to agricultural techniques of food production and from local to market organizations of production and distribution. Long periods of population decline are known to have occurred in several of the great cultural regions in the ancient and medieval periods. Over the millenia, though, population increased, and the rate of increase advanced somewhat. By 1650 there were approximately 470 million people in the world. Growth since the middle of the seventeenth century has been enormous—from the 470 million of 1650 to 1,090 million in 1850 and 2,450 million in 1950. The population of the world in 1950 was more than five times what it had been in 1650. Moreover, the rate of increase has been quickening over time. Numbers doubled in the two centuries from 1650 to 1850, then doubled again in the single century from 1850 to 1950. Within this last century, growth was more rapid from 1900 to 1950 than it had been from 1850 to 1900.

Growth in these last three centuries has differed greatly among the several continents. Asia, always the most populous, is estimated to have increased most regularly—257 million in 1650, 656 million in 1850, 1,300 million in 1950.<sup>1</sup> The combination of a large base population and regular increase resulted in growth that was massive in terms of total numbers. The increase between 1900 and 1950, 463 million, was about equal to the population of the entire world in 1650.

All continents other than Asia have grown irregularly over the centuries. Europe grew most rapidly in the latter half of the nineteenth century, somewhat less rapidly in recent decades. The early population of Africa is conjectural; substantial growth probably began recently. Population growth in the Americas has been prodigious, while numbers in Oceania increased rapidly with the arrival of European settlers. Even in these continents of originally heavy immigration, though, recent growth has been due primarily to the excess of births over deaths.

Estimates of the population of the continents and the world at the decennial years from 1920 to 1950 would seem to indicate at first glance that the acceleration in the rate of growth of world population had ceased. During these three decades world population grew at an almost constant rate of one per cent per year. However, if allowances are made for the in-

<sup>1</sup> The 1950 population of the Chinese mainland was estimated at 500,000,000 and its average present rate of increase at 0.5 per cent per year. If the much higher figure recently announced by the People's Republic of China had been used, the population of Asia and the world would have been higher in 1950, and rates of increase in the century or so prior to 1950 would have been somewhat higher than those presented here. Similarly, the acceptance of the higher figure for the total population and the figures indicating a substantial rate of population increase at present would lead to higher rates of increase and larger population in the future. When sufficient information becomes available to evaluate the new figures, revisions of the estimates of past and future growth may need to be made.

fluence of economic depression in the 1930's and war in the 1940's, the underlying tendency was still one of accelerating growth. In the words of one of the papers prepared and submitted by the Population Division of the United Nations entitled *The Past and Future Population of the World and its Continents*, "Despite temporary setbacks, it appears that the epoch of accelerating world population growth, which can be traced back for 300 years, has not yet reached its climax".

Simple projection of the past rates of increase to secure estimates of future population is hardly valid, for the acceleration of growth in the world as a whole was the result of divergent growth patterns in the various continents. The ideal approach to a world projection would involve the summation of projections for each country of the world, each projection having been made on the basis of careful analysis of past and probable future dynamics of growth in the country concerned. Since paucity of data precludes this approach for many territorial units of the world, it is essential to develop some conceptual framework concerning the trends of the components of growth in differing demographic, social, and economic interrelations. The projections of the future populations in great regions of the world must be based in major part on the known population dynamics of those world regions where statistical records are adequate for analysis and projection. Hence an examination of growth patterns must precede the consideration of probable future populations.

## 2. GROWTH PATTERNS: A TYPOLOGY OF POPULATION CHANGE

The previous discussion of the growth of world population has indicated a five-fold increase in numbers in the three centuries from 1650 to 1950. For the world as a whole, the increase was due to an excess of births over deaths. While in theory such accelerated increase in population could have been due to a rise in fertility, a fall in mortality, or some combination of the two, the evidence is quite overwhelming that the major factor was a fall in mortality. Likewise, while the slowing of growth in regions of formerly rapid increase could have been due to rising mortality or declining fertility, the evidence is quite conclusive that the long-run trend to lower rates of increase where it occurred was associated with declining fertility rather than rising mortality. The growth of population in areas that have had a rising and then a declining rate of natural increase was associated with the movement from initially high birth and death rates through early declines in mortality to delayed, but increasingly rapid declines in fertility.

Increase of population in certain regions of the world in recent centuries was influenced by varying degrees at different time periods by massive migrations, the most notable being the outsurge from Europe which resulted in the peopling of the Americas and Oceania. International migration is no longer nor is it likely to become, the predominant factor in the population change of any of the major regions and continents, with the possible exception of Oceania. The future populations of the regions and continents, like the future population of the world as a whole, will be determined primarily by the changing relations

of fertility and mortality. Interregional relations will influence future populations through their indirect influence on levels of fertility and mortality, through the transfer of capital, of technology, and ideas rather more than through the transfer of men. This is a generalization concerning the probabilities of the future based on the regularities of the past. It constitutes a basic tenet from which projections of future populations can proceed. To the extent to which the basic assumption should prove invalid, projections for the regions and continents affected would require modification.

Characteristic patterns of transition in mortality and fertility have existed in all countries that have undergone substantial economic, social, and demographic modernization. A comparable process of transition is manifest in many countries in process of economic and social development. The Population Division of the United Nations has characterized five major types of demographic situations on the basis of the present relations of death and birth rates. The names attached to the types are not those of the United Nations, but are used to simplify discussion:

(a) *Pre-modern*. Death and birth rates high.

(b) *Early mortality decline*. Death rates high but declining, birth rates high and relatively unchanging.

(c) *Advanced mortality decline*. Death rates fairly low or even low, birth rates high and relatively unchanging.

(d) *Transitional*. Death rates low, birth rates declining.

(e) *Modern*. Low death rates and low or fluctuating birth rates.

The areas of the world that belong to each type, the proportion of the world's total population in that type, and the estimated "normal" annual rate of population growth in that type under conditions as of 1950 are as follows:

(a) *Pre-modern*. Area: Middle Africa. Population: 141 million, 6 per cent of world's total. Growth: 0.50-1.50 per cent.

(b) *Early mortality decline*. Area: Northern Africa and Asia except Japan. Population: 1,280 million, 52 per cent of world's total. Growth: 1.34 per cent, excluding China.

(c) *Advanced mortality decline*. Area: Southern Africa, Middle America, and Tropical South America. Population: 149 million, 6 per cent of world's total. Growth: 2.32 per cent.

(d) *Transitional*. Area: Temperate South America, Japan, USSR, and the Balkan Peninsula. Population: 359 million, 15 per cent of world's total. Growth: 1.56 per cent.

(e) *Modern*. Area: North America, most of Europe, Australia and New Zealand. Population: 523 million, 21 per cent of world's total. Growth: 1.00 per cent.

*Undefined*. Area: Pacific Islands. Population: 2.8 million.

The present growth characteristics of the populations of the regions are phases in a process of change in mortality and fertility which has been diffusing

throughout the world during the preceding three centuries. It is not likely that a process of such duration occurring in such diverse cultures should cease suddenly; there is no evidence that it has done so. On the contrary, there are grounds for assuming that the slow changes in mortality and fertility that have occurred in the past will not characterize nations undergoing public health expansion and economic development now and in the future. There is, in fact, overwhelming evidence of a quickening in the pace at which their mortality is being reduced.

The record of the past and the situation of the present are the only bases available for systematic projections of the populations of the regions of the world. The fundamental assumption is that all regions of the world are moving through a transition from pre-modern to modern growth types. This is an assumption as yet unverified for those massive populations of Asia, North Africa, Southern Africa, and Latin America where fertility has as yet revealed no tendency toward a decline. There is a correlated assumption that rates of change in vital rates in the future are reasoned extensions of those witnessed in the past, and that they move systematically from one growth type to the next. There is evidence in many countries that this assumption may not hold with respect to future changes of mortality, for modern medical science and public health techniques have permitted a precipitant drop from pre-modern to modern mortality rates in many areas. Japan's experience of a very sharp fall in the birth rate and the existence of government research oriented toward a population policy in other countries of high fertility indicate that rates of change in fertility in the future may be more rapid than those which occurred under comparable developmental situations in the past.

None the less, the most probable future trend is an ordered development from the past. Estimation of future numbers and characteristics of the populations in the regions of the world on the assumption of an ordered continuity in the demographic transition is the most reasonable basis for an analysis of the demographic consequences of divergencies in birth and death rates from those assumed in the projections. The projections of the United Nations are statements of future populations that would appear plausible during the next thirty years. They are not predictions.

### 3. THE UNITED NATIONS ESTIMATES OF FUTURE POPULATIONS: 1950-1980

In a study entitled *Framework for future population estimates*, the United Nations presented for the consideration of this meeting projections of future populations at five-year intervals from 1950 to 1980 for regions of the world. Since it was impossible to select the single most probable rate of change from one demographic type to another for each of the various regions into which the world was divided, "high", "medium", and "low" assumptions were made. The staff of the United Nations believe that, "barring such disastrous events . . . as wars or major break-downs in social organization, it is . . . improbable that future population will either exceed the 'high', or fall short of the 'low', expectation". The totals of the three estimates for the continents in 1950 are presented here:

Estimates of population of continents for 1950 and for 1980, according to "high", "medium", and "low" expectations<sup>a</sup>

Continent	Estimated population (millions)			
	1950	1980		
		"High"	"Medium"	"Low"
World .....	2,454	3,990	3,628	3,295
Africa .....	198	327	289	255
America .....	330	577	535	487
Northern America <sup>b</sup> .	(168)	(240)	(223)	(207)
Latin America <sup>c</sup> .....	(162)	(337)	(312)	(280)
Asia <sup>d</sup> .....	1,320	2,227	2,011	1,816
Europe <sup>e</sup> .....	593	840	776	721
Oceania .....	13.0	19.2	17.5	16.1

<sup>a</sup> United Nations, Population Division. *The past and future population of the world and its continents*. Proceedings of W.P. 6. Papers: Vol. III.

<sup>b</sup> I.e. America North of Mexico.

<sup>c</sup> I.e. America South of the United States.

<sup>d</sup> Excluding the Asiatic part of the USSR.

<sup>e</sup> Including the Asiatic part of the USSR.

The future growth projected in these estimates is unequal among the various parts of the world. On the medium assumption, the increases in population between 1950 and 1980 will be 46 per cent for Africa, 33 per cent for Northern America, 92 per cent for Latin America, 52 per cent for Asia, 31 per cent for Europe, and 35 per cent for Oceania.

The demographic differences of the present are related to cultural as well as to economic differences; changes in the future may vary significantly in different regions that now appear quite similar. For this reason, the discussion of the prospects for the future population of the world as a whole was approached at this meeting through prior consideration of the prospects in some of the major regions and cultures of the world.

#### 4. THE FUTURE POPULATIONS OF MAJOR REGIONS: 1950-1980

The first area considered was that of Europe and European populations in other continents. Here for the first time in world history there was a long continued decline in mortality that was followed by an equally sustained decline in fertility. The decline of fertility had proceeded so fast by the 1930's that most projections made before the war envisioned an imminent decline in the actual size of the populations. In more recent years, fertility has risen substantially in nearly all the countries that previously had the lowest fertility. The interpretation of the long-run significance of these rises is still being debated. The problem of projection is therefore a very difficult one. In general, however, mortality rates are so low that future decline in death rates will not be a major factor in determining population prospects.

In the countries of Western Europe, there is general agreement that the problem of estimating future populations is primarily one of estimating fertility. In all these countries family planning is widespread. Short-time changes in birth rates reflect primarily the decision as to *when* children shall be born; these decisions of individual families seem to be related closely to social and particularly economic conditions. The majority of recent projections for individual countries envisage very slow growth so far as total numbers

are concerned, but this slow growth involves important shifts in the age and sex composition of the populations, with manifold social and economic consequences. In Southern Europe, where the decline in fertility came later, the recent years have witnessed a continuation of the long-time downward movement. Rates of growth are becoming more similar to those of Western Europe, although the age structures still resemble those of Western European countries about two decades ago. Reports from the countries of Eastern Europe indicate widespread increases in rates of population growth in recent years, these increases being explained by simultaneous declines in mortality and rises in fertility accompanying the changes in social organization.

European populations in North America, Oceania, and South Africa are increasing more rapidly than those in Western Europe. The primary factors are generally higher levels of fertility and more or less important migratory influxes. Age structures are more favourable to growth, and *per capita* incomes are generally higher and rising more rapidly. Recent population projections assume the maintenance of levels of fertility higher than those of pre-war years, but are uncertain where immigration is important. The future migration will depend far more on the absorptive capacity of the receiving areas than on conditions in the countries from which the migrants originate.

Among most non-European populations, growth in the near future will depend primarily on declines in mortality. Fertility is high; it appears plausible to argue on the basis of the experience in Japan and other countries in the Western Pacific region that eventual declines in fertility will be correlated with the social and economic transformations now in progress. On the other hand, research in India reveals small differentials in fertility for which conflicting interpretations have been offered in this Conference. The downward movement of mortality is almost universal throughout today's high fertility areas, but the rapidity and the extent of the declines differ widely. In some of the smaller countries, expectations of life approach 60 years and mortality is still declining. In the more populous regions of high fertility, death rates are still fairly high. Population growth will be influenced greatly by the magnitude of the declines in the near future. In all these areas, whatever their present levels of mortality, and whatever the long-run prospects for decline in fertility, the likelihood of an immediate decrease in the birth rate seems quite remote.

In areas of high fertility where population is sparse in relation to land and other resources, assessments of population prospects tend to disregard the possibilities of economic or other deterrents to the continuation of growth. In Brazil, for instance, it has been estimated that today's population of about 55 million is likely to exceed 100 million within 30 years. It is believed in the realm of possibility that the population of Malaya may multiply three- to five-fold before rapid growth ceases.

The problem of estimating the future growth of population is of major importance in countries where populations are dense, nutritional standards low, and capital limited. In Java, past increases in population have been accompanied by a more and more intensive use of the land, a qualitative deterioration in diets,

and a resort to inefficient techniques of production and distribution in order to provide some work, however limited, for all. The government of Indonesia is striving to facilitate the movement of people from Java to Sumatra, Borneo, and other sparsely settled islands, but deficiencies of capital limit the amount of aid which the government can give to prospective settlers, while spontaneous movements have been small. In India, the problem of the absorption of future population increase is even more severe, for no great areas remain available for colonization. External migration can provide but little relief for so huge a population. The death rate is declining, and comprehensive policies to reduce mortality further will probably meet with considerable success. Projections which assume a continuation of the present high levels of fertility indicate future populations so large as to jeopardize the plans for economic development and advancing social welfare. Under these circumstances, the Government of India has initiated study and activity aimed at the reduction of fertility and the slowing of population growth. Realistic estimates of probable future populations are difficult. Studies in India itself indicate that the conditions conducive to changes in fertility may differ widely from one area to another, and that population projections should therefore be made separately for regions of the country rather than for the whole country.

The study of the population situation in Japan is of special interest. Japan is the most densely settled large country in the world. Further intensification of agriculture is hardly possible, and the major portion of the labour force is already employed outside agriculture. Foreign trade must be sufficient to provide for the importation of a sizable proportion of the country's food supply, the raw materials which are processed, and many of the essentials for the maintenance of the internal economy. Death rates are very low. The decline in fertility in recent years has been so precipitous that it is not improbable that population growth may become negligible a generation hence. However, as a heritage of the past years when fertility was comparatively high and mortality was falling, Japan faces a long period during which the population in working ages will increase very rapidly. An annual increment of one million in the labour force is occurring at a time when the problems of foreign markets are most acute.

##### 5. THE FUTURE POPULATION OF THE WORLD: 1950-1980

The estimates of future trends in mortality and fertility in the various regions of the world indicate that the population of the world as a whole is likely to reach about 3,600 million by 1980. Low and high estimates for the individual regions indicate that this total by 1980 is not likely to be below 3,300 million, nor above 4,000 million. Growth will be most rapid in Latin America and least rapid in Europe. A belt of countries from Morocco through the Near East to the Philippines will show accelerating growth; populations which numbered 1,300 million in 1950 will reach 2,000 million by 1980. It should be noted that there is a considerable measure of uncertainty in this estimate because of ignorance as to the precise size and dynamics of the population of China. The populations of North America and Oceania will grow at

rates lower than the world average, though more rapidly than those of Europe.

Questions were raised concerning the usefulness and validity of estimates such as these made by the United Nations. The projections had been elaborated on the basis of demographic types delineated according to current levels of fertility and mortality. It was objected that this characterization was not necessarily relevant, that different laws of population growth applied to different stages in social organization. According to this view population trends in capitalistic countries differ of necessity from those in socialistic countries; under socialism, an increase in fertility and a decrease in mortality alike result from a different social outlook, and the consequent acceleration of growth is a source of economic strength. It was observed, on the other hand, that both declines in mortality and rises in fertility have occurred under diverse social situations and that their necessary connexion with particular types of social organization has not been demonstrated.

The United Nations projections were criticized on the ground that past experience in population forecasting has revealed frequent failure of predictions and that it is highly unlikely that these projected populations will be realized in the future. In this connexion it was pointed out that one of the major values of projections is a demonstration of the consequences of a continuation of present trends. This demonstration can itself become a factor in altering the course of events. The utility of world estimates was also questioned on the ground that such estimates may become a subject of international dissensions. It was reported, however, that the estimates of the United Nations were made at the request of the Economic and Social Council of the United Nations and were desired by its specialized agencies. The major reason for the development of the projections by the Secretariat of the United Nations was the impartiality and objectivity of an international secretariat.

##### CONCLUSIONS

The task of this meeting was a peculiarly difficult one. It had been given a central position in the Conference programme because it integrated the discussions and conclusions of preceding meetings into a composite consideration of growth—past, present and future. The essential conclusion of these earlier meetings on the components of growth might seem to be a rather devastating one for population projections. Mortality, fertility, and migration are all dependent variables. They are related not alone to developed natural resources and existing techniques for the utilization of those resources but to levels and types of economic development, forms of social organization, the content and values of cultures, and social-psychological factors. Scientific and technical developments are altering man's utilization of the resources of the earth, his ability to limit mortality, and his control of fertility. The population trends of the past reflect the initial divergences in these factors of resources, economies, social structures, and cultural norms and their changes during recent centuries when the technological revolution was spreading throughout the world. The population trends of the future will reflect not only the variations of the present but the



extension and rapidity of future adjustments and transformations. Thus in one sense in projecting populations into the future we have estimated dependent variables on the assumption of continuity in independent variables when such continuity may not exist.

The past growth of world population has been such as to make the facts of present population size and characteristics, its unequal distribution over the earth, and the widely divergent rates of growth major inescapable facts in all plans for economic development and social change aiming at improvements in the material welfare of the world's people. In this sense, the population situation of today's world may be taken as an independent fact. Modern medical and public health advances have tended to make the decline in death rates independent, within broad limits, of trends in economic development and social change. In an increasing portion of the world, variations in fertility are becoming closely associated with social and psychological factors. In these areas births are not a constant increment to population that can be assumed to continue regardless of the conditions of life, the attitudes of individuals, or the actions of governments.

Hence it is that studies on the demographic aspects of economic and social development in underdeveloped areas must accept the facts of present populations as given and the probable rates of population increase in the near future as virtually given.

With the extension of statistical activities throughout the world and the development of research on the interrelations of demographic, economic, social and political phenomena in various cultural settings, future World Population Conferences may deal with the problems of population growth more realistically than we have been able to do. In this critical problem of the prospects for future population changes, the advance of research is an essential basis for the achievement of maximum contributions to national and international plans and projects for human betterment.

The following individuals participated in the discussions of meeting 14 in addition to the organizer, contributors of papers and nominated discussants: Mr. I. Bogdan, Mr. M. Boldrini, Mr. J. A. Bourdon, Mr. J. D. Durand, Mr. M. V. M. Herchenroder, Mr. B. Minc, Mr. T. V. Ryabushkin, Mr. A. Sauvy, Mr. H. S. Shryok, Mr. M. Tachi, Mr. P. Y. Tsao, Mr. P. K. Whelpton, Mr. S. Widjojo.

### Meeting 15

## PROBLEMS AND METHODS IN DEMOGRAPHIC STUDIES OF PRELITERATE PEOPLES

### Report on the meeting by Mr. V. Neesen, Rapporteur<sup>1</sup>

#### INTRODUCTION

A growing interest in the demography of preliterate societies was indicated by remarks in other meetings of the Conference. The Chairman, Mr. C. J. Mitchell, in opening this meeting, mentioned some reasons for this trend. People in kinship societies at subsistence levels are being brought increasingly into contact with the outside world. This process has reached the point where it can hardly be said that there are now any purely "preliterate" peoples, though patterns of preliterate life still exert powerful influence. Modern interest in the economic development of previously isolated regions creates a demand for reliable information on their populations. This is especially important because new social conditions bring changes in population trends—sometimes a trend toward rapid decline, but frequently a shift from stability or decline to rates of increase that may exceed rates of economic expansion. Moreover, the diverse relatively primitive societies provide living laboratories in which hypotheses about relations between culture and population trends can be tested. Demographic studies of such societies can, therefore, contribute substantially both to administrative programmes and to academic theory.

Anthropologists start from the premise that all elements in a culture are interrelated, so that a change in one is reflected in others. Demographic behaviour is one aspect of culture. It is the special task of the anthropologist to expose the relation of changes in population to other aspects of social change. Some progress has been made in this direction in recent anthropological field work. Recent advances in techniques of demographic analysis are also helpful in meeting this challenge.

The discussion at this meeting was divided into four topics, under two major headings, as follows:

A. Problems in the procurement and analysis of data:

1. Census and field work procedures,
2. Adaptation of concepts,
3. Appropriate methods of analysis;

B. Problems in interpretation:

4. The interrelation of demographic and cultural factors.

Under the first major heading background papers were submitted by Messrs. G. A. Beltrán, R. W. Firth, F. Lorimer, L. Massé, J. R. H. Shaul and W. F. Wertheim. The papers presented by Messrs. W. Brass, C. J. Martin, and C. A. Myburgh for meeting 5 and by Mr. J. R. H. Shaul for meeting 21 were also considered. Messrs. J. E. Goldthorpe, F. M. Keesing, D. N. Majumdar, S. W. Reed and H. H. Sonnabend presented background papers relevant to the second major heading.

Much of the discussion in meetings 5 and 21 was relevant to the first of these major divisions, and that in meeting 28 to the second.

#### 1. CENSUS AND FIELD WORK PROCEDURES

The complementary roles of governmental statistical agencies and academic institutes in studies on the demography of preliterate societies are set forth in a paper by J. R. H. Shaul. His statement was formu-

<sup>1</sup> The rapporteur extends his thanks to Professor F. Lorimer for assistance in the preparation of this report.

lated with explicit reference to conditions in Central Africa, but its import is universal. He shows both the distinct responsibilities of each of these institutions and the importance of close collaboration in their undertakings. Governmental agencies can provide information needed by anthropologists in studying relations between various factors in social change and population trends, and anthropologists can make critical contributions to the planning and conduct of large-scale inquiries. Such co-ordination of interests and activities is needed in overcoming many of the difficulties confronting social scientists in the investigation of preliterate societies. The exposition by Mr. G. Aguirre Beltrán of procedures used in the study of Mexican communities that still adhere to preliterate patterns of living gives further support to this thesis.

The provision of reliable information on population and related topics requires procedures designed on the basis of an intimate knowledge of the ways of living and thinking of the people under investigation, and the government statistician must rely heavily at this point on contributions by anthropologists and other field workers. He should be in a position to seek their assistance on specific problems encountered in designing a census inquiry. On the other hand, the social scientist intensively studying particular situations needs to relate his findings to the results of large-scale inquiries. Contemporary studies should also be co-ordinated with historical studies (in so far as this is possible, as it is in Mexico) in providing information for analysis of social changes.

Where information from a census is available, the significance of intensive studies of more complex relations can be increased by the use of samples designed with reference to this information. (See papers by M. L. Massé and Mr. J. R. H. Shaul, meetings 15 and 21, Vol. VI.) Such intensive studies may also be useful in checking the reliability of census data for the same localities.

In dealing with a small, self-contained population, the intensive investigation of certain complex relations can be combined with complete enumeration—as illustrated in the paper on studies in Tikopia by Mr. R. W. Firth. This paper shows the great advantages that can be derived from repeated inquiries designed to give new information on individuals for whom data were previously recorded during an early survey. (See, also, the discussion of the advantages of repetitive inquiries in studies of preliterate societies in the paper by Mr. C. J. Martin, meeting 5, Vol. IV.) The general applicability of such a procedure was, however, questioned during the discussion—at least with respect to populations much affected by migration, as in Central Africa.

Other specific suggestions on methods of obtaining demographic data on preliterate peoples are noted below.

In opening the discussion, Mr. Massé pointed to the extreme heterogeneity of reports on the population of preliterate peoples—due not only to the inherent diversity of the peoples studied, but also to the variety of disciplines represented in the investigations, their relative isolation, and the lack of a common conceptual framework or accepted principles of procedure. It is very difficult to draw well-substantiated inferences from this mass of diverse ma-

terial. This consideration gives added force to the proposal (noted above) in favour of a close co-ordination of activities between official statistical agencies and anthropologists. In dealing with urban populations, the same principle can be phrased as a need for co-operation between statistical agencies and sociologists. The possibilities of such co-operation are now being enhanced through the organization of institutes of social research.

Mr. Massé called attention to the need and the difficulties of adapting sampling procedures to the specific nature and limitations of available data in different situations, as illustrated in the recent experiences of the *Institut français d'Afrique noire* of Dakar in designing surveys of urban populations.

Mr. Massé expressed regret that neither physicians nor missionaries were represented in the discussion. Many of them are able to make important contributions to scientific inquiries, on the basis of long residence and intimate associations with people in preliterate communities. He suggested that some international society interested in this field should encourage the collection, analysis, and publication of information on preliterate peoples by physicians and missionaries.

Father S. de Lestapis, in a later comment on this point, suggested that prospective missionaries should be introduced to demographic concepts and methods. He also spoke of the co-operation in such undertakings that could be extended by some church organizations.

The importance of establishing close rapport between investigators and the peoples under investigation was stressed by several speakers. It is important not only in order to achieve effective communication, but also to allay suspicions and fears which arise in the minds of people confronted with a type of inquiry that may be an entirely new experience for them, carried on for reasons that they do not comprehend. One must also take account of particular attitudes and practices, such as fear of mentioning or of giving the names of living children to strangers, reluctance to mention any unpleasant event, identification of ceremonial practices with vital events, widespread adoption, etc., in order to overcome biases that might otherwise affect the data, or at least to take the possible effects of such bias into account in interpreting the results. Mr. K. A. Busia, on the basis of his knowledge of rural populations in the Gold Coast, emphasized the importance of sincere interest by the investigator in the people with whom he is working. He also pointed out the advantage of using short schedules, and suggested that if more extensive information is needed it might be advantageous to inaugurate a series of inquiries. Information obtained from a person about himself can frequently be supplemented by that provided by others, subject to being checked in an interview with the person concerned.

The Chairman noted that rapport is most easily established in small, intensive investigations. The importance of large-scale inquiries represents a need that in some circumstances may conflict with the need for such rapport.

Mr. Shaul commented that such a possible conflict may be reduced by reliance on sampling census methods, rather than attempting a complete enumeration. Sampling permits greater selectivity in the choice of



enumerators and greater concentration of attention on their preparation and training. The possibility of bias can also be controlled in large measure by using complementary questions especially designed to reveal such tendencies. He expressed the opinion, based on experience with both European and indigenous enumerators in Africa, that primary reliance must generally be placed on interviewers drawn from the group to be studied, or a related group. There was unanimous agreement on this point among the discussants. Messrs. V. Neesen and L. Massé urged the selection through tests of performance and training of a corps of reliable indigenous investigators.

The experience of census inquiries in Latin America, according to Mr. R. García-Frías, shows that best results can be obtained with enumerators from the areas studied. But in cases where the most qualified enumerators have only meagre education, their mentality as well as that of the persons to be interviewed must be taken into account in the formulation and phrasing of inquiries.

In societies where chieftainship is an important political institution, chiefs generally have intimate knowledge about persons under their authority. In any case, their co-operation is essential to the success of any inquiry. Also, Mr. J. E. Goldthorpe suggested, their knowledge should be tapped as one important source of information.

Photographic strips from an R.A.F. survey of the Beersheba district were used in 1946 by the Government of Palestine in an enumeration of the Bedouin population—as a means of counting tents and as a basis for designing a sampling inquiry. Mr. H. V. Muhsam described some of the difficulties encountered in this venture and the means adopted to overcome these difficulties so far as possible.

Registers maintained by the head of each administrative district in the Belgian Congo, as prescribed by law, provide the primary source of demographic information in this country. The regulations are designed to give a uniform, continuous registration system with information on each person, giving name, names of spouse and dependants, sex (cards of different colour being used for each sex), age (with division between children and adults indicated by cutting a corner of each child's card when he reaches adult status), and residence. (The cards of temporary absentees are kept in a separate box; those of persons who have permanently left one district are sent to places of intended residence.) Births are entered on the cards of the parents. Reports are obtained each year from a sample of districts in each region on the population and its changes. The selection of sample areas is now being revised to conform to the requirements of probability sampling. According to Mr. V. F. Brebant, this system, though still imperfect, is capable of being developed—with provisions for obtaining supplementary information and tests of registration data from field studies in sample areas—so as to yield reliable demographic information. It is already adequate for the differentiation of some areas of high natural increase and other areas of low fertility with a trend toward decrease of population. At present the registration of births appears to be more nearly complete than the registration of deaths.

The sample census on a large scale in Ruanda-Urundi produced more useful results, according to

Mr. Neesen, than could have been obtained either from a complete census or from reliance on a continuous registration system. He noted that the collaboration of the *Institut de recherche scientifique en Afrique centrale* in this undertaking conformed to arrangements proposed by Mr. Shaul. He expressed the hope that such collaboration might be carried even further in the future. He expressed the opinion that, after a large-scale sampling program has been initiated, attention to its development should receive priority over intensive studies in particular localities.

There was a general consensus on the importance of defining simple goals in seeking demographic information on preliterate people, with attention directed toward the provision of reliable information on a few critical questions.

## 2. ADAPTATION OF CONCEPTS

Mr. H. H. Sonnabend opened the discussion on the adaptation of concepts in research on the demographic characteristics of preliterate peoples. He called attention to important work in this field by the Italian Committee on Population Studies under Mr. C. Gini. He then described various difficulties that beset attempts to collect demographic data on preliterate people, including a frequent initial resistance to being counted in any way. A further complication may arise from the use of two or more names by the same individual in different phases of life, or in different relations.

It is obviously difficult to obtain any reliable information on the ages of persons without records and with no interest in quantitative indices. One of the devices most commonly used here is reference to outstanding events in the experience of the people who are being interviewed that can be dated by the investigator. The positions of individuals in family and tribal relations may also be very useful in fixing the approximate ages of various members of a community. Reference can also be made to successive phases of life; but it must be borne in mind that events such as puberty may be culturally defined by reference to ceremonies; these cultural definitions vary in different societies, and may differ between boys and girls in the same society.

Mr. Sonnabend suggested that regional demographic commissions might effectively promote co-operation between demographers and anthropologists within areas having similar cultures.

Some simple concepts such as "birth" and "death" have fairly universal applicability, though even here some caution is needed. The Chairman mentioned in this connexion that in one African society a child is not accepted as having been born and having become a member of the community until the tenth day. The use of appropriate concepts becomes increasingly difficult in dealing with such topics as "marriage" and "divorce". These events must be defined in the context of the actual institutions present in any society. The subject was developed further by Mr. V. Mills. Words which may mean quite different things in different contexts include the following: "household", "building", "occupation", "industry."

Any inquiry must be phrased in the vernacular of the people who are being interviewed, but it is erroneous to suppose that information obtained through

these inquiries can always be classified under concepts developed in dealing with population in very different situations. The conceptual problems involved in framing inquiries merge into problems of appropriate methods of analysis.

### 3. APPROPRIATE METHODS OF ANALYSIS

Mr. C. J. Martin stated that he had little interest in the computation of conventional demographic measures, as such. He proposed that one begin by asking such questions as the following: "What do we want to know? What data are needed to answer these questions? What indices will be useful in our work?" He reminded the meeting that present problems in seeking demographic information on preliterate peoples are not radically different from those relating to European populations a short time ago.

He noted two useful lines of analysis in dealing with demographic data on preliterate societies:

(a) The application of general relations derived from the analysis of more reliable data for other populations. (For an illustration of this approach, see the paper by Mr. C. A. Myburgh, meeting 5, Vol. IV. Another proposal somewhat along this line is described in the paper by Mr. W. F. Wertheim.)

(b) The derivation of "life interval" indices from retrospective information relating to critical age-intervals. (See paper by Mr. F. Lorimer, and also the paper by Mr. W. Brass on methods that combine some aspects of both principles.)

Mr. Martin stated that both of these approaches may be useful. He stated that Mr. Lorimer's proposal, though designed to reduce the effects of biases in the basic data, did not eliminate the possibility of serious errors due to inaccurate reports on previous events. He therefore said that results obtained in this way should be checked against findings with other methods. Mr. Lorimer indicated his agreement with this position. In this connexion, Mr. Martin recommended that a sample be drawn from those interviewed in any large-scale inquiry, and that persons in this sample be interviewed again at regular intervals as a means of getting reliable information on fertility, mortality and migration.

Mr. Sonnabend suggested that, in view of the high mortality of infants after weaning in some situations, it might be advisable to measure infant mortality over a two-year interval. According to Mr. Wertheim, the time at which an infant begins to walk (usually at 15 to 18 months) is accepted in Indonesia as the termination of infancy. However, no conceptual formulation of the problem of infant mortality can eliminate the danger that the basic data may be distorted by neglect or unwillingness of parents to mention deceased infants. Such bias may be especially strong in reports by aged persons.

Mr. Wertheim proposed that considerations be given to the preparation of a manual on demographic studies of preliterate populations. He suggested that such a manual should include several models of possible interrelations among various demographic characteristics. He recommended that this proposal be considered by the United Nations.

### 4. THE INTERRELATION OF DEMOGRAPHIC AND CULTURAL FACTORS

Mr. A. R. Holmberg, in reviewing the papers on relations between demographic and cultural factors, remarked that the reproduction of any people was a necessary condition for the continuance of its culture. This is axiomatic, but it has far-reaching implications. It is the task of anthropology to discover functional relations between a series of demographic variables and a series of cultural variables with the ultimate aim of establishing principles that have cross-cultural validity.

Mr. F. M. Keesing's paper deals with characteristics of isolated and relatively stable preliterate groups, defining relations that may be conducive to equilibrium. Mr. S. W. Reed introduced the concept of "institutional demography" as appropriate to the study of dynamic processes. Relations between demographic and cultural factors can be investigated through the study of social institutions. These papers offer theoretical models that need to be tested in field inquiries.

Mr. A. R. Holmberg stated that the discovery of relations between cultural and demographic factors must, for the most part, be carried out in the field. This must be done through the investigation of specific problems in which relations between two or more variables can be precisely defined. The problem calls for long-term studies in which the same groups are followed under changing conditions. There is already an encouraging recognition of this need on the part of some academic institutions.

He directed attention to the following questions: "What types of research design appear most promising? What units should be used in studying relations between demographic and cultural factors? What types of generalization are now possible?"

The Chairman referred to a study by Mr. M. Gluckman on relations between divorce rates and kinship structures in two African peoples as suggesting a model for studies in line with proposals by the previous speaker. The design is a comparative analysis of two types of social structure, the units of study are the two cultural groups, and generalizations are formulated as possible universal relations—which are being investigated in other groups. Similar studies could be carried out with reference to other demographic variables, such as the birth rate. There are considerable variations in birth rates from district to district in many parts of Africa. It would seem useful to design studies of the relation of these differences to cultural characteristics.

Mr. V. F. Brebant discussed investigations of relations between demographic trends and cultural factors in the Congo. These investigations have led to the rejection of some vague hypotheses in terms of "racial deterioration" or "psychic trauma", which had been advanced to explain the decline of fertility of some ethnic groups, such as the Mongo, Azande, and Bakumir. On the other hand, it has been possible to trace, in part, the influence of certain social changes associated with the presence of foreign soldiers in some districts during World War I, movements from rural localities to cities, and in some cases to show relations between ancient customs and recent practices.

Mr. D. N. Majumdar reported an increasing interest in the demography of preliterate groups in the more remote regions of India—referring particularly to studies being carried out in some Cis-Himalayan districts. He observed that those who have adapted their cultures to new conditions seem to have high rates of increase, whereas very primitive peoples or those exhibiting signs of "cultural shock" are not increasing appreciably.

Mr. Aguirre Beltrán referred briefly to the co-ordination of historical, statistical, and anthropological findings in the investigation of social changes. This theme was developed more fully in his paper, with reference to the programme for the development of the Papaloapan Valley in Mexico. This region includes groups in contrasting demographic situations, related both to differences in physical environment and in culture. In intensive investigations of some communities which had to be re-located, it was found that contact with construction workers engaged in the project threatened the destruction of these communities within their present location. Accordingly, Mr. Aguirre Beltrán emphasized the importance of studying relations between demographic and social factors in the development of programmes for economic expansion.

The ecological situation of different groups must be taken into account in studying relations between demographic and cultural factors. Mr. J. E. Goldthorpe advanced the hypothesis that island peoples may be likely to favour types of family organization and practices that tend to check increase of population—as in Tikopia—whereas the cultures of continental groups with apparently unlimited land are likely to be favourable to high fertility. The possible influence, under changing conditions, of new economic factors and of improvements in health on the culture and fertility of a population with traditional emphasis on large families is discussed in his paper.

Mr. M. Fortes, at the request of the Chairman, gave a brief review of the discussion. In conclusion, he remarked that, although there had been frequent references to differences in interest between demographers on the one hand and sociologists and anthropologists on the other, the conference in presenting these different approaches had served to bridge the gap. The interests of demographers and anthropologists converge in the elaboration and refinement of concepts on the relation of demographic trends to culture and in the need for accurate, comparative data bearing on the basic relations between culture and population trends.

#### CONCLUSIONS

The meeting established a new level of rapport among demographers and anthropologists in dealing with a research field which presents many complex problems and which is attracting increased attention in recognition of its importance both in theory and in public policy.

The participants were, for this reason, more concerned with the tentative exploration of a variety of

problems in research methods and in the conceptual formulation of relations than in an attempt to reach definite conclusions on any particular questions. Nevertheless, there was clearly a convergence of opinion on several important issues.

Major responsibility for the provision of basic data on population characteristics and trends was recognized as the province of official statisticians. There was little interest in isolated unco-ordinated field studies as a primary source of such information, except with respect to small physically or culturally isolated populations. At the same time there was keen recognition of the importance of obtaining the collaboration of anthropologists and sociologists in the planning, conduct, and interpretation of large-scale demographic inquiries.

There was general agreement on the importance of using interviewers with cultural background similar to that of the populations under investigation. This implies the need for much attention to the recruitment, training, and adequate provision for a corps of reliable indigenous field personnel for statistical inquiries. It was agreed that any single inquiry must be limited to a few relatively simple basic questions, but several specific questions may be needed on the same subject as a means of reducing bias in the data collected.

The uncritical utilization of concepts developed in research under different conditions may lead to serious errors. There is need for much experimental work in the development of concepts to be used in the formulation of inquiries and in the analysis of data with which reliable findings can be obtained. This task requires the co-operation of demographers and anthropologists.

Several possible ways of improving the reliability of demographic data on preliterate populations and techniques of analysis were proposed as promising methods for further experimentation and development.

The discovery of specific relations between cultural and demographic factors was recognized as a major problem which has in the past been relatively neglected by anthropologists. It can, however, hardly be said that there was any clear consensus about the most useful lines of progress in this direction.

There was some emphasis on the need for clarifying guiding principles in this task. There was also emphasis on the need for very intensive, exploratory field studies through which it might be possible to formulate precisely certain relations among specific cultural and demographic variables. The problem must now be studied in relation to other aspects of social change, and for this reason long-term intensive studies are likely to be most fruitful.

The following suggestions on questions of organization were offered: the formation of an international organization of demographers and anthropologists with special interest in this field; the formation of regional committees; and the preparation of a technical manual on this subject by an international agency. There was no general discussion of these specific suggestions.

## Meeting 16

## VARIATIONS IN AGE COMPOSITION, WITH SPECIAL ATTENTION TO EFFECTS OF DECLINING FERTILITY AND MORTALITY

Report on the meeting prepared by Mr. G. Mortara, Rapporteur

This meeting, which was presided over by Mr. B. Barberi, was concerned with an analysis of the age composition of populations, with special reference to the influences of mortality and fertility thereon.

One purpose of the analysis was to prepare the basis for the discussion of the economic and social consequences of aging of population scheduled for meeting 18.

A great deal of background material was available for the discussions at meeting 16 itself in the papers submitted at other meetings, more particularly at those devoted to the study of mortality (2 and 4) and fertility (6 and 8).

In order to facilitate the proceedings, the topics for discussion were arranged as follows:

1. Age composition of the population, in general. Analysis of its dependence on fertility, mortality and migration. Influences of war and other exceptional factors;
2. Age composition in the different sections of the same population (various regions, urban and rural areas, ethnical groups, etc.);
3. Variations in the age structure and their repercussions on the size of the potential labour force. Replacement rates for the active age groups;
4. Composition of the population past middle age, by sex, marital status, family relationship, economic activity, dependency, etc., and its relation to the aging of populations.

#### 1. AGE COMPOSITION OF POPULATION AND ITS DEPENDENCE ON FERTILITY, MORTALITY AND MIGRATION

Mr. W. Winkler opened the discussion on the first topic by reviewing the papers submitted and adding a few comments of his own.

Some of the papers aimed mainly at providing an objective basis for the discussion by describing the phenomena studied, while others sought to illuminate the causes and consequences of those phenomena.

Copious international comparisons of age structure and its changes in the last fifty years were submitted by the Central Statistical Institute of Italy and by Mr. S. Somogyi. They revealed the dominant trend towards an increase in the proportion of aged persons and a reduction in that of children and adolescents. Despite that common trend there were still wide differences between the age structures of populations at different stages of demographic evolution. While some populations have very high proportions of adults of mature and old age and very low proportions of children and adolescents, other populations still have a converse structure.

The influences of mortality and fertility on the variations and differences of age structure have been studied in two ways: first, the attempt has been made to distinguish those influences inductively through the observation of actual populations, and secondly it has

been sought to measure those influences deductively and more accurately by considering hypothetical populations subjected to postulated mortality and fertility levels. The first method was used in the papers already mentioned, and the second in those by Mr. L. Lenti and by the Laboratory of the National Statistical Council of Brazil. The opinion that the birth rate exerts the dominant influence did not seem to be borne out by the facts; the increase in the proportion of adults and old persons was largely due to the decline of mortality.

The influences of war and mass exodus on age structure were illustrated by Mr. Winkler. The exceptional character of those factors ruled out any general conclusions, but highly interesting points of coincidence were found in the influences observed in the aftermath of the two World Wars.

Attention should be drawn to a method proposed by Mr. E. P. Billeter for computing an age-structure index which, with a few changes of detail and nomenclature, might prove useful.

In the discussion, Mr. J. Bourgeois-Pichat sharply criticized the method and conclusions of the paper prepared by the Laboratory of the National Statistical Council of Brazil; he maintained that the decline in mortality had little effect on the age structure, while the decline in fertility produced substantial changes. On the other hand, the influence of mortality variations was regarded as considerable by Mr. Winkler and Mr. N. B. Ryder, who explained how that influence took effect. Mr. G. A. Marzouk and the present Rapporteur also took part in the discussion.

#### 2. AGE COMPOSITION IN THE DIFFERENT SECTIONS OF THE SAME POPULATION

The second topic was discussed by Mr. L. Lenti, who summarized the papers submitted and brought out the different phases of demographic evolution corresponding to the different age structures of various populations and of various groups within them; he stressed the importance of the study of the age structure of those specific groups.

The papers set forth the situations observed in a number of countries with widely differing geographical and social characteristics.

The analyses presented by Mr. P. Depoid for France, Mr. A. Occhiuto for Italy, Mr. J. L. Sadie for the Union of South Africa, Mr. A. H. Le Neveu for Canada and Mr. E. Alves for Brazil showed that in every population there were differences, sometimes very marked, between the age compositions of different groups.

Very pronounced regional differences were found in countries long inhabited, and wide divergences between urban and rural areas were found in all countries. The latter divergences were largely due to internal migration; international migration exerted a noteworthy influence mainly in areas where emigration or immigration was considerable.

An important feature was the great influence which the ethnic factor was found to exert on the age composition of populations in countries where a race or colour bar existed and the very limited influence of that factor in countries where such a bar was almost or entirely non-existent.

### 3. VARIATIONS IN THE AGE STRUCTURE AND SIZE OF THE POTENTIAL LABOUR FORCE

The third topic was introduced by Mr. J. L. Sadie, who in an appraisal of the papers relating to the length of the economically-active life, showed the difficulty of setting limits to that period of life, stressing in that connexion the increase in the number of years spent in old age as a result of the decline in mortality, and explained the major economic repercussions of an aging population.

The papers submitted provided a variety of new material for reference purposes and for the analysis of this topic.

Considerable documentation on the topic is to be found in an international comparative study by the Population Division of the United Nations in which the influences of age distribution and of the level of economic activity at different ages on the labour supply are analysed in various countries classified according to the level of their economic development.

The influence of mortality on the average duration of the economically active life was investigated by the Laboratory of the National Statistical Council of Brazil and by Mr. M. Saura del Campo. This duration tends to vary more or less in proportion to the mean length of life. As mortality declines, the proportion of the inactive old persons tends to rise and that of the inactive children to fall.

Another paper from the United Nations Population Division sought to establish a systematic procedure for measuring the incidence of entries and withdrawals which determine the size of active population. A note by Mr. G. Lasorsa proposed also certain changes in the methods of projection generally used in forecasting variations in the economically active population.

Some further contributions to the study of the topics considered were made in the course of the discussion. Mr. W. Winkler drew attention to the factors which account for the uniformity observed in the trends in the average length of working life. Mr. H. Mizushima reported the results of his observations on the average length of the working life of several groups of Japanese workers. Mr. G. Lasorsa stressed the need to vary the upper limit of the period regarded as active according to the proportion of persons surviving to advanced ages, and Mr. R. J. Myers advanced other considerations leading to the same conclusion. The present Rapporteur also took part in the discussion.

### 4. COMPOSITION OF THE POPULATION PAST MIDDLE AGE AND ITS RELATION TO THE AGING OF POPULATIONS

Mr. A. de Vita, opening the discussion on the fourth topic, put forward a number of general conclusions prompted by a co-ordinated analysis of the papers submitted.

Among those papers, the one by Mr. L. Féraud which discusses the concept of aging should be

regarded as preliminary. It was pointed out, however, that the demographer should deal with the numerical age limits and not concern himself with questions of nomenclature. The increase in the proportion of persons of 60 or 65 years and over in the population was an observed fact; it was immaterial to the demographer whether that increase was called "aging" or not. The discussions that had taken place at other meetings of the Conference on chronological age and physiological age showed how difficult it was to formulate general criteria on this subject. At all events, it seemed certain that the extension of the mean length of life was accompanied by a rise in the upper age limit of the working life.

The composition of adults and old persons with regard to some characteristics of the individuals was studied by Mr. R. M. Woodbury and Mr. A. de Vita.

With regard to sex structure, a preponderance of females is generally found in countries of Western civilization, owing to the lower death rate of women.

With regard to the marital status composition an upward trend in the proportion of married persons was observed due to the decline in mortality and, in some cases, the decline in the number of single persons—which generally forms a rather low proportion of the age groups under consideration.

The composition by occupation differs widely from one country to another. Old persons take a relatively larger share in the work in areas where their proportion is higher; there are, however, exceptions to this rule: in poor countries with many children and few old persons, the latter played a large part in economic activity and more particularly in agricultural work. The predominant occupations among persons past middle age and old persons are usually in agriculture and stock raising and also in light industry. The ratio of independent workers to wage-earners increases for older age-groups.

The probability of a further increase in the proportion of adults and old people in the future was brought out by Mr. J. Berent, who discussed the likely course of future trends in a number of countries.

In the discussion, Mr. L. Féraud reasserted his views on the need to define the term "aging", Mr. Winkler expressed a number of objections to the criteria on which Mr. Féraud had proposed the definition should be based, and Mr. Berent illustrated the difficulties to be overcome before a generally acceptable definition of "aging" could be found.

### CONCLUSIONS

After reviewing the written and oral contributions to the discussion on the topics dealt with at meeting 16, it can be said that most of those topics were considered with sufficient thoroughness and that the papers submitted provide a sufficiently wide basis for continuing and developing research on the topics studied.

In the field of science discussion occasionally comes to a halt, but it is never finally exhausted. It often happens that what seems to be the most unshakable theory is demolished by scientific progress.

The discussions on the particular questions to which this meeting was devoted not only solved some problems; they also brought out others or defined them more precisely.

Among the problems that seem to require further investigation the following may be mentioned: the comparative influences of births and deaths on the age composition of populations (a topic which gave rise to divergent interpretations of the phenomena observed); the influence of migration on that composition (which was not discussed systematically); the criteria by which to determine the length of the working life;

the mean length of that life (which must, of course, be computed consistently with the definition referred to above); the definition of "aging" and its reflection on the indices used for the measurement of the incidence of aging.

All these and other topics afford wide scope for future research on the age structure of populations.

### Meeting 17

## POPULATION DISTRIBUTION AND INTERNAL MIGRATION, WITH SPECIAL ATTENTION TO HIGHLY INDUSTRIALIZED COUNTRIES

Report on the meeting prepared by Mr. S. Koller, Rapporteur

### INTRODUCTION

The problems of population distribution and internal migration are among the most neglected subjects of demography. Opening the meeting with this observation, the chairman outlined the basic factors involved in internal migration and its different aspects from the demographic, social and economic points of view. Migration has been of importance throughout the history of man. It has made possible the development of new lands. In each country, migration has accompanied changes in economic and political life, responding to current needs and expectations.

The study of internal migration has been given considerably less attention than that of fertility or mortality. Also, until recently, the volume, causes and consequences of internal migration have been studied less intensively than those of international migration. Only the exodus from the country to the city has been examined very thoroughly. The reasons for this gap are:

(a) International migration is more "visible" than internal migration, and is a subject of study for several international, governmental and scientific organizations,

(b) Much more statistical information is available for international migration—and particularly for inter-continental migration—than in the case of internal migration.

Despite serious gaps, however, there are in existence many interesting and promising studies on internal migration, especially relating to its sociological aspects, but we are far from having a clear knowledge of internal migration as a social phenomenon.

As pointed out in the paper prepared by Mr. E. W. Hofstee, internal migration is one of the most important forces enabling a population to take full advantage of the possibilities offered by a country in providing for the material and psychological needs of its inhabitants. Some degree of mobility is necessary to achieve the maximum well-being of a nation; therefore an adequate knowledge of the processes of internal migration is essential for the formulation of welfare policies.

The meeting confined itself to the problems of population distribution and migration arising particularly in highly industrialized countries. Related problems were discussed in meeting 19 for countries undergoing

industrialization. Meetings 10 and 12, on the other hand, dealt with international migration.

The regional distribution of population and the ways in which migration alters this distribution are very closely connected with the stage of economic development of a country. Industrialization is intimately related to urbanization, as mass concentration of population appears to be both a condition for and a consequence of industrial development. Growing cities need in-migration; their generally low fertility levels would often not even provide a replacement for the numbers who die. Only by receiving migrants from elsewhere in the country or from abroad can the city maintain a constant size or expand. In highly industrialized countries there are many centres of economic activity attracting migrants in accordance with the phase of the business cycle and the relative importance of various specialized industries. Thus, the multiplicity of migratory movements reflects the complexity of economic life in these countries.

The characteristics of persons who migrate are often different from those who do not. These differences can be observed not only in areas of in-migration but also in those of out-migration. A difficult and important question of selectivity arises, and a special part of the meeting was devoted to this problem.

Migratory movements can be promoted or hampered by governmental measures which may affect internal and international migration differently. Therefore, the meeting devoted some study to the relations between these two kinds of migration and to their advantages and disadvantages under different conditions.

The papers submitted for the meeting and the discussion thus dealt with four main topics:

1. The volume of internal migration in different countries and its influence on population development, distribution and density,

2. Changes in the composition of the population with reference to age, sex, religion, intelligence, and other characteristics due to the selective effects of migration,

3. Internal migration and economic development,

4. The relations between internal migration and international migration, and the balance of advantages and disadvantages.

Because of the interrelationships between the various topics and the complexity of the problems, authors and



discussants were not always able to confine their observations to a single topic.

#### 1. THE VOLUME OF INTERNAL MIGRATION IN DIFFERENT COUNTRIES AND ITS INFLUENCE ON POPULATION DEVELOPMENT, DISTRIBUTION AND DENSITY

Mr. R. Heberle introduced this topic on the basis of background papers prepared by Messrs. H. Harmen, R. Heberle, E. W. Hofstee, K. Horstmann, E. S. Lee, C. R. Mertens, and S. Mihara. In the papers and the following discussion it was pointed out that the frequency of migration, irrespective of its direction and effect, is of demographic importance. The study of geographical mobility has thus far been largely a matter of concern to sociologists but demographers, too, should pay greater attention to this subject. On the basis mainly of statistics obtained in the Netherlands certain conclusions were drawn regarding mobility of populations:

(a) Single persons are likely to be more mobile than families, as they have been found to change their residences more frequently.

(b) Short-distance migrants change their residences more frequently than long-distance migrants.

(c) A higher percentage of long-distance moves has been found among single males.

(d) Single women move more often than single men, but over shorter distances.

The mobility rate of a population is influenced by the size and density of the population both in the area of departure and that of arrival. During a period when a city is growing rapidly very high mobility rates can be observed. Later in the city's development, however, the stage is reached when the sum of in-migration and out-migration diminishes, but intra-city migration increases further, accelerated by the incorporation of suburban areas. In general, mobility rates are inversely correlated with the size of the population already in the areas concerned.

The loss or gain in a given population from a large volume of in-migration and out-migration is only a small fraction of the total volume of migration. The large bulk of the movements takes place in opposite directions and, thus, have been described as "compensated migration". No correlation has been found between the total volume of migration and the net gain (or loss). The amount of "net" migration and whether it constitutes a gain or loss seem to depend largely on chance. It was emphasized that not all "compensated migration" is wasteful as it may be of use to meet seasonal labour requirements and to provide an economically more rational distribution of the labour force.

Rural-urban migration typically takes place in stages, as rural migrants move to the towns taking the jobs of other migrants, who move from the towns to larger cities. Small towns thus function as transit and exchange centres.

It was shown that urban areas in some highly industrialized countries may have reached their saturation point. In England and Wales, for example, the proportion of the population living in urban areas declined from 82.4 to 80.7 per cent between 1939 and 1951. In Japan the medium-sized cities seem to be stationary, but some centres such as Tokyo and Osaka

continue to be points of population concentration, especially for the north-eastern and south-western areas of the country. In Germany the rural-urban direction of migration is still preponderant. The smaller communities have the highest mobility, especially with respect to the migration of refugees. The large cities seem to have stopped growing around 1930.

The direction and distance of internal migration have been the subject of many studies. It is clear, however, that the study of mobility is much more handicapped by a lack of appropriate statistics than the study of the net effects of these movements.

Although meeting 17 was not concerned with statistical methodology, various speakers emphasized the lack of statistical information as a major reason for the inadequate study given to internal migration. The best source of statistics on internal migration are complete records of all moves of every person from birth to death, but records of this type are available only in the Netherlands. The same information may be derived for a certain part of the population in France from the file of electoral cards issued at the place of birth and containing all subsequent addresses. The next best system consists in the registration of current moves. Western Germany, Belgium and, during a brief period, the United Kingdom, are examples of countries using this method. Another source is used in the United States, where estimates of internal migration and mobility are obtained showing the number of persons who since a certain date have moved into a different house within the same county or to another county. These estimates are derived from samples within the census and from the Current Population Survey. The questions originally referred to changes of residence during a 5-year period; more recently the period has been changed to one year. No information is obtained on the number of persons making more than one move during the period. Information on the starting place and the place of destination of migration was not regarded as sufficient by participants in the meeting. It was held desirable also to be informed on the chain of moves of a person or a family in order to see the intermediate steps in migration and to be able to relate them to the size of the communities involved. A final source of migration statistics is the population census; census data are, in fact, in most countries the only source of information on this subject. The difference between the population of a certain district enumerated at two successive censuses, minus the excess of births over deaths during the interval, gives an estimate of net migration, including both internal and international migration.

Messrs. R. Bachi, M. Croze, A. Dufrasne, V. F. J. Fallon, R. Heberle, C. R. Mertens, and R. Rochefort took part in the discussion on this topic.

#### 2. CHANGES IN THE COMPOSITION OF THE POPULATION WITH REFERENCE TO AGE, SEX, RELIGION, INTELLIGENCE AND OTHER CHARACTERISTICS DUE TO THE SELECTIVE EFFECTS OF MIGRATION

The Chairman pointed out that migration should not be considered from the quantitative point of view alone and emphasized the importance of the special characteristics of migrants. Mr. K. V. Müller, who had prepared a background paper on this subject, reported on his investigations into the selective effects

of migration. In the field of international and internal migration many studies have been made, showing differences between migrants and non-migrants and between the population groups from which they come. Often the migrants have been shown to differ from non-migrants in age, sex, marital status, occupation, religion, social status, and especially in psychological characteristics such as initiative, vigour, etc. These differences have been found in present-day migrations as well as in those of earlier periods. Forced migration has, of course, other aspects, as auto-selection is not a factor.

Special studies of migration in Western Germany have shown immigrant families to have a higher social status than the indigenous population. Children of such families, and especially those born in cities, were in general more gifted and had a more developed personality. Mr. Müller offered the conclusion that migration is selective as such. In the discussion Mr. Hofstee analysed the various types of selection and emphasized the occupational differences that arise. If migrants show a higher intelligence than non-migrants, this may be largely caused by the fact that the area of in-migration, because of its economic structure, attracts migrants of a relatively high level of intelligence. Migration from the countryside to the towns and cities tends to be selective because of the demand for skilled labour in the towns and cities which is likely to result in an occupational selection of the migrants. The migrant groups must be compared both with the indigenous population at the place of destination and with the population remaining in the area of out-migration.

A discussion took place on whether these selective differences had been fully substantiated. The question was also posed whether these differences arose as a result of migration or whether they exist independently of migration. Are there selective factors that in a group possessing the same social, economic and other characteristics cause some of the members to migrate and others to stay? Is intelligence one of these factors? What type of research is required on these questions? The discussion helped to pinpoint the questions and to emphasize the importance of further examination.

The composition of the population with respect to religious affiliation may be altered by migration, and is often related to a shift in the occupational and social structure. The selection according to age and sex can be disadvantageous for areas of out-migration as it tends to deprive them of young adults in the ages of peak economic activity. It has been found in some instances of inter-urban migration that the age and sex composition of out-migrants was similar to that of in-migrants.

The participants in the discussion of selectivity of migrants were Messrs. L. Chevalier, E. W. Hofstee, S. Mihara, and K. V. Müller.

### 3. INTERNAL MIGRATION AND ECONOMIC DEVELOPMENT

The motives underlying migration are various and not only of an economic nature, though there can be no doubt that economic reasons are the most important. Consequently, there is a close relation between migration and business cycles on the one hand, and the formation of industrial, commercial, and administrative centres on the other. One of the most important

problems in this connexion, for almost all highly industrialized countries is the migration between rural and urban areas. Background papers on this topic were submitted by Mrs. A. R. Miller, Mr. S. Nojiri, Mr. B. Thomas and Miss D. S. Thomas. Miss Thomas opened the discussion, citing the continuous interdependence of migration and the economy, existing over time and in space. A redistribution of labour force accompanies shifts in the location of reproducible capital and of financial resources. For example, a decline in the share of agriculture in the labour force and in the national product reflects, and at the same time influences, the course of migration from the countryside to cities; and even a shift from one manufacturing industry to another may result in the migration of men or capital or both. Population redistribution is a consequence of these changes. To some extent it may be a cause, too.

A summary of the thorough studies undertaken at the University of Pennsylvania for the period 1870-1950 in the United States showed that differential population growth in the individual states was largely determined by internal migration. The progressive industrialization of the country as a whole and regional differences in industrialization were traced in terms of the declining share of agriculture in the total labour force. For the country as a whole, long swings in population redistribution, in the redistribution of the labour force and its components, and in migration were shown in relation to long-term fluctuations in general economic performance, as measured by changes in gross national product *per capita*.

It has been shown that short-term variations of internal migration are in close positive correlation with business cycles. Contrary to popular opinion the mobility rate decreases in times of depression and increases in times of prosperity. Rural-urban migration and urbanization help to raise the educational level wherever school facilities are better in towns than in rural areas. The degree of "centrality" of a city has geographic, demographic and economic causes. A "central" city is the central labour market for a region. As a rule, a high degree of centrality is correlated with high mobility.

The economic interrelation between a city and its environs causes a steady flow of population in both directions. In the city more and better jobs are usually available. To make use of such opportunities people move to their place of work or very often they keep their residence outside the city and commute daily to work even from a long distance. Thus, long-distance commuting has the same basic function as short-distance migration. This results in a very close connexion between the two phenomena in highly industrialized and densely populated countries.

Therefore, the problem of commuting was thoroughly discussed especially in relation to topics 1 and 3. Special investigations on commuting have been carried out in Belgium, France, and Germany. It has been shown that commuting is a substitute for internal migration. For a selected region of Western Germany a map showing population change in the communities from 1950 to 1953 was compared with one showing rates of commuting for the same communities in 1950. It was shown that population decreased by out-migration, especially in those communities from which commuting to places with good possibilities for employ-



ment was restricted on account of their geographical location or transportation difficulties. When transport facilities improved, people could more easily remain in communities at greater distances from the centres of employment and were not forced to move closer to work. In that way metropolitan districts were enlarged. Therefore, the practical problems of commuting include the possibilities of improving transport conditions, of reducing the prices of commutation tickets, and of producing cheaper means of transport.

The participants of the discussion on this topic were Messrs. R. Dugrand, K. Khine, B. Thomas, and Miss D. S. Thomas.

#### 4. THE RELATIONS BETWEEN INTERNAL MIGRATION AND INTERNATIONAL MIGRATION, AND THE BALANCE OF ADVANTAGES AND DISADVANTAGES

The term migration is often understood as covering only international migration. Indeed, considerably more data are available relating to this type of migration. In studying both internal and international migration attention must be paid to the interrelationship between these phenomena. As the first discussant of this topic, Mr. J. A. Bourdon, who had also submitted a paper on this subject, analysed the push and pull factors governing both internal and international migration. Famine and population pressure, economic depression and unemployment are factors tending to cause people to leave an area; higher standards of living and better occupational opportunities, on the other hand, attract population. Migrants in the past often changed their residence without changing their occupation. In later periods migrants, originally farm hands, became industrial workers or otherwise changed the type of work in which they were engaged. Migration is thus often associated with a general shift in occupational distribution though part of such occupational transfer is realized without a change in residence.

From a very broad point of view in which each sovereign country is regarded as a region or component part of the international community as a whole, the distinction between internal and international migration would disappear, and they would be merged as a single phenomenon. In fact, both types of migration depend not only on conditions in a single country but also to a certain degree on what happens in neighbouring countries or elsewhere. The rural exodus is a vast international phenomenon governed by the varying rates of economic growth. In a country of immigration such as Brazil, it has been found that internal migration was an obstacle to immigration from abroad. In Europe, between 1840 and 1920 the rate of internal migration was low in periods of heavy emigration and high in periods of light emigration. This inverse relation needs to be studied more intensively.

The discussion of the interrelations between internal and international migration revealed opinions which

contrasted in some respect with those expressed in meeting 10 where direct relations between internal and external migration were, in general, denied.

Mr. G. O. K. Beijer in presenting some concluding remarks on the practical implications of the relations between international and internal migration pointed out that regional problems of demographic pressure require a solution by Governments, while at present the policy of emigration is also determined by the Government. If there is no correlation between the policy concerning the solution of regional pressure or internal migration, on the one hand, and emigration policy on the other, and advantageous distribution or redistribution of population can scarcely be achieved. There are, moreover, additional reasons in favour of a close relationship between internal and external migration. From the economic point of view, both require investments from Governments or from private capital; from the social point of view both are concerned with the problems of adjustment, assimilation, and sometimes language. Both movements involve selectivity, not only by sex, but also by age and occupation. International collaboration in the field of migration—internal as well as external—will help find solutions to these varying problems which will be in the interest of all concerned.

The discussants of this topic were Messrs. E. T. de Barros, J. A. Bourdon, D. C. Corbett, and B. Thomas.

#### CONCLUSIONS

The concluding statements of the chairman were directed especially towards the problems which require future investigation. At present this field of demography is seriously neglected; in fact, there is not a single figure on internal migration in the Demographic Yearbook of the United Nations. This meeting showed the study of internal migration to be of great scientific and practical importance. The work of developing statistics on internal migration and applying them to analytical studies should be continued and expanded, both for the improvement of scientific knowledge and for the provision of information that is basic to administrative policy. In this connexion, special attention should be paid to "migratory mobility" and its effects, and to differential and selective migration. Historical studies would be very helpful, and better statistics are needed urgently. The data should include tabulations by age, sex, occupation, status, etc. All the relevant sources mentioned earlier should be exploited in order to obtain more detailed statistical information than has been available in the past. The current sampling surveys of population which are being introduced in more and more countries seem to provide especially good opportunities for this purpose. Furthermore, the population censuses to be taken in or about 1960 should be used in this connexion, not only as a basis for calculating net migration but also as an occasion for asking special questions concerning the movements of persons within a given period of time.

## Meeting 18

## ECONOMIC AND SOCIAL CONSEQUENCES OF AGING OF POPULATION

## Report on the meeting prepared by Mr. J. Daric, Rapporteur

Meeting 18, which met under the chairmanship of Mr. A. Sauvy, the organizer, considered the economic and social consequences of the aging of the population, i.e., the increase in the proportion of older persons at present occurring in the western countries.

The work of meeting 18 was a logical continuation of the discussions of meeting 16 which dealt with variations in age composition with special reference to the effects of declining fertility and mortality.

The topics examined in the reports and in the course of the discussion can be summarized under four heads:

1. The economic and financial aspects of the aging of the population. Increase in the burden on the community caused by an increase in the proportion of older persons. The repercussions of the aging of the population on the pensions problem. Need for extending the working life of older persons;

2. Problems raised by the employment of older persons. Changes of capacity with age. The vocational skills of older persons. The necessity of distinguishing between chronological age and—what is more important in the present context—biological age;

3. The psychological, cultural and social needs of older persons who are economically inactive;

4. Aging of the population and its effects on the social and political institutions of the countries concerned.

After an introductory statement by Mr. A. Sauvy, the rapporteur briefly reviewed the eleven papers submitted for this meeting.

## 1. ECONOMIC AND FINANCIAL ASPECTS

This topic was introduced by Mr. J. Bourgeois-Pichat who drew attention to the difficulties involved in properly defining the aging of population. He pointed out that the decline in fertility had hitherto been the sole cause of aging. Contrary to the widely accepted opinion, the decline in mortality had not been a direct cause of aging and had even retarded it. The decline in mortality had affected the younger rather than the middle and older age groups. Mr. Bourgeois-Pichat showed that the increased burden resulting from a higher proportion of older people was only partially offset by the decrease in the proportion of young people. He then discussed various economic and financial mechanisms in a population whose age structure is changing.

In their papers and during the discussions Mr. J. Doublet and Mr. L. Féraud stressed the importance of the problems raised by the aging of the population with regard to the financing of old-age insurance and discussed the relationship between aging and social security from the actuarial point of view. Miss J. E. Backer presented a written paper on the pension system in her country. Mr. R. J. Myers thought that the burden due to the aging of the population might decline slightly within the next forty years. Mr. G. Heubeck drew attention to the steady increase in the proportion of older persons in Germany and empha-

sized the necessity for a thorough knowledge of average life expectancy trends in studying the burden of old-age dependency. Mr. B. Benjamin discussed the financing of assistance for the aged. Mr. J. Berent stressed the need for further research in studying the macro-economic and macro-social effects of an aging population.

The discussion emphasized the fact that economically inactive older persons must be maintained by the active population. Whatever the legal form of assistance (annuities, rent, industrial dividend, retirement pay, pensions, relief, etc.) the maintenance of economically inactive persons is provided for by a levy on the production of the economically active population. When the proportion of economically inactive older persons to active adults increases, the former balance is destroyed, giving rise to various financial, economic and social difficulties. This fact was recognized, but only some aspects of the financial problems raised by the relative increase in the economically inactive population could be covered in the course of the discussion.

## 2. PROBLEMS RAISED BY THE EMPLOYMENT OF OLDER PERSONS

Mr. J. Daric briefly introduced the topic and emphasized its importance; studies in various countries had shown that where older persons are still able and willing to work, gainful employment is the best means of providing for their needs. As a general rule, public opinion tends to be opposed to the employment of persons over a certain age. Prompted by a somewhat superficial social philosophy, it favours a very different solution: the provision of income during a more extended period of economic inactivity in order to reduce unemployment and to facilitate the promotion of the economically active.

At the same time, the reactions of individuals prematurely retired from their normal jobs have to be considered. Many continue to work, either openly and legally, or more or less clandestinely. That state of affairs combines the disadvantages of the two systems: the burden to be borne by the adult population is still heavy, and many people are employed in jobs little suited to their abilities.

The situation calls for a rational and systematic study of the employment of older persons with a view to ensuring that the burden of aging population is as light as possible for both the inactive and the active population.

Papers on the topic were submitted by Messrs. J. L. Sadie, H. Wiles, A. T. Welford and J. Daric. They reported the results of laboratory research on changes in vision, hearing, muscular strength, manual dexterity, etc. with increasing age. They also drew attention to the results of industrial studies on changes in efficiency with increasing age, the quality of the work of older persons, industrial accidents, absenteeism, etc. The employment of older persons involves two problems: the reassignment of older workers to new jobs

within the enterprise, which is easier, or, in other cases, placement in new jobs with further vocational training where necessary.

Despite the diversity of cases and situations, the discussion showed that a much larger proportion of older persons than is commonly supposed is capable of continuing useful employment. However, being based on chronological age, most regulations, especially retirement regulations, do not take into account the diversity of cases and therefore err in one direction or the other.

#### *Biological versus chronological age*

In his paper and oral statement Mr. H. Laugier deplored the regrettable lack of flexibility in the definition of individual aging and stressed the importance of the difference between the "biological age" and "chronological age" of the same person. The divergence between the two ages increases with age and at 70 (chronological age) might be as much as 20 years plus or minus. From the point of view of social organization generally and with particular reference to the consideration of the problems arising in connexion with the retirement of older persons, comprehensive studies should be undertaken with a view to the definition and measurement of biological age. The question might form the subject of a collective co-ordinated research programme of considerable interest, in which the countries concerned should take part.

Mr. Laugier's paper and statement aroused considerable interest and were the subject of much discussion. Mr. P. J. N. Delaporte and Mr. W. Winkler expressed their agreement with Mr. Laugier, as did Mr. L. Hersch who added, however, that the same individual might have not one but several physiological ages, depending, in particular, on his occupation. Mr. S. Peller expressed the view that there is no reliable basis for determining biological age; while the problems raised by Mr. Laugier are of considerable interest, it would be very difficult to solve them in the present state of knowledge. Mr. M. V. M. Herchenroder pointed out that the distinction between physiological and chronological age is complicated by the fact that the sense of the passage of time varies not only with age but with different social conditions.

#### 3. PSYCHOLOGICAL, CULTURAL AND SOCIAL NEEDS OF OLDER PERSONS WHO ARE ECONOMICALLY INACTIVE

It is not sufficient that older persons should be able to *exist*; they must be able to *live* in the broadest sense of the word. Mr. G. Inghé introduced the topic. The problem is to integrate older persons as fully as possible in the life of the community, bearing in mind the role they must be assigned. The psychology of the older person is a special subject, like child psychology. But despite the excellent work done on those lines, especially in the Anglo-Saxon countries, many studies remain to be undertaken particularly in the sociological and psychological fields. Attention must be directed in particular to the problems raised by retirement from gainful employment, the place of the older person in the community, relations between the young and the old, educational and recreational problems, intellectual and spiritual life, etc.

#### 4. AGING OF THE POPULATION AND ITS EFFECTS ON THE SOCIAL AND POLITICAL INSTITUTIONS OF THE COUNTRIES CONCERNED

Mr. A. Sauvy, emphasizing the importance of the problem, regretted that no paper on the subject had been received. Studies undertaken in the field are still very rudimentary despite their great interest. The influence of aging on political and social institutions cannot be denied. A study of the aging of the electorate would itself be an important contribution. Apart from France, the western countries have experienced little more than a half-century of aging, which has limited the possibility of very lengthy research. The time is now ripe for study of the subject from both the sociological and the historical points of view.

#### *Miscellaneous questions*

In his communications Mr. M. P. Goldschmidt-Clermont discussed the question of unemployment among older persons with reference to factors affecting the recruitment and dismissal of the old. Referring to a survey of the behaviour of elderly people in poor circumstances in Stockholm, Mr. G. Inghé noted in particular that men have greater difficulty than women in adjusting themselves to the changes in life caused by age. Mr. T. Lynn Smith discussed the retirement towns in the United States, notably in Florida and California, to which many older people are attracted.

Among the oral statements, special mention should be made of the statement by Mr. M. Lacroix who discussed the effect of age on population mobility and referred to the papers submitted by Messrs. J. Doublet and L. Féraud on social security and by Mr. H. Laugier on biological age. Reverend V. F. J. Fallon expressed the opinion that the proportion of older persons earning their living is tending to decrease while the percentage that must be supported in other ways is increasing. Mr. L. Hersch showed that the decline in mortality in older age groups may become a cause of further aging of populations. Mr. B. Benjamin referred to actuarial studies of pension schemes made in the United Kingdom. Messrs. J. E. van Dieren-donck, F. Fajfr and J. L. Sadie also participated in the discussion.

#### CONCLUSIONS

A great many subjects might have been included in this meeting, since it covered the whole field of gerontology. However, the very fact that the field was so broad compelled the organizers to limit the discussion to a few basic problems.

Although few specific or formal conclusions were reached, the discussion demonstrated the magnitude of the economic and social problem involved. The financial equilibrium of society is being gradually jeopardized by the steady increase in economic inactivity, creating a need for transfer payments which invariably involve difficulties, however high the levels of living and production achieved.

In addition to the purely financial questions, the social and psychological problems raised by the aging of the population must be considered. In the circumstances, the need for a new and rational approach, at the theoretical and later the practical level, to the whole question of the economic inactivity of older persons is obvious. Slow as demographic changes have been, changes in institutions have not kept pace with them.

As some fields of research are still almost entirely unexplored (for example, the effect of aging on society itself), the scope and the importance of the scientific

studies that remain to be undertaken are considerable. The discussion at this meeting should be regarded only as a starting point for further research.

### Meeting 19

## POPULATION DISTRIBUTION AND INTERNAL MIGRATION, WITH SPECIAL ATTENTION TO COUNTRIES IN PROCESS OF INDUSTRIALIZATION

Report on the meeting prepared by Mr. B. Colombo, Rapporteur

### INTRODUCTION

The subject of this meeting was one of the major problems that face countries undergoing industrialization: the problem of achieving a redistribution of population within their borders so as to meet the changing needs of the economy and satisfy as fully as possible the people's desire for a higher standard of life. This problem deserves the most careful attention of the Governments concerned, for the transition from an agricultural to an industrial economy normally involves a radical change in the division of population between the cities and the countryside and may also require other adjustments in population distribution that can only be brought about by large-scale movements of people. On the other hand, such movements entail economic costs and social consequences that are of the first order of importance. Unless adequate precautions are taken, they may create acute distress and social unrest among both the migrants and the inhabitants of the communities to which they migrate. In the long run, their effect may be a fundamental change in the social, cultural, and political life of the nation.

Because of the numbers of people involved, internal migration in the countries in process of industrialization ranks as one of the most important aspects of population change in the modern world. In most of these countries, internal movements are numerically far more important than migration across national borders, and they play a much more vital part in the provision of man-power for expanding industrial centres. Such movements are of interest not only for demographers, economists and sociologists but also for students in other fields such as anthropology, town and country planning, etc. In the highly industrialized countries also internal migration is of major importance, as shown by the papers and discussions at meeting 17 of this Conference, but in their case it is not such a crucial factor as it is in those low-income agricultural countries which are striving to convert their economy to an industrial basis.

In spite of its importance from so many points of view, internal migration in the countries undergoing industrialization has been the subject of very little study to date. It has received much less attention, for example, than international migration affecting these countries. Admittedly, the data available for study in this field are very scanty. It was emphasized in meeting 17 that even in the industrialized countries, where statistical services in general are most extensive, it is often found impossible to get an adequate picture of internal migration from the types of data that are available. In the case of the under-developed countries, the deficiencies of the statistics are generally

much greater. On the other hand, those data which do exist have not, for the most part, been subjected to the analysis which the importance of the subject warrants. The participants in the meeting were therefore concerned, not only with what is known or can be inferred from available information about internal migration in countries in process of industrialization and its relation to economic and social development, but also with what could be done to improve the sources of information and the effectiveness of their utilization.

The main points brought out in the contributed papers and the discussions are summarized below under the following headings:

1. The relation of internal migration to the economic and social development of countries in process of industrialization:
  - (a) General trends and types of movements,
  - (b) Migration of agricultural population to new farming areas,
  - (c) Economic aspects of migration from rural to urban areas,
  - (d) Social problems;
2. Implications of the results of studies on internal migration in industrialized countries, for research relevant to countries in process of industrialization;
3. Problems in the development of statistics and research on internal migration in countries in process of industrialization.

### 1. THE RELATION OF INTERNAL MIGRATION TO THE ECONOMIC AND SOCIAL DEVELOPMENT OF COUNTRIES IN PROCESS OF INDUSTRIALIZATION

#### (a) *General trends and types of movements*

Many papers and interventions in the discussion documented the fact that the volume of internal migration in a number of the so-called under-developed countries has been large in the recent past, and that it has been growing with increasing momentum. The prospects for the future are apparently along much the same lines. The most important types of such migration are: (a) the movement of agricultural workers toward new farming areas and (b) the movement from country to city. These are the types of migratory currents which undergo the greatest changes with economic development.

Mr. K. Davis presented a few empirical generalizations with regard to the sequence of different types of internal migration in connexion with economic development. According to him, the main stimulus to the movement of agricultural workers to new lands comes early in the process of development, and the volume of this kind of movement increases in the early stages

of industrialization but eventually becomes of minor importance. On the other hand, rural-urban migration in the early stages of economic development cannot be great in proportion to the total population, however large it may be in proportion to the population of the cities themselves (which are usually few in numbers). As economic development proceeds, the national rate of rural-urban migration begins to rise. When industrialization has gotten into full swing, rural-urban migration tends to predominate over all other forms of internal movement, and to become especially great in relation to the rural and agricultural population. When, finally, the point has been reached where a substantial proportion of the people live in the towns, rural-urban migration is reduced and the principal movements are inter-urban. Today's experience in the countries in process of industrialization seems to provide a convenient basis for a comparative analysis of these conclusions.

(b) *Migration of agricultural population to new farming areas*

The movement of farmers and farm labourers to new agricultural regions is still of pre-eminent importance in some of the less densely populated countries. In Brazil, for instance, data presented to the meeting showed that between 1940 and 1950 there was a conspicuous movement of that kind from areas less favoured by nature, or subject to periodical calamities, or exhausted as a consequence of irrational exploitation, toward more favoured or still virgin lands. Likewise it was shown that in Costa Rica there have recently been considerable movements of population, chiefly from the densely populated zone of the Meseta Central, with its fragmented agricultural holdings and labour-intensive coffee plantations, to regions where new types of agriculture, suitable for mechanization, have been developed.

These examples show how the redistribution of agricultural population, in favourable circumstances, may contribute to economic development by improving the utilization of available land resources and relieving excess population pressure in certain areas. It has also been mentioned as a means of curbing the migration from rural to urban areas, in countries where a shortage of agricultural labour is believed to hinder a balanced development of the economy. Certainly, many possibilities are still open in this field, and it is also possible to tie more people to the land with transformations in technology and land tenure, combined with a diversification of agricultural production and with more care on the part of central Governments for the economic and social needs of the rural communities. Mr. L. Maroi emphasized that agricultural colonization offers an opportunity for the utilization of superior types of organization and technique and thus contributes to a more stable form of agrarian society.

On the other hand, it was pointed out that similar opportunities for economic development through re-location of the agricultural labour force do not exist in all countries. In many cases the areas of land that are not being cultivated or that could readily absorb substantial additions to the agricultural labour supply are small, and the costs and complexities of resettlement are multiplied. In India, for example, according to information presented at the meeting, movements away from communities where the density of agri-

cultural population is excessive do not necessarily diminish the pressure of population because the places of out-migrants may be taken by in-migrants from other areas where the pressure is as great or greater.

(c) *Economic aspects of migration from rural to urban areas*

Especially in the most densely populated countries, still dependent on an agriculture that yields small per capita income, the absorption of surplus agricultural population into non-agricultural employment is of foremost importance. For them, industrialization is an economic and demographic necessity, and industrialization, at least on the pattern which is almost universally being followed at the present time, involves a large measure of urbanization. In this respect, the geographical mobility of labour plays a major role, as a case of the adaptability and flexibility which are indispensable for all factors of production in the development of more productive types of exploitation of available resources.

On the other hand, the amount of movement from rural to urban areas that is advantageous at a given stage in the development of the economy is open to question, both from the strictly economic and from the broader social point of view. In economic terms, the primary function of such migration in connexion with industrialization is to bring labour supply to places where the other factors of production required for the expansion of industry are located. In addition, urbanization facilitates occupational specialization and the efficient distribution of manufactured products. In some instances, however, these economic advantages may be illusory, or they may be over-balanced by negative items. Migration, too, in fact, involves economic costs, often borne by those least able to afford them—the migrants. In some cases it might be cheaper to move other factors of production to the places where labour is already available. So far as the advantage of specialization is concerned, a detailed division of labour on single products is more readily accomplished by administrative organization than by market exchange. These points were stressed in Mr. W. E. Moore's comment. Mr. J. A. Encinas del Pando emphasized the need for analyzing the costs of alternatives in relation to the economic returns.

On the question, whether urbanization at its present rapid pace in regions undergoing industrialization is desirable or not, there was a diversity of opinions among the authors and discussants. Some of them maintained that the movement is often motivated more by intolerable conditions in the rural areas—whether due to a disproportion between the size of population and the area of agricultural land, to inequities in the system of land tenure, or to other causes—than by the real drawing power of the urban economies. The pressure of in-migration from the rural hinterland, it was said, may have a very damaging effect on the economic situation of the urban population, tending to depress wages and to create unemployment. In other words, rural distress is in danger of being replaced by urban distress, with a cruel waste of human lives and productive resources.

Other participants were definitely in favour of large migration to the cities, even if it were only a back-and-forth movement which puts people at least temporarily in contact with different cultures. The view

was expressed that the present rate of migration from rural to urban areas in many cases is less than what would be desirable for economic development in the long run. It was pointed out in this connexion that in some countries, for example, in Asia, the volume of such movement is small in proportion to the total population in spite of the presence of some large cities, which do not appear to exert a very great drawing power.

Some of the discussants, with reference to particular local situations or in general, emphasized the lack of incentives for the creation and expansion of a new industrial sector on the part of private initiative in the less developed regions. According to one of the discussants, the problems of internal migration in countries undergoing industrialization are of such magnitude and complexity that their solution calls for a planned economy under a strong Government.

#### (d) *Social problems*

Not only the economic aspects of internal migration but also its social implications and consequences deserve attention for a proper understanding and solution in connexion with development. The primary sociological consequence of migration, in Mr. Moore's opinion, is precisely its damaging effect on family, kinship and social stratification. A secondary effect derives from the stimulative, communicative role of the cities. Social change involves social costs which also have to be met.

Attention was called to the experience of southern Africa as an example of attempts to fulfill the primary economic function of providing labour supply through a system of temporary, contractual migration, with little concern for such secondary functions as markets and distribution, or for the need to create new forms of social organization among the migrant population. The consequences, it was said, are wasteful in the short run and doomed to explosive failure in the long run.

Some discussants pointed out that, if certain basic social factors are not taken into account, the consequences of population shifts may impede economic development itself. People who move to new areas and new occupations need vocational training, proper housing, and facilities of many kinds, e.g., health facilities, education, etc. It is not surprising that with the gradual advance of economic planning, physical planning is coming more to the foreground as a method of creating, simultaneously with the population movements, the housing and other facilities needed.

In the paper submitted by Mr. E. Mesaros on Romania, it was brought out that many of the difficulties surrounding industrialization in under-developed countries did not arise in communist countries. By careful planning of the number of migrants (either workers from rural areas to industrial centres or agricultural technicians to the countryside), it is possible to foresee the material and cultural needs of such migrants and thus alleviate the negative influences which their movement might entail.

Many of the authors and discussants emphasized the fact that in very different circumstances, from the Far East to Latin America, the growth of cities, mainly through the external stimulus of international markets and Western culture, has simply favoured the formation of so-called industrial islands, where the elements

of modernism have been introduced and sealed off from the surrounding areas. This is a cause of disequilibrium in the development of these countries, resulting in large regional differences in both living standards and mentality and unfavourable consequences also with respect to a proper harmony between social classes. In contrast with this situation, it has been pointed out that the application of present technology to education and public communication could make towns and even rural villages more urban.

One paper and some of the discussants called attention to the selective effects of internal movements of population, which are said to play a role unfavourable to the more depressed regions of a particular country. It was claimed that the intervention of central Governments in order to stimulate the economic development of their countries should meet directly the needs of the less favoured areas, in order to avoid such a selection increasing the contrast between the wealthiest areas and the poorest ones, which would subject them to an impairment of their social conditions and a further deterioration of their economies.

Problems of social adjustment sometimes arise also from cultural differences between migrants and the residents of the areas into which they migrate. In some cases the problems of social and cultural assimilation involved in internal migration may be fully as important as they are in the case of international movements. It was pointed out at the meeting, for example, that in India variations in language, caste, and religion add to the human and social cost of internal migration.

As to the demographic effects of these population shifts, in particular the effect upon the natural increase of the countries concerned, it does not seem possible to make any generalization. Owing to the little difference—if indeed there is any difference at all—between vital rates in cities and rural areas in all these countries, no important developments are likely to be produced in the short run by the mere fact of the trend toward a higher degree of urbanization. When such changes in the natural increase of a particular country take place in the long run, they can probably be better understood as a consequence of the changes in the standards of life and social organization of which migratory currents are an index, playing the role of cause and effect at the same time.

The contributed papers on various aspects of internal migration in the countries in process of industrialization and its relation to economic and social development included those of Messrs. G. W. Barclay, E. T. de Barros, J. F. de Camargo, K. Davis, R. Espinosa Olvera, N. P. Gist, I. F. Mariani, E. Mesaros and V. Nath. In addition to authors of these papers, the persons who took part in the discussion on this topic included Messrs. A. Arca Parró, J. A. Bourdon, C. Chandrasekaran, Miss A. G. Casis, Messrs. A. Costanzo, J. A. Encinas del Pando, M. Foyaca de la Concha, P. O. L. George, A. van der Goot, L. Maroi, W. E. Moore, C.-L. Pan, and W. F. Wertheim.

## 2. IMPLICATIONS OF THE RESULTS OF STUDIES ON INTERNAL MIGRATION IN INDUSTRIALIZED COUNTRIES, FOR RESEARCH RELEVANT TO COUNTRIES IN PROCESS OF INDUSTRIALIZATION

In general, the phenomenon with which we are concerned poses more questions in various fields of



research than can be answered with the available evidence. Some help in the understanding of the phenomenon can be obtained by a thorough review of the conclusions reached in historical research on countries that are now at a relatively high level of industrial development, and these conclusions may give a few clues to prediction of future events in the less developed areas. For a cautious analogical extension of the results of studies of that sort, some few points—it has been said—should be kept in mind. In the Western experience there was a graduality of achievements which will not necessarily be repeated in the process of the present development of the regions we are interested in; likewise, not all stages of the technological process need be repeated, nor all phases of the change from an agrarian-primitive economy to an economic system based on division of labour and specialization. The channels of innovation also are different: one can mention, e.g. the role played today by central Governments in promoting an acceleration of economic progress, or the decisive impact of elements coming from outside and heterogeneous with regard to the indigenous social structure, or the disparity among the cultures which come into contact.

However, some empirical generalizations of Western experience may prove widely applicable, at least as a basis for hypotheses to be tested by research. For example, industrial development has characteristically been accompanied by a large volume of internal migration, and probably will be so in the future, for the reason that industrial development cannot be spread evenly over the territory of a nation. It is also to be expected that the streams of such migration will be highly selective. It is the young people at the age of entering employment who are most responsive to changing economic circumstances and most ready to move. The migrants to new centres of production are likely to be, on the whole, a selection of the better educated, better trained, and generally more able elements in the population, particularly of the areas that may be adversely affected (through loss of markets, etc.) by industrialization.

Another generalization which is suggested by past experience is that the streams of internal migration will tend to be two-way streams; that is, many of the migrants may return to the place of origin, and sometimes their movements may be partly offset by the migration of other persons in the opposite direction. The total number of moves may greatly exceed the net change in population distribution. A by-product of such migration and cross-migration could be a tendency to reduce regional differences in culture within the country and to break down internal barriers. One of the discussants suggested that although the movements may appear in the short run to occasion much social disruption, one should not exaggerate the consequent social tensions in the long run, for if the migrant himself does not eventually adjust to the new conditions in which he is placed, his children probably will.

The papers submitted to the meeting relevant to this topic included the one by Mr. M. Cappieri and those by Mr. I. F. Mariani and Mr. K. Davis mentioned above. Mr. D. J. Bogue was the principal discussant on this topic.

### 3. PROBLEMS IN THE DEVELOPMENT OF STATISTICS AND RESEARCH ON INTERNAL MIGRATION IN COUNTRIES IN PROCESS OF INDUSTRIALIZATION

There was repeated emphasis, during the discussion, on the need for concrete measures to improve the sources of information in this field. An essential requirement in this connexion is to extend and improve the collection of statistics that can be used for measuring internal migration in the countries undergoing industrialization. Thorough research on the methods of measurement, and adequate diffusion of the results of such research are necessary in order to permit standardization of data and comparative analyses of the movements in different countries and at different times. As an example of the need for standardization, it was pointed out that the result of any measure of internal migration is much influenced by the definition of the geographical components of the country, between which the movement is recorded; the smaller the geographical unit adopted the greater will be the number of migrants.

Attention was called to the need for improving the organization of research, as well as the collection of basic data. It was said, in fact, that owing to the similarities of internal migration in various countries and to the scarcity of funds available for studies on this subject, a planned system of division of labour on a regional or international basis is advisable, with international co-operation in specific inquiries on certain aspects of the question. One speaker made the point that the complexities of the subject are such that only a broad inter-disciplinary co-operation, involving economists, sociologists, political scientists, cultural anthropologists and others, as well as demographers, could provide the necessary information.

One of the discussants suggested that it would be fruitful to compare more often the methods used and the results reached in studies on international and internal migratory movements; for instance, on the assimilation of migrants and on the economics of migration between poorer and richer areas. Internal migration provides an opportunity to make observations under conditions that are relatively favourable for scientific deduction, since a number of factors are constant which would be variable in most cases of international migration. The influence of the latter variables can then be examined in studies relating to international migration.

In justification of a strong and concerted effort to deepen the knowledge of internal migration in the less developed countries, one discussant said that these countries need the basis for a policy regarding such migration, in view of the rapidity of population growth which many of them are now experiencing and the unsatisfactory rate at which productivity is increasing. Almost all of the countries concerned, he observed, have definite policies in regard to international migration, but the same cannot be said with respect to migration within their borders.

Messrs. J. A. Encinas del Pando, W. Jiménez Castro, M. Lacroix and C.-L. Pan were among the participants in the discussion on this topic.

### CONCLUSIONS

Economic progress entails the adaptation of vast segments of the population to types of activity different

from those in which they were previously engaged. To what extent the acquisition of new skills requires, or is facilitated by, geographical shifts of population cannot be stated *a priori*; it depends on the specific circumstances, for example, on the policies adopted by the Government for economic development and the reaction of the people affected.

Redistribution of population in order to extend the area under cultivation and thus to increase agricultural production is still an opportunity open to some of the less developed countries, but in many cases it is likely to involve increasing cost. Especially in the areas under heavy demographic pressure, but also in the less densely populated and more richly endowed regions, a balanced development of diversified agriculture and of new industries seems to be necessary for raising productivity and levels of living. For that purpose, labour can be

moved to places where other factors of production are available or the latter factors can be transferred to areas where labour is abundant. Mobility of labour and the acquisition of new skills go hand in hand with social mobility and development of new forms of social organization. Governments planning development, in comparing economic costs and returns of different projects, should be prepared to face the social implications and the demographic consequences of the transformations which they desire to promote.

A much more thorough collection of data on the various types of internal movements of population and on their results is required. A wider and deeper scientific appraisal of the many facets of this neglected chapter of demography is of foremost importance for enlightened policies in countries bent on industrialization or any other economic transformation.

### Meeting 20

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. I. POPULATION IN RELATION TO THE DEVELOPMENT OF NON-BIOLOGICAL RESOURCES

Report on the meeting prepared by Mr. F. W. Notestein, Rapporteur

### INTRODUCTION

The object of this meeting, held under the chairmanship of Mr. G. Myrdal, was to assist in providing background for subsequent meetings by considering the non-biological materials and the energy on which man depends for his livelihood. With such a huge and highly technical topic, broad perspective is all that could be hoped for. For each of the major types of resources there was an attempt to indicate the regional distribution in the world in relation to: (1) existing levels of utilization by the population and (2) the possibilities of, and obstacles to, expanding the utilization of resources to meet the need for improved living conditions of growing populations in the near future.

A realistic consideration of the possibilities for increased utilization of energy and non-biological materials depends heavily on developments in agriculture, which was the topic of meeting 22, and in the economic field of capital accumulation, investment and employment, which was the topic of meeting 24. Participants in this meeting (No. 20) were therefore asked to limit themselves to the barest essentials in those fields. Two economic topics not adequately treated elsewhere in the Conference were included in this meeting because they were considered to be indispensable to a consideration of problems of resource utilization. One was the relation of industrial demand for raw materials to the opportunities for development of under-developed countries. The other was the use and limitations of international trade in overcoming inequalities in the world distribution of population and resources.

### 1. ENERGY

This topic was introduced by Mr. E. A. Ackerman.

There is very little relation between the size of population and the amount of economic output in the world's regions. On the other hand, energy consumption and economic output are very closely correlated.

For example, Mr. N. B. Guyol shows that at one extreme Asia, with 53 per cent of the world's population, uses only 14 per cent of the world's inanimate energy and produces only 13 per cent of the world's economic output. At the other extreme, North America, with only 7 per cent of the world's population, uses 41 per cent of the world's inanimate energy and produces 40 per cent of the world's economic output.

All improvements in the level of living involve a staggering demand for increased energy supplies far beyond anything indicated by a mere projection of past trends. The conventional world energy sources of today cannot possibly meet these demands of the future. Efforts need to be directed toward the development of new and non-conventional sources of low-cost energy.

So far as global energy resources are concerned, none of the authors of background papers foresees major difficulties in the years up to 1980. The two authors who treated the subject, Mr. N. Guyol and Mr. E. Schumacher, utilize somewhat different assumptions both as to population growth and as to the *per capita* increase in energy use. For illustrative purposes Mr. Schumacher suggests a doubling of annual energy inputs between now and 1980, and Mr. Guyol uses a multiplier of 2.9 times the 1950 figure to reach 1980. Even such large multipliers do not contemplate any spectacular improvement in living conditions. Mr. Schumacher allows for a 2 per cent and Mr. Guyol for a 2.5 per cent annual increase in *per capita* energy use. But, as the former points out, some appreciable increase in *per capita* use would be necessary just to prevent a deterioration of living conditions in a growing population. However, neither author foresees major obstacles in global terms to providing modest increases in energy inputs per capita for a growing population up to 1980.

Looking beyond 1980, Mr. Schumacher foresees difficulty before the end of the present century if



there is continued growth of population and expansion of energy utilization along past lines. He holds "... that 'Western' industrialization, as it has grown up over the last 50-100 years, does not at present possess a permanent energy basis."

On the other hand he does not expect this prospect to become an "active force for change" in the next 25 years because oil and gas, in spite of their relatively short life expectancy, will be able for another 25 years or so to compete successfully with coal and to determine, on the basis of their own production costs, the general level of fuel prices. Continued expansion beyond 1980, on the other hand, would undoubtedly encounter severe obstacles.

Turning from the global to the regional situation so far as coal is concerned, Mr. Schumacher points out that regions outside North America, Europe and the USSR and China contain almost half of the world's population but only 4 per cent of the world's coal reserves. These figures make it clear that coal can never in these "other regions" become the energy basis for an economy developed on the pattern of Western industrialism. Even in India and Japan any large-scale industrialization based on indigenous coal could only be short lived. Moreover, all agree that any substantial mitigation of regional inequalities in the distribution of coal by means of interregional trade would encounter insuperable obstacles of cost. There are, Mr. Schumacher recognizes, possibilities "... that something might turn up. This expectation, supported by entirely premature hopes fastened on atomic energy, is likely to stand in the way of a realistic appreciation of the energy problems to be faced by industrialization on the 'Western pattern'."

With respect to oil and gas, Mr. W. T. Thom, without presenting estimates of either needs or resources, takes a much more optimistic view than Mr. Schumacher. He believes that world oil and gas production may "... reasonably be expected in adequate volume for many many years to come, which is to say, beyond the time when intra-atomic energies will have begun to replace oil, gas, and coal as the major source of energy for world purposes". It is also Mr. Thom's belief that it is entirely feasible technologically to supply natural gas to every large city and region of Europe, North Africa, and Southwest Asia.

So far as fossil fuels are concerned, therefore, there seems to be general agreement that the world supplies are reasonably adequate until 1980. Thereafter, opinions range from the anticipation of rather difficult shortages of the most mobile fuels to high optimism based on known wide occurrence, new economies in transportation, and the past achievements in discovery and production in North America.

Currently the fossil fuels are supplying between 75 per cent and 80 per cent of the world's inanimate energy. These are capital fuels, stored through the ages, which cannot be replaced once they are exhausted. The world, however, receives from the sun each day vastly more energy than man consumes. Indeed, Mr. E. Daniels points out that the solar energy falling on an acre of land greatly exceeds the heat requirements for one person. The difficulty is that it is not possible at present to convert this energy into useful form except through agriculture and to minor extent through water power. Income energy today

constitutes some 20 per cent to 25 per cent of the world's total. Fuel wood and other non-commercial fuels will doubtless continue to be important in isolated areas, but their continued use represents a failure to solve, rather than a solution to, the energy problem.

Outside agriculture, man's commercial use of income energy takes the form of water power which currently represents less than 6 per cent of the world's energy but, as Mr. J. L. Aubert points out, is much more important than the figures on energy production would suggest because of its complementary products of flood control, irrigation, and navigation.

There is perhaps no better example than the case of water power of the need for detailed consideration of all the physical, economic, social, and demographic elements of the situation in initiating plans for development. Without the necessary population, skills, raw materials, and effective organization the development of water power can be a costly failure. In the appropriate setting, and with wise choice among the alternative uses for water, its development can be much more important than figures on power alone would suggest.

At present, aside from agriculture, there is little practical use for solar energy because of the low efficiency and high capital costs of converting it into useable form. Where fuel is very expensive solar heat can now be used for small home cookers, and there are reasonable prospects, according to Daniels, that within a few decades solar energy will be used for at least partial heating and partial cooling of homes—again at high installation but low operating costs. There are theoretical possibilities in the direct production of electricity, in photosynthesis, and the freshening of salt water, but Mr. Daniels thinks that nothing on a substantial commercial scale is in sight, and there is every prospect that initial applications will require high capitalization and be costly. Meanwhile, it is important in view of the heavy drafts being made on capital fuels to promote research on the application of solar energy.

Overshadowing all questions concerning the availability of energy from conventional sources is the prospect of energy from fissionable materials. Should this form of energy become relatively cheap, most of the problems would be solved, because the supply of potential fuel from this source is virtually unlimited and its transportation is almost costless. Nevertheless, Mr. W. Isard and Mr. V. Whitney do not expect atomic energy to fill an appreciable proportion of the world's requirements by 1980. Many technical problems of using atomic energy on a scale that would significantly affect the world situation remain to be solved. Even when they are solved, the present prospects are that capital investments required for its utilization will be extremely high. So far as is known now, the main prospects for the industrial use of atomic energy will arise in situations in which conventional fuel is expensive, capital abundant, and there is a ready market for products of fission other than heat. In short, atomic energy is, on present information, much more likely to provide a long-run solution to the fuel problem of the highly developed and heavily capitalized nations of the world than it is to contribute in the foreseeable future to poor, energy-starved, and under-developed regions of the world.

In the near future, and perhaps in the indefinite future, given hoped-for developments in the atomic field, the world as a whole will not face major problems of securing adequate energy. This conclusion, however, loses much of its significance by virtue of the costs of transportation of most fuels. One of the most important distribution problems is that of moving adequate energy supplies from surplus areas to the great energy-deficient crescent of the Eurasian continent. Unless new energy sources are discovered to take the place of oil and gas before they are exhausted, many parts of the world will be in serious trouble—among them some of the most densely populated. Europe is already feeling the pinch on coal and can only expand its energy use rapidly by increasing its consumption of oil and gas. Areas with vast resources include the USSR and China, the Middle East, and North America. Most of the rest of the world, including something between a third and a half of the earth's population, has wholly inadequate supplies to provide reasonable levels of living for the present population, and rather poor prospects for obtaining them on a sustained basis in the foreseeable future. The solutions can now be imagined, but at present they cannot be realistically foreseen.

In the discussion, Mr. E. A. Ackerman drew attention to a number of problems concerning the relation between population and energy resources which have yet to be adequately dealt with. One was the effect of energy use on demographic changes—for example, the possibility that increased availability of liquid fuels and low-cost electricity in rural areas, by improving the quality of life in these areas and thus retarding the growth of cities, might result in an increase in the birth rate.

Energy resources need also to be studied in combination with other natural resources to understand how, together, they relate to population. In this respect, Mr. Ackerman pointed out that the use of energy is important to assist in the improvement of present low-grade primary resources in order to increase their productivity and to promote the use of the earth's more abundant materials as a substitute for the less abundant. For example, improvement in land productivity may be brought about through the use of low-cost fertilizers, refrigeration, and air-conditioning, but the key to all these is low-cost energy resources.

Attention was called to the implications for public policy of prospective future energy shortages and to the possible desirability of diverting some consumption of liquid fuels away from purposes of low social value.

Other speakers expressed the view that the background papers took too pessimistic a view of possible future technical improvements and that considerably more research devoted to innovations on a national and international scale needed to be undertaken to provide a relatively cheap form of energy supply.

In addition to the chairman, Mr. G. Myrdal, and Mr. E. A. Ackerman, participants in the discussion of this topic included: Messrs. A. Angelopoulos, I. Bogdan, M. Ezekiel, F. Friedensburg, I. Kuzminov, and H. Laugier.

## 2. NON-FUEL MINERALS AND CREATABLE RESOURCES

This topic was introduced by Mr. F. Friedensburg and Mr. S. Zuckerman.

Iron, copper, lead, zinc, aluminum, and sulphur constitute the principal non-fuel minerals which are indispensable to modern economic development. While the production of these minerals has kept pace with the rise in population in recent decades, the stage will eventually be reached when new resources will have to be discovered or better methods of utilizing inferior ores evolved to meet the demands of future population growth. Good deposits of iron ore are found in every continent and in nearly every country. Deposits of some of the other important metals are less plentiful, and it has been estimated by Messrs. M. S. Krishnan and K. Jacobs that at the present rate of exploitation the known resources of copper might be exhausted in from 30-100 years and those of lead and zinc in about 30 years. Supplies of bauxite occur in many countries and will probably enable the world to meet the demand for aluminum for many decades to come, particularly in view of expected technological improvements. Sulphur resources may be considered practically inexhaustible.

Technical development within the next 20 or 30 years and economic progress in the under-developed countries may bring an even faster exhaustion of certain of these minerals. However, as pointed out by Mr. Friedensburg, the definite limit of supply may never be reached, owing to the progress of techniques and the utilization of new deposits of ores previously regarded as unminable.

A number of factors may tend to increase the cost of mineral production in the future. Those cited by Mr. Friedensburg include the greater depth of mining as the more easily accessible deposits become exhausted, increasing distance between the mine and consumer, and the demand for rising wages on the part of the miners.

Mineral resources are not uniformly distributed by regions in relation to population. Moreover, the production of metals and usable products from these minerals does not follow the same pattern from country to country as the distribution of resources, for the highly industrialized countries utilize not only their own resources but also import considerable quantities from the less-developed countries. Thus, the smelting and manufacturing facilities in the different countries are not commensurate with the magnitude of the resources the countries possess. The industrialized countries, because of their advanced techniques, are also better able to utilize ores of a lower grade and to recover most of the useful ingredients as by-products. *Per capita* consumption of metals and minerals bears a close relationship to the stage of development of different countries. The countries which show a high consumption are mainly those of North America, Western Europe, and Oceania, while those of Asia (except Israel and Japan), South America, and Africa are much lower on the scale.

In recent years there has been an increasing realization of the need for economic planning and industrialization as a means of raising living standards of the population. Mineral resources play an important part in increasing the national wealth and it has become apparent that local resources should be used

not merely for export but should be developed to the fullest extent possible for internal use. Shortages of technologically trained personnel and of the required capital for the establishment of metallurgical and chemical industries are obstacles to increased production and consumption of minerals in many countries. However, there are indications that the rate of consumption is rising and that under-developed countries are learning to consume more and more mineral products. While it may take a long time for these countries to achieve a level of consumption equal to that of Western Europe, the general trend is unmistakable, according to Messrs. Krishnan and Jacob.

Recent decades have also seen a rising international interdependence in the world market of mineral raw materials. There is a growing tendency toward concentration of production of minerals in a relatively few places of mining, to a large extent in the so-called under-developed countries. As the contribution of the non-industrialized countries to the world supply of minerals is indispensable to economic progress, Mr. Friedensburg believes consideration should be given to the possibility of declaring mineral wealth an international asset not subject to the disposition of changing Governments of a single country. It was pointed out, however, in the discussion that the less developed countries might look with some reluctance on giving up their main assets to international control and that it was desirable that these countries be permitted to use their resources first of all for their own benefits. One speaker held that the law of the market which rules world economy should be modified so as to promote consumption of materials in under-developed countries at the expense of some unessential consumption in industrialized countries.

In addition to the possibilities of creating new sources of energy and non-fuel minerals, increasing attention has been given to the prospects for meeting some of the world's needs for other raw materials through unconventional methods of production. The outlook for revolutionary progress in this direction does not appear very optimistic, however, at least for the next 25 years, according to Mr. Zuckerman. The development of new non-biological resources requires technical knowledge, power, and capital, and therefore the effective demand is likely to grow most quickly in the already advanced countries, while the need is greatest in the less developed countries where population growth is likely to be most rapid.

The development of synthetic nitrogen for use in agriculture may play a bigger part than any other single factor in increasing food supplies in the next decade. The supply of nitrogenous fertilizer is a limiting factor to the amount of vegetable growth obtained from solar radiation, but unlike phosphoric and potash fertilizers, it can be chemically produced. Atmospheric nitrogen can be converted into fertilizer nitrogen for utilization by plants, but the process requires the use of fuel, a wasting asset, and considerable capital. As the cost per unit of nitrogen production tends to be inversely proportioned to the volume of output, large-scale manufacture is favoured. This works a hardship on the under-developed countries, where the need for increases in food supply is most intense. Some promise is offered by recent developments in fixing atmospheric nitrogen in smaller plants which could meet the needs of under-developed countries with a supply of fuel.

Aside from nitrogenous fertilizer, the major creatable resources are sulphur and high polymers. Sulphur and sulphuric acid play such an important role in industrial progress that over-all consumption of sulphur can be taken as an index of total industrial activity in a country. In agriculture, sulphuric acid is used to convert insoluble rock phosphate into a form soluble in water, so that the phosphorus is immediately available for plant growth. The principal sulphur domes have been heavily exploited, and attention is now being turned to the production of sulphuric acid from iron pyrites and also toward discovering a suitable method of extracting elementary sulphur from these same raw materials.

The control of the intermolecular combinations of relatively simple organic molecules in the process of polymerisation has led to the mass production of many new and versatile materials, including synthetic fibres such as nylon and dacron, synthetic rubbers, resins, and styrene and vinyl polymers. The raw materials for these products are obtained either through wasting assets, such as coal and petroleum, or from renewable assets, such as cellulose and proteins. As the cellulose is provided by vegetation of various kinds, the amount of land it requires as compared with that required for the production of natural fibres assumes importance. There is also competition between the use of land to produce cellulose or food, and in the future food is likely to be in greater demand than textiles.

The economic practicability of obtaining food supplies from unicellular organisms has yet to be proved. Even if the chemical industry could be expected to add significantly to the food supply, wasting assets of coal and petroleum would have to be used in the process. It would be preferable for synthetic chemistry to devote its efforts to the manufacture of essential food nutrients such as vitamins, certain specific amino-acids and other trace elements, which are obtained at small cost in energy and material, and release the land for the production of high yielding crops.

In addition to the leading discussants, Mr. T. V. Ryabushkin and Mr. A. Sauvy participated in the discussion on this topic.

### 3. PROBLEMS OF UTILIZATION AND TRADE

This topic was introduced by Mr. S. May and Mr. F. Hilgerdt.

In his opening statement on industrial raw materials Mr. May supported the following seven conclusions:

(a) In 1950, "world" (excluding USSR, mainland China, Mongolia, North Korea, East Germany, East Central Europe, Albania, Bulgaria, and Romania) production of industrial raw materials amounted to about \$46 billion, of which well over two-thirds were produced and over 90 per cent consumed in countries with relatively advanced industrial economies containing little over one-third of the world's population.

(b) Although the under-developed or "primary product producing" countries produced less than a third of all industrial raw materials, they supplied about half of all imports of such materials as the major industrialized areas received through international trade. This category of exports provided more than half of the total foreign exchange earnings of the under-developed areas from trade with industrialized countries.

(c) Contrary to widely held preconceptions, the long-term record does not reveal any marked degree of price or demand instability in the markets for industrial raw materials or for primary products as a whole as compared with manufactured goods. In fact, since 1940 the terms of trade have favoured most primary products to a marked degree and the evidence suggests that this trend is likely to continue for some time to come. This suggests the wisdom of a policy on the part of the under-developed areas of making a strenuous effort to increase their present share of the raw materials segment of world export trade and it raises sharply the question of whether urgent proposals for international controls that would freeze the relationship between primary and manufactured product prices would not serve the interests of industrialized rather than under-developed nations.

(d) The 1980 "world" consumption of industrial raw materials is projected at about \$80 billion (in 1950 prices) of which about \$50 billion might enter into international trade, as against \$46 billion of consumption and \$27 billion of trade in 1950. Such an increase in consumption should afford the presently under-developed areas an opportunity to increase their production of industrial raw materials from the \$14.5 billion level of 1950 to something like \$31.5 billion in 1980, and their exports from \$13.5 to \$28.5 billion over the same period. Increases of this magnitude, approximately double their expected population increase, should exert a markedly stimulating effect upon the economies of the under-developed areas.

(e) The above projections are contingent upon a growth in the *per capita* demand for industrial raw materials in other parts of the "world" comparable to that which is projected for the United States as a continuation of its trend over the past 50 years.

(f) The potential expansion of industrial raw material production and trade is dependent upon a sufficient supply of investment capital. The capital cost of raising the output of industrial raw materials by as much as \$17 billion in the under-developed areas may be of the order of \$25 to \$34 billion, or \$800 to \$1,100 million per year over the thirty-year period. Such a sum should not be beyond the means of even the capital-poor areas' own investment potential, although there should be a very strong incentive for the industrialized nations to provide this capital wherever reasonably hospitable opportunity is afforded. This would free the domestic investment resources of the under-developed countries for commitment to manufacturing developments or other constructive internal purposes.

(g) Finally, on the basis of this analysis it appears that much of the literature dealing with raw materials in relation to the under-developed areas requires re-writing. In most studies of the developed process, raw material has been made the villain of the piece. The evidence assembled here suggests that it should be made the hero—not as a substitute for manufacturing and a generally broadened base of economic activities, but as the single best opportunity in sight for providing the means for achieving industrial progress. The under-developed areas should take vigorous advantage of the opportunities for increased production and trade offered by a very favourable demand and price outlook. They should use to the limit their special advantages deriving from the possession of the most

economic stores of potential supply to inaugurate processing at the source rather than at the terminus of export. They should employ the need of manufacturing nations for raw materials as a lever to pry from them the funds for the capital investment upon which increased output depends. They should employ the foreign exchange earned from increased raw materials export to buy the equipment needed to found a domestic industry. In short, by adopting a wise strategy in this field, the presently under-developed areas can make that designation inapplicable and move steadily toward the achievement of well-rounded industrial economies.

In the discussion following the presentation of Mr. May's conclusions, attention was called to the fact that while under-developed countries with a low population-resource ratio might profit from the opportunities for increased production and trade of raw materials offered by the favourable demand and price outlook, these conditions would not be so likely to prove advantageous to the densely populated under-developed countries, such as India for example, which have mainly their labour to sell. Another speaker urged that the under-developed countries not be looked upon solely as potential sources of raw materials, but that they should be given an opportunity to benefit from economic development as the present industrialized countries did in the past.

The question was also raised by other speakers as to whether Mr. May's conclusions would in all cases have been the same if his analysis had been broken down to deal with more of the particulars involved.

In commenting further on his remarks, Mr. May pointed out that the fuel segment represented only 2½ per cent of total industrial output which would indicate that even a considerable increase in cost of energy would not be an insuperable hindrance to a growing industrial output.

In his opening discussion of trade, Mr. Hilgerdt cited the history of the last century as suggesting a refutation of the proposition that the movement of factors of production and trade in goods are "... alternative methods of offsetting inequalities in the distribution of resources". Instead, he says "... the movement of labour and capital has paved the way for trade". Trade, he holds, results from discrepancies in the geographic distribution of the factors of production, but it does not tend to equalize the supply of such factors. Indeed, by opening profitable channels of production, it may result in a further increase of the original discrepancies. It is frequently held that if goods moved without hindrance, the uneven distribution of resources would be of little concern, and there would be no such thing as over-population in any given area. Mr. Hilgerdt thinks, however, that too much importance can be attached to the natural and institutional barriers to trade. Even without such barriers in under-developed countries, wages would not rise to the same level as in industrial countries. In this situation, the price of at least one factor of production, namely labour, hardly tends to be equalized through trade. In other words, a reduction in the discrepancies of national prices of goods and production factors that is brought about by trade, does not imply that the inequalities in the distribution of population and resources have been overcome to a corresponding extent.

The key to the issue, Mr. Hilgerdt believes, lies in the absence of capital accumulation and investment which "... does not easily occur in societies that have not accepted the modern ways of life". Nor does he think that it is by any means certain that "... the future economic life of these countries will be woven on the pattern in accordance with Western notions of 'economic man'. Thus, obstacles to economic development are not only technological and financial, but result from valuations which can only be gradually changed."

One of the possible ways out of the dilemma would be, he thinks, to utilize modern technology in a manner permitting organic economic growth without the disturbance of village life, family ties, and highly regarded social values generally. Small-scale dispersed industrial production of many types of goods and based largely on locally produced materials might be economical and permit a gradual change in mind and outlook. However, on one point such change is, he thinks, imperative: "... without a new attitude with regard to family size and birth control little economic progress can be achieved in over-populated countries. The development of local markets not closely tied to those of the nation would not require heavy initial outlays, nor be mainly dependent on international markets which the industrially under-developed countries can scarcely hope to capture from the industrially advanced nations."

In addition to the chairman and the leading discussants the following persons participated in the discussion of the topic and of more general issues: Messrs. E. A. Ackerman, A. Arca Parró, J. Fourastié, F. Friedensburg, R. Mertens and E. G. Morteef.

### CONCLUSIONS

In the briefest possible terms, the results of the session may be summarized as follows:

(a) Participants from the Communist countries expressed considerable optimism as to the future production of energy and materials to meet the needs of growing populations, citing as evidence the past experience of the industrialized countries, their own recent experience, and the possibilities of future technological and scientific progress.

(b) None of the participants foresaw immediate difficulties in expanding the production of either raw materials or energy very substantially during the next quarter of a century.

(c) However, many of the participants pointed out that the difficult problems were regional rather than global in nature, and that, if the object was to improve the quality as well as the quantity of life, the demands for both materials and energy would be almost insatiable.

(d) Moreover, the needs for increased production were particularly acute in the densely settled regions with low levels of living, and in many such regions the prospects for meeting these needs from conventional sources were not very bright.

(e) It seemed to be rather generally agreed that both in the field of creatable resources and in that of non-conventional sources of energy present indications were that technological innovations are likely to be most significant for the industrially advanced and heavily capitalized nations of the world.

(f) There are considerable possibilities of mitigating these difficulties through the further development of international trade, but such developments alone seem unlikely to solve some of the most pressing regional problems.

(g) There is general recognition of the need for intensifying the search, at both the national and international levels, for cheap energy resources and cheap materials, without which rapid rises in living levels are not likely to come to many of the world's poorest and most densely settled regions.

## Meeting 21

### DESIGN AND CONTROL OF DEMOGRAPHIC FIELD STUDIES

#### Report on the meeting prepared by Mr. H. V. Muhsam, Rapporteur

#### INTRODUCTION

While population censuses and current registration of marriages, births and deaths and migratory movements are still the main sources of quantitative data for demographic research, other means of securing information, such as field studies, are used to an ever-increasing extent. The main reasons for this shift in methods of collecting demographic data are the following:

(a) The need to ascertain basic facts on population trends in under-developed areas where, as yet, censuses cannot be taken and current registration schemes cannot be established or can only supply incomplete or unreliable information;

(b) Recent advances in theory and practice of sampling, which have made it possible to undertake surveys in the above-mentioned areas, as well as to use censuses and vital statistics registration in more

developed countries as a framework for selecting population samples for more detailed study;

(c) The growing realization of the close ties between demographic factors on the one hand and biological, psychological, sociological and economic phenomena on the other hand, and of the need for basing population policies on factual knowledge.

In order to restrict the wide subject of methods in demographic field studies, the discussion at this meeting was centred on the following topics:

1. The use of population samples (or other demographic field studies) for estimating the level of, and differentials in, fertility and mortality in territories or localities where birth and death registrations are lacking or seriously deficient.

2. Methods for studying demographic characteristics, levels, trends and differentials in fertility, mortality, etc., of certain sections of populations for

which no data can be directly obtained through censuses and birth and death statistics.

3. Field studies of factors affecting demographic behaviour, or interrelationships of demographic, biological, psychological, economic and social factors.

4. Bias in systematic population samples.

#### 1. THE USE OF POPULATION SAMPLES IN TERRITORIES WHERE BIRTH AND DEATH REGISTRATION IS DEFICIENT

The discussion on this topic was based on communications submitted by Messrs. C. Chandrasekaran, J. C. Koop, P. C. Mahalanobis and A. Das Gupta, L. Massé, A. M. Morgantini, and J. R. H. Shaul.

Under the particular conditions prevailing in Asia, Africa, and other areas of widespread illiteracy, census operations and birth and death registration are usually not very successful, for two reasons: lack of incentive on the part of the population to respond, and inadequacy of resources. Compulsory registration cannot be expected to produce reliable statistics under these conditions, perhaps with the exception of certain areas with well established local authorities. In some cases where complete registration of births and deaths actually have been obtained, its quality has deteriorated because of the lack of initiative on the part of the administrators, as well as the indigenous population.

The great variation in cultures prevailing in the under-developed countries poses a multitude of different problems which cannot be dealt with by any one particular method but often requires a new and different approach in each case. In territories lacking a Western or Westernized administration—such as, for example, Afghanistan—the basic difficulties in establishing birth and death registration are lack of legally recognized registration authorities (*état civil*), frequent changing of names, lack of maps showing the villages or even a list of such villages, absence of proper administration and, sometimes hostility on the part of the population as well as of the administrative authorities.

In economically under-developed countries, in particular those with a Western or Westernized administration, data on fertility and mortality might be obtained by setting up a registration system under strict supervision, limited to certain local areas rather than on a nation-wide basis. The local registration areas may suitably be selected by sampling, as was proposed to the International Conference of National Committees on Health and Vital Statistics held under the auspices of the World Health Organization in London, 1953. Achievements in these areas may have a stimulating influence upon registration in other areas, and such areas may also serve as centres for training of staff. In some under-developed areas where the population is partly nomadic, it has been successfully undertaken to set up a registration scheme covering that part of the settled population which is included in areas of organized local authorities.

Another approach to the problem of obtaining data on mortality and fertility is through the work of public health agencies. Important demographic data may be obtained from hospital records, health welfare centres and medical field workers engaged in other activities, such as vaccination, maternal and child health measures, etc.

However, recent attempts to obtain demographic data through population field studies have been very successful. In connexion with population surveys carried out in India and Burma, sampling techniques have been developed and tested from which even many economically developed countries could learn a great deal.

Various problems will arise in carrying out field studies in under-developed countries which do not exist in more developed countries or which must be solved in different ways. One of the main problems is that of selecting the sample population. In certain cases, primary sampling units are established on an area basis, while in other circumstances systematic sampling is performed in connexion with a complete enumeration. However, even if suitable records from a complete enumeration are available, it is often very difficult to locate the persons to be included in the sample, particularly in urban areas. There are often no street names or house numbers. It has been tried to identify the persons to be selected by means of the name, occupation, race, religion and the section of the quarter in which they live. Information available from an earlier enumeration, such as the type of building in which they live and the material of which it is made, the number of women and children in the family, their ages, etc., has been used for checking whether the enumerator has found the right people. This method has proved to be very cumbersome and expensive, and the question has arisen whether it was really necessary. Under such conditions, area sampling or other techniques of duster-sampling with or without sub-sampling are perhaps more suitable than simple random sampling using lists from census returns as a frame.

The available framework largely determines the sampling method to be followed. Where reliable lists of taxpayers or complete records of villages with the name of every head man are available, single-stage sampling from such lists is easily conducted. If the villages are relatively small, the village can form the sampling unit of a single-stage sample. In cases where the villages are very large, it will be necessary to do sub-sampling. Under still other circumstances, like those in East Africa, where there are often no village units, administrative areas are the only possible primary sampling units.

In the National Sample Survey, initiated by the Government of India in 1950-51 as a continuing organization which operates in the form of two or more "rounds" of survey on a country-wide basis every year, the ultimate sampling unit is the "household". The primary sampling unit in rural areas is the rural administrative unit. Two primary sampling units are selected from each of 240 strata and two sample villages are selected from each primary sampling unit included in the sample. A suitable number of sample households in each sample village is then selected for detailed investigation. In this way, the National Sample Survey supplies two independent but equally valid sample estimates of each variable based on an independent set of primary sampling units.

The design of inter-penetrating samples is also recommended as a check on the work in the field and for filling gaps in the field-work due to last-minute failures of field officers. But it is often difficult to organize because of the duplication of the work and



the necessity for field officers to work in several districts. The time spent in travelling between districts and villages and, consequently, staff requirements and cost of the work are greatly increased.

Some system of follow-up sampling may be more practical, and the systematic comparison of the records from two enumerations at a certain interval, covering the same sample area, may yield valuable information on population structure and movements.

Whereas considerable progress has been achieved in developing sampling techniques suitable for demographic field studies in various types of culture and different stages of administrative and economic development, great difficulties still exist in obtaining accurate information regarding demographic characteristics of the individuals included in the sample. The importance of the design of the sample should therefore not be exaggerated as a factor in the validity of the results.

One of the main tasks of demographic research in under-developed countries is to study whether certain questions can be asked, how they should be worded, and what indirect ways of getting the desired information may be effective where direct questions cannot be asked without raising opposition. In some societies, for example, women are taboo to such an extent that even their names cannot be mentioned nor can their number be asked. But, at the same time, certain questions—such as religion—can in general easily be asked in such countries, although this is not the case in all highly developed countries. Reliable statements on age are often difficult to obtain; it may help to supply enumerators with suitable means of estimating ages by reference to the dates of past events.

Much attention should be given to the formulation of questions to be asked. They should always be simple and, if possible, it is worthwhile to repeat the same question in different forms so that the consistency of the replies can be checked. It may also be useful to include some ancillary questions to help the interviewer in obtaining easily and accurately the required information and to serve as additional checks on important items of information. All data in one part of the schedule should systematically be checked against any relevant data in another part.

In the Household Schedule used in the Population Study in Mysore State sponsored jointly by the United Nations and Government of India, information on marital status, for example, was obtained with the help of the following two questions: Has the person ever married? If yes, is the person *now* married, widowed or separated? Information on the number of children born alive to a woman was obtained by means of the following questions: (i) number of children living with her; (ii) number of children living elsewhere; (iii) number of children born alive but now dead.

Regarding the character of the replies, problems are created by illiteracy of the respondents and the consequent lack of understanding of the purpose of the inquiry, and by their suspicion and lack of co-operation. Other problems are due to their politeness to interviewers, as replies are often given not to tell the truth but rather to please the interviewer. There is often some hope of getting more accurate informa-

tion if both the interviewer and the respondent realize that replies might be checked at future inquiries.

Many difficulties in obtaining the desired information can be overcome by hiring interviewers of the same race, language, religion and sometimes even of the same sex as that of the respondents and by training them adequately. Publicity has also been found to be an important factor. The people to be included might be familiarized with the forthcoming survey by the use of suitable channels, such as the head of the community, the political parties, or "singers" who announce important events while walking through the village. However, under some circumstances, unfortunate publicity has been known to make respondents suspicious or to arouse the hostility of influential persons.

In addition to the Chairman, Mr. R. Bachi, and the authors of the communications, the following persons took part in the discussion: Messrs. G. Frumkin, P. M. Hauser, C. J. Martin, and F. Rosenfeld.

## 2. METHODS FOR STUDYING DEMOGRAPHIC CHARACTERISTICS OF CERTAIN SECTIONS OF POPULATIONS

The topic was discussed on the basis of communications presented by Mr. A. J. Jaffe and Rev. W. J. Gibbons.

Even if census and current registration data are available, the study of demographic characteristics of certain sections of the population sometimes requires special field surveys because these sections cannot be isolated in the official statistics. For instance, welfare or educational agencies may want information about certain religious groups, advertising and market research analysts may desire demographic information about people buying certain types of merchandise, sociologists may want to study demographic characteristics of the "élite" or of new immigrants, etc. Surveys of such groups are always possible but expensive. In small towns, it is often possible to compile a complete list of persons belonging to a certain group; various private agencies are often able to supply such lists. In large towns, field surveys based on area sampling can be carried out, and persons belonging to the group under consideration can be identified by including specific questions in the questionnaire, but surveys of this type are expensive and therefore rarely carried out.

Another approach to the problem of collecting data on certain segments of the population is to establish indicators which will make it possible to identify these segments in demographic material already available. Where this method can be applied, it generally involves a relatively small expense. For the most part, such indicators tend to be unique as to group, time and place. Indicators which may, for example, be applicable to the Jewish population of the United States as of the mid-twentieth century may not be applicable to other segments of the United States population nor to the Jewish population of other countries or of other times. On the other hand, the choice of the indicator affects the definition of the segment. As indicator of Jewish people on a list of marriages might, e.g., be marriages at which a rabbi officiated. Another much less reliable indicator of Jewish persons is their name.



Once a suitable indicator has been determined, it is applied to listings of individuals which may be relevant for demographic analyses, like the original entries on official census schedules, the entries on official birth and death certificates, lists of persons who have applied for or obtained automobile drivers' licences, etc. In using such lists, the investigator has to (a) determine the adequacy of the demographic data which they contain and their pertinency to his problem; (b) find out whether the lists include all the people whom he wishes to include or only a segment thereof; and (c) select from the lists the individuals whom he considers as belonging to the segment under consideration.

Certain demographic information with respect to the Catholic population may be obtained from the *Annuario Pontificio*. Some national or regional directories, such as the Catholic Directory of the United States, contain more complete data on baptisms, marriages and deaths. Statistics on baptisms can be expected to include all births occurring among the Catholic population, as the keeping of records is required by Canon Law. Some still births might be included under the heading "doubtful baptisms". Marriage statistics are less complete because some marriages of Catholics will not come to the notice of the Church. Death statistics of the Catholic Directory are of little use for demographic purposes because of difficulties in identifying the place of residence of the deceased. In countries with a considerable Catholic population, the data available in the Catholic Directory are of great importance.

In addition to the Chairman and authors of the communications, Mr. S. Peller took part in the discussion.

### 3. FIELD STUDIES OF FACTORS AFFECTING DEMOGRAPHIC BEHAVIOUR, OR INTERRELATIONSHIPS OF DEMOGRAPHIC, BIOLOGICAL, PSYCHOLOGICAL, ECONOMIC AND SOCIAL FACTORS

The topic was discussed on the basis of communications presented by Messrs. A. Girard, E. Grebenik, M. W. Hansen, N. Keyfitz and C. V. Kiser.

With respect to such demographic inquiries, two groups of problems were discussed:

- (a) The design of surveys and its effect on the interpretation of results; and
- (b) The reliability and validity of the data which can be collected.

Regarding the design of surveys, it is worth remembering that in many inquiries of the kind under consideration sampling errors are much smaller than non-sampling errors, due to non-response, wrong replies, misunderstanding of the questions, and reluctance or even inability of respondents to give correct replies. Existing records are therefore sometimes a better source for research on economic and social factors affecting demographic behaviour than field studies.

The study of marriage and divorce records, the matching of infant mortality and birth records, and similar studies are often excellent methods of obtaining information, better than either brief or intensive interviews. Sampling from records is also much easier to carry out than population sampling.

In selecting samples from records for both field studies and the elaboration of available records, vari-

ous methods of avoiding bias have been used. Some studies included persons born during a certain week or during certain days of specific months. In other cases, surveys were restricted to one town or other limited population groups. Classical examples are the communal monographs of Arsène Dumont relating to the ways of living and attitudes of the present and the previous generations. Restriction of an inquiry to a certain group raises the question of the applicability of the results, and does not allow for the various characteristics to vary sufficiently, making it difficult to ascertain correlations.

On the other hand, the advantages in having a homogeneous group for study should not be minimized. The homogeneity of the type secured, e.g., in the Indianapolis Study, makes it unnecessary to separate in the analysis such factors as colour, nativity, rural-urban status, age, etc. The use of the homogeneous group is usually more justified in studies concerned with casual relationships than in studies designed to ascertain the frequency of given characteristics in the total population or in efforts to translate rates observed in the study sample to rates for the total community. But it is not easy to make a small sample, such as is always used in studies of this type, representative of as wide a variability as that encountered in the universe being studied.

Probability sampling, with a calculation of sampling errors, is the ideal method, but it is not always possible. It is sometimes advisable to use a small segment in order to develop hypotheses which are tested later, on the basis of a larger group with more claim to be called a representative sample. But it would be misleading to compute estimates of sampling errors which do not stand in a clear relation to the design of the sample.

Another problem is that of the design of surveys. Should all factors but one be held constant? Statistical theory objects to this method. If all but one factor are held constant, results will refer only to the special configuration of these other factors and will be of limited scope, and no information on inter-action between various factors will be available. Perhaps closely related to the problems of multi-factor versus single-factor design are those inherent in what Mr. C. V. Kiser called the "atomistic approach" of analysis and interpretation of results, i.e., the separate analysis of the variable under each hypothesis. In a very real way, this approach necessitates the assumption that all other factors are equal when groups are classified on the basis of only one variable at a time. The atomistic approach neglects the sociological and psychological axiom that motivations are multiple and complex.

Another difficulty arising in the interpretation of the results of such studies is that of separating the independent and the dependent variables, i.e., the cause-and-effect relationships. It was recommended that, in designing new studies, more attention be given to ways and means of separating these relationships.

It is believed that a longitudinal study is the most promising type of design for future investigations in order to minimize ambiguities with respect to cause-and-effect relationships. It is recognized that the conventional longitudinal study in which a panel of subjects is followed for a rather lengthy period introduces certain disadvantages. The time required for

the completion of the study may exceed the lifetime of the investigator. More important, there may be a substantial conditioning of the subjects with respect to the dependent variable by the very process of studying them. Furthermore, experience has demonstrated that, in some studies, at least, the subjects who are lost through death and migration and for other reasons are not representative of the total universe under consideration. However, there are ways and means of offsetting some of the disadvantages of the extensive longitudinal study. One possibility is that of selecting representatives of different cohorts and securing information from them at certain intervals. This permits the utilization of changes over time as one of the parameters. The time required for such a study need not be a serious deterrent; the bias due to loss of subjects can be partly circumvented; and conditioning of the subjects is perhaps minimized.

Irrespective of the design chosen for a study, as long as it involves personal interviews, the character of the contact and the psychological relation between two persons—the interviewer and the respondent—have a paramount effect on the results of any inquiry. These two persons are in a very special psychological situation of which very little is known. It has therefore been proposed that interviewers should keep detailed journals of their experience, and the contents of such journals should be analyzed, summarized and systematically published to make the knowledge gained in various studies available.

It was pointed out that national psychology has various effects on the success of such inquiries. Some people are glad to have a chance to talk with inter-

viewers, while under other conditions prejudice, malvolent action or erroneous psychological approach arouse the opposition of respondents. But it is a most encouraging experience shared by most students in the field that the co-operation of many public institutions and the population itself usually can be obtained.

In addition to the chairman and authors of the papers, Messrs. J. A. Bourdon and W. F. Wertheim took part in the discussion.

#### 4. BIAS IN SYSTEMATIC POPULATION SAMPLES

A communication presented by Mr. D. Lahiri was relevant to this topic.

In all kinds of demographic field studies, systematic sampling from lists is often the easiest way of selecting cases for a survey, but it may lead to a persistent bias of the sample. This phenomenon is now being thoroughly studied, and various methods of estimating the effect of such bias have been elaborated. This work will eventually lead to the establishment of simple procedures in order to minimize bias.

#### CONCLUSIONS

The discussion in this meeting was not expected to formulate a general theory of demographic field studies as distinct from field studies in other social sciences. Its main purpose was to offer an opportunity for demographers engaged in collecting data by field surveys to exchange views and experience—for their own profit as well as for that of other research workers who will be engaged in similar studies in the future.

### Meeting 22

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. II. POPULATION IN RELATION TO THE DEVELOPMENT OF AGRICULTURE

Report on the meeting prepared by Mr. P. L. Sherman, Rapporteur

#### INTRODUCTION

The relation between agricultural development and population cannot really be isolated from problems arising from man's relationship to all the natural resources available to him on earth and in the sea and air. The size, efficiency and living standards of agricultural populations depend increasingly on communications, machinery, fertilizers and pesticides, and above all on the demand for agricultural products from urban populations whose income in turn depends on the successful exploitation mainly of non-biological resources on an ever expanding scale.

If in the past sharper fears have been expressed about the possible failure of agricultural rather than non-biological resources to meet the needs of a growing population, it is simply because food is one of man's basic fundamental requirements—and because, in a real sense, the whole sum of man's activities, the successful fulfilment of all his needs and the creation of new needs that play so important a role in the evolution of civilization, depend largely on his food needs being met. This is a fact that mankind cannot

afford to ignore if war and social unrest are to disappear from future history.

Yet this fact, though acknowledged, is still far from being adequately acted upon. Indeed, in some parts of the world an abundance of goods and services on an increasing scale is being produced, some of which may appear to have little relevance to the genuine needs of an evolving civilization, yet in others large numbers of people do not have enough to eat, and malnutrition with its inevitable effect on health and efficiency is widespread. This paradox is perhaps all the more remarkable in that man's optimum requirements for food are largely known both in quantity and quality. They set concrete objectives for human achievement, whereas on the other hand man's need for the products of industry and other activities, though often less urgent, seems to have no apparent upper limit.

Approximate estimates were, in fact, furnished to the Conference of the increase in food supplies needed to feed the population expected in 1980 at nutritional levels somewhat higher than those currently prevailing, taking into account existing patterns of con-

sumption. The effect on national average requirements of changes in the age and sex composition of population, except for one or two countries, does not appear to be appreciable. Significant changes in *per caput* requirements may of course result from changes in the sizes and distribution of national income and from changes in occupations. This is a field of research in which much work clearly needs to be done. Ignoring such changes, it has been calculated that in order to achieve a moderate improvement in nutritional levels by 1980, supplies of cereals—the most important staple foods—meat by roughly 70 per cent, milk 75 per cent. The relative increases are even greater for protective foods—meat by roughly 70 per cent, milk 75 per cent and fish 90 per cent. This compares with an increase in population of about 40 per cent by 1980. The required increases will of course have to be far higher especially in the less developed over-populated regions, where prevailing consumption levels are very low, and higher still if requirements are based on optimum diet instead of a moderate improvement. These figures disclose something of the dimensions of the problem, the most important aspect of which is the need to narrow the wide gap between the well fed and under-nourished regions of the world.

With this background the Conference discussed two main groups of questions linking agricultural development and population:

(a) Can existing and potential agricultural, fishery and forestry resources be effectively mobilized to ensure over the next decades an increase in food, agricultural and forest production in excess of the growth in world population, so as to meet more fully the world's need for food and forest products in all parts of the world? What are the prospects that this will be achieved and what means must be used?

(b) What changes in the size, composition, efficiency and living standards of the agricultural population must accompany the achievement and what are the prospects and possibilities?

The marked differences in the stage and status of agricultural development in different parts of the world—at one extreme, heavily over-populated rural areas whose population barely eke out a miserable existence on tiny plots of land; at the other extreme, areas where land is abundant and the use of modern techniques and scientific knowledge are exploited to obtain the highest agricultural productivity possible—call first for explanation and interpretation. How far are these differences due to variations in the types and quality of the soil and climatic and geographical conditions, and how far to social and cultural conditions which have retarded progress through antiquated systems of land tenure, religious and social inhibitions, illiteracy and the like and to the consequent poverty which has impeded economic development?

### 1. POTENTIALITIES

Many gaps in our knowledge make it impossible to give precise answers to this question. The effects of weather conditions on crop production and the suitability of different crops for different climates are not sufficiently known. Many conflicting estimates have been made of the earth's food and forest potentialities, but without much more study both on the national and the international levels, such estimates remain largely guesswork. Exhaustive and detailed surveys of actual

land use in all parts of the world are urgently needed. Without this knowledge the historical, physical, social and economic factors influencing the way people actually use their land cannot be properly understood. Equally urgent is the need for exhaustive and detailed soil surveys in all parts of the world. Over major areas of the world where agriculture is important now or potentially, existing soil maps are of little or no use for agricultural interpretations. Without such soil surveys, estimates of potentialities or plans for guiding agricultural development cannot be adequately made. Many years will be required to train enough soil scientists to do the work thoroughly, but in view of the great need, relatively simple procedures, by which soil surveys of under-developed areas can be carried rapidly to an early stage, should be carefully investigated.

However, despite these gaps, it is possible to assert on the basis of existing knowledge, that neither poverty of soil nor unfavourable climatic and geographical factors constitute an insuperable obstacle to a large expansion of agriculture production in the world as a whole and in different parts of the world. For example, it has been pointed out that with the aid of careful soil surveys and research, perhaps as much as 20 per cent of the unused tropical soils, especially those in the continuously hot and wet belt of tropical forest lying athwart the equator, could be cultivated adding some 400 million hectares or roughly 30-40 per cent to the world's present arable area. Large areas can be made more productive, especially for mixed farming in the vast tropical savannahs of Africa, Latin America and Northern Australia, at present used almost exclusively for grazing, because of excessive summer rainfall followed by long dry seasons. Considerable scope exists for bringing more land into cultivation by irrigation both in the monsoon lands of Asia and some arid areas of Latin America, Central America and Northern China. Possibilities also exist in the Northern Podzols for extending area under mixed farming based on adapted cereals and forage crops and for the more intensive use of well-watered, temperate zones in Australia, Uruguay and Southern Brazil, where sparse population has hitherto resulted in a purely pastoral economy.

The technical possibilities for increasing agricultural production by raising crop yields, expanding livestock numbers and yields per animal are perhaps even greater and in many respects less difficult and costly. A very wide margin exists between yields obtained in the more advanced countries and those prevailing in less developed regions. Climatic conditions, of course, can play an important part in these differences, but it can now be affirmed with some confidence that techniques and facilities are chiefly responsible. These differences can be greatly reduced by more irrigation, building up of soil fertility, the introduction of improved varieties of seed and species of animals, better pastures and feed supplies, better equipment and the widespread application of better farm techniques. On the basis of the performance of the average farmer in some of the advanced—but not necessarily the more advanced—countries, the resources and technical basis appear to exist for an output of cereals and crops at perhaps at least twice, and in the case of livestock products perhaps four or five times the present levels. And this applies especially to the less developed regions of the world.

Similar scope exists in the fields of fishery and forestry. Present fish production of about 26 million tons annually provides only a very small part of the valuable animal protein available for human consumption. With the aid of research, it may be technically possible to double or treble the harvest from seas and inland waters without tapping more than a small fraction of the productivity of the waters. Forests, apart from providing man's needs for timber, also play a vital role in protecting agricultural land against erosion, flood and desiccation and in regulating water supplies. About one half of the present world forest area of roughly 4 billion hectares is as yet inaccessible; one-third of the accessible forest is still unexploited. This constitutes a reserve which, after allowing for the likelihood that some part may be converted to agricultural use, is still large enough to meet the timber requirements of a much greater world population at even higher levels of *per caput* wood consumption than at present. Moreover, such expansion is held to be technically possible, while at the same time making fuller use of the protective role played by forests.

The realization of technical possibilities for expansion of this magnitude described would in any case imply tremendous investment and co-ordinated efforts on the part of Governments and international institutions. Certainly such expansion can no longer be achieved, as of old, by the enterprise of individual pioneers. But even if the world's potentialities could be assessed with precision, it would be folly to allow optimistic conclusions to engender a false sense of security. For the really vital question is: can these resources be successfully exploited in the face of the innumerable obstacles interposed by economic, social, cultural and political factors, to meet the needs, year by year, of the world's expanding population? Here the evidence is far less satisfactory.

## 2. AGRICULTURAL PRODUCTIVITY

The most important problem is clearly how to raise the standard of farming in the Far East and in the backward countries of the Near East, Africa, Latin America, and Eastern Europe closer to the levels achieved by the average farmer in some of the more advanced countries of the world. Experience in the advanced countries has shown that increase in agricultural productivity per man is the real key to the growth in agricultural production. In Western Europe, for example, the sustained expansion of agricultural production—except for wartime interruptions—of roughly 2 per cent per annum in the past decades has been the result of an increase in productivity, probably at a somewhat higher rate. This is true also for countries like Australia, New Zealand and the United States, where the rate of increase both in gross farm output and productivity has been even higher. Unfortunately, neither population nor agricultural censuses provide adequate data on this subject, especially on the actual number of man hours spent in agricultural employment. There is a real need in this field for much more research and for greater efforts on the part of Governments, to assemble more basic data. Nevertheless, how formidable the problem is may be seen from some estimates, admittedly imperfect, submitted to the Conference. In general, production per head of the farm population in Oceania,

North America and North West Europe appears to be 10 to 20 times greater than in the Far East, Near East, and Latin America. It is true that estimates of production per hectare show a different story. Here countries like Japan, Egypt, Malaya and Ceylon are to be found near the head of the table. But this situation usually reflects heavy rural overpopulation. Labour intensive methods of farming are the only way to maintain the people. In some of these countries specialization on export crops of high value like cotton, rubber, tea and coffee provides a way of increasing productivity. Valuable exchange earnings accrue to the country, but as a rule not much benefit is received by the mass of subsistence or semi-subsistence producers who are compelled to concentrate on high energy foods like cereals and starchy roots to obtain a bare minimum calorie intake. Not only is agricultural productivity per man in these areas very low, but it has virtually stagnated for generations although there have been indications of some improvement in most recent years. Production per head in sparsely populated under-developed countries, for example, in Latin America, is usually higher owing to the greater abundance of land, but lack and misuse of capital and inefficient systems of land tenure impede development. Yields per hectare remain stationary at low levels. Obviously, the task is long and difficult. Its solution can be found only in overcoming the major retarding forces that have prevented the evolution of agricultural development along lines most suited to man's needs.

## 3. EVOLUTION OF AGRICULTURE

The most typical pattern developed in advanced countries may be regarded as the result of a process, still continuing, of gradual intensification. Settled agriculture began with low crop yields, sometimes maintained only by shifting cultivation. As population increased and techniques improved, methods were found of increasing yields and maintaining fertility of soil, especially by crop rotations and animal manures. The final step, however, only became possible when the growth of industry, urban population and incomes provided a market for additional production under conditions which, on the whole, gave the farmer both the incentive and the techniques needed to increase output. A fully intensive agriculture was developed by the integration of crop and livestock husbandry and by the introduction of specialized crops, thus achieving a high productivity per man as well as per hectare. This type of mixed farming, with livestock husbandry predominant, in a sense completes an evolutionary cycle, for in primitive times the herding of animals preceded settled agriculture. In the newer advanced countries, largely opened up at the time when industrialization on both sides of the North Atlantic created a growing market for livestock products, the abundance of land made it unnecessary to go through an intermediate stage. Livestock husbandry became the main type of farming at an early stage, but more intensified crop production may come later with the growth of population. In the less developed areas, on the other hand, some countries, for example in Africa, have scarcely advanced beyond the first stage, and shifting cultivation is still frequently practised. In the heavily overpopulated regions in the Far East, in the Caribbean and in parts of the Near East, agricultural development has been arrested at varying points in

the second stage. There is usually little diversification of food crops. Chemical fertilizers and specialized feed crops are rarely available. Such animals as are kept are mainly for draft purposes. Because of the heavy rural population, human manure sometimes even takes the place of animal manure.

#### 4. RURAL OVERPOPULATION

But rural overpopulation is not itself an explanation of arrested development. Rural overpopulation is indeed not a simple concept because, apart from considerations of climate, soil and topography, the number of people a given quantity of land can support depends on the level of technical skills, transport and communications, capital available, the presence of restrictions of various kinds, etc. Rough estimates were submitted to the Conference of the agricultural labour capacity of land for different staple crops mostly in less developed countries, where methods of cultivation are relatively backward or even primitive. Estimates were also given of the extent of rural unemployment. The tentative nature of these estimates further emphasizes the need for Governments to establish reliable data on agricultural employment and underemployment. Nevertheless, from the evidence available it is clear that, except in certain circumstances, increasing density of rural population does not necessarily mean lower output per man. On the contrary, some of the more densely settled areas of the world are to be found in the smaller countries of Western Europe where, because of modern techniques, abundant fertilizers and a large degree of industrialization, productivity both per man and per hectare is high enough to enable the labour of one farm worker to support many. Indeed, there appears to be little reason why any region in the world with adequate water and sunlight, should not be eventually cultivated by a farm population as dense as that in the most densely settled regions in Western Europe.

On the other hand, if economic, social and cultural development stagnates, the law of diminishing returns operates with increasing force as densities increase, until, as in some regions, the labour of one man fully at work on a farm will barely suffice to feed two people—and the limit of subsistence is reached. Life among the vast and heavily overpopulated rural areas of the less developed regions has been characterized by this constant struggle against the law of diminishing returns. Some early civilizations may have indeed passed away when soil fertility was depleted. In our own era, population was multiplied, but only at the cost of recurrent famines and the barest subsistence standards for many millions.

The key to the problem in these regions is clearly a profound modification in the patterns and techniques of agriculture that have persisted for centuries. This can be achieved only by the spread of knowledge of better ways of farming, by the provision of better seeds, fertilizers and implements, by the control of plant and animal disease, by consolidation of fragmentary holdings, by the provision of capital for expanding operations, and by the existence of large urban markets, including the means of transportation to enable the farms to market increased output. In certain limited fields quick and important results can be obtained at small cost, for example in the control of animal and plant diseases or in the wider adoption

of simple but more efficient methods of cultivation, such as, for example, the Japanese methods of rice cultivation that are being gradually applied in India. But only slow progress can be made in overcoming the most formidable obstacles.

#### 5. CAPITAL INVESTMENT AND INDUSTRIALIZATION

Not the least is the vast amount of capital required to finance agricultural development programmes. Agricultural population in the densely populated underdeveloped areas usually constitutes 70-80 per cent or even more of the total population. With low agricultural income, national income must also be low. In such circumstances farmers have little or nothing to spare for agricultural development, nor can Governments collect much revenue for this or other purposes except by oppressive taxes on land, animals or crop production, which further tend to lessen incentives to production, or by measures which may have serious inflationary effects. In less developed societies, farm credit has been mainly limited to assisting farmers over seasonal difficulties or crop failures, buying of farms, paying out co-heirs, or expenses for weddings, funerals and the like. Landlords, middlemen and local money-lenders have usually been the main sources of such credit, often imposing harsh and usurious terms. Beginnings have been made in many such countries to provide better means of credit, but the entire scale of efforts needs to be raised. Little domestic capital is available for investment in farmers' services characteristic of modern societies such as water control, storage facilities, processing and marketing, transport and power, health and education. Finally, little capital is available for general industrial development. Without industrialization farmers cannot readily obtain goods required for better farming nor sell increased output for the market. Outlets for surplus rural population are blocked. Indeed, industrialization is sometimes believed to be the main answer to the problem. While recognizing its great importance, however, one should keep it in proper perspective. The notion that the provision of man's basic needs for food can be assured largely as a by-product of his other activities, is a dangerous belief. On the contrary, the rate of industrial development is itself largely conditioned by progress in the agricultural sector. Urban communities depend for their expansion on adequate supplies of food and agricultural raw materials. A flourishing farm population is necessary as an important market for the products of industry. Experience in recent years, especially in sparsely populated countries in Latin America and Oceania, has shown that too speedy industrialization in response to temporary situations tends to divert much needed labour and capital resources from agriculture to industry, not only seriously affecting agricultural development, but causing undesirable distortions in the general economy. A balanced growth of the economy requires that agriculture and industry must keep in step. The best proportion of the total capital investment which should be directed to the agricultural sector and the types of investment needed, depend on the circumstances of individual countries. The requirements of capital in agriculture for a steady and substantial increase of agricultural production in the less developed regions are too large to be financed mainly from external sources. They must be met mostly from the regions

themselves. The scale of foreign assistance is, however, still far lower than the amount that can be effectively utilized, and still greater co-ordinated efforts on the part of Governments are needed to enlarge it. But apart from the difficulties of mobilizing capital for development, cultural, social and other obstacles must be overcome if programmes for development are to have much chance of success. It would be idle to utilize large amounts on programmes which presuppose the abundance of skilled technicians and high standards of literacy and knowledge among backward peasant farm populations. Account must also be taken of basic attitudes towards change if there is to be solid achievement.

#### 6. RESISTANCE TO CHANGE

Resistance to change is perhaps the most serious impediment to progress in the less developed agricultural communities. The traditions that support high fertility are rooted deeply in the cultures of most of today's agrarian societies, especially the least developed. For the large masses of agricultural people who carry on farm work with simple methods and tools and who lack animal or mechanical power, possibilities of increasing production are directly related to the number of hands available, especially at seasonal peaks. During large parts of the year there may be little to do. Total income for the individual worker may therefore be very low, but no other possibilities appear to be open. In such circumstances the only clear way in which the farmer can feel secure is to assure his labour supply within his own family. The network of family relations, duties and obligations, which are a feature of the functioning of other institutions of such societies, reinforces the ideal of the large family. Such societies may and often do readily accept measures that promise to reduce mortality, but if methods of production remain unchanged and additional land is not readily available, these measures only increase the pressure of population on resources. Where other outlets are not developed, this leads to surplus agricultural population, underemployment, fragmentation of holdings, oppressive tenancy, and landlessness. These in turn make any real improvement in agricultural efficiency difficult or impossible. Where little opportunity exists to acquire capital to put new practices or equipment into operation, the farmer can scarcely be expected to risk even a small part of his production by new methods. Resistance to change, therefore, appears as a cultural response to growing economic pressure on limited agricultural resources. The large family attitude also makes difficult the transmission of intact farm holdings to the next generation. In many areas of the world, equal division among the heirs has been a factor in excessive fragmentation. Even where measures for exchange and consolidation of holdings and for limitation of the rights of sale or future subdivision are in effect, severe pressures arise when there are large families and therefore a large number of claimants. In the Western world on the other hand, the awareness of the consequences of continued subdivisions of holdings has been a factor in the acceptance of the smaller family pattern in agricultural areas. Moreover, in an agriculture organized on modern capitalistic lines, the necessity to secure cash to pay off heirs may mean the liquidation of the holding. Thus, social pressures in modern

societies are against the maintenance of the large family pattern.

Resistance to change among less developed agricultural societies can, however, gradually be overcome, provided basic values in these societies are not violated. For example, the advantages that might accrue to large families, which could send many members into factories, soon yields to the insistence of children that they dispose of earnings in their own way. The higher fertility in agricultural communities observable in nearly all parts of the world does not remain unaffected by changes occurring in cities, especially where movement of people between country and town takes place in both directions. Again, efforts to reduce mortality have been remarkably successful because they promote the accomplishment of social values. In the same way improved methods and equipment are finally adopted once they are shown to be compatible with culture. Literacy, knowledge and better nutrition, the impact of which is already widening, can be fostered still further by carefully conducted campaigns. In particular, better nutrition can play a role of far-reaching importance not only in the more effective and economic use of food supplies but also in the health and efficiency of people. This in turn provides a psychological basis for the adoption of more progressive attitudes and a greater willingness to exploit opportunities.

Improvements in agricultural productivity and changes in attitudes and patterns of culture exert a reciprocal influence on each other. As attitudes slowly change, the possibilities for putting into effect basic measures like land reform and for the adoption of better techniques of production are increased. More resources can then become available for agricultural and general development, and this in turn must considerably affect the size, structure, and efficiency of the agricultural populations. This is part of the long term process by means of which economic and cultural standards of rural populations are raised more nearly towards those enjoyed by urban populations.

#### 7. AGRICULTURAL INCOMES AND SIZE OF AGRICULTURAL POPULATION

For there is no inherent reason why incomes in agriculture should be appreciably lower, as they are in nearly all countries, than incomes in other activities. Agriculture requires a labour force as skilled and intelligent as that in industry. The greater simplicity of life in rural areas and the higher degree of illiteracy among the rural population in less developed areas are not permanent factors. They will gradually disappear with improved communications and interpretation of town and country ways of life and thought. The main reason for the present disparities is probably historical. Agriculture preceded industry as the main human occupation and provides the principal reservoir for further recruitment to industry. Even in countries where industrialization has been in progress longest, there is still a steady drift of labour from agriculture to industry. Despite the many compensations of farm life, this recruitment persists because the rewards in industry are on the average usually higher than in agriculture. This movement has sometimes been retarded or even reversed in periods of industrial depression. But the process will obviously continue until labour requirements in agriculture and industry



come into balance in circumstances in which the skill, techniques and efficiency of the agricultural worker are on a par with those of the urban worker. If in such circumstances, one man in agriculture, for example, can feed himself and nine men in other occupations, the balance will be reached with an agricultural population of 10 per cent. The ultimate proportion is of course a matter of speculation.

#### 8. ECONOMIC DEMAND AND TRADE

But this theoretical conclusion applies only to self-contained societies or to the world considered as a single unit. For individual countries, the proportion must also depend on each country's natural resources and other advantages for agricultural production compared with those for other activities. Many food deficient countries, even with increasing agricultural productivity, will not be able, except at prohibitive cost, to meet more than a part of their food requirements from their own food output. Food exporting countries, with abundant land and other advantages for food production, will continue to expand their food output to cover the needs of others, but only if markets for their products remain favourable. Thus for many countries, trade in agricultural products has an important bearing on the balance between the agricultural and industrial sectors of their economy. A good deal of research has been devoted in recent years to the response of food demand to rising income and changes in food prices. Much more work needs to be done in this important field, especially for less developed regions, before food demand of future years can be forecast with any degree of success. As far as Western Europe is concerned, rising income will not call for any significant increase in average calorie intake, but a large shift from cheaper to more expensive foods, especially animal products, is likely. Livestock products require large amounts of grain and fodder crops for their production. A substantial increase in the demand for such feed crops will occur. In countries with low *per caput* income, rising income will result mainly in a larger *per caput* demand for high energy foods, particularly cereals. Since the food exporting areas of North America, Oceania and Latin America are experiencing very high rates of population increase, the pressure on their food exports in the future could easily become considerable. Unless, therefore, there is an assurance of adequate markets and supplies at prices fair both to producers and consumers, the planning of agricultural export and import programmes and, therefore, of production may become difficult, if not impossible. Violent instability of agricultural prices on world markets is especially disruptive of proper planning. The development of sparsely populated regions, for example in Oceania and Latin America, provides one of the most important possibilities for the transfer of people from over-populated countries, but immigration of this nature is seriously impeded when booms and slumps dislocate internal economics.

#### CONCLUSIONS

Without exhaustive surveys of land use and soil characteristics, no one can really assess the extent to

which the size or distribution of land, fishery and forestry resources in the different regions of the world is out of balance with the population in these regions. A few countries, however, obviously suffer from a very serious lack of such natural resources. In the modern world the advantages clearly lie with large areas under unified economic control, where land and other natural resources are abundant in relation to population, and where restrictive traditions do not impede the full development and application of modern techniques of production. In many small countries in the Western world modern techniques are applied, but economic units have become too small in relation to requirements. Tariff barriers and other obstacles impede full economic development. On the other hand, in the less developed countries of heavy population, the possibilities for increasing agricultural production are considerable, but knowledge of better techniques has not penetrated to the broad masses; low income and unchanged traditions make progress difficult. In many sparsely populated less developed regions, large new areas could be brought into cultivation and the scale of production raised if capital on the required scale were available and if systems of land tenure could be modernized. Clearly, the worse problems for agriculture come from the widespread maldistribution of health and education, skills, techniques of production and marketing, availability of fertilizers and farm machinery, fuel, transport and communications. Some of these things raise questions of the relation between the distribution of agricultural and non-biological natural resources. But many of these types of maldistribution can be remedied by human effort. Failing greater and individual efforts by Governments and a large expansion of co-ordinated effort of the type undertaken in the Technical Assistance and other programmes, there is no assurance that population and agricultural production can be brought into balance in the same way as the adjustments that followed industrialization in the Western world. Progress, even with the greatest efforts, will be slow. Those countries whose natural resources are very low in relation to heavy population, may not be able to achieve a full balance by increasing productivity and industrialization. In some others, income and productivity is so extremely low that economic development may not be rapid enough to bring a balance in sight. In such cases, efforts on the part of Governments to adjust population by other means may be inescapable.

The discussion in this meeting was based on papers submitted by Messrs. P. G. H. Barter, M. Cépède, C. G. Clark, P. Dossing, C. Ferragut, H. Flores de la Pena, Miss G. A. Goldsmith, Messrs. H. M. Husein, L. Juréen and H. O. A. Wold, C. E. Kellogg, J. Kingston, K. Mihailovic, S. Nojiri, W. H. Pawley, K. K. P. N. Rao and C. J. Amaral, J. M. Ríos, P. Sartorius, S. R. Sen, R. G. Snider, L. D. Stamp, T. H. Strong, C. F. Taeuber, and E. De Vries and O. Zaglitz. In addition to these authors in so far as they were present, Messrs. I. Bogdan, A. Bonné, J. A. Bourdon, M. Ezekiel, V. F. J. Fallon, P. O. L. George, J. Pando Gutiérrez, C. J. Martin, G. A. Marzouk, B. Minc, E. G. Mortelev, L. B. Rist, and T. V. Ryabushkin took part in the discussion.



## Meeting 23

## RELATION OF POPULATION CHANGES TO THE DISTRIBUTION OF GENETIC FACTORS

Report on the meeting prepared by Mr. F. H. Osborn, Rapporteur

## INTRODUCTION

In opening the meeting, Mr. J. A. Böök pointed out that perhaps the most important fact we have to face in relation to all problems of human populations is the tremendous diversity of the individuals who make up these populations. Cultural diversities have long been studied. The more recent studies of genetic diversities are in the field of the rapidly growing sciences of genetics and biology. But man's diversity in regard to his genetic potentialities has such far-reaching consequences that it should not and cannot be left to the consideration of only biologists and geneticists. If there is to be a realistic science of man, individual and group genetic differences cannot be disregarded.

Meeting 23 was concerned with human genetic differences in the larger framework of population genetics and medical genetics. The genetic base underlying individual differences in mental and emotional development, which is not yet well understood, is the subject of meeting 25.

The science of population genetics is just coming of age. Its theoretical aspects were developed more than a score of years ago by Haldane, Wright and others. Its experimental work was confined chiefly to *Drosophila*. Objective data on human beings seemed far in the future. But all this has been changed by the use made of the blood groups in the years since the war, by other means of determining genetically determined traits, and by improved methods of measuring consanguinity.

The papers presented to this session reflect this change. Mr. L. D. Sanghvi measures the genetic relationship of the different castes in India described by Mr. S. G. W. Wahlund as the world's largest experimental material for the study of human genetics. Messrs. J. A. Sutter and L. Tabah describe the breakup of isolates in France: "L'éclatement des isolats". Messrs. K. Kishimoto, E. Matsunaga, Y. Komatu, and T. Furuhashi describe differential survival in Japan under different types of mating and for various characteristics. Demographers, geneticists, and anthropologists in great numbers are making objective studies on the population genetics of man. As the psychologists follow suit, our understanding of the effects of migration, racial admixtures, and differential mortality and fertility should make rapid and cumulative growth.

In the medical field, human diversity expresses itself in three main directions, namely, in (1) genetic diseases or defects, caused by specific and potent gene mutations; (2) individual gene constellations which constitute a necessary prerequisite for the environmental causation of a *specific* disorder; and (3) individual gene constellations which constitute an important basis of reaction types to be considered in terms of vulnerability or predisposition for disease as well as for health and in terms of individual response to therapeutic measures. The first part of the meeting was concerned with these aspects of medical genetics.

## 1. THE PREVALENCE OF GENETICALLY BASED DISEASE AND DEFECT

The frequency of genetic disease and defects and of specific genetic morbid predispositions was presented by Mr. T. Kemp, Director of the Institute for Human Genetics in Denmark. The prevalence is very high and consequently of the utmost importance for medical research and practice. By now there are very few medical research workers who do not accept this fact. On the other hand, most of them think of medical genetics as still representing the rather static picture of the early decades of this century, dealing mostly with frequencies, pedigrees and attempts to fit the data into simple, clear-cut Mendelian schemes. Although such analyses remain a basic framework in this field and, together with conventional twin research, serve the purpose of identifying genetically determined morbid conditions, their results now mark rather the beginning than the end of the inquiry.

At present more than 500 different genetic disorders are known in man. Many of them are extremely rare, and others cause only moderate or light incapacity; but Mr. Kemp estimates that 2 to 3 per cent of the European or North American populations are severely incapacitated at any given moment; and Mr. Böök believes that in these populations the total morbid risk for severe genetic disorders should be of the magnitude of 5 to 10 per cent.

Most of the prevalence figures now available refer strictly to nothing but clinical syndromes which on statistical evidence have been shown to be genetically determined. It is an open question whether or not these syndromes also constitute genetic entities. Recent investigations in various fields suggest that the diversity in regard to genetic disorders is much greater than hitherto assumed. As long as the correlations between clinical and genetic entities remains dubious, the calculations of gene frequencies and mutation rates will also be questionable.

In countries which already have achieved a relatively high standard of living, genetic disorders probably constitute the greatest medical problem of our time, and some of these disorders are on the increase. Among other populations the situation may be quite different. For example, in certain South American or Asian countries where the life expectancy is low, where neither infectious diseases nor nutritional deficiencies are under control, and a substantial part of the population is suffering from chronic starvation, genetic disorders must be of secondary importance in regard to public health. Here the measures should be, in order of significance: (1) reduction in mortality, accompanied by more responsible parenthood, (2) control of infectious diseases and nutritional deficiencies, and (3) control of genetic disorders.

But in European and North American populations genetic disorders have a high prevalence and constitute a major cause of human disease and maladaptation. Consequently they should be a primary concern of public health authorities and medical research workers.

It has become increasingly apparent that each individual is heterozygous for a number of recessive genes with undesirable homozygous effect. The identification of such genes constitutes an enormous task, discussed particularly by Mr. R. C. Cook.

Among one group of carriers, namely, those who are heterozygous in regard to genes commonly thought of as "incomplete" recessives, Messrs. H. F. Falls and J. Neel reported that it is now possible to identify the carriers of 29 different disorders. For the future there is the possibility of identifying individual genes or constellation of genes in heterozygous individuals by means of biological stress designed to bring out subclinical metabolic deficiencies, by chromatography, electrophoresis and by other refined techniques.

The positive identification of healthy or only slightly deviating carriers of genes which subsequently may cause disease in the carrier himself or only after duplication in his children has a number of consequences. The effect of selection on genetic disorders cannot be fully understood unless the fitness (in terms of effective fertility) of carriers is reasonably well known. The recent discovery that, in certain regions of Africa, heterozygotes of sickle-cell anaemia display a better fitness (immunity to malaria) than the normal homozygote, deserves serious attention. If such effects should not prove to be rare exceptions, they will render many conventional calculations of gene frequencies or mutation rates worthless.

Mr. I. Bogdan took exception to all these conclusions. He held that progressive biology has demonstrated that the development of the individual is determined not by a hypothetical combination of genes but by the conditions of development, that the base of heredity is constituted by the type of metabolism, which in turn can be influenced by the environment, that the so-called pathological heredity determined by a morbid gene is an erroneous conception. The evidence offered for this position, particularly that concerning vegetative hybridization, was held by Mr. M. Lerner and other discussants to run counter to the experience of modern biology. It was felt that the free interchange of ideas among scientists of all countries should help to clear up such misconceptions.

## 2. THE MECHANISM OF GENE FREQUENCY ALTERATIONS

Changes in gene frequency, both due to chance and to natural selection, are likely to be continually proceeding. The mechanism was discussed by Mr. L. S. Penrose.

It is reasonable to assume that any hereditary trait which comes under observation is due to a gene whose frequency is not changing very rapidly. Unless a gene were nearly in equilibrium, it would not have survived to be observed. Hence, in order to understand the nature of gene frequency alterations in natural populations, the conditions of genic equilibrium must be studied.

There are three main types of genic equilibrium which can occur. These are:

(1) *Neutral equilibrium* (a) with random mating—the Hardy-Weinberg principle—or (b) with deviations from random mating,

(2) *Stable equilibrium* due to (a) recurrent mutation, or (b) advantage of the heterozygote,

(3) *Unstable equilibrium* (a) in connexion with disadvantage of the heterozygote and (b) in certain types of social selection.

(1) *Neutral equilibrium* (a) The principle discovered in 1908, independently by Hardy and Weinberg, is the classical example of neutral equilibrium. It arises when there is random mating (panmixia) and if no genotype has any selective advantage, expressed either in terms of fecundity or in vitality, over any other genotype. Gene frequency changes which can take place by chance (drift) remain permanent. Within large groups this effect is insignificant, but differences originally produced by lack of homogeneity in small parent populations can remain for long periods. All estimates of gene frequencies made by serologists are based upon the assumption of random mating and absence of natural selection. The fact that good agreement exists between observation and theory in such calculations suggests that the genes concerned are in a state not far from equilibrium.

(b) Deviations from random mating do not disturb the gene frequency provided that all genotypes are equally fit. Thus, neutral equilibrium is compatible with both assortative mating and inbreeding. These processes, so long as they last, increase the proportion of homozygotes at the expense of heterozygotes. The opposite processes of dissortation and outbreeding have the converse effect. There is outbreeding when two previously isolated populations mingle, or in cases of migration, but the gene frequency in the total human population is unaltered. In other respects, deviations from random mating have important consequences. A survey of the effects of consanguinity on stillbirths in France showed a definite positive correlation. Owing to the reduction of inbreeding in France, as in other European communities, a temporary reduction in stillbirths attributed to lethal recessive genes may be expected.

In such examples as this, genic equilibrium is disturbed and there is selection against the homozygote. The reduction of frequency of the gene concerned is very slow, but it becomes more rapid if there is inbreeding. *Selection against lethal recessives* should therefore be stronger in Japan, and also in India where consanguineous unions are very frequent, than in European countries.

(2) *Stable equilibrium* In this state, if a chance circumstance alters the gene frequency in a population, the original frequency tends to be reestablished. There are two basic types:

(a) Selection against a gene with unfavourable effects can be balanced by the recurrence of fresh mutation. In the typical case, a rare gene with deleterious consequences, diminishing fitness in certain individuals, remains at the same frequency in each generation.

The different gene frequencies of hereditary diseases in different parts of the world may be interpreted as being due to different points of equilibrium between fitness and mutation.

(b) Selection against a gene in homozygous form can be balanced by advantage conferred when it is in heterozygous form. This situation can occur as a consequence of hybrid vigor, sometimes called heterosis. Provided that it is permanent, the advantage of heterozygote need only be very slight in order to preserve

equilibrium in random mating. An increase of just over 1 per cent in the fertility of the heterozygote above that of the normal homozygote will balance a rare recessive lethal gene with 1 per cent gene frequency.

This equilibrium is stable because there would be gradual restitution of the previous state after a chance disturbance of gene frequency. Moreover, after an alteration in fitness of one of the genotypes, provided that the heterozygote still remains the fittest of the three, a new stable frequency is eventually reached. The stability of the process makes it a powerful method of preserving polymorphism in a natural population. This can apply both to genes for segregating traits and to genes producing metrical variations, like stature.

Inbreeding and especially assortative mating can neutralize, or even destroy, the stability of "heterosis" equilibrium: to maintain stability in such circumstances, the advantage of the heterozygote must be correspondingly larger. The observed differentials in fertility connected with intelligence are marked enough to maintain equilibrium even in the presence of the very high degree of assortment for this trait which occurs between husband and wife.

(3) *Unstable Equilibrium* (a) The converse of heterosis occurs when the heterozygote is less fit than either homozygote. A system of this kind occurs in connexion with antigenic incompatibility. It produces unstable equilibrium at a point where the antigen causing incompatibility has a gene frequency of 50 per cent because the two homozygotes are equally fit. In the region of this percentage, the gene frequency will only change very slowly, though the extermination of a rare antigen, if unbalanced by mutation or heterosis, would be quite rapid. Conversely when an antigen is very common, the instability is shown by its tending to become universal at the expense of its neutral allele.

It is interesting to note that, in European populations, the gene for the D-antigen and that for the A-antigen, which have frequencies of about 59 per cent and 29 per cent, respectively, are near enough to the point of unstable equilibrium, at 50 per cent, not to change very rapidly even under strong selection produced by incompatibility.

Only a very slight advantage in surviving heterozygotes is necessary to produce stable conditions, which would occur, theoretically, at any specified gene frequency.

The search for increased fertility of surviving heterozygotes in the blood groups which would keep the system in equilibrium has not yet been intensively pursued, though some of the papers presented to this meeting provide pointers. Mr. J. A. F. Roberts pointed out that more is known about geographical variations in the frequencies of the ABO blood-group genes in man than is known about the similar conditions of any other plant or animal genes whatsoever. Recently there have been indications that the ABO groups may confer high selective advantages or disadvantages quite apart from their antigenic properties.

### 3. VARIOUS FACTORS WHICH INFLUENCE THE DISTRIBUTION OF GENE FREQUENCIES

The discussants were generally agreed on the following findings as summarized by Mr. C. Stern:

A prolongation of the mean expectation of life is liable to increase the frequency of certain genetically deter-

mined traits in the population because of the increased proportion of older people living to the age at which these traits appear.

Medical advances often permit survival of individuals with formerly fatal genetic defects. Therefore, in modern societies, the frequencies of genes for various formerly serious congenital abnormalities or for genetically influenced diseases will probably increase, though slowly.

Changes in social conditions or specific social trends may affect the distribution of genes by selective migration between and within larger populations. Large-scale immigration or transfer of population often will change gene frequencies in the areas of immigration and may do so also in the areas of emigration provided that the emigrating part of the population is genetically different from those who remain. There is little documented evidence for such selective emigration, but, as Mr. Stern pointed out, lack of evidence does by no means signify absence of the phenomenon; it is much more likely that emigration has some genetically selective aspects than that it lacks them. Certainly one of the important tasks for the future should be to determine quantitatively the degree of influence which emigration and immigration have on the distribution of genes.

Internal migration, from rural to urban areas and in the opposite direction, and social mobility which attracts and discharges specific individuals to and from various occupations and socio-economic layers are liable to form sieves through which some genetic types can pass and others are retained.

While changes in public health measures and medicine may lead to true changes in the frequencies of genes, the various types of migration at first simply change the distributions of genes. Since the patterns of reproduction of different populations, urban and rural sections, different occupational groups and different socio-economic layers vary, changes in the distribution of genes between different groups must result in changes in overall gene frequencies. Mr. Y. Koya raised the question as to possible selective effects of the present high rate of abortion in Japan.

Genic reproductive fitness is a relative property. In single dose many genes have no obvious effect on the fertility of their carriers while in double dose they may reduce it to zero. Moreover, the rest of the many thousand genes which make up the genetic material of a human is important. In different "genetic backgrounds" a given gene may have very different fitness, and so manifold are the interrelations of genes in development, growth and reproductive fitness that the opposition "single gene versus genetic background" may lose all precision. The human traits are the result of polygenic systems whose components often are not separable.

Even when a meaningful definition can be given to the term reproductive fitness for a given gene, the frequencies and distributions of the gene in future generations cannot be predicted. Fitness depends upon the specific environment. Changes in the external milieu can increase the fitness of poorly fit genotypes, making them more likely to survive and changing the fitness of better ones. Obvious examples of improved fitness pertain to sugar diabetes with the discovery of insulin or to eye defects with the invention of optical and surgical remedies. Important examples of changed fitness in a changed social environment have been adduced by Mr. T. Sjögren: the genetic basis for dyslexia (writing and reading difficulties) may have become subject to nega-

tive selection in literate societies while it may be neutral in illiterate ones. Similarly, certain high-grade mental deficiencies imply a rather moderate social handicap in non-industrialized communities but may become seriously disadvantageous in industrial systems. In Mr. Sjögren's striking phraseology "these forms of oligophrenia—without any genetic change or any change in the clinical picture having taken place—have acquired an increased malignancy". Considering differential fertility, this social malignancy may actually imply increased reproductive fitness. The meeting was not charged with value judgments and hence did not express opinions on whether a relative increase in such genotypes was desirable.

Selection may be directed against or in favour of heterozygotes. Dependent on how widespread positive selection is as compared to negative selection for heterozygotes, the genetic consequences of intercrossing of formerly separated human groups will be very different.

Mr. H. Nachtsheim presented rates of mutation for various pathological genes, with the low in the neighbourhood of  $4.4 \times 10^{-6}$ . It is likely that such rates of spontaneous mutation will remain more constant than intensities of selection. This will lead to slow changes in the frequencies and distributions of genes. In particular, there will be an increase in the proportion of those genes involved in diseases and abnormalities whose origin by mutation is not sufficiently counterbalanced by selection. This increase in pathological genes is particularly likely because of the long-range effects of reduced selection due to the saving of lives by therapeutic measures. Artificial increases of potentially unfavourable genes are also bound to occur because of the widespread use of mutagenic radiations in medicine and industry, not to speak of war.

Formerly, geographically or sociologically separated populations and sub-populations—so-called isolates—reproduced within themselves. They became genetically different from one another as the result of selective forces or of chance.

The break-up of isolates due to better transportation and other factors leads to a scattering of clusters of like genes over the population at large. One consequence of this is, at least temporarily, a decrease of homozygotes, thus reducing the number of individuals homozygous for deleterious recessive genes. This reduction, however, will not take place with traits which depend on recessives with relatively high frequency or on dominant genes.

The reduction in deleterious homozygotes will often shield from negative selection those genes which become carried increasingly in healthy heterozygotes. Very slowly, mutation will fill up the new population with the shielded gene until the proportion of homozygotes rises to the former level.

The loss of adaptive gene combinations by isolate breaking is difficult to evaluate. The future seems likely to bring a large-scale redistribution of genes by the interbreeding of diverse populations. Our present knowledge is too incomplete to foretell the consequences of such intermingling. Many geneticists feel that the result will not be harmful. Others are hesitant to adopt such a view so long as it has no basis in objective studies. The increased independence of modern man from formerly restrictive environmental agents may often—but perhaps not always—mean that no loss of adaptiveness is involved.

The elimination of morbid mutations can be achieved more efficiently by birth selection than by death selection; and this does not necessarily imply an authoritarian abridgement of the freedom of action of the individual. Present frequencies and distribution of human genes are the result partly of processes beyond the control of man, and partly of man's voluntary actions and inactions. In an increasing manner, future frequencies and distributions will be predictable on the basis of human activities. This will mean increased responsibility since whatever we do or omit doing has its definite inescapable consequences.

#### 4. THE NEED FOR OBJECTIVE DATA AND CRITICAL RESEARCH

There was general agreement that the only way to follow and control and study the whole body of pathologic genes in a population, "our load of mutations," is through a permanent systematic and thorough medico-genetic registration, a recording or reporting system, comprising all the patients in the population who are afflicted with a serious hereditary condition and also their families. This view was stressed by Messrs. A. P. Leon, K. Evang, T. Kemp and others.

Such an epidemiological, genetic-hygienic control can be established in districts, regions or countries where the civilization has developed to a certain stage. The public health system and social care must be well-organized. Hospitals and other institutions for diseased and defective as well as the public care system must have attained a certain standard.

By means of such a genetic-hygienic registration we can follow the hereditary diseases in a population. We can check on their behaviour. We can ascertain whether they decrease or increase in frequency and form an estimate as to whether the genetic-hygienic measures are carried through in the right way. Ultimately we can limit their prevalence.

Thorough instruction in human genetics, especially genetic pathology, ought to be included in the curriculum of medical schools.

There is need to break down the barriers between disciplines, as pointed out by Messrs. M. Lacroix, M. J. Aubenque and D. Kirk. International action is needed to standardize or at least to clarify definitions and terms. "Psychosis" for example is, as we know, not only a medical but certainly also a social diagnosis. Confusion will undoubtedly arise unless great care is taken in defining terms.

In regard to nearly every aspect of human genetics, the nature-nurture problems are with us. Their solution, specific for each trait, is of prime importance to reaching conclusions on the distribution of genes in the population. Studies of maternal age and birth order throw light on these problems, as shown by Mr. T. McKeown. The review of twin studies by Mr. L. Gedda emphasizes the importance of twins as most valuable material for the evaluation of the hereditary and environmental components of an unlimited range of traits. There should be a world-wide search for the largely untapped reservoirs of identical twins reared apart. More work should be done in co-twin control research and with the "twin-family method," as well as in studies of foster children and orphans.

These conclusions on the importance of twin studies in the field of psychogenetics and psychosomatics meet

with the expectation of the animal psychologists, as reported by Messrs. J. P. Scott and J. L. Fuller, that the development of methods of measuring basic emotional and physiological differences at the earliest possible point in development is basic to an understanding of present and future distributions of human genes.

If, as seems likely, knowledge of human genetics increases as rapidly in the next ten years as in the years since the war, studies in the genetic qualities of populations can be expected to play a constantly increasing role in advancing human welfare. We may close with the words of Mr. A. Sauvy: The sciences of demography and human genetics share a common ground.

Their union can be exceedingly fruitful for the future of the human race.

Basic papers for the meeting were presented by Messrs. R. C. Cock, H. F. Falls and J. Neel, T. Furuhashi, L. Gedda, T. Kemp, K. Kishimoto, Y. Komatsu, E. Matsunaga, T. McKeown, H. Nachtsheim, L. D. Sanghvi, J. P. Scott and J. L. Fuller, T. Sjögren, C. Stern, J. A. Sutter and L. Tabah; summaries of the different sections were prepared by Messrs. J. A. Böök, L. S. Penrose, C. Stern; additional discussants included Messrs. M. J. Aubenque, L. Bogdan, K. Evang, D. Kirk, Y. Koya, M. Lacroix, M. Lerner, A. P. Leon, S. Peller, J. A. F. Roberts, A. Sauvy, S. G. W. Wahlund.

### Meeting 24

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. III. POPULATION IN RELATION TO CAPITAL FORMATION, INVESTMENT AND EMPLOYMENT

### Report on the meeting prepared by Mr. R. Dalla-Chiesa, Rapporteur

#### INTRODUCTION

In meetings 20 and 22 the relations of population trends to natural resources (agricultural and non-biological) were reviewed. Meeting 24 was largely devoted to the question of how trends of population influence other cardinal factors in economic development such as capital formation and investments, labour supply and employment. The chairman, in opening the meeting, said that the subject under discussion was often simplified by assuming that population growth as such increases poverty in a country with an unfavourable ratio of population to resources, by decreasing the margin for additional savings and the amount of capital formation necessary for an improvement in the level of living. He emphasized that a great many intermediate factors have to be examined before a useful statement about the effect of population growth on economic development can be made. The purpose of this meeting would be to bring together the theoretical conclusions about the relation of population trends to capital and employment and the practical results of some of the development programmes actually in progress. He expressed the hope that this attempt to identify the theoretical and practical difficulties to be faced by countries during their development would clarify the problems that are amenable to scientific analysis and help to show what recommendations regarding public policy can be made.

Background papers for this meeting were provided by Messrs. S. W. Anderson, F. Lorimer, A. Molinari, R. Prebisch, K. N. Raj, A. Sauvy, H. W. Singer, J. J. Spengler, J. R. N. Stone and A. Vegas Pérez. The principal points of these papers and of the general discussion which followed are summarized below under the following headings:

1. Interrelations among economic variables in a growing economy;
2. Population structure as a factor in the problem of economic development;
3. Practical implications for public policy.

#### 1. INTERRELATIONS AMONG ECONOMIC VARIABLES IN A GROWING ECONOMY

A general lack of basic knowledge on capital formation, saving patterns, and employment opportunities in most under-developed countries makes it desirable to define at the outset, within a broad theoretical framework, those economic relationships which are the most significant for analysing the problems confronting this type of economy.

##### (a) *Some relationships between capital and economic growth*

The relationship between capital formation and economic development does not lend itself to any all-embracing formulation. Its relevance to economic growth can be fully appreciated only when its different aspects are formulated conceptually and discussed in terms of alternative functional relationships and on the basis of different historical experiences.

In order to show the manner in which changes in each type of wealth, or capital, may affect the output of a society, capital is classified by Mr. J. J. Spengler according to the extent to which it is reproducible, economically contributing to the productive process, and relevant to income generation.

In the long run, as population and income grow, the ratio of non-reproducible wealth to population and income will fall while the ratio of reproducible wealth to population and income will increase. No matter how intensively non-reproducible wealth is utilized, its contribution to the generation of income per person must eventually decline as the population continues to grow. The increasing relative scarcity of non-reproducible wealth must therefore tend to brake the growth of income per head unless this scarcity is offset by imports, changes in input-output ratio, the development of substitutes, etc. Growing communities are thus compelled to stress the accumulation of reproducible wealth. They must invest in directly productive capital and economic overhead capital (transportation, communications, power, etc.) if their output is to be increased.

This does not mean, however, that the accumulation of social overhead capital (schools, training centres, hospitals, etc.) should be neglected. As Mr. Spengler points out in his paper and as Mr. Molinari emphasized during the discussion, social overhead capital also affects output: an improvement in the quality of the population and in the social environment eventually results in an increase in the capacity of individuals to produce.

The relevance to income generation of any form of overhead capital was also stressed during the discussion by Mr. J. R. W. Stone. He pointed out that the indivisibility implicit in the phrase "overhead capital" is an important factor tending to make the adoption of certain new technological devices very difficult for a country at its initial stage of development. If this type of asset were divisible, a little could be accumulated each year without too much strain on the country's scarce resources. In fact such facilities have been largely brought into being in many under-developed countries by foreign investment. Although the necessity of speeding up the accumulation of this type of capital is of most immediate concern to the under-developed countries, Mr. Stone observed that in a technologically progressive era no country can safely minimize the importance of keeping up with the process of overhead capital formation. The most developed country may become under-developed if, through failure to improve its overhead capital, major technological innovations make its existing facilities obsolete.

The relation between non-reproducible wealth and population is also analysed by Mr. Spengler in terms of its effect on international transactions and on the prospects for economic development. With regard to international transactions, this relation has more significance for developed than for under-developed countries, for the latter tend to be net exporters of food and raw materials, no matter what their population-resources ratios are, since these exports are usually necessary to pay for their imports of manufactures. With regard to development prospects, an insufficiency of land and other natural resources may render countries with high population-resources ratios virtually undevelopable. According to Mr. Spengler's view,<sup>1</sup> the process of capital formation in a country with a low population-resources ratio may be less difficult to start than in a country with high population-resources ratio.

In another part of his paper, Mr. Spengler examines the contention that a one per cent rate of population growth requires a 4 per cent rate of growth of savings to prevent a decline in *per capita* income. He observes that this rule-of-thumb implies a fixed ratio of capital to output, but actually there are many circumstances in which this ratio may either rise or fall.

Mr. A. Sauvy also emphasized that, when considering capital requirements derived from mathematical ratios of capital to output, it must be recognized that there is no single formula that can be easily applied to all situations, and also that there are many intangible factors which rarely receive sufficient attention. Mr. Sauvy defined these factors as "human elements" which almost invariably make for discrepancies between what is theoretically planned and what is actually achieved.

<sup>1</sup> It will be seen in the third section of this report that Messrs. H. W. Singer and K. N. Raj hold, either explicitly or implicitly, a different view of the significance of population factors in the process of capital accumulation.

Mr. C. G. Clark also warned against excessive simplification and against the conventional attempt to analyse the problem of capital formation simply in terms of income per head and capital per head. Admittedly, no economic analysis is possible without a considerable simplification of data. Before reducing a flow of varied goods and services to a single aggregate, however, it is necessary to make sure that at least the major components are moving in similar directions. It is generally assumed that the amount of capital per head that is necessary is about four times the income per head, though the ratio may be lower in advanced countries. But it is not possible to estimate this requirement more closely until capital is analysed in terms of its three components which may show widely different trends, namely, (i) housing, (ii) other construction, and (iii) equipment. In this connexion, Mr. Clark observed that while there are interesting signs that the required ratio of equipment to income is now falling in advanced countries, "construction" is far cheaper relative to other investment in the poorer countries than it is in the advanced countries, and the needs of the poorer countries for construction will therefore be met sooner than their needs for equipment. "Housing" may represent nearly half the entire stock of capital, or a value equivalent to two years' national income in some countries, but in countries where capital is scarce and where houses are constructed of cheap materials and frequently replaced, this component of the capital stock may represent only one-fifth of a year's national income. Mr. Clark thus suggested that if the relation between capital and output is considerably lower than is often believed, the prospects for capital accumulation and income generation for the poorer countries are to that extent brighter, despite their large population growth.

After discussing how population growth affects the demand for, or requirements of, different types of capital, Mr. Spengler reverts to the other side of the relationship between population and economic development. Is it possible to assess the final effect of economic development on population growth? He tentatively suggests that an increase in the rate at which per capita income rises is generally likely to accelerate population growth, at least in the short run, but that the effect of an income increase on population in the longer run will be smaller. Mr. Spengler concludes, however, that much more information is needed before questions of this sort can be dealt with adequately.

#### (b) *The interrelationship between capital and the other economic variables*

Mr. J. J. Spengler's paper is largely based on the implicit assumption that the capacity for adaptation required in any dynamic process of capital formation does exist, at least in some degree, in any type of community, regardless of its stage of economic development.

It may be observed, however, that technological flexibility, in the sense given to it in economically advanced countries, is not common to many communities. There is a large number of countries that have not experienced significant economic changes for long periods in the past. For this reason, and in order to emphasize the importance of other variables such as the rate of population growth and the patterns of consumption and savings, the analysis presented in Mr. J. R. N. Stone's paper assumes, as a first approxima-



tion, that in the type of community considered, technological conditions are generally fixed.

As Mr. Stone observed during the discussion, there exists at any time a vast amount of technical information which describes the various ways in which different goods and services can be produced. Given the factors of production available, existing technology sets a limit to production possibilities. If only two factors—labour and capital—and only one product are considered, these production possibilities can conveniently be summarized in an aggregative production function in which output per head is expressed in terms of capital per head. With the state of technology and capital per head given, increasing the input of labour should cause output per head to increase at first but then later to stabilize or decline.

Some countries approach the production limit while others are far from it. The former are called developed countries, the latter, under-developed. As technological possibilities change, production possibilities expand. To stay close to the limit, however, an economy must be flexible; if it is not, the economy will tend to stagnate or even move backward and be unable to realize its full productive potential. Mr. Stone describes a society which is unable to adapt itself economically and so remains at or returns to a subsistence level of production, as being in a state of "misery". By contrast, a society which succeeds in exploiting fully the technological possibilities is in a state of "bliss".

In Mr. Stone's words, adaptive behaviour is a complicated phenomenon. In his paper he concentrates on only one aspect of this adaptive behaviour—the provision of capital through saving. He assumes that saving characteristically conforms to a single version of the usually accepted function of income and assets. In equilibrium, the savings required will be just sufficient to provide the increase in the population with an equal amount of capital per head required to maintain the equilibrium.

From the equation for the supply of savings an expression for consumption can be derived in terms of income and assets. As consumption is related to income and saving, income (or product) may be expressed in terms of assets, and this may be compared with the production function. The comparison shows that a steadily growing community should not endeavour to reach the maximum point on its production function since by aiming at a lower level of assets and output per head it will be able to enjoy a higher level of consumption per head.

(c) *The impact of technical progress and investment on employment*

If a change occurs in technological conditions, i.e., in the production function, such that the optimum output can be produced with a smaller amount of assets per head than before, an unchanged rate of savings could sustain a higher level of consumption per head provided that the rate of population growth does not rise. The beneficial effects of such a change are evident. There may be offsetting considerations, however, which should be incorporated into any calculation of the benefit. The employment effect of the application of new methods of production is the principal consideration that was discussed.

Mr. A. Sauvy points out that the possibility of a reduction of the employment level, in the type of community considered, must be weighed against the appa-

rent benefits of technical progress, especially when the assumption is made that labour mobility is very low.

From this point of view, Mr. Sauvy notes that it is necessary to distinguish between two types of technological change and investment. The first, which may be called "expansive", makes for a permanent increase in the volume of employment and in productivity. The second, which may be called "regressive", and corresponds to the popular idea of technological unemployment and the "push-button" economy, makes for a reduction in the volume of employment.

In the old industrialized countries, technical progress has had the effect of enlarging the consumption stream and diffusing it over an ever-growing range of industrial products and services, thereby increasing the numbers of employed people. In the short run, and for a growing community at the initial stage of development, however, this process of consumption differentiation must be slow; investment intended to apply new techniques in the process of production may therefore actually reduce the number of persons employed.

The interrelationships of investment, consumption and employment can be illustrated by briefly taking into consideration the final effect of institutional changes such as land reform or income redistribution which are introduced by many countries at an early stage of development to bring about desirable social improvements. These changes may cause significant disruptions in the patterns as well as in the level of consumption which, in turn, may create short circuits in the economic system and ultimately unemployment. Changes such as land redistribution, by increasing per capita consumption and by promoting a pattern of production based on "subsistence agriculture", may eliminate from the economic system that surplus which had been previously utilized by a few wealthy people for obtaining services from the large class of the less privileged.

2. POPULATION STRUCTURE AS A FACTOR IN THE PROBLEM OF ECONOMIC DEVELOPMENT

(a) *The economic implications of high birth rates and high death rates*

In most under-developed countries population growth occurs under conditions which tend to dramatize its damaging economic effects. First, characteristically high birth rates create a "bottom heavy" age structure of population which results in a large number of dependants and in a relative deficiency of adult manpower. Secondly, the expectation of working life is typically rather short, because many infants and children die before they have reached working age.

Among others, Messrs. F. Lorimer, A. Molinari and H. W. Singer deal at some length in their papers with these aspects of the relationship between population and economic development. By and large, there appears to be unanimous agreement on the general proposition that the population age-structure, which results from the combination of high birth rates and high death rates, hinders the economic improvement of under-developed countries. Among other things, the combination of high birth rates and high mortality rates makes for a high proportion of dependants in the population and for a high proportion of investment that is not immediately productive. "Human" investment competes with "economic" investment in the allocation of scarce resources; however, infant



mortality prevents a sufficient number of children from surviving to repay, by sustained production throughout their working lives, the investment made in them in terms of maintenance, education and training.

In this connexion, Mr. Singer points out that demographic factors alone may account for a considerable part of the differences in national incomes between industrialized and under-developed countries. They may account even more for differences in rates of capital formation and hence for the growing gap in incomes between the two groups of countries.

As a first approach to these questions, one may compare the proportions of the populations of working age in different countries. In general, the proportion of the population in this group is assumed to give a crude index of "economic efficiency" of a population's age structure. Taking the proportion prevailing in the United Kingdom as a standard, Mr. Singer shows that the number of persons of productive age in most of the under-developed countries is one-sixth less than it would be if the age composition in these countries were the same as that in the United Kingdom. This means that, even if it were possible to discount entirely differences in capital equipment, levels of education, productive efficiency, natural resources, etc., output in the under-developed countries would still be one-sixth lower than it is in the United Kingdom. One-sixth of the national income used for capital formation, at a rate of return of 10 per cent in total productivity, would increase the national income by 65 per cent within a generation of 35 years.

As it might be said that a comparison of the proportion of the populations of working age groups is somewhat crude, Mr. Singer also appraises the economic significance of death in each age group by comparing death rates at specific ages as they are recorded in countries at different stages of development. Arguing from set assumptions that the average production of every new-born individual for the period between 15 and 65 years of age is two times his life expectancy, that his average consumption is equal to the life expectancy for his entire life span, and that the differences between average production and average consumption over the expected life span of the individual considered is his average saving per life time, Mr. Singer reaches the following conclusion: assuming all other things to be equal between industrialized and under-developed countries, at the vital rates prevailing in the two types of communities, the productive value of a given number of births in the industrialized countries will be twice as large as in the under-developed countries.

#### (b) *The effect of falling death rates*

Recent statistics show that death rates have been falling in almost all under-developed countries, and there is reason to believe that they will continue to fall in the future. What would be the economic impact of lower mortality and longer survival upon the populations of under-developed countries?

This issue is dealt with at some length both by Mr. H. W. Singer and Mr. F. Lorimer. As summarized during the discussion by Mr. J. Bourgeois-Pichat, although the reduction of death rates will lengthen the average span of economically active life of each successive generation, this will not without a corre-

sponding reduction of birth rates, improve the balance between the productive and dependent sectors of the population in under-developed countries, for it is primarily the birth rate, and not the death rate, which determines the age structure. It has been said that if mortality losses among children are avoided, investment in their upbringing will not be wasted, and thus the productivity of investment for a new-born individual over his life span will be increased in terms of net addition to the output of the community. On the other hand, it is not sufficient to consider productivity of investment for a new-born individual alone. The reduction of mortality rates, without any change in fertility, will have the effect of increasing the numbers of survivors in all age groups, adults and children alike, and unless there is a concomitant increase in the capacity to invest, the result will be to reduce investment *per capita* when the community as a whole is considered.

#### (c) *Demographic pressure, under-employment and dependency ratios*

It is sometimes suggested that the employment of children and older people tends to moderate the negative impact of an "inefficient" age structure of a population: as economic need increases the span of working years, most under-developed countries can compensate to some extent for the relative shortage of adult manpower. As Mr. Molinari points out, however, the lengthening of the span of working years at both ends of the age structure is not sufficient to bring the numerical relationship between the dependent and the productive population in under-developed countries into line with that which is found in the economically advanced countries. For in under-developed countries, this process is usually accompanied by a large accumulation of disguised unemployment. This unemployment denotes a condition of family employment in peasant economies in which a very large number of people are working on farms contributing virtually nothing to output, but subsisting on a share of their family's real income.

When the full implications of this disguised unemployment are realized, it would seem misleading to dismiss the negative impact of an adverse age structure by saying that this factor is somewhat offset, in its economic impact, by the existence of a large proportion of economically active population within the various age groups. It is true that in an under-developed peasant community most of the people may in some way be economically active, at least in the sense that very few may be considered entirely idle. But the total output of this community would not be greatly affected even if it were possible to remove many people from their present occupations. The magnitude of the "economically active population" of peasant economies should thus be appraised conservatively, if for no other reason than to allow for the presence of disguised unemployment.

Significant evidence of the changes over time which the economic structure of a population is bound to undergo under conditions of demographic pressure and of chronic disguised unemployment are offered by the census data of Italy and India. These data are reported and commented upon by Messrs. A. Molinari and K. N. Raj. The Italian data appear to be particularly relevant since they permit one to compare,

over three-quarters of a century, the relative changes which occurred within the same country in two areas characterized by different economic and demographic conditions. They show that, in spite of the premature employment of young people and the prolonged economic activity of the aged, the dependency load in peasant agricultural societies remains heavy and tends to rise over time.

### 3. PRACTICAL IMPLICATIONS FOR PUBLIC POLICY

There is more or less general agreement among all the contributors that the problem of capital formation lies at the very centre of the process of development of economically retarded countries.

It should be noted, however, that the problem of capital formation cannot be analysed as though it were entirely a matter of capital supply. The papers contributed to the panel have been mainly concerned with potential sources of capital formation in under-developed countries confronted with a dynamic population problem. But this does not mean that the difficulties that lie on the "demand side"—the factors determining the level of investment—should be neglected or minimized. They have only been kept separate for the sake of an orderly discussion.

It is also necessary to point out that the problem of capital formation as a real issue in public policy almost always escapes a single general formulation. In the first place, the initial conditions of various countries as to resources, employment, status of technology, and the like may differ in many respects. More important, the prevailing rates of change in important variables such as population, saving, and income, may also be significantly different from one country to another. In the second place, while it may appear possible to formulate a policy programme in steps by first determining the quantity of capital (savings) needed and then the type of investment to be carried out and the order of succession, this cannot really be done. Actually the type of investment and the order of priority may affect the quantity of capital that is needed. These factors are interdependent rather than separately determinable.

Such practical difficulties are not discussed below. In the following paragraphs, the problem of capital formation is discussed only in its aggregative aspect. The discussion is largely based on the second part of Mr. J. R. N. Stone's paper in which he recommends measures designed to enable an under-developed community to increase its production to a point beyond that which it could reach with its original spending and saving behaviour. Particular investment requirements dictated by the economic structure of the population, its dynamics, and the situation of the labour force, are discussed in a concluding section more or less independently of the aggregative problem.

#### (a) *A policy prescription pertaining to the quantitative aspect of capital formation*

Mr. J. R. N. Stone's paper indicates that an under-developed community, whose consumption and saving behaviour is characterized by the relations summarized in the first section may well reach a static state in which its standard of living falls short of that which could be achieved in the existing technological environment. If, however, the community becomes will-

ing to forego present consumption for the purpose of increasing its stock of capital assets so as to make possible an expansion of consumable output in the future, policy should be directed to making this will- ingless effective and to generate additional savings.

But to know how much the community ought to save if it is to attain the highest standard of living which its technology will allow, is plainly not sufficient. Indications are also needed as to how saving should be distributed over time in order to yield the largest possible stream of consumption. According to Mr. Stone, these aspects of the problem can be illuminated by referring to the saving principle expounded by Mr. Ramsey,<sup>2</sup> which points to the optimum rate of saving and to the optimum time-path along which the transition to this goal should be made.

Ramsey's saving principle assumes that individuals do not discount later enjoyments in comparison with earlier ones, and that enjoyments and sacrifices at different times can be calculated independently and added. It also assumes that no misfortunes will occur to sweep away accumulations and that a given generation need not be deterred by the thought that a subsequent generation might selfishly consume the savings of the past. It finally assumes that the rate of growth of population is zero. On this basis, Ramsey shows that the flow of saving multiplied by the marginal utility of consumption should always equal the excess of the utility to be derived from the rate of consumption. From this principle a saving function is derived, according to which savings, although growing consistently with the amount of total output, represents an ever smaller proportion of this output as its maximum attainable level is approached. The rate of growth of output will thus increase rapidly at the beginning and then will progressively decline towards zero. In other words, the community which saves in this way will find its income and consumption increase at a rate that diminishes until it reaches zero. This means that at some point the community will pass that assets-manpower ratio which requires the maximum rate of savings and that in subsequent time periods this rate will gradually decline while income and consumption per head will rise.

As long as population remains stationary, the application of Ramsey's principle points to high rates of savings for under-developed countries. For rapidly growing populations at near starvation levels, however, the optimum savings rates are practically zero. In the absence of foreign assistance, very poor communities acting on this principle will thus tend to stay poor or only advance very slowly. Foreign aid is therefore called for, first, to start the process of improvement, and second, to accelerate it. In this regard, Mr. Stone emphasizes that special precautions are necessary to ensure that foreign aid is used by the receiving country for development rather than for consumption, but during the discussion, Mr. K. Bjerke suggested that this optimum use of foreign assistance may not be attainable under all circumstances. He pointed out that in temporary situations, such as harvest failure or sudden worsening of the terms of trade, foreign resources will have to be used to add to consumption rather than to investment; there

<sup>2</sup> See F. P. Ramsey, "A Mathematical Theory of Saving" in *The Economic Journal*, XXXVIII, No. 152, Dec. 1938, pp. 543-59.

may not be any free choice in the utilization of foreign aid in such cases.

(b) *Qualitative aspects of capital formation and their policy implications*

Almost every contributor paid some attention to the qualitative problems of investment policies intended to achieve the economic betterment of an under-developed community.

According to Mr. A. Sauvy, the contribution of investment to sound development should be appraised in terms of two basic criteria: (a) its economic yield for the economy as a whole (the social marginal productivity of investment) as measured by the ratio between the increment in income and the increment of investment; and (b) its influence on employment (expansive or regressive). Messrs. A. Molinari and S. W. Anderson note, however, that there are other aspects of investment which should also be taken into account in the formulation and implementation of a well-balanced and nationally co-ordinated investment programme: large-scale public investments should not be neglected; rapid industrialization and simultaneous development of agriculture are desirable; diversified external economies should be created; investment should not be liable to abrupt variations in amount, etc. More than any other form of investment, the building overhead capital was particularly emphasized. It requires a long view and must be steadily pursued. It is particularly suitable for cooperative action, if for no other reason than that its benefits to private investors tend to be less than its benefits to the community. Mr. J. J. Spengler emphasized that an initially high ratio of capital required to produce a given output should not be considered a deterrent to this kind of investment. Their great contribution to the productivity of the community as a whole makes these investments the *sine qua non* for the implementation of a well-rounded development plan. Furthermore, while the under-utilization of overhead capital may make for an initially high ratio of capital to output in under-developed countries, this ratio tends to fall in the long run.

In practice, as Messrs. Spengler and Molinari point out, the process of capital formation and the allocation of available resources to their optimum uses are subject to various restrictions. Strictly economic criteria must be frequently foresaken for other considerations such as strategical and political factors and the necessity of relieving population pressure in limited areas.

With regard to the relationship between investment and employment, Mr. Sauvy deals with the policy implications that are suggested by the effect which investment, dictated by technical progress and profit considerations, would have on the existing level of employment in an economy at an initial stage of development. Mr. Molinari, on the other hand, analyses the implications of a large accumulation of unproductive labour which normally accompanies the process of population growth in most under-developed countries.

The primary importance of investment which can increase productivity and at the same time increase the number of workers employed has already been emphasized. Mr. Sauvy points out, however, that the significance of this kind of "expansive" investment is generally ignored by private enterprise. For this reason

and also because of the possibility that the existing composition of investment may be determined by the country's backwardness, the public authorities should encourage investments that are "expansive" and discourage those which are "regressive". Mr. Sauvy notes especially that if at least the existing level of employment is to be maintained, it is necessary, from the beginning of the development process, to promote production and consumption of wage-goods and services, even though technical possibilities or profit considerations would point in other directions. Only at a later stage, when the consumption of these goods has reached a satisfactory level and a higher demand for the products of secondary industry arises, should investment be guided solely by principles of technical progress and profit considerations. Only then will the ensuing increase in productivity be accompanied by higher employment.

Mr. Sauvy, being concerned with the problem of displaced labour brought about by technical progress, suggests that labour-intensive methods should be favoured in the process of capital accumulation, at least in the initial stages of the process. This point of view appears to be shared by Messrs. Molinari, Raj and Singer. Mr. Spengler cautioned, however, against excessive reliance on a low ratio of capital to labour requirements as a suitable criterion of investment to be fostered, pointing out that this may actually limit the rate of economic growth. In his words, even if "automation", that is, the use of automatic methods, does tend to displace labour, capital should still be invested in it for the labour-input per unit of output and probably also the capital-input per unit of output will be reduced and the net national product will be increased, or the opportunity for increasing it will be improved. Displaced labour is a utilizable resource which can be put to work in other activities. If the existing economic structure does not permit the use of this displaced labour, the system should be re-organized to permit its use.

(c) *Population density and capital supply*

(i) *The case of sparsely populated countries*

The rate of population growth in Latin America, which has recently amounted to 2.2 per cent, is even greater than in South-Eastern Asia; it is actually the highest in the world. There is little or no evidence to suggest that Latin America has much disguised unemployment in the sense discussed up to this point. But there may be disguised unemployment in another sense. As there are always some occupations that are less productive than others, a transfer of labour from the former to the latter would increase output. The people in the less productive occupations might, in this sense, be considered under-employed.

It is for this reason that Mr. R. Prebisch considers technical progress and the transfer of active population employed in primary production and other activities of low productivity to manufacturing and services to be essential for the economic development of the region. But industrialization is also essential on another ground: at the prevailing rate of growth in gross national product, the domestic demand for manufactured goods tends to increase more rapidly than the foreign demand for primary exports.

To say that one occupation is less and another more productive and to indicate that a change in the structure of employment is required is, according to Mr.

Prebisch, not sufficient. It still begs the question of capital supply. It is true that between 1940 and 1953, Latin America has experienced a very rapid rate of annual growth (4.9 per cent) in its gross national product. But this high annual rate of growth, which is equivalent to 2.6 per cent on a *per capita* basis has been made possible by favourable terms of trade which are not expected to repeat themselves. In order to accelerate the rate of growth, Mr. Prebisch therefore emphasizes that an inflow of foreign capital is required. He tentatively suggests a figure of some \$2.5 million per year or approximately 6 per cent of the total gross national product of the countries in the region. Only with foreign capital can a 20 per cent gross investment coefficient, or the equivalent of about 13 per cent on a net basis, be achieved; this would make possible an annual growth in gross national product of 6.2 per cent or 4.1 per cent on a *per capita* basis.<sup>3</sup> For it is difficult to assume that a rate of domestic savings higher than 14 per cent (approximately the 1940-1953 figure) would be possible, especially with the tendency for consumption to increase.

If the proposed rate of development could be realized, important changes in the distribution of manpower would result. In order to show the relative shifts in the employment structure of the population, which would occur over a period of 25 years, Mr. Prebisch assumes that the income elasticity of domestic and foreign demand for agricultural commodities is 0.6 and that the productivity of the agricultural labour force increases by 4.1 per cent per annum. Under these assumptions, agricultural labour as a percentage of the labour force would drop from 58 per cent in 1953 to 36 per cent in 1978 (i.e., at a rate of 1.3 per cent annually) while industrial labour as a percentage of the labour force would increase from 16.5 to 23.3 per cent, and services, from 24.4 to 36.8 per cent.

This redistribution of the labour force, which would involve about 23 million people over the period considered, will imply a large shift of population from rural areas to urban centres. And this internal migration will tend to aggravate the difficulties of absorbing European immigrants with the existing capital stock. Mr. Prebisch therefore concludes that the additional foreign investment would have to be even greater than suggested above in order to provide immigrants with the required stock of capital. Under the existing circumstances there is room only for the immigration of qualified labour and skilled workers.

Mr. Prebisch also draws attention to the tendency in Latin America to imitate techniques, forms of capitalization, and patterns of consumption of the United States, notwithstanding the considerable discrepancy between their respective real income levels. It is because of this tendency that international income disparities are not just a source of strain in the balance of payments, but also an impediment to domestic saving and capital formation in poorer countries.

#### (ii) *The case of over-populated countries*

The relation between population, capital formation and employment in densely populated under-developed areas has been treated by Messrs. K. N. Raj and S. W.

Anderson with special reference to India and to the premises underlying its Five-Year Plan.

Since 1921, population has been growing in India at an average annual rate of about  $1\frac{1}{4}$  per cent. This growth of population has been largely due to a sharp fall in the death rate. The birth rate has not increased; in fact, it has probably declined slightly during this period. At the prevailing rate of net capital formation of 5 per cent of the net national income, and with an assumed capital-output ratio of 4:1, income per head could thus at best have remained constant. The demographic factor has also influenced the economic structure of the population and the industrial distribution of the labour force.

Although the Five-Year Plan was not originally intended to affect the occupational structure or to increase employment opportunities, certain guiding principles for policy have been indicated in the Plan as part of its longer-term approach to the problems of economic development. Mr. Raj has attempted to link the problems of capital formation and employment with the rate of growth of population within this context.

The Five-Year Plan assumes that population will continue to grow at a rate of  $1\frac{1}{4}$  per cent per annum and that to absorb additions to the working force in productive employment and to double *per capita* incomes within about 25 years, certain investment targets should be achieved (7 per cent of national income by 1955-1956; 11 per cent by 1960-1961; and 20 per cent by 1967-1968). At the same time it is recognized that, until the rate of capital formation has been stepped up substantially (this may take 15 years or more), adequate employment opportunities can be provided only by relying on industries which require relatively little capital per employed person.

The process of stepping up the rate of capital formation has been generally visualized, partly as one of ploughing back increases in output after allowing for the consumption requirements of the annual addition to population, and partly as one of mobilizing idle manpower. With Messrs. Singer, Molinari, and Vegas Pérez, Mr. Raj emphasizes that, to the extent that idle or unemployed manpower can be drawn upon, the rate of capital formation and consumption levels can both be raised faster, and the growth of population, rather than being an embarrassment, may to some extent become an aid to development.

There are many practical difficulties, however, which tend to hinder the smooth development of the process of capital formation as visualized in the Five-Year Plan. Mr. Anderson expresses some doubt as to the possibility of increasing the rate of savings; even if capital formation does not involve any further belt-tightening, some immediate relief of the crushing weight of poverty is probably imperative. Institutional obstacles, the importance of which was particularly underlined by Mr. Raj during the discussion, introduce further complications. For one thing, the scope for mobilizing unutilized labour through labour-intensive investment or by substituting labour for machinery where technologically possible is limited by the extent to which the prices of the more important wage-goods, particularly food grains, can be kept under control. In a predominantly agricultural economy organized in small subsistence units, there may be a need for

<sup>3</sup> An average 0.46 output-capital ratio is hereby assumed.

reorganizing the form of production and distribution and for promoting forced savings. The same comments apply if the problem is viewed in terms of ploughing back increases in output. The process requires a high marginal rate of saving, with the saving accumulating at certain points in the system. This does not take place automatically in an economy in which *per capita* income and saving are low, particularly when the channels open to the Government for tapping increases in income are limited, and the corporate and cooperative forms of organization to assemble such savings are not sufficiently developed.

In Mr. Raj's opinion, the institutional implications of a more rapid rate of capital formation have not yet received adequate attention. To this extent, the whole approach to the question of capital formation and employment opportunities in relation to population growth remains tentative. For instance, the mere possession of a surplus labour force in over-populated countries is no guarantee of progress. It is an advantage only if, and in so far as, the surplus labour force, i.e., this potential supply of capital, can be effectively mobilized for real capital formation. From a policy point of view it would thus seem more important to concentrate on the institutional aspects of

the problem of economic development than on theoretical ratios which apply only under certain assumed conditions.

### CONCLUSIONS

The discussion in this meeting brought out the complexity of the relation of population trends to capital accumulation, investment and employment. It was agreed that an increase in the rate of population growth due to declining death rates might make economic development more difficult unless at the same time the capacity to invest expanded. Such an increase in capital formation requires the use of all available technological knowledge and also a selective investment policy so that not only an increase in national product but also in employment opportunities is created. This last aspect is especially important for those under-developed countries with a high population-resources ratio and much disguised unemployment in agriculture. A favourable institutional framework has further to be developed in order to promote the transfer of population from less to more productive occupations and to assure that a large part of the additional income is really saved and invested instead of being consumed.

### Meeting 25

#### METHODS OF RESEARCH ON RELATIONS BETWEEN INTELLIGENCE AND FERTILITY

Report on the meeting prepared by Mrs. H. T. Himmelweit, Rapporteur

In meeting 6, the relationship between social class and size of family was examined. While there is some variation in fertility differentials as between countries and over time, the pattern remains relatively uniform—an increase in the mean size of the family as one goes down the social scale. In recent years, psychologists have been concerned with the relations of fertility to intelligence. Generally, a small but significantly negative correlation was obtained showing that the mean intelligence level decreases as the size of the families increases.

Meeting 25 was convened to examine the relevant research data concerning the relationship of fertility to intelligence. It was hoped that this would assist in the resolution of the two sets of contradictory findings which have been reported in recent years and which make the prediction of the trend of intelligence a hazardous task. The topic is a complex one as it touches on many interacting factors such as the relation of environmental influences to intelligence test units, the genetic transmission of intelligence, social mobility, and equality of educational opportunity. In view of the complex interaction of many factors, stress was laid in this meeting upon a discussion of methodology and upon an evaluation of feasible lines of inquiry which would aid in the explanation of the paradox and would make possible more accurate prediction of intelligence trends in the future. The sets of contradictory findings were as follows:

On the one hand, numerous investigations have repeatedly yielded negative correlations between the performance of individuals on intelligence tests and the size of their sibships; correlations which, although

small, are yet sufficiently substantial to point to a likely decline of one to two points of I.Q. in the average intelligence level of the following generation. On the other hand, a test of the predicted intellectual decline is provided by the very authoritative successive Scottish surveys of the intelligence levels of 11-year old children. After a time interval of 15 years there was a small rise instead of a decline in the average test scores of the later generation of children.

The discussion proved a very fruitful one, first, because it provided a platform for an exchange of views by participants from various disciplines: psychology, sociology, demography and genetics; and secondly, because of the emphasis given to possible improvements in future research.

Miss A. Anastasi, and Messrs. O. Klineberg, J. Maxwell and P. E. Vernon discussed in particular the psychological factors in this problem, the most important of which relates to *the extent to which intelligence test performance is influenced by environmental factors*. Miss A. Anastasi quoted several American studies in which a rise in average test performance was obtained when similar samples were tested after an interval of 15 to 20 years, thus supporting the findings from the Scottish survey. Particularly striking in this connexion is a study carried out in an eastern Tennessee community where improvements in educational facilities occurred in the intervening years and where a rise of as much as 10 points in median I.Q. was obtained.

Several participants examined the implications of the culture-bound character of intelligence tests for the clarification of our paradox. Mr. P. E. Vernon, for

instance, showed that if we assume no more than a 25 per cent impregnation of the test performance with environmental components, this would be sufficient to offset or at least to halve an anticipated decline of 1 to 2 points, depending upon the strength of the favourable environmental factors.

All the speakers agreed that the search for a culture-free test is illusory. As Mr. S. Chandrasekhar mentioned, for example, special tests would have to be devised for India if a study of the relation of fertility to intelligence were to be carried out in that country.

Mr. Vernon further pointed to the fallacy of assuming that a test becomes substantially less culture-bound when non-verbal, pictorial content is substituted for the verbal one. As Miss Anastasi has indicated, the cultural environment reflected in the child's performance at this and other intellectual tasks encompasses far more than relative familiarity with the test material itself. It includes the nature and strength of contact between the adults and the children in the family, the educational and recreational facilities provided in the home, and the many other facets which represent the social and cultural background characteristics for each child. In this connexion, Mr. C. P. Blacker called attention to the influence of mass media of communication which, in his opinion had made people more familiar with verbal material in recent years and which he saw reflected, for instance, in the improved verbal facility of soldiers in the Second World War over that of soldiers in the First World War.

The speakers differed somewhat in the solutions which they proposed for the isolation of the genetic component in intelligence test performance. Mr. Maxwell took the position that this is an intractable problem and that we must be content with devising tests which do not attempt to isolate innate intelligence, but which reflect differences in effective performance in every day life, such as the child's school progress for example.

Mr. Vernon, on the other hand, took a somewhat more optimistic view and suggested three possible approaches: (1) An analysis should be made of the way in which complex intellectual functioning expresses itself in a given group. A series of tests could then be devised and by means of factorial analysis those with the highest 'g' loadings could be isolated. Whenever two groups are not too dissimilar, tests might be found which have sufficiently good 'g' loadings in both groups. (2) A second, in his view more promising approach, is that of equating for the factor of intellectual stimulation. If possible, some rating scale should be devised including such items as the amount of time spent by the child with adults and the intellectual facilities provided in the home. By means of this rating scale, differently sized families could be matched for these environmental influences. There is danger, however, that such matching procedure would overcompensate, for only the genetically more intelligent large families would be likely to provide as good environmental stimulation as would the small families. (3) The third and in his opinion most fruitful approach consists in studying orphan or foster children whose true parents' families differed in size.

Relevant in this connexion are the findings reported by Mr. K. V. Müller of Bamberg who showed that only children tended to do less well at school than children with one or two siblings, suggesting therefore

that the relationship between fertility and scholastic may be non-linear and may vary in different cultural *milieux*.

The need for long-term studies was stressed by Miss Anastasi. She envisaged such a study to begin by testing young people about the ages of 10-11, prior to their educational and vocational differentiation, and then to follow them through until such age that most of their families were completed. Such a study, she thought, would be of value if sufficiently detailed information about the social and demographic variables could be obtained. Ideally, the test results of the children of the original subjects should be obtained. Miss Anastasi felt that such a study would not be too difficult, if it would utilize for its starting point pupils from schools where psychological tests are regularly administered. A similar suggestion was made by Mr. A. J. Jaffe who drew attention to the fact that in the 1920's all Chicago school children had been tested and that information about their subsequent career and marriage history could be obtained. Mr. Maxwell however said that in the Scottish survey they had had to abandon attempts at following up the subjects of the first survey, since it proved administratively too difficult.

Apart from the problem of the cultural loading of intelligence tests, other factors were mentioned which would tend to increase the unreliability of prediction. Mr. Maxwell and Miss Anastasi listed the following:

(1) *Predictions have been based principally upon the correlations between an individual's test performance and the size of his sibship:* Very few studies have been carried out relating parental intelligence to the number of offspring, but in every instance the correlation differed from that of .25 characteristics of most studies on the relation of fertility and intelligence. Such a discrepancy is not surprising in view of the correlation of only .5 between parent and child intelligence—a correlation which would permit sufficient variation to render any prediction of future trends unreliable.

(2) *Selective factors in sampling:* Speakers mentioned the inevitable over-representation of large families when a single age group is studied and the presence of incomplete families. The latter may operate in a way which is difficult to predict. On the one hand, since all children from such incomplete families are classified as coming from somewhat smaller families than will eventually be the case, the differences in test scores between the various family-size categories would thus be spuriously reduced. On the other hand, when incomplete families are included, the negative correlation between intelligence and family size may simply reflect the tendency of persons of lower intelligence to have children earlier. Should they also complete their families earlier than the more intelligent members of the community, then the correlation would disappear when completed families are studied.

(3) *Age of parents:* A third factor is age of parents, especially in its relation to educational level. Miss Anastasi suggested that when incomplete families are included in the sample, the differences in parental age, coupled with the rising level of general education, might be sufficient to account for the negative correlation found between family size and intelligence.

Both Miss Anastasi and Mr. D. V. Glass stressed the need for the gathering of extensive demographic



and social data, when inquiries into the relation of fertility and intelligence are carried out, in order to permit an analysis of these factors.

(4) *Birth order and intelligence*: The hypothesis has frequently been put forward that there is a negative correlation between birth order and intelligence. This hypothesis has, however, been contradicted as a possible major factor by quite a number of studies.

(5) *Intelligence, fertility and social class*: In the analysis of the Scottish data, Mr. Maxwell showed that the negative correlations remain when comparisons are made within occupational class and that these negative correlations were only a little smaller than those obtained for the survey population as a whole. This makes it very unlikely that occupational differences as such are sufficient to account for the obtained association. While the elimination of broad occupational differences certainly narrows the over-all environmental discrepancies, it by no means eliminates them. Miss Anastasi referred, for instance, to variations in the intelligence of the parents which lead to variations in the amount of stimulation provided for the children and also to the possibility that size of family itself may act as a casual factor in so far as it reduces *per capita* expenditure on education and recreation.

(6) *The effect of changes in fertility differentials*: Most speakers referred to the changing pattern in fertility rates as between social classes. Such a change in pattern would certainly affect the accuracy of the prediction, which takes as its starting point the fertility pattern prevalent at the time of the inquiry. There appears to be a trend especially in Western societies towards a significant decrease in fertility differentials, leading in some countries even to a mild reversal of the traditional pattern. Of interest in this connexion are the findings of the Indianapolis study, reported by Mr. C. V. Kiser, which utilized information on the relation between age upon completing high school and the practice of contraceptive measures.

(7) *Social mobility*: An added complicating factor is that of social mobility and its effect upon fertility. In a country, for instance, where there is rapid social mobility within one generation the fertility pattern of the classes will change significantly since socially mobile individuals tend to have a number of children which is intermediate between that of the class from which they came and that of the class to which they have moved. Mr. O. Klineberg suggested that the number would be closer to that characteristic of the class to which the individual has moved.

(8) *Other historical and sociological factors*: Mr. J. A. Sutter, in addition to the factors already mentioned, listed several others whose effect cannot readily be assessed. These are the relative spread of birth control, the influence of wars, and the influence of political ideologies.

(9) *Problems connected with the genetic transmission of intelligence*: The problem of the genetic transmission of intelligence was examined by Mr. Sutter and other speakers. Geneticists differ as to the amount of variance in intelligence test performance which they attribute to genetic factors. Mr. Sutter put it at approximately 50 per cent, Mr. Vernon and Mr. W. R. C. Cook gave somewhat higher figures. Messrs. Sutter,

Glass, and others pointed to our lack of accurate knowledge as to the nature of the gene transmission of intelligence. The prevalent view is that it is polygenic in character.

In view of the difficulty of obtaining empirical evidence about genetic factors, Mr. Glass expressed serious doubt about the advisability of attempting predications. He stressed our lack of knowledge concerning associative mating and the fact that isolates are being increasingly broken up as indicated, for instance, by Mr. M. Fracarro's report. Important in this connexion are the French studies of consanguineous marriages.

Mr. C. Stern also stressed the gaps in our knowledge regarding the relation of fertility to intelligence and especially regarding the extent to which environmental influences determine intelligence test performance. Too much insistence on this lack of knowledge may, he felt, be misleading by giving the impression that there is no genetic factor in intelligence. Mr. Stern suggested, therefore, that a balance be struck between these two points of view and that it should be accepted that differential fertility will have an effect on the qualitative genetic endowment of a population, since, particularly in countries with considerable social mobility, the assumption might be made that there are genetic differences between the socio-economic groups.

#### *Studies of methodological interest*

(1) Messrs. J. Meerdink and P. de Wolff reported on an inquiry which is of considerable methodological interest. This inquiry affords an indirect measure of the relation of intelligence to social and demographic variables, where direct estimates could not be obtained. By relating the test scores of Amsterdam army recruits to the social and demographic characteristics of the wards of Amsterdam from which they were drawn, confirmation of Holland could be obtained of many of the findings reported from other countries where direct measures could be used by the investigators. Certain findings are of special interest. They found, for instance, that premarital conception was more closely related to intelligence than was size of family. The investigators suggested that this correlation may reflect either differences in effective intellectual planning or differences in social mores, since these wards differed from one another in their social class composition.

(2) Another approach is that to be used in the proposed inquiry into promising families to be carried out by the Eugenics Society, London. Mr. C. Darwin reported that this study would attempt the assessment of intellectual and of personality factors.

#### SUGGESTIONS FOR FUTURE RESEARCH

(1) Several speakers, among them Messrs. M. J. Aubenque, R. C. Cook, L. Livi, J. Maxwell, H. V. Muhsam and J. A. Sutter suggested that the relationship of height to family size, about which a great deal is known, would provide a useful model to be studied to clarify the general principles involved.

(2) The geneticists in particular stressed the value of twin studies. Some like Mr. F. H. Osborn favoured the study of random samples of twins; others like Mr. J. A. Böök preferred the investigation of twins



whose intelligence test results lie at the extreme ends of the distribution curve. Mr. Böök argued that, with a random sample, the majority will be of average intelligence, thus having a gene combination which is very common in the population. By selecting extreme plus and minus variates more infrequent gene combinations would be obtained, which would make it easier to highlight significant differences between identical and fraternal like-sexed pairs as far as the genetic components were concerned.

(3) Mr. M. V. Muhsam referred in addition to the need for studies of all aspects of growth including physical and mental, because certain lessons to be learned from other aspects of growth might be most valuable guides for the interpretation of mental test data. It has been shown for instance that children reach their adult height sooner than their parents did, without, necessarily, reaching a higher stature, and that girls from higher socio-economic strata menstruate earlier than those from lower strata, without exhibiting, necessarily, higher fecundity. Similarly, it is possible that today Scottish children mature mentally at an earlier age than they did 15 years ago, so that at 11 years of age they may show a better performance on certain intelligence tests, without, necessarily, reaching a higher level of intelligence at maturity; they might even reach a slightly lower level, as predicted on the basis of the negative correlation between fertility and intelligence. To test this hypothesis, the

children would have to be retested on reaching adulthood.

(4) Mr. M. Fraccaro pointed to the value of studies of isolated communities such as the one carried out in northern Italy.

(5) Nearly every speaker mentioned the importance of follow-up studies, not so much those of selected groups of which Terman's inquiry is the most outstanding as those of a random sample of the population. Regret was expressed at the difficulty of enlisting the help of foundations for follow-up studies of such populations. It was very strongly felt that only by the most careful collection of social, demographic and intelligence test data and by long-term follow-ups, could any real advance be made in a field where we do not as yet understand clearly the casual relations among the multiplicity of factors involved. It is for this reason, too, that speakers welcomed the interdisciplinary character of much of the research that had been done.

The discussion in this meeting was based on the background papers provided by Miss A. Anastasi, Messrs. J. Maxwell, J. Meerdink and P. de Wolff, J. A. Sutter, and P. E. Vernon. In addition to these authors Messrs. M. J. Aubenque, C. P. Blacker, J. A. Böök, S. Chandrasekhar, R. C. Cook, M. Fraccaro, D. V. Glass, C. V. Kiser, O. Klineberg, H. V. Muhsam, F. H. Osborn and C. Stern participated in the discussion.

### Meeting 26

## DEMOGRAPHIC ASPECTS OF ECONOMIC AND SOCIAL DEVELOPMENT. IV. INTERRELATIONS OF POPULATION, ECONOMIC DEVELOPMENT, AND SOCIAL CHANGE (WITH SPECIAL REFERENCE TO PLANNING SOCIAL AND ECONOMIC DEVELOPMENT PROGRAMMES FOR UNDER-DEVELOPED COUNTRIES)

### Report on the meeting prepared by Mr. P. M. Hauser, Rapporteur

#### INTRODUCTION

This meeting, focused on the interrelations of population, economic development and social change, was the fourth of a series of meetings devoted to the consideration of the demographic aspects of economic and social development. The other meetings (20, 22, 24) were concerned with population in relation to the development of agricultural and non-biological resources and to capital formation, investment and employment.

This meeting dealt with population both as a determinant and a consequence of economic and social change, with special reference to the planning of economic and social development programmes in under-developed countries. Special attention was devoted to the problem of the extent to which rapid population growth obstructs efforts to raise the levels of living of the peoples in the less developed areas. Although the meeting was most closely related to the above-mentioned meetings, it also drew on the discussions in the meetings on mortality trends in areas of higher mortality (meeting 4); on fertility trends in areas of higher fertility (meeting 8); on the social aspect of population changes (meeting 28); and on the design and control of demographic field studies (meeting 21).

The meeting was organized around three main topics as follows:

1. Gaps in knowledge about population and economic and social development, with special reference to the less developed countries;
2. Case studies of the interrelationship between population, economic development and social change; and
3. Demographic research and the formulation of economic and social development programmes.

#### 1. GAPS IN KNOWLEDGE ABOUT POPULATION AND ECONOMIC AND SOCIAL DEVELOPMENT

The Population Division of the United Nations Secretariat submitted a paper for this meeting based on its recent significant and monumental work, *The Determinants and Consequences of Population Trends*.<sup>1</sup> This paper, a brief summary of much that is known about the interrelationships of demographic, economic and social change in under-developed countries, sets the stage for consideration of what is not known. It sets forth the population problems of the under-

<sup>1</sup> Document ST/SOA/Ser.A/17, United Nations 1953. (Sales Number 1953.XIII.3).

developed countries in these terms: In practically all of the less developed areas of the world for which data are available, the birth rate greatly exceeds the death rate. Natural increase in many of the less developed countries is about 2 per cent per annum. The prospect is that their population is likely to grow rapidly. Although declining mortality has in the past been associated with rising levels of living, this association seems no longer necessarily to hold. Rapidly growing population in some areas augments problems created by the shortage of land. In favourable circumstances, industrialization may utilize rapid population growth as an aid in obtaining a higher level of living. It cannot be expected, however, that industrialization will provide an easy answer to all of the under-developed countries. Major obstacles to industrialization include a limited amount of capital, and a scarcity of workers with the necessary skills. Rapid population growth intensifies the shortage of capital and tends to decrease the ratio of productive to dependent population.

In brief, under-developed countries have three principal population problems: (1) their high birth rates create a heavy load of dependent children per adult which retards savings and capital formation and augments the difficulties of educating the population; (2) falling death rates with high birth rates result in rapid population increase which aggravates the shortage of capital and increases the difficulties of raising levels of living; and (3) in some cases excessive density of agricultural population in relation to the area of cultivated land retards economic development. Essentially, these same three problems are outlined in Mr. F. Lorimer's paper.

In the under-developed areas, according to the United Nations paper, the balance of births and deaths will continue to be the major determinant of population trends. Emigration does not offer a practicable solution to the problem of population growth, at least in the largest and most populous of these countries. High birth rates are likely to continue for some time, although increased research on suitable methods of family planning may affect future birth rates. To raise levels of living, economic development must "over-balance the natural growth of population" within the under-developed regions.

Mr. Lorimer points out in his paper that progress in achieving an understanding relation between population and economic development has been hampered by misdirected attention to issues not amenable to scientific determination. "Traditional questions" associated with the Malthusian controversy tend to be futile, riddled with ambiguity, and loaded with emotional bias. A restatement of problems in this field with respect to real issues in public policy and with attention to the nature and limitations of our present knowledge is needed.

Mr. Lorimer attempts to state the problem in "operational" terms subject to scientific study and stresses the importance of considering the relationships between particular social conditions, demographic trends and economic development in specific situations.

In addition to the papers prepared by the United Nations Secretariat and by Mr. Lorimer, the meeting considered the preliminary report of an expert committee which had been appointed by the United Na-

tions, with the co-operation of the United Nations Educational, Scientific and Cultural Organization, the International Council of Social Sciences, and the Social Science Research Council, to examine the gaps in knowledge of the interrelationships of population, economic and social development, with special reference to under-developed countries. This preliminary report was prepared by Mr. F. W. Notestein, the Committee's rapporteur.

The Expert Committee took as its point of departure the longer United Nations publication referred to above; this study indicates the inadequacies of present knowledge of the interrelationships of population, economic and social change, especially for purposes of dealing with practical problems in the less developed areas. Basic population data are entirely inadequate for most of the world's population. Demographic theory is over-simplified and often obsolete. We are far from being able to evaluate the consequences of specific changes—population, social or economic.

The Committee made fifty specific recommendations on subjects that need to be studied; those deemed particularly important include references to: (1) the establishment and improvement of basic series of population and vital statistics; (2) the preparation of an international reference volume of basic statistics for as long a historical period as possible; (3) studies on human fertility with special reference to the status of women, the role of education and the part played by religion; (4) studies on the development of family planning, with special reference to the technology of family planning and its rate of spread; (5) studies on concealed unemployment in agriculture, and labour likely to be released by better agricultural methods; (6) studies on social mobility and its stimulation; (7) studies on linking efforts to improve public health with other forms of modernization; (8) studies on problems of incentive.

The chairman of the meeting Mr. Hla Maung, opening the discussion, spoke from the standpoint of an official charged with the responsibility of preparing and implementing economic development plans. He stressed the importance of data for planning in two respects: first, the need for the collection, analysis and interpretation of relevant data; and second, the use of the data in the formulation of plans.

Demographers can perform an essential service in planning economic development, the chairman said, by bringing "their present knowledge and their battery of modern instruments and devices" to the under-developed countries concerned with development programmes. Demographers can also perform a major service by producing population projections and providing guidance that will insure a rate of growth that will not jeopardize efforts to raise levels of living. In this connexion, however, demographers must not be too pessimistic. They must bear in mind the experience of the Western world and especially that of the United States and the USSR which belies Malthus's gloomy outlook.

Restrictions of rates of population growth may be necessary in some countries but not in others. Each area must be studied separately and the population factor considered under specific economic and social conditions.

Further discussion emphasized the fact that demographers must meet the challenge posed by economic programmes. Despite the many gaps in knowledge, there is much that the demographer could do that would be useful in economic and social development. No economic development plan is possible without demographic data. Statistics on population, births and deaths, age structure, geographic distribution and occupational classification are needed. Population is the basis for an economic plan.

It was pointed out that we do not know enough about what rates of population growth under what specific social and economic conditions are optimal for a given area. The relations between population and economic conditions are much more clearly understood, in their general outlines, than the relations between population and other non-economic features of civilization and culture. Yet, information on the latter relations is essential for an adequate basis for national policy.

It was suggested that theories concerning the effects of population change on economic growth of the under-developed countries are better-developed and better-founded than theories concerning the effect of economic change upon population growth. There is a theory that nations passing through a transition from a low-income agricultural economy to a higher-income industrial economy typically pass through a certain cycle of falling death rates followed after an interval by falling birth rates. But this theory is mainly based on the experience of Europe and countries of distinctly European culture overseas, and it may not be applicable in other areas with very different cultures. Furthermore, there has not been adequate opportunity to observe the possible effects of Government measures of policy designed to facilitate the planning of families in under-developed countries. One must be cautious, it was emphasized, in extrapolating the experience of the Western world to determine the prospects of contemporary under-developed nations. The conditions which confront under-developed nations today and the characteristics of these nations are quite different from those of the more developed nations at the initial stages of their development.

Under-developed countries today, it is often said, have less favourable conditions for development than those of European countries in the eighteenth century. For example, they do not have the prospects of benefiting from colonial profits. On the other hand, they can benefit from the much higher level of technical knowledge. They are able to adopt the most developed technology without going through elementary or intermediary stages of development.

In general, it would seem that rapid population growth under some circumstances may definitely retard savings and capital growth and hamper efforts to raise levels of living. The details of this position are set forth in the United Nations publication and in several of the prepared papers.

Attention was drawn to the importance of considering sociological factors, such as the intellectual, religious, moral and artistic, which affect economic development. The major factor in explaining differences in economic development among nations is not to be found among technical factors such as capital, investments, etc., but in the human will—the will to

progress. It is essential to make each citizen understand that he has a role to play in progress. The fundamental cause of economic progress is the progress of experimental science. It is the spirit of experimental science which must be caught by the masses of the under-developed nations. The will to progress is something rare in the history of mankind. The basic question is how to develop the will to progress and to maintain it among both the élite and the mass of the people.

Modern technique makes possible knowledge about the population itself. Such knowledge is an important tool necessary for economic development. Gaps in our knowledge, it was stated, fall into two broad categories. The first, the "particularistic", relates to our ability "to predict the specific responses of individual variables to specific change". The second is an inadequacy of "synthesis". We have only a limited ability to utilize the particular information at our disposal in order to trace the net consequences in demographic, social, and economic trends of any given system of change. Particularly stressed was the importance of research designed to discover the effect on fertility of a variety of programmes designed to extend popular education, enhance the status of women, and spread the practice of family planning. Also stressed was the importance of study of the "population-resource-technology complex" and of the construction of models showing the relationship between demographic, economic and social development under varying assumptions.

In addition to the chairman, Mr. Hla Maung, the principal discussants on this topic were Mr. J. D. Durand, Mr. J. Fourastié, Mr. P. H. Hauser, Mr. F. W. Notestein and Mr. A. Sauvy.

## 2. CASE STUDIES OF THE INTERRELATIONSHIP BETWEEN POPULATION, ECONOMIC DEVELOPMENT AND SOCIAL CHANGE

In addition to specific case studies of individual areas, two general papers were presented on this topic, one by Mr. S. Kuznets and one by Mr. T. Minoguchi.

Mr. Kuznets compares the economic position of the under-developed countries today with that of the more developed countries in their pre-industrial phase, defined as the time when six-tenths or more of their labour force was engaged in agriculture. The comparison shows that the more developed countries in their pre-industrial phase enjoyed a *per capita* income several times higher than that of most under-developed countries today; that, unlike the latter, they were at that time at, or near, positions of economic leadership and had already experienced a long period of growth and expansion under conditions of political independence—growth initiated much earlier by the intellectual (Renaissance and Reformation), political (formation of national states) and geographic (discovery of the "New World") revolutions.

In comparison with the older (European) developed countries in their pre-industrial phase, many under-developed countries today show much higher rates of over-all population growth—traceable partly to higher birth rates, partly to lower death rates, and partly to negligible loss by emigration.

Mr. Kuznets emphasizes the following implications of his analysis: (1) It is far from safe to extrapolate

economic or demographic trends as observed for the developed countries to current and prospective levels for the under-developed. (2). The great difference between economic levels, social framework and demographic patterns of the developed and under-developed countries itself is an important factor affecting policy and prospect of economic growth in under-developed countries. (3) Study of the economic development of the area must take into account the changing world scene, the historical heritage of each country, the timing of its development, etc. To understand the problems of growth of the currently under-developed countries, particular emphasis should be placed on the study of the development of those countries "whose effective entrance into the process of rapid economic growth and industrialization came late". (4) Many of the countries which have more recently become industrialized, for example the USSR and Japan, are still in the process of economic growth. The experience of such countries should be particularly valuable. The experience of "late comers" in Latin America and in the Near East might be particularly valuable to the other countries in those areas. (5) "The very width of the gap between developed and under-developed countries today may also be indicative of the wealth, and the variety of the economic potential that must exist in the under-developed areas. The realization of even a minor share of this potential might mean striking relative increases in their economic performance". (6) A variety of national studies are needed for countries of different size, historical heritage and the timing of their industrialization. Time series are desired permitting the study of secular change. Cross-country comparisons and projections are helpful in providing suggestive ideas but do not provide adequate or testable conclusions.

Mr. Minoguchi points out that the effects of population growth are quite different in the under-developed and the more developed countries. Rapid population growth in pre-industrial under-developed countries with little division of labour tends further to decrease an already low productivity. In contrast, in highly industrialized countries with an extensive division of labour, population growth tends to increase productivity.

A more extensive division of labour does not necessarily accompany population growth. In consequence, increased population does not necessarily mean an increased capacity to support population.

Increased capacity to support population does not necessarily result in rapid population growth. In the more developed and industrialized countries, the rate of population growth has declined or the population has become practically stationary. Mr. Minoguchi holds that such declines in the rate of population growth are not to be explained by economic factors but rather by social changes. More specifically in societies characterized by a class-structured type of living, that is "status-befitting-living" tradition bound so as to preclude acceptance of new and higher levels of consumption, increased productivity does not necessarily lead to higher levels of living. It is for this reason that the birth rate remains high with initial increases in productivity. The birth rate declined in the more developed countries only after class-structured types of living broke down, and human values changed.

Among the case-study papers presented was one by Mr. H. Belshaw summarizing recent population growth in New Zealand in relation to levels of consumption, with some comparisons with Asian countries. He makes the following points:

(1) If a country is subject to constant returns, capital must increase at the same rate as population to maintain levels of consumption or output per head, apart from innovations. An increase in output per head requires a more rapid rate of increase in capital. In the absence of innovations and a continuously higher rate of increase of capital, the increase in output would eventually disappear because of the decline in the marginal productivity of capital. With increasing returns due to economies of scale, output per head may be maintained with a slower rate of growth of capital than of population. Except in the rare case of a pioneer society with an abundance of natural resources resulting in increasing factor returns to labour, output per head will grow faster with a slower than a faster rate of increase in population.

(2) Innovations and the rate of capital formation in New Zealand have enabled *per capita* output and consumption to grow, but the growth would probably have been greater with a slower population increase.

(3) Currently, the rate of population increase in New Zealand is higher than in most Asian countries, but in the latter, prospects for economic development are precarious. Morbidity conditions and the demographic pattern in Asian countries cause the ratio of effective labour supply to population to be much lower, and disease and inadequate nutrition lower the quality of the labour force. Unemployment due to a shortage of effective demand is less significant in affecting the ratio, but institutional unemployment and under-employment are of great importance.

(4) Improved health and nutrition are necessary to improve the ratio and the quality of labour in Asian countries. But such measures would increase the rate of population growth. Even with present rates of growth, savings are barely adequate to maintain output per head, and more rapid population growth would increase capital needs. The organization of idle or near-idle labour for capital formation and other production might make an important contribution; but since economies of scale to population growth are usually unlikely, any cumulative increase in output per head would peter out if it depended on accelerated capital formation alone. Family limitation programmes are desirable, but early results are unlikely. This line of argument reinforces the need for international capital aid and technical assistance.

Messrs. C. F. Taeuber and H. Miller in their paper on the United States say that during a span of less than 100 years, a period ending about 1870, the United States changed from a predominantly subsistence agricultural economy to one well-advanced on the road to industrialization. Although the country possessed vast resources, these were largely unrealized at the beginning of the period. Economic growth was gradual until (a) new equipment had been fashioned to increase the productivity of agriculture and of industry; (b) transportation facilities had been created; and (c) the institutions which made possible the assembling of

the required capital were developed. Foreign capital and foreign workers were attracted to the new country. It would be another 50 years before the shift from debtor to creditor status was to be accomplished.

The demographic transition in the United States was a rapid one, with fertility declining more rapidly than mortality. Declining fertility was associated with growing industrialization and urbanization, and probably with increasing age at marriage. Urban population, even in colonial times, had lower fertility than rural and agricultural populations, but all groups, except for the inhabitants of some isolated areas, shared in the decline of fertility. Economic development proceeded in all parts of the economy. The needs for manpower in the non-agricultural industries could be met by the surplus manpower from farms, and by tapping the manpower resources of overseas areas.

The setting in which economic development took place in the United States, as Messrs. Taeuber and Miller point out, was markedly different from that confronting some of the countries which are embarking on programmes of economic and social development at the middle of the twentieth century. During the period of most rapid population growth, the thinly settled frontier to the West always had room for yet another farm. Long before the land frontier was gone, other resources were being developed, and industry had grown sufficiently to provide opportunities for the population not needed in agriculture.

Another major difference is that the demographic transition in the United States took place at a time when improvements in mortality were relatively slow, compared with the possibilities from the application of modern methods of disease prevention and control. The factors leading to a reduction in fertility appear to have been more effective, and fertility declined more than mortality. The result was a decline in the rate of natural increase, which continued into the period of rapid economic development. The transition from high mortality and high fertility to low mortality and controlled fertility was made in a setting in which the agricultural and industrial frontiers continually called for additional manpower.

Mr. A. Bonné, in his paper on population and economic growth in the Middle East, points out that the demographic conditions in this region have followed in recent years the pattern which has become a common feature of many under-developed countries. While birth rates remain in general high and do not show great fluctuations, death rates tend to decrease substantially. The result is an accelerated growth of population which exceeds considerably the pace of growth in most Western countries.

The relation between population growth and economic growth in the Middle East has been observed for a considerable time with great concern. Most observers including official committees predicted a deterioration of levels of living in the light of demographic data, in particular because of the high birth rate and the decreasing mortality rates. These data, though they are scanty and for most of the countries not reliable, show indeed the phenomenon of a rapidly growing population which would, without a corresponding economic expansion, cause severe hardship.

The appraisals referred to did not, Mr. Bonné says, take sufficiently into account the potential natural re-

sources of the region nor appreciate their bearing on the problem of capital supply for important countries in the region. Land resources, especially for irrigated agriculture, are abundant in a number of countries (Iraq, Syria, Iran, Turkey) and far from being fully utilized. More important, the potential development has been fundamentally altered by the ever-growing findings of oil in the region. The magnitude of oil production is already amazing and will reach in a short period one quarter of world production. Proven oil reserves of the area comprise more than half of the world's reserves.

While the potential of future economic growth is very substantial for the region as a whole and for a number of Middle Eastern countries in particular, recent economic developments have not been even in the various parts of the region. In some countries such as Turkey and Kuwait, the rate of economic growth has been sufficient not only to maintain the existing population but to allow for substantial improvement. In other countries, primarily Iraq, Syria and Iran, economic growth hitherto has been limited in spite of the remarkable unused potential. In the case of Egypt, Mr. Bonné says, the potential growth in agriculture would hardly suffice to balance the needs of the rapidly increasing agricultural population. Substantial improvement would require a resolute policy of industrialization and the introduction of birth control.

Recent trends of economic growth in a number of Middle Eastern countries contradict thus the gloomy views on the development prospects of the area, except those pertaining to Egypt. For all the other countries, the pace of actual development, as well as the potential of probable expansion, has to be regarded as much larger than originally assumed. In Mr. Bonné's view, the experience of the last four or five years justifies the belief, not only that the requirements of the population increase can be met, but also that there is room for improvement in levels of living. The obstacles to such a development are not of an economic nature.

During the discussion of population problems in the Middle East, it was said that fertility and mortality patterns are like those of other under-developed areas and pose serious problems for raising levels of living. A country which is in the stage of development needs to be fully aware of the facts about its possibilities and limitations. The countries of the Middle East, it was said, are now trying hard to achieve such knowledge. They are trying to avoid the mistake of underestimating their difficulties, for which solutions have to be devised.

Egypt, it was said, is now trying to augment her national wealth by innovations of various types, but mainly in the form of industrialization. At the same time, she is trying to attract foreign capital, and even foreign talent, by providing several types of safety measures and privileges. Moreover, the labour force is being gradually increased, and efficiently, by the gradual introduction of women into all professions and all walks of life.

Needed, it was stated, is a redistribution of population in Middle East countries. Some countries of the region are sparsely populated and yet in need of people with experience in certain occupations; Syria, Iraq and the Sudan are in need of agricultural

labourers. It will undoubtedly be to the benefit of the whole region if its countries interchange portions of their populations according to their needs. Thus, the recipient countries will benefit from the experience of specialized immigrants, and the population pressure in the sending countries will be alleviated.

Two papers on the USSR were presented; one by Mr. W. W. Eason and one by Mr. T. V. Ryabushkin. The paper by Mr. Eason describes and evaluates some of the relationships between population growth and economic development in the USSR which appear under conditions of Soviet economic planning, as gathered from information in Soviet sources. The rate of population growth is seen to have followed an over-all downward trend since the beginning of the First Five-Year Plan (1928), the result of a fall in the death rate by 9.3 per thousand, and a fall in the birth rate by about 17 per thousand, compared to respective pre-plan levels. The various phases through which the downward movement has passed, and the influence of economic factors, the effect of changing rates of population growth on the rate of growth of the Soviet economy, and the implication of these considerations with respect to future population growth are discussed.

The growth of the urban population by 54 millions in about 25 years, or by more than three-fold, is presented in relation to the growth of the total population, showing that the rural population (on comparable territory) has fallen to near 60 per cent of the total, but in absolute terms (within the limits of our ability to estimate from Soviet sources) has remained equal to the rural population in pre-plan 1926 or has perhaps declined by as much as 16 per cent.

The distribution of the population and labour force between agricultural and non-agricultural sectors is discussed. The non-agricultural sector (on comparable territory) may have declined by 10 to 20 per cent, with most of the decline in the pre-war period.

The importance of women in the Soviet economy is presented in terms of changes in the sex composition of the labour force. Of the total number of collective farmers and workers and employees, comprising most of the labour force, more than half are seen to be women.

Figures on the rapid growth of the educational system are included in a brief discussion of the problem of skilled manpower, a problem which has been especially acute in a country which entered the planning era with the vast majority of the population lacking any formal education and having no experience in an industrial society.

Mr. Ryabushkin sets forth "the Marxist-Leninist theory of population" and criticizes prevalent Neo-Malthusian tenets. His leading idea is that population phenomena depend on the character of the social system and that there are no "universal superhistoric laws" of population change. The experience of the Soviet Union is generalized to document the dependence of population dynamics on social-economic conditions.

The "level of mortality" in the USSR, Mr. Ryabushkin says, is lower than in the United States, England and France and, contrary to the experience of Western European countries where rates of popula-

tion growth declined, the population increase of the Soviet Union continues at a higher level.

The rates of increase in productivity in the economically developed countries over a long period of time are greater than rates of population growth. Proper use of natural resources and national wealth on behalf of the total population can, with modern technology, produce a "normal level of life" for a population two to three times as numerous as the present population of the world. Mr. Ryabushkin holds that the proposals of the Neo-Malthusians to restrict population growth are "anti-scientific" and "reactionary" and are belied by the experience of the USSR.

Mr. B. Minc, in a paper analysing the case of Poland, presented as his leading idea the dependence of population phenomena upon a specific social and economic order. There is no such thing, he said, as a law of population which exists for all places and all times. It is necessary for science to study the applicability of regularities or laws in concrete terms. Demographic changes must be studied in relation to economic and social changes in specific cases. Poland was used as a specific case to document the position that her socialist social and economic order, achieved after World War II, accounts for the decrease in her death rate, the increase in her birth rate and rate of natural increase, and cessation of emigration. This is in contrast to the situation under monopolistic capitalism and foreign control of capital before the war, when Poland's birth rate and rate of natural increase decreased and emigration, associated with high levels of unemployment, was high.

Mr. Minc pointed out that the rise in Poland's post-war rate of natural increase is in contrast also with the rise in natural increase in capitalist countries, in that it persisted up to 1953. The higher post-war birth rate and rates of natural increase of capitalist countries lasted only a short while and had dropped by 1953.

The post-war increase in Poland's population growth occurred despite the unfavourable structure of the population produced by pre-war population trends and war losses and despite an increase in the proportion of urban population. Poland's post-war rise in natural increase and lowered death rate are associated with increased industrial production, increased agricultural production, the abolition of unemployment and various national welfare programmes. These results of a socialist economy, Mr. Minc stated, support Marxist theory and demonstrate that the law of population growth in a capitalist society is different from that of a socialist society. In a socialist society, conditions are favourable for high fertility and rapid population growth. Poland's experience demonstrates that the study of demographic questions must be associated with the study of social and economic conditions, the development of a national economy and the levels of living of the different classes of the population.

During the discussion, it was brought out that the experience of the communist countries is at variance with that of capitalist countries. The economic and social organizations of the communist countries, it was claimed, resulted both in increasing rates of population growth and rising levels of living. The materials



in the papers on the USSR and on Poland were cited as demonstrating the validity of Marxist population theory and the weakness of the Neo-Malthusian position.

The paper on Poland and Mr. Ryabushkin's paper on the USSR were criticized on the grounds that misleading conclusions were drawn from the international comparison of crude death rates because differences in the age- and sex-structure of populations were not taken into account. Moreover, it was stated that age-specific mortality rates in Poland decreased from 1931-32 to 1948, as well as from 1948-52. The conclusion that Poland's rising rate of natural increase was attributable to her transformation to a socialist economy was also challenged. Such a conclusion could not be drawn without first accounting for the important population transfers which occurred and the changes in national boundaries.

In the discussion of Mr. Ryabushkin's paper, it was pointed out that the effects of urban-rural shifts, war losses, and changes in the population structure should be distinguished before changes in the birth rates of the USSR could be explained. Moreover, it was pointed out that more statistics are needed about the USSR to support the generalization made. Without adequate statistical evidence the conclusions drawn, it was stated, could not be accepted by scientists.

In defence of the papers by Messrs. Ryabushkin and Minc, it was said that these papers confirmed the basic theses of Marx and Lenin. In a socialist economy, unlike capitalist societies, there can be no surplus population or over-population. Social and economic conditions and the actual living conditions of the people in specific countries determine their population growth. The Neo-Malthusian use of India as an example of too rapid population growth is fallacious. Economic growth can keep up with and proceed more rapidly than population growth.

It was stated by others that, in most papers on problems of under-developed areas submitted to the Conference, the main theme was that population growth in such areas outstrips economic growth. The charge was made that these conclusions were arrived at under assumptions which took population dynamics fully into account but neglected the dynamics of production. The potential of productivity per worker is largely determined by the volume of natural resources and produced capital goods. Both aspects of production dynamics, it was said, have so far only been inadequately treated. As long as we do not possess a fairly well established frame of estimates for both potentials, productivity as well as production, we should not claim too much validity for conclusions as to the future ratio of population growth to economic growth. The Middle East was mentioned as an interesting case of underrating the potential of production of a whole area.

The developed countries, it was said, took fifty to seventy years to achieve an equilibrium in their economic structures. The development of the capitalist economy was produced by capital accumulation; feudal institutions were destroyed; the colonial system facilitated capital formation; and the exportation of capital to new countries encouraged economic expansion. Such conditions no longer exist. Capital

formation is very limited in under-developed countries because of their low national income. If initial industrialization is directed at energy resources, transport and communications and the development of natural resources and an industrial base, a high *per capita* investment is necessary for each additional worker. If the rate of investment is increased, consumption may decline, reacting unfavourably on a potential expansion of an industrial production and above all of tertiary activities. Under such conditions economic aid from abroad is necessary.

It was also stated that the difference between the population characteristics of the under-developed and the more developed countries tends to reduce the importance of observed differences in the economic situation of the two groups of countries, based on crude economic statistics. Under-developed countries have a comparatively high birth rate and a large average size of family. Since family consumption does not increase proportionally with family size, an increase in average income accompanied by a decrease in family size does not bring a proportional improvement in average economic well-being, i.e., real economic progress under these conditions is less than the apparent progress. On the other hand, it was said, a given proportion of unproductive persons among the population of working age is a greater burden, from an economic point of view, in the under-developed countries where families are large than in the more developed countries where families are smaller.

Participating in the discussion on this topic were Mr. B. Minc and Mr. T. V. Ryabushkin, who presented data supplementing and defending their papers on the USSR and Poland, respectively; Messrs. W. W. Eason, P. M. Hauser and W. P. Mauldin, who criticized the papers on the USSR and Poland; Messrs. A. Bonné and H. M. Husein, who discussed particularly the problems of the Middle East. Messrs. G. Frumkin, M. Macura and M. de Vergottini contributed to the general discussion on the interrelationship of population and economic and social factors.

### 3. DEMOGRAPHIC RESEARCH AND THE FORMULATION OF ECONOMIC AND SOCIAL DEVELOPMENT PROGRAMMES

Three papers were received on this subject, one by Mr. P. M. Hauser, one by Messrs. T. Moscoso and B. Harris, and one by the secretariat of the Economic Commission for Asia and the Far East.

The third of these papers brings out the fact that Asia, with 53 per cent of the world's population, has, next to Europe, the highest density of population. While it has been possible to bring down death rates even with relatively limited expenditures on health programmes, birth rates have remained unaffected. Because of this widening spread between fertility and mortality, there is the danger that gains in production will be largely consumed by increasing numbers so that the system will remain in a stable equilibrium of poverty and ill health. If this is to be avoided, the growth of real income should be faster than the growth of population. There are, however, serious limitations to the extent to which production can be increased in a short time.

Alongside the attempts to increase all forms of production, the more densely populated Asian coun-



tries should also formulate appropriate population policies. In this respect the study of factors affecting the fertility of the peasant populations constitutes the most important single item of demographic research in Asia.

The extent of unemployment and under-employment is another important factor in policy-making. The peculiar features which have led certain agrarian societies toward industrialism should be examined in this connexion. Another aspect which deserves special attention is the changing relation between rural and urban population. The general nature and significance of internal migratory movements should be studied if planning is to be purposeful.

Messrs. T. Moscoso and B. Harris refer to an apparent disparity between demography and development planning based primarily on the differing time-sequences of the two sciences. This division is more apparent than real and can be overcome through a longer-range and more comprehensive outlook on the part of the development planners on the one hand, and through more attention to short-term and small-scale population movements by demographers on the other hand. The experience of Puerto Rico indicates that the development planner needs detailed information on short-run changes in population and labour force, and on the basic factors affecting internal migration at all levels short of national boundaries. It is urged that demographers and sociologists pay more attention to such problems, and in general that co-operation between demographers and development planners be furthered.

Mr. P. M. Hauser states that the less developed areas of the world now attempting to raise their levels of living through induced economic development are faced with the prospect of rapidly increasing populations absorbing much of their gain in productivity and output. It is important, therefore, that the planning and implementation of economic development programmes include provisions for the study and, as far as possible, the control of the population factor as it affects economic development. This will involve explicit provision for the collection of general population, labour force, and vital statistics and the utilization of such population data as may be available as by-products of Government administration. Such statistics must be collected within the framework of a general statistical system. Recent developments in the theory and practice of sampling human population make feasible, even in the less developed areas, the collection of population, labour force, and vital statistics on a benchmark and current basis; and make feasible also a sample "family survey" to obtain general population and vital statistics where no censuses or registration systems exist. The study and control of the population factor, Mr. Hauser says, will also involve explicit provision for the analysis of population data and their interpretation in relation to economic development. Finally, in addition to provision for the routine collection and analysis of population data, it is desirable to keep abreast of, and to undertake, demographic research related to specific development problems.

The study of the population factor and economic development involves statistical and demographic competence. It will usually be necessary in less developed areas undertaking economic development programmes to arrange for technical assistance in statistics and

demography as well as in other aspects of development programmes.

In respect to the role of demographic research in economic development programmes, it was pointed out during the discussion that more collaboration is needed between demographers, economists and other social scientists. Specific avenues of research had been proposed in the report of the United Nations Committee of Experts on gaps in knowledge. It was proposed to define in more detail the objectives of economic and social development programmes, as a first step towards determining the gaps in knowledge and the specific types of research that may be needed to carry out such programmes. Two main objectives of social policy were mentioned in this connexion:

(a) The creation of optimum social conditions required for the carrying out of economic development programmes (sphere of production),

(b) The bringing about of an equitable distribution of national income (sphere of consumption).

To translate these objectives into well-defined programmes for social development will be possible, it was said, only if and when the basic demographic data are further refined along the lines indicated in many of the discussions at the Conference. It is of the greatest importance that, increasingly, these demographic data be more closely related to specific factors determining economic development, and to the needs of specific social groups. For example, while it is important to have separate series of data concerning the age structure of a population, on the one hand, and national income, on the other, this will not be sufficient if decisions have to be taken concerning the organization of a social security system. For that purpose, it will be necessary, for example, to refine the available data in order to get an insight into the variations in income among specific age groups.

Emphasis was placed also on the need for more precise data concerning the levels of living. Economic and social development in essence being dynamic processes, it is of the greatest importance to determine, at any given point in these processes, the actual levels of development achieved. In this connexion, attention was drawn to a publication of the United Nations entitled *Report on International Definition and Measurement of Standards and Levels of Living*.<sup>1</sup> Many of its recommendations were proposals concerned with improvements in demographic research which might be derived primarily from short-range improvements in census statistics and regular governmental administrative statistics, supplemented by sample surveys.

In the discussion of available agrarian and natural resources, one or two of the most important ones, it was stated, have been largely overlooked. One of them is the impact of future scientific progress. If possibilities of improving the balance between land available and human demand are being assessed, it is not sufficient to start from present scientific knowledge. Future technical innovations, one of the aspects of further social development, have to be considered as essential resources. Scientific progress can be planned, paradoxical though it sounds. Social inventions and innovations are also to be considered as resources.

<sup>1</sup> Document E/CN.3/179—E/CN.5/299, United Nations, New York, 1954 (Sales Number: 1954.IV.5).

When there is a question as to whether enough fertile lands are available, most experts leave out of consideration the lands which cannot be effectively tilled under present conditions. But, what is too expensive today, for example from the point of view of the private individual, may pay its way tomorrow under changed circumstances. Stress was laid on the importance of research on international movements of capital, on migration and on the whole interrelated complex of economic and social phenomena in relation to demographic changes. The magnitude and importance of these problems called for international co-operation in such research.

Principal discussants on this topic were Messrs. A. van der Goot, J. Mertens de Wilmars, and W. F. Wertheim.

### CONCLUSIONS

The specific case studies presented served the purpose of posing and illustrating some of the more important problems in the relationship between population growth and social and economic factors as related to economic development. The case studies, together with the demographic literature cited, indicated that, in general, rapid population growth in an agricultural economy subject to decreasing returns will tend to depress levels of living, and may retard economic development. On the other hand, at some stage of industrialization, when economies of scale are achieved, rapid population growth may promote economic development, since population plays the roles of both producer and consumer.

There are three ways in which rapid population growth in the under-developed countries may obstruct economic development and rising levels of living. First, rapid growth may aggravate an already high density of population in relation to land and other natural resources. Second, rapid growth creates a greater need for capital investment to increase *per capita* output than would be necessary with relatively slow population growth. Third, a high birth rate creates a heavy load of dependent children which tends to retard savings and aggravate the problem of capital shortages.

These conclusions, while subscribed to by a number of demographers were, in general, challenged by some participants who stressed the fact that in the experience of the more developed countries productivity increased more rapidly than population even under conditions of relatively rapid population growth. Participants from communist countries held that the experience of their countries demonstrated that rapid population growth would not retard economic development. In accordance with Marxist-Lenin theory, there could be no surplus labour supply and, consequently, no over-population. The economic and social organization of the communist countries, it was claimed, resulted both in increases in rates of population growth and levels of living.

New Zealand and the United States were presented as illustrations of countries in which rapid population growth was accompanied by an even more rapid increase in productivity and levels of living. The New Zealand experience, however, was interpreted as indicating that the increase in output *per capita* would have been even greater had New Zealand's rate of population growth been slower.

The situation in the Middle East in respect of economic development was viewed as exceedingly difficult, especially in the case of Egypt, because of high fertility and high mortality patterns, but it was not regarded as hopeless because the potential for future economic growth in this area was regarded as substantial.

There seemed to be general agreement, that it is not safe to extrapolate the early experience of more developed countries in efforts to foresee the problems of economic development in less developed areas of the world. The conditions which confront under-developed nations today and the characteristics of these nations are quite different from those of the more developed nations at the initial stages of their development. The more developed countries in their pre-industrial phase had much higher *per capita* incomes than contemporary under-developed nations; they were at, or near, positions of world economic leadership; they had already experienced a long period of growth and expansion under conditions of political independence; they benefited greatly from the Renaissance and Reformation, rising nationalism, and the discovery of the New World.

Under-developed nations must face many problems in their efforts to raise the standards of living of their peoples. Scarcity of capital probably requires the importation of foreign capital. Peoples must acquire incentive and the will to progress, and modern techniques must be utilized to awaken the national consciousness in this regard. A relatively small proportion of the national income of the developed areas could do much to finance economic development in the less developed areas, but there are of course many obstacles in the way. In the final analysis, the population problem of under-developed areas varies with the individual area and must be approached on a specific basis.

In respect to gaps in knowledge on the interrelations of economic, social and demographic factors, the meeting indicated that, although the demographer has much to contribute on the subject, particularly as related to problems of economic development, he also has much to learn. The demographer must take seriously the challenge posed by economic development programmes and help to provide the additional knowledge which is needed to facilitate the problems of raising levels of living in under-developed areas.

In general, the major gaps in present knowledge of the relationship of population to the problems of economic and social development are of at least the following types:

- (1) Gaps in basic population data—statistics from censuses, sample surveys and vital registration systems are inadequate for most of the world's population;
- (2) Gaps in demographic theory which is often over-simplified and, to a considerable extent, obsolete;
- (3) An insufficient basis for predicting specific demographic consequences of particular economic and social changes, and a practically non-existent basis for prediction in the opposite direction;
- (4) An inadequate fund of data on specific sequences of interrelated demographic and economic and social changes;
- (5) Limited marshalling and organization of demographic data to meet the policy and administrative

needs of specific economic and social development programmes.

The gaps in knowledge, of course, highlight the areas in which further research is needed. Knowledge both of a particularistic and synthetic type is needed: the former to determine the effects of particular social and economic factors on population; the latter to develop interrelationships of demographic, social and economic factors in a total situation. Stress was laid on the importance of "operational research" related to problems of development programmes as distinguished from polemical and abstract consideration of traditional demographic problems. More collaboration in research is needed between demographers, economists and other social scientists.

Specific types of needed demographic research were indicated in the fifty recommendations for further study made in the Report of the Committee of Experts on "Gaps in Existing Knowledge of the Relationships

between Population Trends and Economic and Social Conditions". These included studies ranging from the improvement of basic data, bibliography, theory and analysis, on the one hand, to specific substantive researches in both developed and under-developed areas on the population-resources-technology complex and the interrelations of population change and changes in social and economic factors. Regarded as equally important was research on conditions under which population growth might obstruct or accelerate economic development and parallel studies on conditions which result in decreases in mortality and conditions which could rapidly reduce fertility rates or increase productivity.

Economic development programmes should include a provision for the collection of demographic data and for demographic research as necessary tools for planning purposes and for the effective administration of specific development projects aiming to raise levels of living.

### Meeting 27

#### MISCELLANEOUS NEW CONTRIBUTIONS TO DEMOGRAPHY

##### Report on the meeting prepared by Mr. G. de Meo, Rapporteur

The Preparatory Committee of the World Population Conference foresaw that various contributions might be made which, while relevant to the general subject of the Conference, could not readily be classified under the topic of any meeting. A special meeting, meeting 27, was therefore organized to facilitate discussion on various topics of this kind. The Chairman of this meeting was Mr. L. Livi and Mr. G. de Meo was rapporteur. The contributions were on diverse subjects. For convenience of discussion, the Chairman grouped them according to these four broad topics:

1. Methodological contributions relating to life tables;
2. Studies on education and literacy of populations;
3. Studies on ecological and economic characteristics of populations;
4. Questions relating to the organization of demographic statistics.

##### 1. METHODOLOGICAL CONTRIBUTIONS RELATING TO LIFE TABLES

The Chairman gave the floor to Mr. P. J. N. Delaporte to introduce this subject. The construction of life tables is of interest both to demographers and actuaries; in fact the history of life table construction is largely a history of co-operation between scientists in these two fields.

For demographic purposes, those life tables are most suitable which portray accurately the mortality rates for each age. This purpose can be served by methods far simpler than the mathematical formulae devised for actuarial purposes. Demographic analysis of the causes of deaths at various ages, on the other hand, points the way towards comparatively simple yet relevant actuarial methods. Continued close co-operation between demographers and actuaries is therefore both

desirable and promising. In this connexion, the initiative taken recently by the International Labour Office was mentioned. Reference was also made to the International Actuarial Congress of 1951.

As was suggested at that congress, a distinction might very well be drawn between actuarial science in a narrow sense and in a wider sense. The latter, which is indispensable for programmes of social security, requires ample recourse to demography and various branches of economic science. As Mr. K. B. Madhava pointed out, there are actually no frontiers to actuarial science. It has given rise to life insurance, social insurance, and insurance of crop and livestock, all of which have helped to improve material living conditions. The same methods may also find application in much wider fields, where mathematical models can permit statistical inference. The value of actuarial methods to demography is undeniable.

Mr. J. A. Bourdon expressed some doubt whether actuarial methods have not led demographers astray. Life tables represent in general the mortality risks to which persons of all ages are subjected at a given moment of time. Children born around the time for which a life table was constructed may, at first, be subject to the life table mortality risks in childhood. Yet, with the passage of time, as they reach adult ages, they will be subject to different mortality risks than those which pertained to adults at the time to which the life table refers. Hence, for the purpose of population forecasts, actuarial life tables can be misleading.

Mr. Delaporte conceded that most life tables are, in fact, life tables of a given moment of time. Nevertheless, in addition to the construction of such "current" life tables, much work has been done to derive "generation" life tables in which the mortality risks for persons born at the same time are traced from their childhood to their most advanced ages. In addition,

"mortality surfaces" have been studied in which time is one co-ordinate and age another. A length-wise section in a mortality surface corresponds to the current life table of a given moment. A diagonal section, in which time is related to the simultaneously advancing age of an identical population group, results in a generation life table. Unfortunately, generation life tables covering the entire life span can be computed only for long periods of the past, assuming that vital registration over the entire period has been accurate. Hence, for most practical purposes, demographers will have to derive whatever use they can from current life tables.

## 2. STUDIES ON EDUCATION AND LITERACY OF POPULATIONS

Very useful cultural and social information can be obtained from a demographic study of literacy and education. In introducing this topic, Miss N. Federici noted that, though a rather imperfect index, the measurement of literacy is still most useful in broad international comparisons, since more detailed and internationally comparable statistics on educational attainments are not yet available for many countries.

While the proportion of literate persons in a population can be determined relatively easily, methodological problems arise when it comes to a measurement of progress in literacy. Thus, one might measure the relative increase in the proportion of literates or the relative decline in the proportion of illiterates. Other methods are also possible. The results of various methods, however, differ widely. If the proportion of literates was initially low, a relatively large rise in that proportion may still signal a relatively very slight decline in the proportion of illiterates. Conversely, if at an earlier period there was already a high proportion of literacy, a very slight increase in this proportion can correspond to a sharp decline in the proportion of illiterates. How the progress of literacy ought to be measured in actual practice will depend on the point of view from which the problem of illiteracy is being studied. Since progress in literacy can vary greatly among different age classes, much more detailed study is desirable, provided the relevant statistics are available.

Literacy has been a subject of special study in Romania during recent years. The annual censuses of literacy have shown tremendous progress and will therefore not have to be continued any further in the future. Incidentally, the Romanian literacy censuses, in conjunction with annual censuses of children in pre-school ages, have furnished useful data for the study of fertility and mortality.

Where statistics on educational attainment exist, new methods of analysis can result in hitherto unsuspected cultural information. This was demonstrated in the study by Mr. C. A. Anderson and Miss M. J. Bowman presented to this meeting. The statistical device used in this analysis consists in the computation of a "convention index". This index records any deviations from a cumulative "normal" distribution of educational attainments which, theoretically, would correspond to a straight line if plotted on probability paper. Wherever it is conventional for a population group to aim at a certain minimum educational target, school education is more often discontinued when the

target is attained than either one year prior or one year subsequent to its attainment. This is the phenomenon which the "convention index" records. Though subject to some possible pitfalls in interpretation, this index is very useful. It shows with regard to detailed statistics for the United States, that education is widely diffused and that conventional targets are not strongly pronounced in industrial urban communities; here the comparative equality in education stands in marked contrast with the inequality of incomes. In agricultural areas, notably in the South of the United States, relatively high targets of education are largely restricted to a cultural élite and conventional norms are marked accordingly.

These findings are quite parallel to the results of a similar study of educational norms in Italy. Miss N. Federici also found that in industrial northern Italy education is widespread and no longer a characteristic of social-class distinction, whereas in agricultural southern Italy the educational standards of the majority have remained comparatively low while those of a small minority are very high. The similarity of the conclusions of both investigations, conducted in such different countries as the United States and Italy, emphasizes their great utility.

## 3. STUDIES ON ECOLOGICAL AND ECONOMIC CHARACTERISTICS OF POPULATIONS

Although nearly all censuses record urban and rural population and the population in communities of various sizes, many important relationships between the populations in different categories of communities have hitherto been little studied. This topic was introduced by Mr. G. Galeotti. Reference was made to two papers, one dealing with the mathematical relationships in the geographic distribution of population, the other with certain economic relations between town and country.

In the first of the two papers, Mr. C. M. P. Alves Martins observed that the distribution of population among communities of various sizes can be expressed by a mathematical law closely similar to Pareto's curve of the distribution of incomes. This theorem was demonstrated with the statistics of Portugal, the United States, and the State of New Hampshire. While it was emphasized that mathematical models of this type are very suitable for purposes of simplification and description, the discussants were sceptical of their value for purposes of statistical inference. A curve of this type, which is most conveniently plotted on double-logarithmic graph paper, has the property that small variations in its parameters result in large variations in the absolute numbers, thus greatly restricting its practical utility. The Chairman regretted the absence of Mr. Alves Martins, who might have given some valuable comments with regard to the practical value of his analysis.

The second paper, by Mr. R. Dugrand, considered the distribution of rural land properties among the residents of particular towns, on the basis of data obtained from cadastral registers. This analysis lends itself to a vivid graphic presentation of the extent to which rural properties are owned by urban residents and of the extent to which various social groups benefit from such properties. Mr. P. O. L. George pointed out that it represented the first study of this

type yet undertaken and that such studies should be encouraged since they can show most clearly some of the social and economic relations between town and country. It was regretted that this study was geographically restricted to a small number of communities. If conducted on the scale of a large region or an entire country, this type of investigation would be most valuable.

#### 4. QUESTIONS RELATING TO THE ORGANIZATION OF DEMOGRAPHIC STATISTICS

Mr. P. M. S. Gasc commented on his paper which describes a practical method of obtaining additional information from the statistics of families generally compiled in France. In the available statistics, French families are classified by the following characteristics: number of children of any age; number of children aged less than 14, less than 18, and less than 21 years. With a minimum of mechanical tabulation of punch-cards, the method proposed makes it possible to obtain as by-products the distributions of families according to numbers of children between two age-limits (other than age zero) such as, e.g., children no longer subject to compulsory education who have not yet attained majority, i.e., at ages between 14 and 21 years, etc. For the first time in France, a complete distribution of families according to children in each class of ages has been elaborated in 1946 by the Institut national de la Statistique et des Etudes économiques.

Mr. I. U. Pisarev made some comments on the organization of demographic statistics in the Soviet Union, about which comparatively little is known outside that country. He emphasized that, to understand the nature and importance of Soviet demographic statistics, it is necessary to recall the great changes in economy and society which have occurred in that country. Economic production is planned, agriculture is collectivized, ownership of productive property is public, and crises and unemployment have ceased to

exist. Under the conditions of central planning for the welfare of the society, statistics are of special importance, being a means of studying the effects of, and requirements for, a variety of economic measures. Demographic statistics are derived from censuses, the registration of vital events, the registration of particular groups of the population (such as voters, school children, rural households, etc.), the accounts made in industrial enterprises, and other data. The speaker noted the scientific character of the design of statistical operations, and the high degree of public cooperation in such undertakings. As a result, a great variety of statistics become available, making an essential contribution in the comprehensive planning for the economic growth and social well-being of the country. Some of the economic achievements of the Soviet Union, such as the remarkable increase in the volume of industrial production during recent years, were also mentioned.

The Chairman regretted that, despite the high quality of Soviet demographic statistics indicated by the speaker, their usefulness to international science is severely limited by the fact that only very few of the resulting figures have become publicly available. He deplored especially the lack of absolute figures. It was also pointed out by Mr. G. de Meo that the recently published crude death rate of 8.9 per 1,000 for the Soviet Union—assuming that it is in accordance with standard statistical definitions, and admitting that it represents a tremendous advance over the high death rate of forty years ago—cannot be readily interpreted. It remains uncertain whether this really represents a low level of mortality as compared with that of Western Europe in view of differences in age structure, differences in recent trends, and the unknown level of the Soviet birth rate. Only the release of more detailed information, including absolute figures and figures by age groups, will enable Western students to appraise the current demographic situation of the Soviet Union.

### Meeting 28

## SOCIAL ASPECTS OF POPULATION CHANGES, WITH SPECIAL ATTENTION TO INTER-DISCIPLINARY STUDIES

Report on the meeting prepared by Mr. F. Lorimer, Rapporteur

### INTRODUCTION

The social aspects of population changes have been more neglected in the past than population changes as such or their economic aspects. This fact may be attributed, in part, to the need for basic information on changes of population and to the intensity of interest in economic problems. The neglect of the more subtle social relations in scientific demography must also be attributed, in part, to a lag in the development of adequate methods of scientific analysis in this field. Increased recognition of the importance of social organization, culture, and psychological factors in human affairs and recent advances in the social sciences have led to a new emphasis on such studies. Accordingly, in planning the Conference, it was agreed that one meeting should be especially devoted to this topic.

One general subject within this broad field was selected for consideration: the contribution of inter-

disciplinary studies to the understanding of inter-relations between population trends and patterns of family life. The Chairman, Mrs. A. Myrdal, in opening the meeting emphasized the joint responsibility of historians, economists, anthropologists, sociologists, psychologists, and demographers for studies on the social aspects of population changes, and the need for co-operation among investigators approaching these problems from various angles and with various skills. She proposed, in the interest of an orderly discussion, that attention be given to the following four phases of the relations between patterns of family life and population trends:

1. Traditional family patterns in different cultures;
2. The impact of changes in economic and social conditions on the family, with special attention to areas in process of industrialization;
3. The changing Western family;

#### 4. Special research problems and techniques.

The first of these topics is a sequel to the discussion of demographic studies of preliterate peoples in meeting 15 and at some points the discussion drew on material presented at that meeting. The second topic is, in effect, part of the series of meetings on the demographic aspects of economic and social development, which were treated primarily with respect to various economic problems in meetings 20, 22, 24 and 26. The discussion of changes in family life in the Western world is most closely related to that of fertility trends in areas of lower fertility (meeting 6), while the last of the four topics deals with some aspects of demographic field studies considered in meeting 21.

#### 1. TRADITIONAL FAMILY PATTERNS IN DIFFERENT CULTURES

Some salient points in present information and hypotheses about families in relatively stable non-industrial societies were reviewed by Mr. M. Fortes, in the context of general anthropological theory, on the basis of background papers presented to the Conference by Mr. M. Gluckman, Mr. J. E. Goldthorpe, Miss H. N. Granqvist, Mr. K. Nomura, and Mr. N. V. Sovani and the recent United Nations Educational, Scientific and Cultural Organization study entitled *Culture and Human Fertility*.<sup>1</sup>

The maintenance of a society is a hazardous undertaking under primitive conditions. The frequency of death in pre-industrial societies is an underlying factor, affecting all aspects of life including institutionalized religious beliefs, as evidenced by practices centred on ensuring fertility and on eliminating the distress and disturbance caused by death. The continuance of a society requires the "social replacement" of one generation by the next. This is a two-fold process, involving both the physical replacement of members lost by death and the constant re-building of the skills, ideas, and activities which make human life *social*. Even physical replacement requires that children not only be born alive but also be reared to reproductive ages. And their "societization" is no less vital to the life of the community.

Perhaps, under some conditions, the begetting of infants might be adequately provided by "Mother Nature," by sexual impulses. But, even if this were possible, the rearing of children requires a close co-ordination in pre-industrial societies between a system of family organization and systems of control and manipulation of reproductive and productive resources. In pre-industrial societies the rearing process is mainly carried out within the family, so that the study of family systems and their operation is the primary link between anthropology and demography. And the study of marriages, births and deaths in pre-industrial, subsistence societies has implications for the understanding of demographic phenomena under different conditions.

The need for maintaining a stable social order, as an explicit or implicit aim of pre-industrial societies, gives rise to distinct patterns of family life which often show a remarkable tenacity in the face of large economic and political changes. This is indicated in

the reports on the Japanese and Indian family systems, and in the reports on the West African Ashanti in the UNESCO study. On the other hand, there is more indication of the break-up of traditional family patterns in Uganda. In this connexion, it must be noted that the kinds of family system found in pre-industrial societies depend in part on the general framework of the societies in which they fit. Changes in this framework, such as new differentiations due to technological changes, will therefore affect family structure. The tenacity of family patterns in some rapidly changing situations is, therefore, all the more surprising. It reveals the persistent force of ideals of conduct laid down in the rearing of children.

It is important to differentiate between three distinct aspects of family systems: (1) the procreative aspect, including the nurture and rearing of children, (2) the economic or domestic aspect, including residence arrangements and household organization, and (3) the jural aspect by which obligations and rights are laid down and sanctioned. The primary reproductive resource of the community is the fertility of women, but this requires mating for its realization. Actually we find that mating for procreative purposes is universally subject to jural regulation. However, in many pre-industrial societies jurisdiction over the reproductive resources of the community is not vested primarily in the nuclear families, which are the actual reproductive units, but in larger component groups, usually formed on a kinship basis, which also have important economic and religious rights. The role of lineage systems in many societies in this connexion is stressed in the UNESCO study. Various institutions connected with marriage, such as the bride price among Palestinian Arabs mentioned by Miss H. N. Granqvist and in many other populations, are significant in this context. Control over the fertility of a woman is initially vested in the group that reared her. The transfer of this control to another group requires public recognition, and often requires compensation.

The situation is quite different in this respect in societies that group people and attribute legal status by reference to matrilineal descent from what it is in patrilineal societies. In the former case, the rearing group retains its control over the woman; all her children become its assets. This distinction may have an important bearing on the extent to which unsatisfactory marriages may be ended by divorce. According to the hypothesis advanced in the paper by Mr. M. Gluckman, this propensity is significantly greater in matrilineal societies, and there is much evidence in support of his position. On the other hand, strong emphasis on the role of either matrilineal or patrilineal lineages may be generally associated with strong sanctions for high fertility. In many societies sexual aspects of marriage, as distinguished from procreation, are treated as largely a private affair subject to personal feelings and moral ideas, whereas fertility is treated as the concern of a larger group, often with little attention to personal feelings.

Clearly if a joint family or lineage has responsibility for assuring the nurture of children, who increase its strength as compared with other groups, it must control the productive resources with which to fulfil this task. This is in fact the case. Control over transmission of material and institutional assets is a distinctive characteristic of extended family and lineage arrange-

<sup>1</sup>Zürich, 1954 (Sales No.: SS.54.XI.1A).



ments. The desire of such groups for the control of ample reproductive resources and their desire for large productive resources and power are complementary. The absence of emphasis on such arrangements in Western European society, even prior to the industrial era, may have had far-reaching importance, as suggested in the UNESCO study. But in Asia, as in Africa, the unit of domestic economy is often a larger group, with larger joint resources, than the nuclear family which is the unit of procreation.

The jural aspect of family organization must be distinguished from its biological aspect. In many African societies as in ancient Rome a child is recognized as a member of the family of his mother's husband, without respect to its biological paternity. This emphasis on the legal basis of family relations, as contrasted with biological origin, is reflected in various institutions in many societies. Mr. K. Norimura's exposition of the role of jural principles in the development and reconstitution of family systems in Japan is particularly illuminating in this respect. Moreover, his account reveals the force of a joint family system in Japan even where, on superficial observation, there would appear to be only nuclear families. He also suggests possible relations between systems of family organization and levels of mortality mentioned at the beginning of this statement.

The speaker concluded by noting that in view of the diverse aspects of family organization in various societies, the scientist concerned with the investigation of family characteristics and their relations to demographic trends must exercise care in defining precisely the phenomena which he proposes to measure.

A question was raised about the attitudes of various populations toward their own number, as related to their ideas of numbers in other populations. In the case of some African pygmies, according to Mr. J. Stoetzel, ideas on this subject are quite contrary to fact. What are the prevalent attitudes on this matter in various populations and how do they influence behaviour? Similarly, it is important to take account of ways in which affective attitudes in different societies toward the family as a social structure are differentiated from affective attitudes toward personal and sexual relations.

We need systematic tests of many current hypotheses, such as the thesis mentioned above about an association between frequency of divorce and matrilineal inheritance.<sup>1</sup> In this case, as suggested by Mr. K. A. Busia, investigation of the relation of divorce to residence of wife where, as among the Ashanti, this may be either in her natal home or with her husband, affords one possible approach. Similarly we need more information on the relation of divorce to fertility in situations—as among the Ashanti and in modern America—where high frequency of divorce is associated with high frequency of remarriage.

The comparability of research findings in different situations can be damaged by unconscious prejudice in the selection of topics for investigation. The papers on the family in industrial societies place emphasis on such subjects as the role of the wife, the sharing of authority, parent-child relations, psychological atti-

tudes, and the influence of differences in level of family income. These questions have been neglected in studies of the family in pre-industrial societies. On the other hand, some of the aspects emphasized in the latter are neglected in studies of technically advanced societies. We need to seek comparable information in different situations. We must also exercise humility with respect to the limits of our knowledge about personal relations and personalities.

Inter-disciplinary studies seem particularly important at this time in studies of social change in situations where formerly isolated societies are now affected by new contacts, new ideas, changes in economic structure, and the differentiation of economic activities.

## 2. THE IMPACT OF CHANGES IN ECONOMIC AND SOCIAL CONDITIONS ON THE FAMILY, WITH SPECIAL ATTENTION TO AREAS IN PROCESS OF INDUSTRIALIZATION

Problems of changes in social life resulting from the impact of new forces on previously isolated societies, with special attention to family relations, were introduced by Mr. F. Lorimer on the basis of background papers presented by Reverend S. de Lestapis, Mrs. R. Sofer, Mrs. Y. Talmon-Garber and Mr. B. S. Platt. He noted that, under different social conditions, technological changes might stimulate the progressive adaptation of patterns of social life to actual conditions or might lead to confusion, conflict, or apathy. He suggested that changes in family relations may play the key role in cultural responses to new conditions.

Several of the participants in the meetings on economic development had already emphasized the importance of social and psychological factors in these processes—notably in the paper by Mr. S. Kuznets, and in interventions by Messrs. J. Fourastié, A. Sauvy, and others. We know little, and we need to know much, about how specific characteristics of the original culture and particular factors among new influences and transitional processes influence these responses. Did emphasis on the nuclear family in the pre-industrial European society facilitate social adjustments to technological changes? What conditions are conducive to an orderly transition from emphasis on lineage systems to emphasis on the nuclear family in adaptation to technological innovations and differentiation in economic activities? How may leadership roles in economic and demographic transitions in various countries today differ in nature and scope from the roles of leaders during early industrialization in Europe? These questions merely illustrate some problems on which more intensive inquiry might yield very useful information.

The speaker then directed attention to the paper by Reverend de Lestapis on the psychological conditions of prosperity in populations with high potential for population growth. He noted certain areas of agreement and of disagreement between his own treatment of this problem in the UNESCO publication, *Culture and Human Fertility*, and the statement by Reverend de Lestapis.<sup>1</sup>

There is recognition in both treatments of the critical importance of social and psychological factors in econ-

<sup>1</sup> For a statement of methodological problems and preliminary findings in an investigation on this subject, see J. A. Barnes, "Measures of Divorce Frequency", in *Royal Anthropology Institute of Great Britain and Ireland*, Vol. 89, Nos. 1, 2, 1949.

<sup>1</sup> For complete text of statement by Mr. Lorimer (in French translation) and statement by Rev. de Lestapis, see: "La conscience humaine avant le problème des accroissements de population", *Revue de l'Action Populaire*, No. 82, November 1954, pp. 947-955.



omic development. Reverend S. de Lestapis also calls attention to problems created by inequalities in the relation of population to resources and by rapid increases of population in under-developed countries. And he affirms that profound cultural and psychological changes are essential to progressive economic development. He warns that unless the social changes stimulated by technical innovations are directed toward a new "sociological equilibrium", the result may be "dehumanisation or proletarianisation". This indicates the importance of respect for indigenous leadership and institutions. It also suggests the importance of programmes both for the education of leaders and for mass education, designed to foster the creative reconstruction of social institutions and cultural values.

Reverend de Lestapis places major emphasis here on the role of moral and religious values in social reconstruction. Mr. Lorimer, as a demographer, emphasizes the possible development of attitudes of indifference and irresponsibility conducive to unregulated procreation. Both Messrs. de Lestapis and Lorimer emphasize the danger of a drift toward "irresponsibility" in personal relations in processes of social transition, and both recognize an "acceptance of responsibilities" as a key value in social relations. Moreover, both contributors recognize the primary family as a pivotal institution in the reconstruction of stable social relations—though relations within the family are influenced by the ways in which families are oriented in other social relations.

They are in agreement in holding that the reflective regulation of procreation, involving mutual respect by each spouse for the interests and personality of the other and concern for the nurture and education of their children, is a characteristic of families with a mature sense of responsibility under contemporary social conditions. There is, however, a significant difference at this point in their interpretation of these relations. Reverend de Lestapis views any resort to contraceptive practices as inconsistent with a creative approach to personal relations and as tending to undermine a sense of social responsibility. Mr. Lorimer, on the other hand, treats contraceptive practices as consistent with positive social values, and as associated in many cases with a sense of responsibility in family relations. Their differences in this respect may be attributed to differences in philosophical premises and values which lie outside the realm of empirical science.

Reverend de Lestapis, in replying to this statement, suggested that Mr. Lorimer had treated social disorganization almost exclusively with respect to irresponsible procreation. He fully recognized the peril of irresponsibility in a population in which there is careless procreation, but he insisted that this is only one of many aspects of irresponsibility and that some of these other aspects may be even more fraught with danger as, for example, irresponsibility on the part of property-holders, large or small, with respect to their social obligations, and comparable attitudes in public affairs both on the national and the international level. There is danger he said, that, in focusing attention on this particular aspect of irresponsible behaviour, attention may be diverted from basic conditions and goals that give persons the sense of being socially productive and creative.

Their different positions with respect to contraceptive methods, Reverend de Lestapis said, arise from

principles that Mr. Lorimer has not fully taken into account. Contraception tends to undermine rather than to stimulate a social sense of responsibility and creative will, so that it is incompatible with a regulation of births only in the service of love that is genuinely altruistic through personal self-mastery. A reflective regulation of births must respect the objective structures of sexual phenomena. In true science both the human body and its psychic attitudes must be taken into account. The physiological cycle of female sexuality thus presents a finding and a value to be respected. Such respect for objective structure does not imply a purely "situational morality" but is consistent with the highest respect for the human will. Respect for these ethical positions will require greater efforts and greater sacrifices as regards economic, political, and institutional reforms, but will safeguard the source of moral energy.

One interesting approach to the study of social changes affecting family life is described in Mrs. R. Sofer's contribution—namely the intensive investigation of particular aspects of the family in one community, with differentiation among sub-groups. In this study, for example, information was obtained for one rapidly changing community in Africa on the changing roles of husbands and wives, the relation of disaffected persons to the initiation of change, cleavages between parents and children, and contrasts in the responses of established residents living in village clusters outside the town and in-migrants with different home backgrounds now living in barrack-like structures in the town. The responses of these two groups are quite different, but the outlook in both cases appears rather dismal. This raises the question as to whether or not new industrial ventures can be considered a positive contribution to sustained economic and social development unless conditions are established that are conducive to normal family relations and aspirations for orderly progress.

The study by Mrs. Y. Talmon-Garber in Israel, which is a veritable laboratory of social change, conforms rather nicely to the conditions of an experimental design. Changing patterns of family life were studied in two contrasting types of community, co-operatives and communal villages—the position of the family as an institution being quite different in the social organization of these two types of community—with use of both quantitative and qualitative information, and with attention to different trends over time in demographic and social behaviour in villages of each type. One of the theoretically important angles of this study stems from the investigation of the operation of community standards on fertility in the communal villages where the economic responsibility has been largely transferred from the individual family to the community.

Research on the relation of roles within the family to the introduction of social changes offers a promising line of inquiry. A social change does not affect all members of a family in the same way. It is, therefore, important to learn which members are likely to initiate variations in accepted customs. There has been some research on this subject among immigrant groups in Israel. In general, women and adolescents show more disposition here toward change than men; but there are differences in this respect among groups. Among families coming from North Africa having been in

contact with French civilization, the men had established more economic and social contacts outside traditional Jewish society, and were therefore more inclined to initiate changes, such as limitation of families, than women. But among those coming from isolated, orthodox communities in Yemen, men are more imbued with traditional norms and therefore less ready to adopt any new modes. The women, on the other hand, can accept manual labour or domestic service without causing loss of status to their families. They often seek advice on birth control methods, whereas their husbands are likely to be opposed to this. In villages organized as collectives (where the family is minimized in the social structure) women are most likely to instigate changes directed toward strengthening the position of families. In the material presented by Mrs. Sofer, divorced women appear most likely to depart from traditional patterns; but being marginal and disaffected, they exert little positive influence. Among many immigrant groups in Israel, the older siblings appear as the most active agents of social change.

Family patterns among educated classes in underdeveloped countries merit special attention, in view of their prestige and influence in spite of their small numbers. Miss A. G. Donnithorne suggested that the second and third generations in these families are subject to unusual social and economic pressures and to Malthusian propaganda. Studies should be carried out on conditions affecting size of family in these groups.

Mr. E. Mesaros stated that a new family code was adopted in 1953 which differs in many respects from that previously in force in Romania and from legal conditions affecting the family in some Western countries. It guarantees complete freedom of marriage, in contrast to conditions in some countries, such as requirements for consent by parents in the case of marriages below certain ages, or the situation in a certain state of the United States where marriage between white and coloured persons is prohibited by the constitution. The new code also provides equal rights and duties for husband and wife in all respects. Couples now decide together in harmony all questions about marriage. The code provides proper regulations relating to family property, divorce, and relations between parents and children.

Mr. J. Fourastié commented that human behaviour, in technically advanced populations as well as more primitive communities, is largely controlled by non-rational ideas: sentimental, affective, ritualistic, artistic, and moral. For this reason, greater attention to the history of art, ideas, and conceptions of world order is required for accurate interpretation of demographic developments.

The analysis of changes in patterns of family life and related social and demographic phenomena under transitional conditions challenges the resources and ingenuity of social scientists today. The indications of work on these problems presented to the Conference are encouraging, but they represent only first approaches to difficult and important problems.

### 3. THE CHANGING WESTERN FAMILY

The discussion of this topic was introduced by Mr. N. N. Foote on the basis of background papers

presented by himself, Messrs. P. C. Glick, E. von Hofsten, A. Lehner and H. W. Schelsky and also reprints from articles on the subject by Messrs. M. Brésard, J. Hajnal-Konyi and C. F. Westoff, which had previously appeared and which had been distributed prior to the meeting. He noted that the Western European family is now undergoing rapid change, perhaps more so during the past 15 years than ever before. One illustration of this is the new emphasis on the sharing of leisure and recreation, comparable to that previously placed on the sharing of work. Some of the demographic factors affecting these changes, described in the paper by Mr. Glick, are earlier marriage, early childbearing, and increased longevity. In the United States the average woman marrying in 1950 will be about 48 years of age when her last child leaves home. The average couple can then expect to have some 14 years together before their marriage is dissolved by the death of either spouse, whereas near the end of the nineteenth century there was a 50-50 chance that such dissolution would occur while there were still children at home.

As shown in recent papers by Mr. Hajnal and in other material, there is evidence of an increasing frequency of marriage at early ages, a decrease in childlessness, and probably an increase in size of completed families among urban salaried groups with superior education. There is even some scattered evidence of a tendency toward reversal of the former differential fertility among occupational classes, i.e., toward a positive association between income and number of children.

The question must be asked as to whether or not this is a transient phenomenon. The educated urban group had the lowest fertility during the depression. If its fertility is so elastic, may this not drop rapidly again? Some reasons can be advanced to the contrary. Major institutional changes have occurred which are irreversible, and which may sustain the present trend. For example, employment in tertiary activities continues to expand at the expense of the primary, and now of the secondary, activities. Employment of married women is also increasing. Suburbanization is an important, irreversible factor in the trend toward the domesticity conducive to larger families.

Within the family itself a change has been taking place which might be described as a substitution of motives in having children. When compulsory education and urbanization deprived children of their economic worth, a period ensued in which the more rational elements saw any large number of children as an impediment. But with the efflorescence of leisure and family living for its own sake, there is a steady growth of non-economic motives for procreation.

Reverend de Lestapis reviewed accounts of the contemporary family in America, by Mr. N. N. Foote, and in Germany, by Mr. H. W. Schelsky. The former takes its point of departure from the changing position of the wife. This has been profoundly influenced by her release from a sense of economic dependence, which formerly hampered the full development of her personality. This release is associated with an increasing sense of partnership between spouses, not only in financial matters and in household tasks that were formerly regarded as strictly feminine, but also extending into common interests in outside occupations, leisure, *et cetera*.

These tendencies sometimes lead to ambivalent and conflicting attitudes, due to their divergence from traditional patterns. Yet women appear in process of resolving the conflict between vocational and feminine roles. In doing so, there is a new emphasis on the feminine role, but with a changed and broader perspective. The parental role remains largely traditional in conception. Nevertheless there is increased emphasis on values associated with children, with acceptance of the child as a person to be nurtured and cherished for his own sake.

In short, and with over-simplification, the picture is presented here of a family oriented toward three major values: community of interests, complementary relations between men and women, and optimism with respect to the future.

The account of the German family presents some similarities, but is developed along a quite different line. It proceeds on an intuition that the German family is conceived as a refuge from an unsatisfactory social order and as an institution with interests opposed to those dominant in the public domain—under conditions disturbed by war, migrations, unemployment, and political crises. As a corollary, there is less emphasis within the family itself on intimate personal values, and the sharing of leisure interests, and greater emphasis on solidarity and co-operation in assuring both economic and personal security.

There has been a decline of paternalism, in both its primary and secondary aspects, within the German family. Authority within the family becomes a personal function, with more equality between husbands and wives in the distribution of responsibilities. There appears, however, to have been a decline also in the degree to which parents are preoccupied by thoughts about children and the development of their personalities.

The German family, in short, is seen as attaining increased solidarity, but at the cost of greater dissociation from other social institutions and some loss in cultural and personal values.

The speaker then described "the French family" as a norm and as observed among those who, though relatively few, exert a powerful influence on future trends through their realization of this norm. He defined this type in the terms of five key values: It stakes its goals on love. The wife is, in all matters, a member of the team. The adult tries to adapt himself to the child's world, and accepts children as persons. The creative will is conscious, rational, and altruistic. It seeks common ground with other families in mutual services, activities, and interests.

Mr. H. W. Schelsky stated that our commonly accepted image of the Western European family can only be found in countries which have a stable, dynamic character, and in which the interests of the public order and the interests of the family are identical to a high degree. A different tendency was present in Germany during the war and the post-war periods and in eastern Europe—due to crises, strains, and systems of public order with aims contrary to those which arise in the private life of families. In such situations the family tends to develop an autonomous stability, dissociated from or contrary to the public order. This tendency is conspicuous among refugees

in Germany. It is also generally characteristic of central and eastern Europe today.

Mr. T. V. Ryabushkin criticized the limitation of the meeting to only one aspect of its announced title. The family is important, but other social changes are also important. Even in treating this topic we have not given enough attention to economic and social conditions which affect the size of the family. Also we should treat various types of families found in different social groups. In the Soviet Union the pattern of family life has been greatly influenced by the principle of equality between men and women proclaimed in the October revolution, and by measures designed for the protection of women. This is illustrated by the role of women in economic and political activities. Women now form 42 per cent of the total labour force of the USSR, and have been especially prominent in medicine and in education. They are also present in large numbers as members of many important councils.

The family must be studied with reference to successive phases of its experience. Mr. P. C. Glick directed attention to various research needs along this line. For example, what relations are there between age at marriage and stability of marriage? Are there optimal limits under present conditions as regards age at first marriage within which family tensions tend to be lessened and prospects for family life improved? We need studies of family dissolution by divorce and remarriage in relation to age at marriage and economic status.

How does employment of women before marriage affect marital adjustment in various phases of later married life? It is possible that such experience leads women to accept motherhood with less anxiety due to increased confidence about the possibility of re-entry into employment when their children no longer need their constant care at home. It may be noted that the number of married women now far exceeds the number of unmarried women in the United States labour force. Does the present small family lead to a prolongation of parental assistance of children, extending beyond their marriage to a sharing of responsibilities for their children's children, thus prolonging the child-bearing phase of the family life cycle? Is there, in other words, any trend toward a new kind of "joint family" pattern?

There was a general recognition in the discussion on this topic that the interrelations between population trends and family life are so intimate and complex that research in one of these fields necessarily involves attention to problems of the other.

#### 4. SPECIAL RESEARCH PROBLEMS AND TECHNIQUES

Mr. O. Klineberg, in introducing this topic, reviewed various prospects and problems in research relating to family and population trends, with special attention to their psychological aspects.

He first discussed research on *opinions* about preferred, or ideal, size of family—with reference to Mr. J. Stoetzel's summary of results from 32 studies in 14 countries and the contribution by Mr. S. Groenman on this subject. He called attention to certain serious problems encountered in such studies.

(a) The problem of international comparability between findings obtained under different conditions.

This problem might, of course, be partially resolved by specific attention to setting up comparable procedures.

(b) The problem of validity. Some general agreement has been noted between variations in statements of opinion and in performance. But more direct and detailed checks are needed.

(c) The problem of depth or intensity of stated attitudes. Attention to this aspect of opinion inquiries is important here, as it is in studies of political attitudes.

(d) The problem of causation. When differences in attitudes to size of family are found in different situations or among different groups, probes into the origin and significance of these differences are needed.

The question of *communication* of ideas concerning the family and the control of fertility, raised by Mr. J. M. Stycos, also deserves an international approach. Here, too, there are many critical research problems. How does communication vary in different cultures and sub-cultures? What different forms will it take? Special attention should be given to groups in which there is a marked difference between the attitudes of men and those of women in this sphere.

The speaker expressed surprise at the statement by Mr. Stycos that over one-third of the couples interviewed in Puerto Rico had not discussed the question of number of children and his conclusion based on this finding that "... the culture in general operates to discourage communication in this area". How can this be said in view of the finding that almost two-thirds of the couples had discussed this subject? In any case, a study of communication between couples in this field needs to be complemented by attention to similar communication in other relations, as between parents and children, and among friends.

The question of the *cost of children*, treated in Mr. E. von Hofsten's paper, suggests two problems to which we might give special attention.

In simpler societies, children are viewed as economic assets rather than as costs. This may still be true, to some extent, in some segments of more complex societies, e.g., in agricultural communities.

How do parents themselves look at these costs? Do they expect to keep up, in other respects, the level of living they might enjoy if they were childless? What costs are they prepared to accept? The implied suggestion is that, as regards prediction of behaviour or the effect of expenditure for children on family relations, the psychological components of these relations must be taken into account.

The interesting question of the relation of social mobility to fertility is treated in the communication from Mr. A. Lehner. His material gives us information about the amount of mobility with some indication of an association between upward mobility and reduction in size of family. Here, too, related attitudinal material might be very useful. We have, for example, found that upward mobile and downward mobile persons tend to have quite different attitudes as regard racial prejudices. It would be important to know how these classes differ as regards attitudes toward size of family—especially in view of the finding reported by Mr. Stoetzel that families with relatively high income tend to favour larger families than those at lower income levels. When, and to what

degree, do attitudes found at one socio-economic level change in the process of social mobility?

The studies reviewed here show the value of utilizing research techniques developed in other fields in advancing knowledge on demographic problems. They also suggest some of the difficulties encountered in making such applications.

Mr. C. Chandrasekaran entered a strong plea for close association between anthropologists and demographers in the development of suitable techniques in demographic field studies. The intensive studies by the anthropologist of small communities are time-consuming, and limit the applicability of his findings. On the other hand, the demographer is concerned with large problems, but he may be pressed to provide rather quickly information about attitudes and motivation with respect to children and family planning. This is the case in India today, where there is great interest in the development of suitable techniques of mass education in this field. Large-scale surveys of attitudes relating to demographic behaviour seem to be required, but techniques for conducting such surveys are not well-developed. Perhaps both large-scale surveys and intensive studies of small groups are needed and should be carried out simultaneously.

It is impossible to review here many of the problems faced in the present field survey now being conducted under the auspices of the Government of India and the United Nations; but one problem may be mentioned. It was initially assumed that the best results could be obtained by women interviewers talking with wives alone. But, especially in rural areas, relatives and friends are likely to be around and the wives may say that these friends know all about the problems and can help in answering the questions. In these circumstances is it best to work in accepted settings or to make a strong effort to obtain interviews with wives alone? This is only an example of the need at many points for co-operation between anthropologists and demographers in some important aspects of research on population questions.

Mr. H. V. Muhsam discussed the use of statistical models in dealing with the question of actual size of family as related to expressed desires of husband and wife, taking account of differences in their ideals. With given distribution of stated ideals by husbands, stated ideals by wives, and actual numbers one can set up models to test various hypotheses, such as the following: The actual size of family may correspond to the number of children wanted (a) by the spouse with the lower ideal, or (b) by the spouse with the higher ideal, or (c) to some intermediate value in cases of disagreement to a high degree. But the extent of correspondence of observations to one of these hypotheses must then be related to the extent of correspondence found between actual size and desired size in cases of agreement between husband and wife before any conclusion can be drawn. He reported briefly on experimentation along this line with data from the Indianapolis study which had been made available to him. Perhaps the most interesting result was the finding that the cases of material agreement between the actual number of children born and the desire of the husband, if different from that of the wife, exceeded by 25 per cent the cases of agreement between the actual number born and the desire of the wife, if different from that of the husband.

Studies of costs of children were discussed by Mr. J. E. van Dierendonck and Mr. E. von Hofsten. It was emphasized that such studies are frequently not applicable to the situation of individual families, but positive information on this subject is important in its bearing on public policies. In the Netherlands a special effort was made through the use of very detailed family expenditures accounts to include all costs occasioned by children, even though this involved some arbitrary principles about allocation of expenditures. Two findings obtained here, but not reported in Mr. von Hofsten's paper, are: (1) the cost of a child during the first year was much greater than during each of the next few years, so that rise of cost with age does not begin until the post-infancy period; (2) the cost per child at early ages is significantly lower in multiple-child families than in the case of a family with only one child. In studies on the relation of the economic status of families to the presence of children (which affects opportunity for employment of wives), a serious error may result from inferences based only on information about money income—to the neglect of contributions by the wife to the home which are ordinarily not taken into account in economic computations. Finally, it was noted that, whereas related attitudinal studies would be useful in dealing with certain problems, as noted by Mr. Klineberg, definite economic information is urgently needed for taking the needs of families with children into account in public policies.

Mr. Groenman, commenting on the paper by Mr. Stycos and others, stated that explicit discussion may not be necessary for agreement between husbands and wives in family affairs, "if both are imbedded in a culture pattern" that carries implicit expectations about size of family. (Note: The paper indicates that this study was concerned with a somewhat different problem, namely, the relation of family communication in this sphere to the initiation of changes in be-

haviour.) His discussion emphasized the importance of implicit motivations and adaptations in contrast to verbal opinions. This point was also stressed by Mrs. Sofer.

Mr. K. Evang stated that inadequate attention has been given to motivations relating to preserving the health and resources of the mother in influencing attitudes about size of family. Emphasis on attention to conditions affecting the health of mothers, both in under-developed and transitional societies and in those technically advanced is, however, properly stressed in the paper by Mr. Platt.

Methods of analysis in studies of the relation of social mobility to fertility were defined by Mr. J. Berent. In one approach, variations in social mobility among different family-size groups are examined. In the other procedure, size of family is measured between groups classified with respect to social mobility. The former method was used by Mr. A. Lehner; the latter has been used by Mr. M. Brésard and by himself. He expressed a preference for the latter method because it obviates the need for any precise measurement of mobility (which involves serious difficulties) and it makes possible measurement of the statistical significance of apparent differences, which is not possible with the other procedure. He suggests that it would be interesting to learn what results might be obtained by application of the alternative method to Mr. Lehner's very interesting material.

The chairman, Mrs. A. Myrdal, in concluding the meeting observed that even after limiting the very broad subject of this meeting to one related series of topics, we still found ourselves engaged in "tentative explorations across an uncharted ocean". There must be far more concerted effort, drawing on the techniques of different disciplines, before a firm basis can be established for far-reaching conclusions on many critical social aspects of population changes.

## Meeting 29

### RECRUITMENT AND TRAINING OF PERSONNEL FOR DEMOGRAPHIC RESEARCH AND TEACHING

Report on the meeting prepared by Mr. O. Cabello González, Rapporteur

#### INTRODUCTION

The object of meeting 29 was to investigate the need for trained personnel in the field of demography in various parts of the world and to determine how these persons might best be recruited and equipped with the knowledge and techniques necessary for producing and exploiting demographic data.

The meeting was organized as a panel discussion on the basis of papers presented by Messrs. H. Alpert, O. Cabello, A. J. Jaffe, G. F. Mair, F. S. Morrison, J. Ros Jimeno and C. F. Schmid, and by the United Nations Secretariat. The following topics were discussed:

1. Fields and forms of training for demographic analysis (introduced by Mr. C. E. Dieulefait and Mr. O. Cabello);

2. International cooperation in training for demographic analysis (introduced by Mr. G. Goudswaard);

3. Needs for inclusion of demographic training in training projects in other related fields (introduced by Mr. C. L. Dedrick).

#### 1. FIELDS AND FORMS OF TRAINING FOR DEMOGRAPHIC ANALYSIS

The needs for demographic data and for their evaluation and analysis have been increasing considerably throughout the world. The demand for information in this field is more pressing in some countries than others, its urgency being related to the degree of development of demography as well as to the demographic, economic and social situation of the country. The supply of personnel with the necessary training for demographic studies also varies from country to country, and in some regions a severe shortage is being felt.

In an effort to define the needs for the training of specialists in this field and to formulate solutions to

some of the problems involved, the authors of contributed papers addressed themselves to the following questions: (1) What are the principal fields of demographic analysis for which training is required? (2) What forms of training will best equip persons for work and teaching in these fields? (3) What criteria should be observed in selecting the trainees? The answers to such questions evidently vary in different countries. Attention was focused primarily on the less developed countries where there are acute shortages of personnel, though the needs of more developed countries were also taken into consideration.

An important question relevant to the fields of training is the relationship between demographic analysis and the compilation of demographic statistics. A proper analysis of the demographic situation and problems of a country is impossible without adequate statistics; on the other hand, even the most complete statistics are of restricted value unless they are analysed and applied by suitably trained persons. Furthermore, an essential requirement for competent analysis of these statistics is an understanding of the methods of collection and the limitations to which the data are subject, just as understanding of the applications of the data is essential for persons engaged in their collection. The training of demographic analysts, therefore, cannot realistically be separated from the training of demographic statisticians.

Nevertheless, the training of personnel to be engaged primarily in the compilation and development of demographic statistics may differ from that of persons who are to take a larger part in research and teaching in this field. As the authors of contributed papers for this meeting stated, in the less developed countries there is a shortage of the type of technician who, without being a professional of the academic variety, would contribute effectively to the improvement of demographic statistics. For example, in Latin America, although there is still a shortage of these "technical demographers", the training of such technicians has done much to make possible the remarkable progress experienced in recent years in the fields of population censuses and vital statistics and has facilitated the development of demographic research in this region.

Various opinions were expressed with respect to the requirements for the training of "technical demographers". Some participants thought that a year's training would be enough to teach them the most current methods used in the production of statistics and give them an elementary knowledge of statistical methodology, economics, sociology and public health. This would equip the technicians with the knowledge necessary to improve the organization and mechanism of the registration system and to provide at least the most basic vital statistics. It would also enable them to understand the uses of the statistics which they produce and to make relatively elementary analyses and interpretations. On the other hand, some participants were inclined to place greater emphasis on the need for academic training as a part of the preparation of these technicians. One participant took the position that there should be a gradual shift of concentration during the training course from in-service to academic training. It was generally recognized as a difficult problem to determine in what proportions the training course should combine academic and "on-

the-job" training, instruction in the methods of data collection and in the methods of analysis, practice in the solution of immediate problems and grounding in the relevant sciences. It was stressed that the solution should be adapted to the specific conditions in the countries concerned.

In training persons for teaching and research at a more advanced level, academic preparation is of course more important than it is in the training of the type of technicians mentioned above. There is a need for increasing the number of persons with such capacities in the less developed but also in the more developed countries. The participants in the meeting felt that before a programme for developing professionals of this kind could be formulated, the position of demography among the social sciences should be considered. On this point, there were some variations of opinion with respect to the relation between demography and statistics. Some participants held that demographers should be professional statisticians with a specialization in population. The more generally accepted view was that demography should be an integrated, inter-disciplinary science.

A study of the ways in which demographers have obtained their training and experience would reveal a diversity of academic backgrounds. Many of them are also regarded as statisticians, economists, mathematicians, sociologists, biologists and actuaries. The techniques of demographic analysis have been acquired in most cases as an area of special interest carried out within the framework of these disciplines, and few people have been trained specifically in the field.

The training of undergraduate and graduate students was considered separately. With regard to training of undergraduates, one participant thought that it might appear to be unrealistic as well as impractical to establish any definite pre-professional curriculum for demographers. This is because, unlike graduate students in many of the physical sciences and in professional schools, those entering demography usually do so relatively late in their academic careers. But as a consequence the students' qualifications and orientation are frequently deficient. He therefore found it preferable that a series of basic undergraduate courses be prescribed for prospective majors in demography. The major goals of such a curriculum are (1) scientific orientation, (2) a liberal education, (3) a well-grounded substantive knowledge of the social sciences including population, and (4) the acquisition of basic skills and techniques for analytical thinking.

The basis for a realistic and functional graduate-training programme for demographers is an appraisal of the services that the demographer is called upon to render. Demographers function chiefly in the areas of teaching, research and administration. One participant thought, therefore, that a programme of advanced training should have the following clearly defined objectives: (1) A mastery of the fundamentals of observation and analysis with special emphasis on statistical techniques; (2) a sound foundation in the social sciences, particularly in sociology, and a comprehensive knowledge of the subject matter and basic theories in the field of demography; (3) an understanding of the theoretical foundation of modern science as well as a sound appreciation of the implications of science to sociological, economic and demographic theory and research; (4) an ability to carry



out independent thought and inquiry including a facility for clear and logical expression.

The participants realized that these objectives could not be achieved through the adoption of a standard curriculum or a standard form of training. It was thought preferable to keep the programme flexible, adapting it to changing conditions and circumstances. Either economics or sociology might be selected as the major field of study, but the overall programme should be inter-disciplinary in nature. This inter-disciplinary training should be governed by the individual needs, aims, interests and capacities of the student. Extensive training in research methods is important, and research methods should be included not only in specialized courses and research seminars but in substantive courses as well. Both quantitative and non-quantitative methods should be covered. Mathematics and statistics were considered items of major significance in the training of demographers, since these disciplines are indispensable to providing the necessary research skills and techniques. Practical training, such as that provided through internships, as well as the theoretical training afforded by the university should be incorporated into the programme. Some participants at the Conference gave preference to practical training in research. They held that after basic instruction, learning in demography is likely to come most rapidly from participation in a variety of going research projects. However, it was clearly shown that the importance to demography of university study in related fields is very great, and especially in a setting conducive to active discussion and thinking.

Some consideration was given to the importance of the doctoral dissertation, language requirements, laboratory facilities and internships in graduate training programmes. It was thought that the dissertation, an important function in any graduate training programme, should be a quantitative study involving an extensive application of statistical techniques and a review of a large body of the literature. Foreign languages were considered an integral part of the training programme, and laboratory facilities were held to be as essential to the training of the demographer as to that of the physical and biological scientist. Internships and other forms of participation in actual research were shown to be valuable aspects of the demographer's training.

The participants also gave some attention to the possibility of selecting certain fields of demographic analysis which particularly need to be developed and to which the training either of "demographic technicians" or of persons more specialized in research might be chiefly oriented, particularly in the less-developed countries with acute shortages of personnel. Although there is an urgent need for specialists in particular parts of the demographic field, it was thought that the need for persons who can effectively perform a wide variety of work in the field is even greater. It was agreed, however, that demographic research and training in these countries should be concentrated on the actual problems which the countries face at the present time, and not on more general or theoretical questions.

The nature of the training programmes and their focus will vary, depending on whether they are given at a national or international centre and also in accordance with the final objectives that are to be ob-

tained. The desired training may be generally applicable to any set of working conditions, or it may provide a knowledge of only those techniques that can be applied under the conditions which prevail in the country where the person works. It was agreed, however, that any specific training programme must be built upon the knowledge which the student brings with him and must also take into consideration the uses which he will make of his training.

The selection of trainees is as important to the success of a training programme as the subjects and methods of training. The participants in the meeting considered the selection a serious problem, primarily because, in terms of employment opportunities, salaries and other inducements, demography is in a disadvantageous competitive position. Nevertheless, it was agreed that, in order to maintain high standards in work performance, careful screening of trainees is essential.

Persons who are to be trained as technical demographers should be selected from high school graduates who are about to enter a specialized field. Other trainees for less advanced work may be recruited from persons who have had practical experience but no formal instruction in the field. The following conditions were considered prerequisites for a career as an advanced demographer: (1) native ability; (2) high academic qualifications; (3) a keen sense for numbers and a special aptitude for handling quantitative data; (4) interest in the field; (5) an inclination towards research and a willingness to undergo the disciplines of research in population.

Several of the participants pointed out the importance of establishing close relations between the universities and the statistical services in a country for the successful operation of a training programme. The training programmes of Australia, where the newly created Demographic Department of the University of Canberra is working in close collaboration with the Australian Census Bureau, were considered a good example. The Government of Egypt recently created a National Committee on Population which will utilize the services of specialists in the fields of economics, sociology and statistics. These specialists will work together in what was cited as further examples of the inter-disciplinary scope of demography and of the value of practical training in research.

The attention of the meeting was called to the fact that none of the papers submitted made reference to the close relationship that exists between actuarial techniques and demographic training programmes. However, several participants recognized that actuaries have made a very fundamental contribution to the science of demography and that if a more detailed study of the subject had been made the role of actuarial techniques could have been more fully determined.

The consensus at the meeting was that there is no need at present for the establishment of a large number of training centres offering programmes at an advanced level. It was felt that perhaps a dozen such schools adequately staffed with qualified faculty would be sufficient. Indications are that the greater need is for intra-regional if not world-wide co-operation in creating training centres in the field of demographic studies.



## 2. INTERNATIONAL CO-OPERATION IN TRAINING FOR DEMOGRAPHIC ANALYSIS

Since relatively few highly trained demographers are needed in each country, their training can be undertaken most efficiently through international co-operation. In specialized fields such as demography, it is too expensive for most individual countries to establish adequate training facilities, and a co-operative international effort seems to be the answer. The need for such a co-operative effort was recognized by many participants at the meeting.

International training on a co-operative basis may be initiated in any of several forms, depending upon the resources available for training and other conditions. Among the forms suggested are: (1) regional institutes for research and teaching of demography, that can be organized on a co-operative basis, with a regular programme and linked to universities with well-developed social science curricula; (2) organization of teams of demographers that could work on broadly defined demographic research projects for periods of varying duration in a particular country or region; (3) modification of existing training programmes, with a better utilization of available experts and visiting professors under a system which would permit the location of training centres in places where it would be possible to gather a reasonable number of students; (4) preparation of manuals and text-books for the use of students, compilations of analytical techniques and collection methods which could be used by students who have no possibilities of carrying out regular studies. One of the participants pointed out that while international programmes of training in a number of technical fields have been developed, little had been done on an international basis for professional demographers. No suggestions for the creation of co-operative centres for training advanced demographers were offered.

The Statistical Training Centre in Afghanistan and the "Inter-American Centre of Biostatistics" established jointly by the Government of Chile, the United Nations and the World Health Organization were cited as examples of successful projects in international co-operative training.

Several participants reported the difficulties that they had encountered in their experiences in the field of international training. It was shown that in addition to the problem of organizing and equipping training centres, the successful operation of these centres is handicapped by the heterogeneous composition of the student body, language barriers and the actual recruitment of students. The students have varying cultural backgrounds, and there are vast differences among them in previous education and experience. Furthermore, they ordinarily do not have a good speaking knowledge of any language except their own. The participants thought it essential that a sufficiently large number of fellowships should be available so that people from less developed countries could be trained for demographic research in existing institutions in more advanced countries.

Some consideration was given to the manner in which international training centres might be set up. One suggestion was that the existing facilities should be supplemented by setting up a limited number of regional institutions for teaching and research in

demography. Such centres should have a permanent or semi-permanent character in order that research might be undertaken.

The following factors were mentioned as fundamental to assure the success of international co-operative training: (1) the programmes must be truly international, reflecting the interests of the various countries in the region; (2) the programme of training should be adapted to the particular region which the project is to serve; (3) the detailed programmes should be made known to the persons concerned in the region; and (4) periodic evaluation of results should be undertaken.

The many views on this subject that were expressed by the participants, together with the marked interest shown in the possibility of extending international co-operative training in demography, reflect the importance of the work accomplished by international organizations in different areas of the world. The participants took full cognizance of the recognition and support given by Governments, in varying proportions, to the great task of improving available demographic data and of securing the resources for the training of personnel—which is indispensable for teaching and research in the field of demography.

## 3. NEEDS FOR INCLUSION OF DEMOGRAPHIC TRAINING IN TRAINING PROJECTS IN OTHER RELATED FIELDS

The different kind of students for whom training in demography is contemplated should be considered when any training programme is planned. The participants pointed out the need to offer some training in demography to students of medicine, engineering, public health and welfare, economics, sociology and so on. Knowledge of the fundamentals of demographic analysis will enable them to recognize and cope with demographic problems in the course of their regular professional duties. It was noted that unless a person has had some formal training in demography, he may not realize or become convinced of the utility of demographic analysis in formulating and evaluating economic, public health, educational or other problems.

Professionals other than demographers work with rates, ratios, and population estimates. They compare different groups and areas; make short or long-run estimates which require corrections for age, sex, births, deaths, migration, etc. This work requires the use of techniques which are not normally a part of the training of persons working outside of the field of demography.

This lack of familiarity with the basic concepts and procedures of demographic analysis is not confined solely or principally to under-developed countries. The publications of many countries often contain absurdities and fallacies which could have been avoided by such simple devices as correcting for changes in the age-sex composition of two populations before making comparisons.

Not only should the fundamentals of demographic analysis be included in special training projects in other related fields, but a way should be found to include the more essential aspects in all regular statistical courses for students in the social and biographical sciences.

## CONCLUSIONS

The conclusions of the meeting may be summarized briefly as follows:

(1) In the less developed countries, where trained demographers are scarce and demography is in a comparatively infant stage, there is a pressing need for technicians capable of producing basic demographic statistics and making relatively simple analyses. Any programme for training such technicians must be flexible, taking into account the varying conditions under which the trainees will work and the tasks they will be required to perform.

(2) Professionals capable of teaching demography and performing demographic research are also sorely needed in highly developed countries as well as in the under-developed areas. The meeting found it impractical to outline a rigid training programme for students who hope to qualify as advanced professionals.

(3) It was agreed however, that the curricula of educational institutions and the programmes of training centres should be designed to give the student a thorough knowledge of statistical techniques and a theoretical foundation in demography and other social sciences. This would enable him to carry on independent inquiry.

(4) In addition to the social sciences, mathematics and statistics, foreign languages, the extensive use of laboratory facilities and internships are also valuable aspects of the demographer's training.

(5) Careful screening of trainees is essential in order to maintain a high standard of performance.

(6) The meeting recognized the need for the establishment of close relations between universities and the statistical services of a country as an important factor in the successful operation of training programmes, particularly local ones.

(7) While there is no need at present for a large number of centres for advanced training in this field, a small number of such institutions in the less-developed regions would be highly valuable. International co-operation in such training would be efficient and economical.

(8) Among the forms of co-operative training recommended at the meeting are: (a) regional institutes for the research and teaching of demography; (b) organized teams of demographers, or missions, that could work for varying periods of time in a given country or region; (c) the better utilization of available experts and visiting professors under existing programmes; and (d) the preparation of text books, manuals and other literature that can be used by students who cannot carry out regular studies.

(9) Co-operative training programmes should be truly international in character and adapted to the region which the project serves. They should be well publicized and subjected to periodic evaluation.

(10) Essentials of demography should be included in the curriculum for students working in other related fields, e.g., public health, welfare and educational research. Technicians in these fields frequently use population census data and vital statistics, but there is also evidence that demographic data are not used as often or as effectively as they might be if these technicians were more familiar with demographic techniques.

## Meeting 30

## OUTLOOK FOR WORLD POPULATION GROWTH AND DISTRIBUTION

## Report on the meeting prepared by the United Nations Secretariat

Since 28 meetings had been devoted to a great variety of topics, a synthesis of the results of discussions was imperative. This need was met by the last two meetings of the Conference.

What will be the changes in the size and distribution of world population during the coming years? Can one distinguish the changes attributable to each of the three basic factors of population movement: deaths, births and migration? These were the points to be clarified first, as stated by Mr. P. K. Whelpton, Organizer and Chairman of meeting 30, in his introductory remarks.

Five broad topics were under consideration:

1. Mortality
2. Fertility
3. Structure of population
4. Migration
5. Future population trends.

For each of the first four topics, two principal speakers had been selected from among the rapporteurs of those meetings where they had been studied in detail. Only one principal speaker dealt with the last topic. In order not to neglect the methodological aspects, two additional speakers had been asked to comment from that point of view on each topic except the third.

## 1. MORTALITY

The countries of the world can be grouped in two categories according to the level of their mortality: economically developed countries, where mortality is low, and economically backward countries, where mortality is high or was high at least until recently. The Chairman indicated that the discussion would begin by considering the first of these two categories. The low level of their mortality is the result of a long evolution during which these countries gradually gained mastery over those diseases due to causes outside the individuals afflicted. Improvements in the level of living and increasing knowledge regarding the behaviour of bacterial diseases have continuously reduced the dangers of infection. Finally, the recent discovery of antibiotics and sulphonamides has completed this social progress of more than two centuries. For the economically developed countries, one chapter in the struggle against death is now closing while, at the same time, a new task is becoming apparent. It is now a matter of combating the diseases caused by internal factors, the debilities of old age; in this field, most if not everything still remains to be done. Having defined the problem in this form, the Chairman called on Mr. M. Spiegelman; rapporteur of meeting 2, who

made the following statement of the prospects in this matter which had emerged from the discussion in his meeting:

"The summaries presented on the course of mortality in countries with lower death rates have a common denominator. Through control of the infectious and parasitic diseases, mortality before midlife has been brought to low levels, with the result that the focus of attention has shifted to the chronic diseases associated with later life. The problems presented within this framework may be conveniently classed within one or more of the following categories.

"1. *Cause of death data:* The scope of cause of death data in countries of low mortality may be considerably enhanced. With the increasing emphasis on the chronic diseases in these areas, there is a growing need for data regarding causes of death to describe more completely the morbid conditions that are involved. Tabulations of single causes of death are becoming less adequate because deaths in later life are frequently characterized by a complex of illnesses. There is need for the study and development of tabulations of multiple causes of death as recommended by the World Health Organization.

"For utility, these data should properly be based upon medical information and must fit into a logical scheme of medical terminology. Comparability of cause of death statistics is helped by observance of international agreements, such as those proposed by the World Health Organization. Nevertheless, important problems still arise from international differences in classification practices in addition to the questions that come out of differences in medical diagnosis and in certification of causes of death. The facts behind these differences and their evaluation are still to be uncovered. Furthermore, for several countries among those with lower death rates, the quality of the cause of death data is rather uncertain. This is particularly the case for those countries that are just beginning to experience low mortality.

"In the current situation reduction in death rates at the older ages is a much more difficult problem than was the case at the younger ages. This situation was created by the great advances in medical science and medical care that have prolonged the lives of many young people with physical impairments which would have taken their toll sooner under earlier conditions. Thus, many of the degenerative and chronic conditions typical of the older ages have their beginnings in earlier years and their origins may be either environmental or genetic or both. As large numbers of such impaired lives are being carried forward, the proportion of them in the total population at the older ages may be increasing, with a correspondingly unfavourable effect upon mortality.

"Several steps may be taken to obtain an insight into this situation. For example, it may be possible, by localized studies, to supplement the data on the cause of death certificate by securing significant environmental, medical, or genetic data from the family of the deceased, from the attending physicians, and from hospital and clinical records. The study in France of 3,500 files of cancer patients is an example of such investigations. It suggested the

use of smoking tobacco and drinking alcohol as a favouring cause of cancer. Another area for development is the long-term follow-up survey in which groups of lives with specific physical impairments are traced forward in time to record their mortality experience. Also, because the chronic diseases are of relatively long duration, there is need for an adequate body of morbidity data in relation to environmental and demographic factors.

"2. *Mortality in extreme old age:* Very little is known of mortality in extreme old age. The difficulty lies principally in the erroneous statement of age in the census and in the vital statistics, while the statements of the cause of death leave much to be desired. This problem is of some importance in the construction of life tables, for the methods used so far in closing the mortality curve at the extreme old ages are purely arbitrary. Also, with the increasing proportion of the aged in the countries of low death rates, a more accurate picture is needed of the death rate for the residual age group shown in published reports.

"3. *Foetal and infant mortality:* The emphasis so far given to the problems of mortality at the older ages should not obscure those of very early life. In almost all countries of the world, infant mortality is declining as a result of the control of the medical causes of death. However, the reductions during the first few days of life have been at a much slower pace than in the remaining period of infancy. This problem cannot be discussed satisfactorily without considering at the same time that of foetal death. The causation of perinatal mortality (foetal deaths plus deaths in the very early period of life) is of a different nature from that in later infancy and the lack of knowledge in this area is great. Even in countries where infant and general mortality have attained their lowest levels, perinatal mortality is still excessively high. Biological, physical, and social factors appear to be strongly associated with this early wastage of life. The nature and relative importance of these factors remain to be adequately explored.

"4. *Socio-economic factors:* Studies of social class mortality are generally derived from death records and census returns of adult male workers, the social class groupings being on the basis of occupation. These studies commonly show an upward gradient in mortality in proceeding from the class of professional workers to that of unskilled workers, although for the first time the 1950 British experience based on sample data showed incidental departures from this pattern. The British studies of the mortality of married women grouped according to the occupation of their husbands indicate that the higher mortality of the lower socio-economic classes is largely a product of their environment. However, this finding does not rule out the effect upon mortality of the occupational hazards of adult male workers in some instances. These British studies, with their analyses by cause of death, are unique in demographic experience; they should furnish an example and stimulus to others. However, there is room for amplification since there are many socio-economic variables influencing mortality within each social class. Among these are family income, the extent of schooling of the family heads, the health

habits of the family, and the level of social and medical care in the community.

"5. *Marital status*: It is usual to find the mortality of the married lower than that of those not married (single, widowed, or divorced), but the selective factors in the situation are still to be determined and evaluated. The selective factors are different for the single, the married, the widowed, and the divorced. Thus, a single person may elect to stay so for health or economic reasons; the same reasons may also cause a single person not to be selected for marriage. It may be asked, for example, whether selection by marriage affects the differential in mortality between the single and the married more in the case of one sex than the other, and also differently at various ages. Another question may be whether the mortality of the widowed is high because they are more heavily weighted with the lower social classes, particularly at the younger ages. Among the married women, studies may be made of mortality in relation to such fertility characteristics as parity and child-spacing.

"6. *Sex differentials in mortality*: A feature of recent mortality changes among the countries of low death rates is the more rapid decline of female mortality relative to male mortality. Such differentials have also been noted for several of the important causes of death. Thus, in many countries of low death rates, cancer mortality among females has declined, but the recorded rate among males has risen. This differential is probably due to advances in diagnostic techniques and an extension of their availability, factors of some significance in view of the large proportion of cancer among males in relatively inaccessible sites. However, for cancer of the lung, the recent marked rise may be significant, with improved diagnosis as a secondary factor.

"Cardiovascular-renal mortality has generally declined at the ages of maturity under 45 years. However, in the important productive ages from 45 to 64 years, the death rates from these conditions rose among males, in most countries, while the rates for females declined. No satisfactory explanation has yet appeared for this contrary trend.

"The British studies of socio-economic variations in mortality also show some sex differentials that require confirmation and explanation. Thus, the 1950 study showed that mortality from coronary disease for men was decidedly higher in the most favored social classes, but for some reason the ratios for women run in the opposite direction. It has been suggested that differences in dietary habits and physical activity may perhaps explain the male pattern of gradient. Another phenomenon of some interest is the upward gradient in mortality from cancer of the lung among males with descent in the socio-economic scale; no such signs were found among married women when they were classed according to the occupations of their husbands.

"The excess of male over female mortality is general in countries of low mortality. It is a phenomenon observed in many other species than man. However, it would be incorrect to infer that, in the human species, male mortality is invariably the poorer for there are examples of a contrary situation. The biological, social, economic, and cultural

factors bearing upon sex differences in mortality are yet to be made known.

"7. *Mortality projections*: Even if age-specific death rates should continue at their present levels, the crude death rate would rise simply because of the increasing proportion of aged in the population. However, reductions in age-specific rates are in prospect. Mortality projections are particularly important for population forecasts. They are also of some significance in setting standards of health accomplishment in the light of current medical knowledge. Since these purposes are different, the approaches used will differ. The traditional techniques used in projections for population forecasting have been either curve-fitting methods or the pattern of best records observed elsewhere. A third and relatively new technique is based upon analyses of trends from specific causes of death. Thus, it has been stated that the future trend in mortality rates will be affected not only by new advances in the therapy and prevention of specific diseases, but also by the rapidity with which the potential benefits of present knowledge are made available to the entire population. Both of these are governed by the social and economic conditions under which any population exists. In the earlier years, the major factors contributing to the decrease in death rates have been largely in the fields of preventive medicine, public health measures, and a general rise in the standard of living. Unlike the pre-war period, the major factors in bringing about the future large decreases in death rates in countries of low mortality will be advances in medicine and in surgery.

"This relatively new technique for making mortality projections, namely by studying recent trends in specific causes of death, requires further study. It calls for additional insight into the social and economic factors influencing mortality, beyond the medical factors. The medical and surgical advances of the future can hardly be predicted, but the lessons of the past can surely acquaint us with the means and speed by which they are used to advantage."

The Chairman then requested Mr. W. P. D. Logan to make some comments on Mr. M. Spiegelman's statement. Mr. Logan confined himself to five of the major causes of death that prevail in countries of low mortality and to the prospects, from the medical viewpoint, of achieving a reduction in mortality from these causes.

(a) *Neonatal mortality*. Deaths of newborn infants depend largely on factors operating before and during birth. Their elimination is difficult but given sustained research the prospects of further reduction are good.

(b) *Tuberculosis*. Gradual improvements in levels of living and medical treatment have for long been producing slow but steady progress. In the last few years new drugs like streptomycin have suddenly reduced tuberculosis mortality tremendously, and there are hopes that the disease may soon become a relatively unimportant cause of death.

(c) *Accidents*. These are not strictly speaking a medical problem though they have serious medical consequences. The remedy lies in social measures. Many accidents could be prevented if we were prepared to take the necessary trouble to prevent them.

(d) *Arteriosclerotic (coronary) heart disease*. The fundamental causes of this condition are still undetermined, and there are no indications of any early reduction in mortality.

(e) *Cancer*. Despite an impressive amount of research in many countries the causes of cancer are largely unknown. While ultimate prospects are hopeful no substantial reduction in mortality can be looked for in the very near future.

During the discussion at the end of this meeting, Mr. Stefan Szulc referred to the turning point which modern medicine has reached. Until now, medical science has enabled us to overcome the diseases resulting from influences of the environment. From here on, we shall have to come to grips with diseases caused by endogenous factors. This is a long-range task which requires, above all, an innovation of technique; in this connexion, Mr. Szulc cited in particular the efforts made by Soviet scientists.

Turning attention to the mortality of economically under-developed countries, the Chairman pointed out the great difference in their situation as contrasted with that of economically advanced countries. Hitherto, economic backwardness has been the chief factor in the poor health conditions of the under-developed countries. In the most recent years, however, the discovery of certain cheap but highly effective products, (antibiotics, sulphonamides and, above all, powerful insecticides) enables these countries to reduce mortality independently of economic development. This constitutes a disturbance of their equilibrium, the possible consequences of which it is important to assess. The Chairman asked Mr. S. P. Jain, rapporteur of meeting 4. to discuss this problem. Mr. Jain made the following statement:

"Areas of higher mortality have their own special features and trends, and, therefore, deserve separate consideration. Most of these areas either do not have any system of birth and death registration at all or have only a deficient system. Some idea of the mortality level and its pattern in such areas is furnished by certain special studies and surveys of limited scope. However, the prevalent health and environmental conditions are such that it is usually possible to recognize an area of high mortality. Broadly speaking, countries of South-Eastern Europe, most countries of Central and South America, Africa (non-European populations) and Asia (excluding Japan) form a high mortality zone, with Africa and Asia having a higher level of mortality than the other regions mentioned. The zone would seem to include over two-thirds of the world's population. It derives its importance in the context of world population outlook not merely from its size but also from the population potential implied by the mortality trends.

"It seems clear that in all the countries there has been a substantial decline in mortality in recent years. However, natality does not seem to have undergone a similar decline. In the past, high mortality restrained population growth, but now that mortality is declining without a corresponding reduction in natality, population is growing more rapidly in most of the countries. India, which contains nearly one-sixth of the world's population, shows a growth rate of 1.2 per cent per year during the last thirty years as against the rate of 0.17 per cent

in the preceding thirty years. The present growth rate is not unnaturally high. It is matched by the mid-Victorian growth rate in England and Wales and the present rate in several developed countries. The recent growth rates of Brazil and Indonesia are estimated to be nearly 2.5 per cent; the percentage is likely to be even higher for Africa.

*"Health and mortality conditions in the under-developed countries"*

"Most of the countries of higher mortality are characterised by an under-developed economy, which has resulted in the people having a low standard of living. This has led to certain common features as regards health and mortality conditions and recent developments have affected them in much the same way. In the past, most of these countries experienced large scale food shortages, famines and epidemics. Some of them had unsettled governments. Now, with the emergence of stable administrations charged with the primary duty of ameliorating the plight of the people, the picture has changed. The governments are not only taking effective steps to meet calamities as they occur, but are also adopting long-range measures to avoid their recurrence. International aid is also available in the event of an internal break-down. The technique of meeting food shortages through imports, rationing and controls has been evolved. More efficient methods of food storage are known. Transport and communications are better developed. Improved agricultural methods are being adopted and steps are being taken to increase the food resources of the country. These developments seem to be major factors in reducing abnormal mortality from the much too frequent break-downs in food supplies. Political stability has had an important bearing on the growth of public health and medical activities also, as the administrations have had to take note of the heavy loss of life from causes which developments in other countries had already shown to be capable of being controlled.

"Most of the countries of higher mortality have poor sanitary and other environmental conditions with the result that infections and parasitic diseases claim a heavy toll of life. Cholera, smallpox and plague, the most spectacular of the epidemic diseases, have been ravaging these areas as fulminant epidemics and endemic diseases. By prophylactic vaccination and inoculation and other timely precautions, they have been greatly controlled and several areas are now practically free of them. Malaria is a common scourge. It directly and indirectly accounts for a heavy loss of life, particularly among infants and children. Effective advances in the control and cure of the disease have led to a reduction of mortality due to this most important cause. Typhoid, dysentery and diarrhoea are important common diseases, which, with others, arise because of unsafe water supply, soil pollution and poor environmental sanitation. Tuberculosis is considered to be presenting a serious threat in some countries, particularly as it is held to be invading new areas. There are also other diseases in each country, which account for a large number of deaths.

"As the cause of death is generally reported by non-medical personnel, reliable statistics even for limited areas are not available for showing to what extent the specific causes of death have been con-

trolled by the recent developments in regard to the provisions of safe water supply, excreta disposal and improvement in environmental conditions including housing. Though much remains to be done in these directions, the progress made so far seems to have resulted in reducing mortality, particularly that due to infectious and parasitic diseases. Maternity and child-welfare services are doing their bit to reduce the high infant and maternal mortality, but they are not yet fully developed to serve the needs of the entire country. Due to their low economic level and ignorance of the principles of nutrition, the people are malnourished. Diseases of nutritional deficiency are not uncommon. Efforts are being made through health education and publicity to make the people conscious of the rules of personal and environmental hygiene and of the principles of proper nutrition.

"With the expansion of public health activities, curative services also have been developed within the financial resources of each country. There have been important discoveries in the treatment of fatal diseases and in this connexion antimalarials, sulphadiazine and antibiotics may be specially mentioned. Hospitals and medical services are now saving many lives which would have met a fatal end before, but their usefulness is limited to the areas of their operation. Inadequacy of resources in personnel, equipment and finances greatly restricts their beneficial role in reducing mortality in the country at large.

#### *"Mortality by age"*

"Reliable data on mortality by age groups are not available for most of the areas, but whatever data for small areas exist suggest that for both sexes mortality has declined at all ages. The greatest improvement has occurred in the infant and child sector, mainly as a result of control of infectious and parasitic diseases including malaria. In countries of higher mortality over 20 per cent of total deaths are among infants and another 20 per cent among children aged one to five. This improvement is, therefore, of great significance in the context of general mortality. The cumulative effect of improvement in mortality at all ages has been to increase the expectation of life substantially for both sexes at all ages in most of the countries.

#### *"The causes of the recent decline of mortality— long-range prospect"*

"From the foregoing analysis, it is clear that countries with higher mortality are at present going through the phase of controlling preventable loss of life, which, as we know, has already been passed through by the countries at present enjoying lower mortality. It, however, does not seem necessary for the countries having higher mortality to pass through all the experiences of the latter countries, as now they can benefit from the recent discoveries and the experience of other countries. It seems that the processes, which are at work in causing a decline in mortality, are likely to gather further momentum for some time at least under conditions of world peace and a spirit of international collaboration. Improvement in food supplies, public health activities and socio-economic changes are playing their roles in bringing about a reduction in mortality but it is difficult to isolate the part of each. The examples of

Ceylon and Japan show that it is not necessary for an improvement in mortality to be accompanied by an improvement in the nutritional standard of the people. On the public health side, in the relevant countries, anti-malarial activities, more than anything else, are responsible for the observed steep fall in the death rate. It has been observed in Greece that malaria mosquitoes were developing resistance against DDT and other insecticides in use. If this happens on a large scale, malaria may return and general death rates may go up unless some other effective insecticide is discovered in the meantime.

"On the whole, a further fall in mortality may be expected in the near future, particularly in countries where the death rate is still high. In countries where the death rate has already touched a low level, it seems likely that the level will be maintained. Long range prospects are more difficult to see, for a continuation of the short-term trends depends on the persistence of the factors promoting them. Welfare states will, of course, strive to continue the declining trends, but much depends on the development of their financial resources.

"The declining mortality trends, if not accompanied by a corresponding lowering of fertility, are likely to result in accelerated increase in population. This may lead to a serious strain on an attenuated economy and cause a setback to the pace of mortality improvement. Future trends in mortality are thus intimately bound up with the economic development of the countries, and the possibility of reducing population pressure by restricting births and emigrating surplus numbers. The irony of the situation is that it is the "have nots" who are faced with the prospects of growing numbers and the problem of eliminating under-feeding. Much of the increase in food production is in countries already well off in these respects. The consumption of world resources by the economically advanced countries is increasing. The task is how to secure a better coordination between world resources and the needs of mankind, which is so unevenly distributed over the globe. It is not an easy matter, as it bristles with serious political, economic and social problems. However, the first round will have been won, if only the countries concerned can be made to see the need for adopting an active population policy.

#### *"The improvement of the statistics"*

"For a proper consideration of the world population outlook the importance of keeping track of mortality trends in countries having higher mortality is unquestionable, yet it is in respect of these countries that the requisite data are most scanty and desultory. While it cannot be gainsaid that the collection of the primary data is mainly the concern of the countries themselves, international interest can stimulate progress in the matter. The immediate problem is to get dependable birth and death rates. The United Nations Organization is publishing the available figures with a note on the reliability of the country's registration system. It is suggested that an attempt should be made in collaboration with the national agencies to assess the quality of data furnished by the various countries, by appropriate analysis and not merely by collecting information on a standard questionnaire. Standardization, based



on purely Western experience, is unlikely to deliver the goods unless the peculiar conditions of the countries concerned are taken into account. However, certain defects can be remedied without much effort. In publishing the birth and death rates, in certain cases a doubt is expressed about the correctness of the population figure adopted in deriving the rates. In instances where the deficiency is due to the method of estimation, it should not be difficult to remove it in consultation with the national agencies concerned. In fact, for some countries serial data extending over a long back period stand in need of some such treatment. The position, where the latest available censal population is very old or unreliable, would need a greater effort for rectification.

#### *"The importance of a good census"*

"All the same, the pressing need is to have a recent proper census. It may be permissible here to lay emphasis on the fact that in statistically underdeveloped countries the development of a proper census needs a higher priority than the more difficult problem of improving birth and death registration. Besides the fact that censuses throw a lot more light on the demographic situation of a country, censal data can be used to obtain fairly reliable estimates of the various vital statistical measures, particularly in cases where migration is small. In India, life tables are prepared by comparing cohorts at two censuses. Fairly reliable estimates of death rates during an intercensal period even for the subunits of States have been obtained by comparing population at two censuses. It has also been possible to directly estimate birth rates during an intercensal period by projecting back the number of children enumerated. A variant of this method, based on the observation that the proportion of infant deaths in the year of birth from amongst the births in a year is approximately constant, gives births in the year preceding a census. Population increase brought out by the direct records of births and deaths can be checked up against that shown by the census enumeration. In fact, this relationship is of wider application for establishing the reliability of registration data and can be used to demarcate areas having reasonably good registration system. These methods were applied in 1951 Census studies in India with fairly good results. Similar applications have been made in Brazil. The ratio of children to women in reproductive ages has been used to trace fertility differentials. It is also easy in a census to collect simple data on the number of children born to a mother, for studying the fertility pattern. Thus, it would appear that a concentration of effort on the development of reliable censuses is likely to yield most useful results. It may be opportune to suggest the minimum information which censuses in underdeveloped countries should aim at collecting.

#### *"The sample surveys"*

"It is not intended to imply that censal data can take the place of those given by direct birth and death records. The censal estimates of vital statistical measures are improvised and acceptable only in the absence of proper data. Their limitations need to be properly emphasized. In view of the fact that most of the countries having higher mortality do not yet have the necessary finances and conditions to set up

a country-wide system of birth and death registration on the model of that in other better-placed countries, it seems desirable to explore other possibilities. In several countries sample censuses have been carried out to obtain information on the current birth, death and infant mortality rates. It seems desirable to make a critical appraisal of these studies with a view to detecting snags and pitfalls and improving the technique in the light of the obtaining conditions. There are certain peculiar features of the problem. To be useful the results should be available quickly and at not too much expense, as periodic resurveys are necessary to keep track of the changes. Necessarily, the data have to be collected through the existing administrative agencies in the country, as it seems financially impracticable to set up a special force for the purpose. The general ignorance and indifference of the informants is also a factor to be reckoned with. It is not always easy to get correct information on such simple matters as births and deaths in the family, unless proper caution is exercised. Closely connected with the problem of sample censuses is the question of improving the usefulness of the material obtained from normal registration, wherever such a system exists.

"While it is obviously essential to tap and develop the available facilities for ensuring a complete recording of births and deaths, it seems equally important to review the basis on which national and regional rates are calculated. On the basis of other collateral evidence it seems possible to demarcate areas according to the reliability of their registration data, and figures known to be highly deficient can be excluded. Reasonably reliable data for a smaller area are more helpful than those of poor quality covering a more extensive area. Perhaps the birth and death rates for the various countries published by the United Nations Organization could be reviewed from this point of view. It also seems practicable to develop calibrating samples with a view to arriving at the true national rate. This really touches upon the problem of sample censuses.

#### *"The inadequacy of the crude death rate"*

"In view of its importance, attention has been focused on the problem of improving the accuracy of information on birth and death rates. However, this is not enough. For prognostic purposes, it is necessary to analyse mortality by various characteristics such as age, sex, cause of death, occupation, and social and economic factors. For most of the countries statistics of deaths in these classifications are not available, and even where they are available for certain tracts, they are unreliable and not refined enough to be useful for analytical studies. Statistics of deaths by causes are particularly unsatisfactory due to the inadequacy of medical personnel for determining the cause correctly. Due to a heavy preference for reporting ages ending in certain digits, age groupings commencing with ages in multiples of 5 are unsuitable. Conditions are not likely to change radically for some time yet, and it seems that a solution has to be found within the limitations of the present conditions. It may be that an integrated and planned scheme of quick and cheap sample surveys is the way out. It seems that the classifications to be adopted have to suit the local conditions, and that considerations of international



comparability can be observed only in broad principle rather than in details. This aspect of the question requires an intensive study of the various issues. It seems desirable to set up separate minimum standards for the under-developed countries.

### *“Conclusions*

“The remarks made above indicate the lines on which the work of collecting material for a study of the interrelationship between mortality trends and the factors affecting them may be organized in countries of higher mortality. The task in the first instance is to initiate and develop various methodological and factual studies, so that the information that is usually necessary for demographic analysis may be available for each country. It might be possible to accelerate the process, if an international organization were to set up a special section charged with the responsibility of initiating and developing action in collaboration with national agencies. The World Health Organization is already collecting available mortality statistics and may perhaps find it possible to expand the activities of its regional offices in the suggested directions.”

The Chairman called on Mr. O. Cabello to give some supplementary information. Mr. Cabello noted, first of all, that the quality of mortality statistics corresponds always to the extent to which the authorities are interested in them. They are chiefly required by the public health authorities. He indicated several measures which might ease their task:

(a) It would be a mistake to reject mortality statistics entirely on the grounds that they are defective. Even from imperfect statistics useful information can often be derived.

(b) In some high-mortality countries the statistics are quite adequate for purposes of practical action. These can serve as guides for other high-mortality countries.

(c) The creation of experimental areas in every country, though not adequately representative of mortality conditions for the entire country, can serve to clarify some problems and suggest their solutions.

(d) Probably the most difficult problem is to ascertain causes of death. This requires a large medical staff which is usually not available. Special surveys can partly compensate for this deficiency, but one may also make use of observed relationships between certain causes of death and various other phenomena. For example, deaths of children caused by diarrhoea occur mostly in summer.

(e) Technical training of the personnel in charge of collecting the statistics is undoubtedly the most urgent task. In this respect, the situation of the under-developed countries is anomalous. They lack qualified personnel, and it is precisely here that persons of the highest qualification are needed in view of the difficult problems to be solved.

(f) The ideal, of course, would be the organization of a good system of vital statistics registration. This point hardly needs stressing.

## 2. FERTILITY

The contrast between the economically developed and the under-developed countries is perhaps still more marked with respect to fertility than to mortality

trends. After nearly a century of continuous decline of fertility the economically advanced countries have experienced some stability at a level which makes a decline of the total population unlikely. With the prevailing mortality an equilibrium has been reached which assures the full replacement of most of these populations and a considerable margin of safety for some of them. Having opened the debate on these lines, the Chairman gave the floor to Mr. E. Grebenik, one of the rapporteurs of meeting 6, who made the following statement:

“In meeting 6 fertility trends in areas of low fertility were discussed. These were defined as the countries of Northern, Western, Central and Southern Europe, the U.S.A., Canada, Australia and New Zealand.

“In the first place a background picture of developments in fertility in the area studied was submitted and it was pointed out that recently there had been indications of a stabilization in fertility after a long period of decline. The secular trend towards the decline in family size appears to have been checked in most countries. It is difficult to pass a final judgment on the large rise in births that has taken place in the late forties and to assess the significance of the so-called ‘baby-boom’. Some speakers were doubtful whether there had been any real increase in fertility. Further research on the effects of the various social, economic and psychological factors influencing fertility would be necessary.

“The discussion then passed on to problems of measuring fertility differentials among different sections of the population. A number of papers were contributed dealing with this problem in different countries. The groups whose differences were studied were defined in many different ways, in some cases by type of residence, in others by occupation or income group, educational status, race or religion. Frequently results were not really comparable because of differences in definitions or methods, and the results in different countries appeared very different, but it was not easy to see to what extent these differences could be explained in terms of differences in the methods used. It was felt that there was considerable scope for the standardization of methods and terms in this field, and that the United Nations Populations Division might well consider this problem.

“Where fertility differences between different groups had declined this was generally due to the fact that the fall in the group exhibiting the smallest size of family had been checked, whereas it was continuing among the groups which still had larger families. There was not, however, any clear evidence of a decline in inter-group differences in fertility.

“The importance of differential fertility studies was emphasized, not only because of their general sociological interest, but also because a fuller knowledge of the subject might help to improve forecasts of population movements and therefore be of considerable practical value.

“Birth spacing was the next point that was considered, and a number of the methodological difficulties inherent in the subject were pointed out. These were still not completely solved, but it was clear that such studies were important in that they

could provide valuable information on family building habits and on the influence of economic and social factors on births.

"After a brief discussion of some of the biological aspects of fertility the meeting passed on to consider questions relating to the measurement of desired family size. Two methods were put forward, one which used survey techniques and the other which proceeded by setting up certain probability modals. Both these methods had their usefulness and further research on this topic was desirable.

"The sixth topic was concerned with implications for the future. In a sense the previous discussions were all leading up to this subject, but the conclusions that could be drawn were very tentative. In spite of the fact that the development of fertility in these areas was relatively well documented, a good deal of further research was needed before the mechanism of fertility changes could be fully understood. There seemed to be some consensus of opinion that the very low fertility rates experienced in the thirties were exceptional and unlikely to recur. It was believed that as fertility became increasingly planned there might be bigger and more violent short term fluctuations in births connected with economic and political factors which could make forecasting difficult. But there seemed to be agreement that a large scale rise in fertility was unlikely, and that fertility in low fertility areas would in the near future be not very different from replacement level."

Mr. J. Bourgeois-Pichat expressed the fear that the way the discussion at various sessions proceeded might have given the participants the impression that demographers are incapable of solving the methodological problems of fertility. Since the communications were distributed in advance the discussions were understandably focused on the weakest points. But in spite of the imperfection of their tools the demographers know by now pretty well the nature of fertility trends in the countries of low fertility. The secular decline has come to a stop at a level which, in conjunction with the current mortality, ensures slightly more than the reproduction of the population. But around this level important variations, associated with economic and social fluctuations, may occur. Returning to the methods of measurement, Mr. Bourgeois-Pichat said that he would like to see the application of the new technique of cohort analysis to the study of past trends. This would help to clarify the present as well as the future trends in fertility. Among all possible cohorts, the group of women giving birth in the same year at the same parity level is the one which permits the most refined analysis. It requires the knowledge of spacing of successive births, and it is the distribution of children of the same family overtime which ultimately should be analysed. In addition surveys of attitudes on the desired family size are of capital importance for the analysis of fluctuating trends. Finally, Mr. Bourgeois-Pichat thought detailed studies should be encouraged on biological and sociological aspects of human sterility. Such studies would provide answers to many questions pertaining to fertility in the countries of high fertility.

Introducing Mr. K. Williams, rapporteur of meeting 8, the Chairman pointed out that the fertility problems are different in countries of high fertility. Behind the

façade of uniformly high fertility there is, in the various countries in question, a complex variety of frequently contradictory factors, which make forecasting difficult. Mr. Williams made the following statement with reference to the high-fertility countries of Asia:

"The material presented at meeting 8 brought out the exceptional variations in demographic, social and economic characteristics in countries of higher fertility. The underlying causes of high fertility are not the same in all these countries and, therefore, the trends of future fertility rates are also likely to be different in different parts of the area.

"So far as India is concerned, the first real obstacle in the way of making any reasoned judgment is a tremendous lack of vital statistics. Much reliance has to be placed on data of sample surveys carried out in different parts of the subcontinent. In addition, considerable use has been made of the census data and the reverse-survival method, and information has been obtained from the preliminary results of the all-India sample survey.

"While Indian vital statistics are deficient, one should not assume that this is true of the entire South-East Asian region. There are, for instance, the exceptionally accurate vital statistics of Ceylon. After the last census of 26 March 1953, an island-wide sample verification of the census count was undertaken. This opportunity was utilized to use the same sample to test the completeness of birth and death registration. The survey revealed that 88.1 per cent of all births in Ceylon and 96.8 per cent of all births in urban areas were registered, while 88.6 per cent of all deaths and 94.7 per cent of all urban deaths were registered. These figures indicate a high degree of completeness of registration.

"I do not think that the explanation for this is simply that Ceylon, being a small country, is being better administered or that the literacy rate is high. The reasons which prompt persons to register their vital events should be studied in the context of the social structure of the country, the degree of enforcement of sanctions prescribed by law and other factors, in order to make use of this experience for the improvement of registration of vital events elsewhere. It should be remembered in this connexion that the registration system was introduced into Ceylon by the British about the same time as it was introduced in several other neighbouring countries.

"At this stage I should like to mention a few important facts which might throw light on the future of fertility rates in India. The evidence presented at meeting 8 appeared to indicate that there is no significant difference between urban and rural fertility rates. It would seem that a moderate degree of urbanization does not influence the number of children born to women who have recently completed their reproductive life in a married state.

"Another curious feature of Indian fertility, which appears contrary to experience in other parts of the world, is that fertility seems to increase with social position. The explanation for this phenomenon is to be found probably, strange to say, in the mortality rates. It would appear that re-marriage of widows is not socially accepted by many Hindu castes. As the expectation of life of the husband in the higher social sectors is obviously greater, the

women in such higher sectors have longer child-bearing periods prior to widowhood. The danger here is that with improvement in mortality conditions and some liberalization of the ban on widow re-marriage, which might be expected, fertility rates are likely to go up.

"Another feature which might be important in the study of future fertility trends is that there is some evidence that women married between 16 and 18 years of age have a somewhat larger number of children than those married younger or those married after 18 years. Since the average age at marriage is now below 16, an increase in the age of marriage, which we can logically expect, might actually result in increased fertility.

"It has also been shown that various restrictions governing sex life between husband and wife exist in Indian society. In addition to specific days on which sex relations are taboo in India for religious reasons, long periods of abstinence are required during pregnancy and lactation. These taboos are found to be less prevalent in urban than in rural areas. When the observation of these codes becomes less rigid, as is to be expected, there is likely to be a further rise in fertility.

"Estimates of the birth rate by the method of reverse survival from census data appear to show a downward trend in fertility. A possible reason for this may be a greater use of family limitation techniques, but the statistical evidence for this is extremely limited and unsatisfactory. On the other hand, the national sample survey has given some valuable information which appears to support the theory that fertility rates are on the move upwards. What is significant is that on such an important matter, which affects India so vitally, there should be so much room for doubt. The birth rate in India is already high enough to be alarming. If, as some of the evidence appears to indicate, there is likely to be a further rise in fertility, it would seem a very urgent matter indeed at least to see that the statistics for measuring fertility trends are put on a sound basis.

"I therefore suggest that it would be advisable to set up some form of institution for the scientific study of the various factors underlying fertility in this region which could, in the first instance, study the problem, why registration is unsatisfactory in some regions and quite satisfactory in others. The problem is, however, extremely urgent. Any improvement in the national registration system would be a long term process and cannot be expected within the next few years. The data presented at meeting 8 on sample surveys are extremely hopeful and it would seem that improvement and expansion of these surveys might possibly be the solution that we are looking for.

"The most important factor which is going to decide the future trend of Indian fertility is the extent to which family limitation is to be practiced by the Indian people. On this question the data presented to the meeting were extremely meagre. Sample surveys seem to indicate a widespread desire on the part of Indian women to restrict their families, but this is accompanied by an equally widespread ignorance of the methods of family

limitation. The Government of India has initiated measures designed to satisfy a growing desire for family limitation in most sectors of the Indian population. The chief obstacle is the absence of a cheap and effective method which can be practised by the masses. Much research is being made on the "safe period" method as applicable to India. New lines of research are also being followed in order to develop methods that would influence some of the other essential steps in the physiology of reproduction, namely, sperm or egg formation, fertilization or nidation. If all this research should produce satisfactory results, one would expect—even if Governments do not take an active part in the propagation of birth control methods—that there would be a decline in birth rates.

"I shall now mention another country which until recently did not differ very much in its fertility experience from India but which has within four years experienced almost a revolution in this field. I refer to Japan. The crude birth rate in Japan, which was 33.0 per thousand population in 1949, has come down to 21.4 in 1953 and is expected to go well below 20.0 this year. This would bring Japan within the category of low fertility countries. There is little doubt that the primary cause of this spectacular reduction in the birth rate was the practical legalization of induced abortion by the Eugenics Protection Law of 1948. The number of legal abortions in 1952 is estimated at 800,000 while illegal abortions could have amounted to another 200,000 to 300,000. Between January and June 1953 there were about 540,000 cases of legal abortion. One could only observe that this is a drastic solution to a drastic problem. What it proves is the extremely widespread desire on the part of Japanese women to limit their families.

"Considerable evidence was presented to the meeting on the increasingly widespread use of contraceptive methods in Japan. I think one can safely say that in the course of time the unethical and ineffective way of limiting the family through induced abortion will be replaced by better use of contraceptive methods. The lesson that one learns from the Japanese experience is the extent to which women in some parts of this region would go to limit their families if there were a way of doing so. If cheap and effective contraceptive methods become available, we might probably see an equally startling reduction in birth rates in other countries of this region.

"I would now like to refer to another important factor which could well influence fertility rates. I refer to the effects on fertility of the increasingly successful results of measures to eradicate malaria in this region. Common sense would lead us to expect an increase in fertility following the eradication of malaria, but the statistical material placed before the meeting for a number of countries was not so convincing. Some detailed analysis made on the Ceylon data, however, does support this theory. In the areas of Ceylon where malaria was previously endemic, the birth rate is stated to have gone up from about 40 to 50 per 1,000 population. The collection of much more reliable data and more accurate analysis would seem to be necessary before a definite judgment could be made.

"Some research made on inter-racial fertility rates in the mixed population of Singapore has revealed some very interesting facts. The age specific fertility rates of married Chinese women are found to be much greater than those of Malaysians and Indians. For instance, the birth rate per 1,000 married women in the age group 15 to 19 was 499 for the Chinese, 139 for Malaysians and 240 for Indians. In the age group 20 to 24 the rates were 939 for Chinese, 286 for Malaysians and 473 for Indians. On the other hand, Chinese women appear to marry much later than Malaysians or Indians, with the result that the net reproduction rates are not so divergent as the age specific fertility rates would indicate.

"Figures on fertility for Taiwan also seem to indicate that the fertility of Chinese women is very high. This rate was about 47 per 1,000 of population in 1930 but there is evidence of some decline thereafter.

"I do not propose to take your time describing the prospects of fertility trends in the other areas which were considered at meeting 8. In any case the data presented were so uncertain as to prohibit any definite conclusions. What is common is that birth rates are consistently high in all parts of this region. Improvement of sanitary conditions and other factors are likely to increase these further. One fact is clear: that the knowledge of family limitation methods is spreading and Governments themselves in some countries are taking an active interest in the population problem. That would be one certain factor towards a reduction in fertility rates.

"In conclusion I would like to stress again the need for more widespread research in this region on all aspects of fertility—statistical, social, psychological and economic. One dares not attempt to prophesy. What one could probably say is that if existing conditions prevail, there is likely to be an increase in fertility rates in the absence of any conscious limitation of the family. To what extent family limitation will be practised is the most difficult question to answer. On that will depend the accuracy of all forecasts."

Mr. C. Chandrasekaran, commenting on Mr. Williams' statement, stressed once again the diversity of factors which are hidden behind the similarity of birth-rate trends observed in the countries of high fertility. The decline of mortality, he said, has produced still closer similarity of situations, bringing to light the problems of the rapid growth of these populations. But it is necessary to take into account the differences rather than the similarities if one wants to explain the past and to foresee the future developments. It is a mistake to think that the fertility of under-developed countries represents a biological maximum. In fact, this fertility is a result of multiple factors which act in opposite directions. Some of them, like early age at marriage, tend to raise fertility, others tend to lower it and, moreover, this reduction is caused by different factors in different countries. The Indians, for instance, have always relied on abstinence from sexual relations as the means of family limitation, whereas the Japanese have had recourse to infanticide and abortion. Obviously, Mr. Chandrasekaran said, the methods of birth control employed in the countries of European civilization cannot be transferred—lock,

stock and barrel—to the countries of high fertility. It is not likely that India and Egypt, for example, will adopt the Japanese method of legalizing abortion or the Puerto Rican method based on mass sterilization. It follows that the future fertility trends in the under-developed countries are difficult to foresee. Once the equilibrium is disturbed the outcome becomes unpredictable. The demographers alone cannot provide the answer. The co-operation of sociologists, psychologists and physicians is imperative.

### 3. STRUCTURE OF POPULATION

After discussing the mortality and the fertility of human populations, it was logical to continue the meeting with the examination of their effects on the structure of population. The Chairman first gave the floor to Mr. G. Mortara, rapporteur of meeting 16, who made the following statement regarding the age composition of populations:

"The conclusions which emerge from the papers presented at meeting 16 and from the discussion with regard to the influence of mortality and fertility trends on age composition of population are pretty clear.

"The pattern of age-specific mortality is well known. A high initial mortality rate is followed by a period of decline until puberty is reached. Mortality increases slowly and sometimes with fluctuations through the period of adolescence and maturity until the last stage, when the increase becomes progressively steeper. Given this pattern, a high level of mortality tends to produce a high proportion of infants and young people in the population and a small proportion of adults and old people, whereas low mortality tends to produce the contrary effect.

"As to fertility, its influence depends less on its absolute level than on its relation to mortality. In a stationary population with high mortality, an equally high fertility does not modify the age structure; the same applies when the stationary population is characterized by low mortality and low fertility. An excess of fertility over mortality tends to reinforce the proportion. An excess of fertility over mortality tends to reinforce the proportion of infants and youngsters and to diminish that of adults and old people. An opposite effect takes place when fertility is lower than mortality.

"In this context one speaks, however, only about long-term trends which are not quite uniform. The influence of fertility on age structure varies considerably according to whether the absolute number of births tends to increase, to decrease or to remain more or less static in time. If mortality remains constant at all ages, an increase in the number of births will tend to create a higher proportion of infants and young persons and a lower proportion of adults and the old. The opposite is true when the number of births declines.

"It seems that the effect of fertility on the age composition deserves more detailed study and it is to be hoped that it will attract the attention of demographers.

"Among the other aspects of age composition which need clarification I would like to mention those pertaining to the proportion of sexes at various ages. The study of this aspect has been difficult on

account of omissions and errors in census data. There are countries where failure to enumerate females is frequent, both among children and among adults. Again, in many countries there is a gap between the observed and the true age composition of the female population due either to deliberate understatements of age or to errors connected with old age. The former type of error is almost exclusively restricted to women; the latter is at least more frequent among women than among men.

"In spite of the inaccuracies which arise from these considerations one can state that in general the proportion of females increases with age in the countries of Western civilization on account of their lower mortality.

"What are the likely changes in the age structure of populations in the next 10 to 30 years? The demographers who have studied this question reply that, as the combined result of mortality and fertility declines, one can expect a further increase in the proportion of adults and old people and a further diminution in the proportion of the young. Personally I do not accept this forecast without reservations since I have little trust in any demographic predictions. I recognize that they might be acceptable on the basis of the logical application of past experience to future trends. However, the possibility of surprises is not excluded, especially of the type encountered in the post-war period, which upset all the forecasts of demographic prophets."

In the discussion which followed, Mr. A. Sauvy expressed surprise at Mr. Mortara's failure to mention the discussion which took place at meeting 16 on the relative importance of variations in mortality and fertility affecting the age composition of populations. By no means, Mr. Sauvy recalled, was there a unanimity of views on this subject. He himself believed, contrary to the view stated by Mr. Mortara, that the age structure is determined by the variations of fertility rather than of mortality.

Fertility and mortality differentials have an impact also on the genetic structure of the populations, and this fact is of great importance in the qualitative evolution of populations. The President asked Mr. J. Böök, one of the chairmen for meeting 23, to report on the debates on this subject both at meetings 23 and 25. Mr. Böök made the following statement:

"The prevalence of genetically based severe physical and mental deficiencies in European and North-American populations amounts to no less than 2-3 per cent. The conditions in other populations have not yet been sufficiently investigated. With the elimination of nutritional and infectious diseases the relative importance of genetically based deficiencies is greatly increasing. The need of establishing epidemiologic control of this category of diseases was stressed at meeting 23. Ascertainment of such deficiencies should include data on age of mother, order of birth and other environmental influences which may significantly affect the frequencies.

"The genetic characteristics of populations are subject to many short and long-time influences, such as panmixia, assortative mating, selection for or against homozygotes or heterozygotes mutation and shift of gene frequencies by chance particularly in times of greatly reduced population size.

"Differential fertility of sectors of a population will change the gene frequencies, provided the different sectors are genetically differentiated. Research is needed concerning genetic differentiation between socio-economic groups and between emigrating and immigrating groups. Particular attention should be paid to the problem of genetic differentiation due to social mobility. In countries with high social mobility the consequences of differential fertility may be very important.

"The break-up of isolates, be it within a country or between larger human groups, has genetic consequences whose significance is manifold. There must result at least a temporary decrease of many rarer genetic deficiencies. No obvious effects of the break-up of adaptive features are known, but research on the physiological effects of race crossing is needed.

"The nature-nurture problems are an integral part of considerations on gene distributions. Renewed emphasis on their solutions including refined studies of twins is required. The quality of the genetic material of populations is bound to undergo changes and the understanding of this process will help in directing these changes towards desirable goals.

"In meeting 25, where the relation between intelligence and fertility was considered, it was generally agreed that the deductions of past years were too simple: namely that because there is a negative correlation between the test scores of children and the number of their sibs a decline in the intelligence of the population is inevitable. Much attention was devoted to the statistical, psychological, sociological and demographic complications of the type of surveys carried out hitherto, and many useful suggestions were made as to how the surveys of the future might be improved, so as to lead to less ambiguous results and to add to our present knowledge. It was stressed that culture-free tests are unattainable, but that nevertheless, with due safeguards, existing types of psychological tests can be used for the purpose under discussion.

"All are agreed that there are genetic and environmental components in the determination of intelligence. It may be impossible to separate their effects other than partially, but again carefully designed studies are capable of yielding useful, if not simple information.

"While the stress was on caution and the gaps in our knowledge, it was emphasized by a number of speakers that a problem still remains. Fears of an immediate large decline, or indeed of any decline at all, may be groundless, but there is some balance of probability in favour of the view that a genetic loss may be taking place; this being masked by improvements in social and educational conditions as well as by other factors of a more subtle nature. Differential fertility in respect of intelligence may not be causing a fall, but it may in some countries be preventing rises which might otherwise be obtainable. It is essential that work should be continued and increased, and we may hope that as a result of this conference the surveys of the future will be an improvement on those of the past."

During the discussion, Mr. H. V. Muhsam, having acknowledged the importance of studies on the relationship between family size and intelligence, stated that still graver problems for the future of mankind

are posed by the relationship between family size and the integration of an individual in the society. Mr. Muhsam recalled some studies which seem to indicate that socially maladjusted, e.g. aggressive, persons are more frequently found to be members of large than of small families. If further evidence corroborates this finding, the degree of "aggressiveness" of human populations ought to increase through the effect of differential fertility. This would be a deplorable circumstance on the national basis and a disastrous one on the international plane.

#### 4. MIGRATION

While only vital rates are to be taken into account in discussing world population as a whole, this does not apply to a consideration of the distribution of the population over the surface of the earth. Migratory movements may often bring about radical changes. The Chairman gave the floor to Mr. A. Oblath, rapporteur of meeting 10, which was devoted to questions of international migration from the point of view of countries of emigration. Mr. Oblath made the following statement:

"Emigration was considered at meeting 10 under three broad headings: (a) the size and structure of the total and the economically active population of emigration countries; (b) the economic situation of emigration countries and of their populations; and (c) emigration needs and possibilities. The meeting threw light on these three elements and gave the participants a clearer idea of the nature of international migration as well as an indication as to the problems on which further research and study are required.

"As a supplement to the report of meeting 10, I should like to make some additional remarks on the kind of problems that ought to be studied further in order to increase and round out our knowledge in this field. I should also like to give my opinion on the prospects for future emigration, based on the information that is available.

"The difficulties that Professor Parenti and his collaborator have encountered in trying to evaluate the effects of emigration on the size and structure of the total and of the economically active population of certain European countries have once again confirmed my views as to the extent to which our knowledge in the general field of international migration is limited by the absence of adequate statistics, an absence that persists in spite of the constant endeavours of the United Nations in this field. It seems imperative that the utmost effort be made to fill such a fundamental gap, caused by the incompleteness and the inadequacy of the available statistics or by their non-existence for certain countries.

"I should like to add that however praiseworthy Professor Parenti's study is, it should be supplemented by similar studies on other countries where population trends are, or have been, different. Such studies should seek to assess the past effects of emigration over a fairly long period and not only make forecasts of the effects on future population. This is a question of such great importance for the other problems discussed in our meeting as to warrant the undertaking of more intensive and more extensive research.

"It is particularly on the question of the relationship between emigration and the economic and social development of the countries of emigration that more research seems to me to be so desirable. The experience of a number of countries that have in the past seen very large numbers of people emigrate should make it possible to arrive at findings concerning the effects of such movements, according to their volume and composition, not only on the demographic but also on the economic and social development of the various countries. Research on this subject should at least lead to the formulation of theories that would usefully supplement the new concepts that were presented to the Conference by Mr. J. Isaac.

"I should also like to draw attention to the need to study further the human and subjective aspects of migration problems. These aspects cannot be considered in theoretical formulations, let alone in mathematical formulas. Their importance, however, cannot be overlooked in attempts to evaluate the economic and social consequences of emigration or to determine the factors that influence not only the needs for emigration but also its feasibility.

"If these factors are taken into consideration with regard to the situation existing in countries of emigration, one can probably arrive at a better comprehension of the motives which give rise to a migratory movement and ascertain to what extent the emigration country itself can satisfy its need for emigration.

"There is no doubt that the possibilities of emigration depend mainly on the possibilities of immigration and that the volume and nature of the migratory movement mainly reflect the attitudes and needs of the country of destination. It appears to me, nevertheless, that the part which the emigration country can play is being underestimated, for such a movement presupposes precisely that there are people there who desire to emigrate and who have the necessary qualifications.

"With regard to persons desiring to emigrate it would be interesting to find out to what extent their decision to leave their country is taken in relation to the economic and social conditions in which they find themselves and those which they hope to find abroad. To what extent do unemployment, underemployment or poverty suffice to foment the desire and need for emigration? To what extent can the prospects of industrialization reduce this desire among the agricultural labour force? Is the difference in working conditions and, more particularly, wages, between the country of emigration and that of immigration sufficient to give rise to such a movement? What part is played by other subjective elements such as the desire to transfer from agriculture to industry and commerce or to improve social status by taking up independent employment? This is the type of question which should be asked and deserves to be answered.

"As regards qualifications for emigration, even if it is assumed that the country of origin contains a sufficient number of persons of appropriate age and sex for admission to and employment in the immigration country, prospective emigrants with the occupational qualifications required by employers abroad may be insufficient in number for the needs



of the country of destination. The extent to which an emigration country can satisfy the needs of immigration countries depends on its own need of qualified workers for its economic development and on whether facilities for the vocational training or retraining of its surplus manpower exist or can easily be created.

"If the real availability of potential emigrants both with respect to their occupational qualifications and to their desire to emigrate, could be known at least for the main countries of emigration, this would be in the general interest and migratory movements could be facilitated accordingly. For, leaving aside other aspects of immigration policy, the economic absorptive capacity of immigration countries depends more and more exclusively on the availability of qualified immigrant workers who can immediately become productive. In this manner, the size of the migratory movement depends in equal measure on the ability of the country of emigration to satisfy specific needs in the area of immigration.

"In my opinion, it is on the basis of a study of the above-mentioned questions—which I consider the most important of the many questions requiring study—that future migration prospects, from the emigration point of view, should be considered.

"As judged by certain admittedly incomplete indications, it would appear that in certain countries in Europe the trend of emigration is leveling off. The progress made in these countries, particularly in the level of wages and social security benefits, may be found to have reduced the economic advantages which emigration can offer workers and their families; at the same time, the prospect of finding satisfactory working and living conditions in their own countries would seem to have improved. It appears likewise that certain countries of emigration have an insufficient number of workers with certain types of qualifications to meet both national and international needs of economic development.

"Aside from this first point, it appears to me essential that, in order to facilitate international migration up to the limits of economic absorptive capacity of immigration countries, the emigration countries suffering from a shortage of certain types of qualified workers must make great efforts to increase their emigration potentials through vocational training and retraining. To ensure successful migration it is no less important for the countries of immigration to determine, on their part, their precise need for immigrant workers so that the action in the emigration countries can be properly oriented and facilitated. Such action by the countries concerned implies co-operation at the international level. I wish to mention this fact since in this particular respect international co-operation may succeed in reconciling the often divergent interests of emigration and immigration countries."

The Chairman then called on Rev. W. Gibbons, rapporteur of meeting 12, who made the following remarks on the point of view of countries of immigration:

"Discussion of immigration and its influences comes as a logical complement to what has already been said on the subject of emigration. Taken together, these in- and out-migratory movements

across national boundaries for purposes of permanent or quasi-permanent settlement constitute international migration as a demographic phenomenon. In various ways such movement affects not merely the quantitative distribution of world population at a given point in time, but also the age and sex structure, and so indirectly the rates of growth, of particular populations. Furthermore, it affects the composition of the labor force and the size of consumer markets, beneficially or otherwise depending on circumstances. Thus it is related to levels of living in so far as these are the effect of the quality and volume of economic activity in relation to the population of a given area.

"In addition to these primarily demographic and economic aspects of international migration, there are also effects of a broad social and cultural nature which result from inter-penetration of immigrant and resident groups. This particular aspect of migratory movement is more properly the object of disciplines other than demography. Yet it is pertinent to demographic analysis of migration to the extent that the very existence of varying culture patterns and social structures throughout the world tends to set limits, other than economic ones, on migratory movement. The way in which peoples of differing cultures and societies react to one another has a definite bearing upon the flow of migration in a given direction at a particular point in time. The prospects for migration cannot be reduced to economic factors alone.

#### *"Some historical data*

"Historically, the years preceding World War II were characterized by low levels of immigration. This was in sharp contrast to the mass movements of the 19th and early 20th centuries, when tens of millions of Europeans moved overseas as settlers, principally to the Americas, but also to Australia, New Zealand and portions of Africa. That movement was not exclusively European, but was swelled by Asians, chiefly Chinese, Japanese and Indians. These began to migrate internationally in modern times later than the Europeans. It was not long before the Asians found themselves at a disadvantage, and were diverted from the main migratory streams to the chief areas being peopled by the migrants of European ancestry. The latter already occupied the less populated 'new' lands of the world. Thus the flow of Asian international migration, with some exceptions, remained within the Asian continent. The northern portion of that continent, however, was not open to free migratory movement, being controlled by Europeans.

"During the period of modern mass migration perhaps 65 millions went from other continents to the Americas alone, over half of them to a single country, the United States. Not all stayed, and return movement was at times, and in the case of certain countries, as high as fifty per cent. This was not universally the case, however, so that the immigrants contributed substantially to the population and the labor force of the major immigration countries. Two of the larger countries, Brazil and the United States, had populations of approximately three million each in 1800. Today their populations are 56 and 161 millions respectively, in signifi-



measure because of the direct or indirect effects of immigration.

"In the slow-down of immigration prior to 1940, several factors were at work. The depressed economic conditions of the 1930's discouraged prospective immigrants and led immigration countries to regulate more strictly the inflow of a supposedly competing labor force. New political forces were also at work in Europe, some devoted to economic autarchy. But of more permanent significance was the growing tendency of immigration countries to place restrictions, both quantitative and qualitative, on immigrants. The trend had to do with new views regarding the absorptive capacity of the receiving countries, and became particularly noticeable in the years following World War I.

"The years following World War II witnessed a revival of immigration in substantial proportions, though still below the 1880-1914 period, or the pre-depression years of the 1920's. This revived immigration has been of two kinds: (1) refugee resettlement consequent to upheavals in certain war-torn areas, and other areas affected by the establishment of new states; (2) the more normal voluntary movement of persons rejoining families, filling specific jobs, or seeking a new way of life in other lands.

"As regards the refugee movement, it was in several instances of a decidedly crisis character and involved movement of large numbers of people, in relation to the area and resources of the receiving country, within a very short period of time. This was the case in Western Germany, where millions of expellees of German ethnic origin were transferred within a matter of months, and without suitable economic preparation, from Eastern Europe. Refugees from the Eastern European areas, most of them later to emigrate out of Germany, swelled the numbers. Another example of crisis resettlement was Israel, where between 1948 and 1952 some 700,000 Jews immigrated during the period of 'Ingathering of the Exiles'. This latter immigration movement was made possible in part by the out-migration of some 600,000 Arabs at about the same time. The Israel and German experiences are not without lessons regarding emergency immigration possibilities.

"The postwar voluntary movements have been largely of selective character, and related to recruitment of labor force by immigration countries in process of economic expansion or with particular needs for skills. In the case of a number of countries the immigration has had some sort of government assistance, from the immigration or the emigration country, or both. Australia and Canada are examples of this type of immigration, and in Latin America Venezuela is demonstrating how substantial immigration can be fitted into economic development programmes.

"In assessing immigration trends and prospects, as these have a bearing on world population growth distribution, several points should be borne in mind:

"(1) The effect of immigration upon the growth structure of population in the receiving countries;

"(2) The achievements and objectives of recent and current immigration plans as regards non-economic aspects of assimilation;

"(3) Possible absorptive capacity as regards non-economic aspects of assimilation;

"(4) Implications of potential immigration as a means of redistributing world population.

#### *"Effects on the structure of the population"*

"The age and sex structure of population in immigration countries will undergo some direct modifications as a result of immigration, depending on the nature of the immigration. In general, there will be a tendency toward a younger population, since immigration of elderly persons is not common. Today, with the emphasis on familial immigration, there is likely to be a number of children and dependents among the immigrants, in addition to the actual workers joining the labor force. This has implications as regards consumer markets. While the labor force may be increased substantially, it will not necessarily be sufficient to meet all the consumer needs of the expanded population. If special skills, and methods of high productive capacity are introduced, then the potentially inflationary effects of this population increase can be avoided. In countries of substantial economic expansion, like Canada, the effects of the migration on the economy may be negligible. In countries of less productive capacity, however, the inflow of migrants with dependents may occasion some inflation. It is particularly important in such situations that the immigrants contribute significantly to the productive effort either as workers or as entrepreneurs.

"The indirect effects of immigration on age and sex structure will not be very pronounced, it would seem from some analyses made. The younger population, however, will tend to grow at a more rapid rate, a fact which must be taken into account in the case of immigration countries now entering into periods of fairly rapid growth. The growing populations will need constantly expanding economic activity, and hence capital investment, to maintain their levels of living or improve them.

"The discussion of these economic aspects raised further questions as to the methods by which the immigrants can most easily be absorbed into the economic structures of the receiving countries. France in particular, and to some extent Australia and certain Latin American countries, have attempted to fit immigrants into particular occupations. Canada, by contrast, has relied considerably upon freedom of choice on the part of the immigrant, as has also the United States. No positive conclusions as to the merits of either system appear to be justified in the present state of our knowledge, yet it is probably desirable that after entry into a country immigrants should not be held rigidly to the occupations for which they may have been recruited. Finally, there has developed a tendency in the postwar period for receiving countries to recruit immigrants for agriculture and the less skilled industrial occupations in which marginal productivity of labor is low. However, no serious economic consequences are likely to flow from this provided immigrants are free to enter more productive occupations if capable of doing so, and provided

a high level of employment is sustained in the economies of the receiving countries. The evidence from France and Australia indicates that while the immigrants may have been selected initially for certain occupations of low marginal productivity, there nevertheless is substantial mobility amongst the immigrants in situations of relatively full employment. The degree of mobility appears to depend not only upon economic factors but also upon social and cultural aspects.

#### *"The social factors*

"The social aspects of immigration are of importance. The most evident one is the extent to which immigrants can be received in a given country without evident reductions in the level of living. People in some immigration countries have become accustomed to certain social benefits and are minded to retain them. They tend therefore to judge immigration by whether or not it disrupts the economy or affects adversely these benefits. Great strains can be placed on an economy, and nevertheless the levels of living may improve. This was the case in postwar Germany, where the integration of refugees did not prevent improvement in living levels. The reluctance of persons in receiving countries to make the necessary effort, however, is a limiting factor as regards absorptive capacity. The theoretical economic potential is there, but the social structure or social will to face the special situation is absent.

"In other situations the social conditions presently existing may not be particularly favorable to immigration. It has been noted that under such circumstances temporary immigration of workers with skills in demand may pave the way for more permanent immigration. Their presence tends to spread skills and initiative, and their levels of living are imitated.

"Each country of immigration presents a particular social and cultural milieu which may not be particularly friendly to immigrants, at least those of certain cultures or nationalities. There is need to consider this limiting factor on absorptive capacity, which may be operative in cases where there is no question of economic capacity to absorb the immigrants. Then, too, there may be political factors at work, as is the case in contemporary immigration into the United States.

"Assimilation of immigrants rarely succeeds completely until the second generation. The immigrants themselves are psychologically at a loss for some time, and perhaps for their whole lives in their country of adoption. The scale of difference between the social and cultural structures of the sending and receiving countries will have an important bearing on the degree of assimilation required of the immigrant. The degree of difference may be less between an immigrant receiving country outside Europe on the one hand and the sending country within Europe on the other, than between sending and receiving countries both within Europe. In the latter case attitudes are strongly influenced by historical conditions and institutional practices which render their structures less flexible than those of the newly settled countries overseas. Furthermore, the overseas countries have been accustomed since their foundation to receiving immigrants, whereas

in most European countries immigration is less a part of historical tradition.

"The difficulties of assimilation, however, should not be exaggerated. To do so, may be to unwittingly or unnecessarily impede migration. Short term studies of assimilation experiences are not necessarily valid as to results, for the assimilation process is a complicated and long-term one.

#### *"Immigration and the distribution of world population*

"The volume of world migration is determined in the last analysis by two facts: the availability of emigrants and the absorptive capacity of immigration countries. In view of the existing pressures on resources in some areas of the world, the supply of emigrants may be taken for granted. What is of great importance in effecting international migration is the absorptive capacity of the receiving countries. This at times is overlooked or minimized.

"Since World War II Canada has received one million immigrants and has a goal of up to 200,000 a year. Australia has continuing plans for immigration, though at the moment it has been found necessary to slow down the inflow because of housing and economic absorptive problems. Latin America is an area of substantial immigration potential, which could receive some hundreds of thousands of immigrants a year. The world immigration possibilities are limited by economic factors, and also by the social, cultural and political barriers to movement of peoples. The possibilities, nevertheless, are greater than is sometimes imagined, and are in the magnitude of some millions each year.

"It is not to be expected that under present circumstances the population pressures of certain areas, especially those of continental proportions like India's, can be resolved by emigration. The rates of growth seem to exceed the possible or likely rates of emigration. On the other hand, it is not sound to say that migration cannot help population pressures. It certainly has done so in the case of Puerto Rico, and thus provided opportunity for intensive development. In the long term we cannot now say that mass migration is impossible or unlikely, nor that it cannot contribute to better distribution of world population. Much depends on rates of growth, and on rates of economic expansion in the less populated receiving countries. Immigration can be an important factor reducing economic, social and political tensions; but a related and even more important question is the efficient use of the resources of countries and regions, as well as of the world as a whole. This rather than the movement of people is the crucial problem of great and densely populated areas such as India and China, and even of Western Europe."

The Chairman next called on Mr. H. F. Rossetti. Taking up the slogan that Mr. Parenti had suggested for meeting 10, "Population pressure is a state of mind", Mr. Rossetti said that the welcome given to immigrants is also a state of mind. The human point of view should never be lost from view in any studies on migration. Migrants are not just units on the move, but human beings with desires, prejudices, preferences and fears of their own. Governments have an im-

portant part to play, Mr. Rossetti thought, in "humanizing" the ideas of the economists and planners.

Mr. W. D. Borrie expressed the view that studies on migration should not deal exclusively with problems of universal interest. Often it is more important to solve problems existing at the regional level. Nevertheless, the importance of international studies on a broader plane should not be under-estimated. Only these, Mr. Borrie said, clearly show up the similarity, or the divergence, of interests of receiving and sending countries. Mr. Borrie stressed the importance of improving the migration statistics collected and published in various countries. He stressed particularly the great interest that immigration countries should take in statistics of emigration countries and *vice versa*. He underlined the role that individual research workers could play in this improvement of migration statistics. Further, the collaboration of private research seemed to him indispensable in studies of the effect of migration on the demographic and economic characteristics of the population. Referring to the social effects of migration, Mr. Borrie observed that the present time is particularly propitious for studies on this subject. The assimilation of immigrants cannot be studied properly immediately after their arrival, but only after some ten years of settlement. This is precisely the period that will soon have elapsed since the major migration wave that followed immediately after the second World War. Mr. Borrie expressed a preference for the word "absorption" rather than "assimilation". The latter expression implies somewhat that the immigrant must identify himself with the culture of his new country. Assimilation of this type is not necessary, he said, for the success of immigrant settlement. Very often, for example, occupational absorption may be quite sufficient. Finally, Mr. Borrie underlined that in his view the international agencies should not insist too rigidly on the global approach in studies on international migration. The conditions particular to individual countries must be taken into account.

##### 5. FUTURE POPULATION TRENDS

When the trends of the effects of the various demographic factors have been considered, it remains to synthesize the total effect on population. Given that the population of the world will continue to increase, is it possible to be more specific and to state how large the increase will be? How is this increase likely to be distributed over the surface of the globe? Mrs. I. B. Taeuber, rapporteur of meeting 14, spoke on these points in the following terms:

"In the year 1950 there were some 2,400 million people in the world—twice the number there had been a century before, five times the number there had been three centuries before. The rate of increase had been quickening over time; in 1950 it was approximately 1.2 per cent per annum. The United Nations estimates indicate the most reasonable figure for total population in 1980 to be 3,600 million; the estimates extend from a low of 3,300 million to a high of 4,000 million. Let us accept the middle estimate of 3,600 million for the moment. If realized, this would mean the addition of 1,200 million people to the population of this planet within thirty years. The increase in this one generation would be two and one-half times the entire population of the world in the year 1650.

"Evaluation of the validity of this estimate for the world as a whole or its social and economic significance if realized would be a rather futile exercise, for the regions of the world, though inter-related, are not unitary, and the realization of future populations involves more than a splendid isolation of demographic computation. The components of growth—mortality, fertility and migration—are related functionally to each other; all are separately and together related to the changing cultures in and through which they occur. They are related particularly to the economic factors involved in levels of living, to forms of social and political organization, and to the status and advancement of applied science in fields that extend from the utilization of atomic energy to the adaptation of physiological and bio-chemical knowledge for purposes of controlling conception.

"The approach to the future taken by the staff of the United Nations was an analysis of the past, the basic assumption being continuity in processes of change that had already been operative for some three centuries in some parts of the world and that seemed to be diffusing throughout ever wider areas. The economic, social and demographic changes that have been variously designated as the vital revolution of the demographic transition began in Western Europe with a long continued decline in mortality that was soon followed by an equally sustained decline in fertility. The lag in fertility decline resulted in a vast increase in population. Not only did Europe's own 103 million people of 1650 increase to 593 million in 1950 but with the aid of substantial numbers of immigrants from Africa, the population of the Americas and Oceania grew from 10 million in 1650 to 343 million in 1950.

"By the thirties of this century the pattern of demographic evolution appeared clear; in many countries a rapidly declining fertility was reaching or falling below a mortality so low that future declines could have slight numerical impact. Absolute declines in national populations seemed imminent not alone in many European countries but in North America and Oceania as well. In recent years fertility has risen substantially in practically all the countries that had previously had very low fertility. There is no longer relative assurance in the precise estimation of the future. Short-time changes in birth rates reflect primarily decisions as to *when* children shall be born; these decisions of individual families seem to be related closely to economic conditions. The projection of either short-time fluctuations or longer time trends in fertility seems to have as precondition an advance in the techniques of projection used by economists. This precondition is not sufficient, however, for economic factors are not direct determinants; they influence population only through social-psychological processes that are almost infinitely complex in derivation and in operation. More refined measurements of fertility, analysis of economic-demographic interrelations in the short and the long run, and social-psychological research on attitude formation and decision-making in individual families may eventually permit estimates of future population based on measurement of processes rather than on mathematical projection of demographic variables.

"Additional complications of projection and further requirements in research are added by cultural and demographic developments in Eastern Europe and the USSR. Reports from individual countries to this Conference indicate widespread increases in rates of growth during recent years, these increases being explained by simultaneous declines in mortality and increases in fertility that have accompanied changes in social organization. Research on the social-economic and psychological changes and on the detailed dynamics of fertility in these regions would contribute greatly to the projection of future populations for the countries concerned. Such research would also advance comparative demography in the fields of all the components and correlates of population change.

"That the transition to low mortality is not limited to European culture or to the particular types of industrialization and urbanization that occurred among European peoples is indicated by the experience of Japan. Here the declines in mortality and fertility and their relations to social-economic and rural-urban transformations were similar in broad outline to those that had occurred earlier in Western countries, but the specific timing and the rates of decline differed sharply. Moreover, postwar Japan has witnessed extraordinary declines in mortality and in fertility, and both were associated directly with scientific and technological advances applied under the auspices or with the implicit approval of the government.

"The major numerical uncertainties as to future populations do not concern the industrial and urban cultures where mortality and fertility alike are low. They relate to the agrarian societies where mortality remains rather high and where fertility has as yet shown no definitive movement toward sustained decline. This demographic situation where the growth potential is very high characterizes virtually all Africa and Asia together with Middle America and Tropical South America and most of the islands of the South Seas. Almost two-thirds of the present population of the world live in these regions.

"Rates of growth in the high-fertility areas have been increasing irregularly over past decades and centuries; they are likely to increase still further as the extension of health and sanitation activities reduces death rates in additional areas toward or even to those low levels now achieved in many areas throughout the world. What is possible in the way of mortality reduction is subject to analysis country by country, region by region; but what will occur is subject to objective prediction neither in the individual countries nor in the world as a whole.

"The imponderables in the future of fertility are so great that nothing is possible beyond illustration of the numerical consequences of hypothetical dynamics. To project present levels into the future is highly unrealistic in the light of the differentials that now exist among rural-urban and social-economic groups in many countries of high fertility. Yet to project a repetition of the Western or Japanese pattern in rates of decline involves an implicit assumption of comparability in industrialization, urbanization, and their associated demographic changes. Moreover, detailed analysis in many areas and many cultures has indicated that peasant fertility is an

integral aspect of ways of living and earning a living, of attitudes to life which include ancestors, the living and the descendants in a meaningful continuum. It is highly resistant to many forces of decline. Japanese experience demonstrates that economic and social changes which leave a basic adjustment to the peasant society intact have little or no influence on marital fertility. To project the lethargy of the peasant societies may be unrealistic, however, especially when such diverse countries as India, Japan and Egypt are labouring to develop policy and effective action in the field of family planning.

"The United Nations estimates of the population of the regions of the world and the world as a whole in the coming generation give a preliminary outline of the magnitude of future changes, if the future represents an ordered continuation of the past without acceleration, deceleration, or reversal in the components of growth. These projections, like those in individual countries, are a first step in the assessment of the future. The projections that will be the apex of a mature demography lie far in the future, but the research presented to this Conference makes it quite reasonable to anticipate continuing improvements in the bases for and the techniques of projection. Developments in the quantity and the quality of data on the numbers and characteristics of populations, on mortality and fertility, on family formation and dissolution, are essential. These are not sufficient, however, for whether we predict the future of mortality or of fertility, we need to know the interrelations in stability and in change of demographic, social, and economic variables in different cultural contexts within different forms of over-all social and political organization. And in areas of low as of high fertility, in varying economic circumstances and under different religious and ethical systems, we need to know the attitudes of men and women, of family groups and village communities, of secular and religious leaders, to family values and to human reproduction. Moreover, we need to know the relation of expressed attitudes and values to behavior.

"The outlook for immediate improvements in estimates of future populations for many great populations where fertility is now high may look rather dark but the research in process and in prospect is truly exciting in its analytical depth and its geographical dispersion. As areas and spheres of ignorance are reduced, future World Population Conferences may assess the prospects with far greater assurance than has been possible at this conference, where we have raised questions far more often than we have given answers."

The Chairman invited Mr. L. W. Törnqvist to make to make a comment on the methods of population projections. Future population growth, Mr. Törnqvist said, is not entirely determined by past and present trends. Under a given set of conditions, a large variety of alternative future patterns is possible. A sound method of estimating at least the most probable among all these possible future trends would constitute an important step forward. But if real progress is to be made it is necessary to consider the varying probabilities of alternative possible courses of future development and it is no exaggeration to say that the

task of demography is to arrive at the probability distribution of the emerging population trends. Since the range of such probability distributions depends in part on the data relating to the past and method selected for the forecast, demographers must try to find the method that gives the narrowest range. They are under obligation to explore the relevant methods from this point of view in order to fulfil the high hopes that other disciplines have placed in demography. Mr. Törnqvist suggested that teachers of statistics encourage their advanced students to undertake research on the stochastic processes of population growth.

Mr. L. T. Badenhorst stated that he did not feel that the methods presently being used for making population projections could be improved considerably in the near future, because of the serious gaps in available knowledge about the patterns of social behaviour of human beings. Nevertheless, Mr. Badenhorst hoped that the criticism that had been levelled during the Conference at the existing methods of making population projections would not discourage those engaged in making projections. In spite of their imperfections, he said, projections are most useful. Above all, the relative inability to make accurate forecasts should not be allowed to obscure the fact that the world's population will certainly grow very considerably during the next thirty years and that the increase will be distributed very unequally among the various regions of the world. Mr. Badenhorst expressed the hope that the historic World Population Conference of 1954 would draw the whole world's attention to these facts.

During the discussion Mr. G. Frumkin expressed grave doubts about projections of the total population that merely extrapolate past trends and that cover countries for which no demographic statistics whatever are available. He agreed that mortality trends lend themselves fairly well to projection, but even here medical progress might speed up the anticipated decreases. In the case of fertility trends, the choice of

methods is much more difficult. At its beginning, Mr. Frumkin said, the capitalist system, stressing the importance of the individual, necessarily brings about a reduction in fertility. But in the course of the evolution of capitalism, major changes have taken place. The more equal distribution of wealth, social security systems and systems of family allowances have brought a veritable revolution and have created conditions favourable to a rise of fertility rates. The important question, as stated by Mr. Frumkin, is, what path will the economically under-developed countries choose to follow? Western culture surely implies constant limitations of fertility, but it brings with it a social structure that tends in the opposite direction. The decrease of fertility in the under-developed countries will depend very considerably on the extent of the influence which these two trends of Western civilization exert in countries, as they develop. Mr. Frumkin went on to suggest that projections *a posteriori* be made, starting at a date quite far back in the past and working towards the present. He was sure that the results of such calculations would be quite surprising.

Mr. I. U. Pisarev and Mr. I. Bogdan affirmed their opposition to Malthusian doctrines. They felt that it was not the size of the population that should be adjusted to the available resources, but rather that economic and social institutions must be continuously readapted to permit a growing population to raise its level of living. Mr. Pisarev was happy to find that many demographers, belonging to different schools of thought, agreed with him on this point and he regretted that the reports presented at this meeting had not given strong enough expression to the opinions of the anti-Malthusian demographers. Mr. Bogdan expressed his satisfaction that the Conference had given him the opportunity to exchange views with demographers from all over the world. He felt that demographic science could be of the greatest service to humanity provided that it be utilized in the cause of the happiness of the people and of peace among nations.

### Meeting 31

## ECONOMIC AND SOCIAL IMPLICATIONS OF POPULATION TRENDS

### Report on the meeting prepared by the United Nations Secretariat

This last substantive meeting of the World Population Conference was devoted to a review and summary discussion of the principal points which had been brought out at earlier meetings of the Conference with reference to the social and economic implications of population changes. It was complementary to meeting 30, which was intended primarily for a summary discussion of factors influencing population trends and prospects for future population growth.

Mr. D. Vogelink, organizer and chairman of the meeting, emphasized that it would be unrealistic to consider the effect of a population change upon economic or social conditions without at the same time studying the reciprocal influence of the latter conditions upon the population trend. Only by trying to understand the inter-dependence of these factors in their actual complexity could a solid basis be found for evaluating the probable consequences of an action

programme. He requested the participants in the discussion to examine the implications of population trends from this point of view, with the aid of drawing a few conclusions of major interest and importance from the points discussed at the previous meetings.

Statements on different aspects of the subject were made by eight persons selected from among the rapporteurs of the meetings at which these aspects had been discussed in detail; and a general discussion followed. The result will be summarized under the following headings:

1. Agricultural resources and population trends
2. Non-biological resources and population trends
3. Capital formation, investment and employment and population trends
4. Internal migration and population trends
5. Aging of the population

6. Social aspects of population trends, with reference to the patterns of family life
7. Legislation, administrative programmes and services relevant to population
8. General discussion of interrelationships of population trends and economic and social factors

#### 1. AGRICULTURAL RESOURCES AND POPULATION TRENDS

Introducing the discussion of this topic, the chairman pointed out that it is not enough to know whether the food resources of the world considered as a global unit can or cannot satisfy the present and future needs of the world population. A much more complicated question is the distribution of resources in relation to the distribution of population. There are overpopulated regions where the people suffer from a shortage of land and underpopulated regions suffering from insufficient labour supply. The chairman emphasized the necessity of taking into account the social and economic conditions which would guarantee a rational exploitation of resources and distribution of products. In this connexion he mentioned particularly the role of investments in agriculture, their forms, and their possible effects on agricultural productivity. He then called upon Mr. P. L. Sherman, rapporteur of meeting 22, who made the following comment on the discussion of the subject at that meeting:

"The problems of agriculture in relation to population cannot be separated from those of man's relationship to all other natural resources. However, if people are more disturbed about the possible failure of agricultural rather than non-agricultural resources to meet the needs of a growing population, it is simply because food is one of man's basic requirements and all the rest of his activities depend on it. Yet this obvious fact has not been adequately acted upon, with the result that the world is faced with the many dangers of which we are acutely aware. In some parts of the world an abundance of goods and services are produced, some of which may appear to have little relevance to the genuine needs of an evolving civilization. In others, millions of people are short of food. This paradox is the more remarkable because man's optimum need for food is largely fixed both in quantity and quality. It sets a concrete objective for human achievement, whereas man's need for many other things though less urgent, seems to have no apparent upper limit.

"The Conference had in fact before it some rough estimates of the food supplies needed to feed a population expected in 1980 to have increased by about 40 per cent. These estimates assumed only a moderate improvement in nutritional levels, mostly in the poorly fed countries. They showed that cereals would have to be expanded by 50 per cent, meat and milk by 70 per cent or more and fish by 90 per cent. The increases would have to be larger still if requirements were taken at an optimum level. Rough as they are, they show something of the magnitude of the task facing the world during the next few decades.

"This is the background of the two fundamental questions linking agricultural development and population. The questions are, first: Can agricultural, fishery and forest resources be effectively mobilized to meet needs of a growing population more fully

all over the world? What are the prospects that this will be achieved and what means must be used? Second: What changes in the size, efficiency and living standards of the agricultural population must accompany this achievement?

"In considering these questions, the vast differences in the levels of agricultural development in different parts of the world have had to be borne in mind. Are they chiefly the inevitable results of different soil, climatic and geographical conditions? Or is under-development mainly due to backward social and cultural conditions and to consequent poverty impeding progress?

"We cannot answer these questions precisely because we do not know enough. Estimates of potential resources are usually conflicting and largely guesswork. The effects of weather and climate on production are not sufficiently known. Exhaustive and detailed surveys of actual land use everywhere are urgently needed if we are to understand how history and geography, how social and economic factors have influenced the way people have settled and used their land. Equally important, we must have far more detailed soil surveys everywhere if reliable estimates of potentialities of proper plans for guiding agricultural development are to be made.

"But there is enough evidence to show that large new areas could be brought into cultivation all over the world and especially in the tropical forests lying across the equator. Even greater still are the technical possibilities for increasing production by raising crop yields, expanding livestock numbers and yields per animal. Indeed, the technical basis may exist for a cereal and crop output perhaps twice and in the case of livestock products perhaps several times the present levels—and this applies especially to the less developed regions. Similar scope exists in the fields of fishery and forestry.

"But even if we knew enough to gauge the world's potentialities with precision, it would be folly to allow any optimistic conclusion about resources to engender a false sense of security. For the really vital question is, can these resources be successfully exploited in the face of all the innumerable obstacles interposed by economic, social, cultural and political factors—and time presses as well as population? Here, however, the evidence gives no ground for complacency.

"I think we all agree that increase in agricultural productivity per man is the real key to the sustained growth of agricultural production. Some very rough estimates of agricultural productivity in different countries were submitted to the Conference. There is a real need in this important field for more research and greater efforts on the part of Governments to assemble reliable data on man-hours actually spent in agricultural employment. It would appear, however, that production per head of the farm population in Oceania, North America and North West Europe is about 10 to 20 times greater than in the Far East, Near East, and Latin America. Productivity is not only low in these regions but in many countries has virtually stagnated for generations. In some sparsely populated and under-developed countries, for example in Latin America, production per head is rather higher owing to the availability of more land. But lack of and sometimes



unwise use of capital and inefficient systems of land tenure impede development. Yields per hectare over the years have not improved much from low levels.

"These facts alone should restrain optimism. The task is clearly long and difficult. Its solution requires overcoming some of the major retarding forces that have prevented the evolution of agricultural development along lines most suited to man's needs.

"Rural overpopulation is not itself an explanation of arrested development. The number of people a given quantity of land can support depends not only on natural factors, but also on skills, transport, communications, capital, etc. In some circumstances increasing density of rural population does not mean lower output per man. Modern techniques, abundant fertilizers and a large degree of industrialization have enabled the labour of one farm worker to support many in the densely settled smaller countries of Western Europe. There appears to be little reason why this should not eventually apply to all regions in the world with adequate sunlight and water. On the other hand, if techniques remain unchanged, the law of diminishing returns operates with increasing force as densities increase until the labour of one man fully working will barely suffice to feed two people—and the limit of subsistence is reached. Some early civilizations may have indeed passed away when soil fertility was depleted. In our own era, population has multiplied, but only at the cost of recurrent famines and bare subsistence for many millions.

"Clearly a profound modification is required in the techniques and patterns of agriculture that have remained largely unchanged for centuries. In some fields quick and important results can be obtained at small cost, for example, in the control of animal and plant diseases or in the wider adoption of simple but more efficient methods of cultivation such as the Japanese methods of rice cultivation that are being gradually applied to India. But in general the economic, social and cultural impediments are formidable.

"Not the least is the vast amount of capital required to finance development. Beginnings have been made to provide better facilities for credit, but the entire scale of effort needs to be raised. Little capital is available for investment in farm services characteristic of modern societies; little for general industrial development without which rural population cannot sell increased output or find an effective outlet for surplus labour. Indeed, industrialization is sometimes regarded as the solution to the problems of agriculture. But while recognizing its great importance, it should be kept in proper perspective. The provision of man's food cannot be assured merely as a kind of by-product of industrial activities. Urban communities cannot expand unless their food supply expands accordingly. A flourishing farm population is necessary as an important market for industrial products. Indeed, too speedy industrialization, especially in response to temporary situations, often results in inflation and the diversion of needed labour and capital from agriculture. Balanced growth requires that agriculture and industry keep in step and capital investment must be directed accordingly. Still greater co-ordinated ef-

forts by Governments are needed to enlarge capital resources in less developed areas. But it would be idle to use large amounts of capital on programmes for development which presuppose an abundance of skilled technicians and high standards of literacy and knowledge among backward peasant farm populations. Account must be taken of basic attitudes towards change if there is to be solid accomplishment.

"For resistance to change is one of the most serious impediments to progress. The traditions that support high fertility are rooted deeply in the cultures of less developed agrarian societies. With few tools and little animal power, production is directly related to the number of hands available, especially at seasonal peaks. In such circumstances the only clear way in which the farmer can feel safe is to assure the labour supply within his own family. The network of family relations, duties and obligations which are nearly always a feature of these societies, reinforces the ideal of a large family. Thus if methods of production remain unchanged, pressure of population grows leading to under-employment, fragmentation of holdings, oppressive tenancy and landlessness. Income and productivity remain low and the farmer can scarcely be expected to risk even a small part of his production by new methods. Resistance to change therefore appears as a cultural response to growing economic pressure on agricultural resources. It can, however, be overcome provided basic values in these societies are not violated. For example, the advantage for large families of sending many members into factories soon yields to the insistence of children that they dispose of earnings in their own way. Movement between country and town is not without its effect on the higher fertility of the rural population. Again, efforts to reduce mortality have been remarkably successful because they promote the accomplishment of social values. In the same way improved methods and equipment are finally adopted once they are shown to be compatible with culture. Literacy and knowledge, the impact of which is becoming wider, can be fostered still further by carefully conducted campaigns. In particular, the teaching of better nutrition can play a role of far-reaching importance in the health and efficiency of people. A psychological basis can thus be created for the adoption of more progressive attitudes and for the acceptance of reforms. In this way productivity can be increased and more resources become available for development. This is part of the long-term process, through which economic and cultural standards of rural population may be lifted gradually towards those enjoyed by urban population.

"For there is no inherent reason why incomes in agriculture should be appreciably lower than incomes in other activities. The main reason for the present disparities is probably historical. Agriculture preceded industry as the main occupation and provides the principal reservoir for further recruitment to industry. Despite the many compensations of farm life, this recruitment persists even in countries with a long history of industrialization, because of the higher rewards in industry. This process will no doubt continue until labour requirements in agriculture and industry come into balance in circumstances in which the skill, techniques and efficiency



of the agricultural worker are on a par with his urban compatriot. If, for example, one man in agriculture could eventually feed himself and 9 men in other occupations, the balance would be reached with an agricultural population of 10 per cent. The ultimate proportion for each country is of course speculative.

"But this conclusion applies only to self-contained societies or to the world as a single unit. For an individual country engaged in foreign trade, the proportion must depend on its natural and other advantages for agricultural production as compared with other activities. Most of the food-deficient countries, even with increasing productivity, cannot, except at prohibitive cost, produce enough for their own food needs. Food exporting countries will not continue to expand output to meet the needs of other countries if markets become unfavourable. Much research has been devoted in recent years to the response of food demand to rising income and changed prices. Much more needs to be done in this field, especially on the effects of changes in the *distribution* of national income. Enough, however, is known to assert that rising incomes will result in a large increase in demand both for livestock products and high energy foods. In view of the high rates of population increase in North America, Oceania and Latin America, pressure on their food export surplus could become heavy. The assurance of adequate markets at prices fair both to producers and consumers is therefore vital, otherwise planning of food and agricultural import and export programmes and, therefore, of production may become difficult. Again, the development of sparsely populated regions like Oceania and Latin America offers an important possibility for the transfer of people from over-populated countries. Immigration of this nature is seriously impeded when booms and slumps dislocate internal economics.

"In conclusion, without exhaustive surveys of land use and soil characteristics, we cannot say whether the size or distribution of land resources among the regions of the world is greatly out of balance with the population in these regions. We do know that some individual countries suffer seriously from lack of such resources. But the worse problems for agriculture come from the widespread mal-distribution of health and education, skills, techniques of production and marketing, availability of fertilizers and farm machinery, fuel, transport and communications. Some of these things raise questions of the relation between the distribution of agricultural and non-biological natural resources. But many of these types of mal-distribution can be remedied by human effort. Failing greater individual efforts by Governments and a large expansion of co-ordinated effort of the type undertaken in Technical Assistance and other programmes, there is no assurance that population and agricultural production can be brought into balance by the adjustments that followed industrialization in the Western world. Progress, even with the greatest efforts, will be slow. Those countries whose natural resources are very low in relation to heavy population may not be able to achieve a full balance by increasing productivity and industrialization. In some others, income and productivity are so extremely low that economic development may not be rapid enough to

bring a balance in sight. In such cases, efforts on the part of Governments to adjust population by other means may be inescapable."

## 2. NON-BIOLOGICAL RESOURCES AND POPULATION TRENDS

The Chairman observed that in spite of the special importance of agricultural resources in satisfying the most elementary human needs, the quantities of fuel, minerals, and other non-biological resources required by modern industrial nations have increased to such an extent that these items can be considered no less important than biological resources as a basis for the existence and development of modern civilization. He requested Mr. F. W. Notestein, rapporteur of meeting 20, to summarize the principal results of the discussion in that meeting with regard to the relationship between population growth and non-biological resources. Mr. Notestein made the following statement:

"The evidence clearly indicates that large populations are unnecessary for the achievement of large economic production. North America, for example, which has only about 7 per cent of the world's population, consumes 41 per cent of the world's inanimate energy and produces 40 per cent of the world's economic product. Clearly, production depends more heavily on the abundance of cheap energy and materials and on effective economic organization than on the size of the population.

"A world-wide projection of past trends in population growth and *per capita* consumption of energy and industrial materials does not indicate any immediate dearth of either materials or energy. None of the participants foresaw immediate difficulties in expanding the production of either raw materials or energy very substantially during the next quarter century.

"The world-wide view of the question, however, is not very useful. The difficult problems are regional. It is not clear that the conventional fuels will be adequate to meet the long-run needs for cheap energy in large parts of the world. Serious shortages of conventional fuels are present or in sight for many areas around the rim of the Eurasian Continent. These areas, containing a large part of the world's population, do not have a favourable prospect of obtaining ample supplies of energy in the near future.

"If we think of improving the conditions of life, the demand for cheap energy is quite insatiable. In part this demand will arise from the expanding needs for materials that will force the processing of lower-grade ores and the substitution of more abundant materials. Nearly all such shifts require greatly increased uses of energy. The demand for energy will also be vastly increased by the expanding need for the production of fertilizers.

"The prospect of meeting these needs for abundant and cheap energy from non-conventional sources is not bright for the near future. Few people expect that nuclear energy will be commercially available on a major scale during the next quarter century. In the long run the prospect is better. Nuclear fuels may be almost inexhaustible, although many technical problems remain to be solved. However, present evidence suggests that this source of

energy will be most significant for regions where other fuels are expensive, where capital is abundant, and the demands for energy are very large. It would seem, therefore, that nuclear fuels are likely to be least significant for the very regions where the need is most acute.

"There are many other theoretical possibilities. The world receives from the sun each year more than enough energy to meet its needs. The difficulty lies in converting this energy into economically useful form. Outside the field of agriculture, there are no highly significant developments immediately in sight. There is reason for hope, and great need for research, but practical results are not very likely in the near future. Again, the most promising prospects seem to involve heavy capitalization and high technological skill.

"In the field of creatable resources, significant developments continue to be made. In the next quarter century we may anticipate developments on something of the scale of the past 25 years. Since, with the notable exception of atmospheric nitrogen, most such materials utilize wasting assets such as coal, gas, oil and sulphur, or agricultural lands, they compete with conventional materials for resources heavily drawn upon.

"The prospect of solving through international trade the problem of imbalance in the relation of population and production in different parts of the world is not very bright. Even if a free movement of goods could equalize prices throughout the world, the major problems of poverty would remain unsolved. There are, however, considerable prospects that many of the under-developed regions could utilize the world's demand for industrial raw materials to earn foreign exchange and attract capital which is greatly needed for the development of their own industrial production. In view of the growing demand for such materials there is a considerable prospect that the terms of trade will turn more and more in favour of industrial raw materials. Such a shift would assist under-developed regions having supplies of these materials. Unfortunately, some of the heavily populated under-developed regions have inadequate supplies of industrial raw materials. For countries having mainly their labour to sell, an increase in the relative price of raw materials would be disadvantageous. On the matter of resources several participants held that adequate solutions were unlikely to be found unless in the field of raw materials and capital the rule of the market were to be softened by consideration of social justice.

"On the question, whether or not the growth of population in the under-developed countries could be matched with a greater expansion of production in the near future, little unanimity of opinion emerged from the conference. In general participants from the communist countries expressed considerable optimism as to the future possibilities of meeting the needs of growing populations, citing as evidence the past experience of industrialized countries, their own recent experience, and the general possibilities for future technological and scientific progress. Others held that in many of the most densely settled and industrially under-developed regions, it was not certain that rapid rises in levels

of living were likely to come in the near future. They saw no panaceas.

"Everyone seemed to agree that there was great need for intensifying the search at the private, national and international levels for the cheap and abundant energy and materials required for the improvement of living conditions in the world's poorest and most densely settled regions."

### 3. CAPITAL FORMATION, INVESTMENT AND EMPLOYMENT, AND POPULATION TRENDS

The Chairman repeated his emphasis on the factors in the social and economic environment which mainly determine the possibility of a rational use of resources. He called particular attention to the case of those under-developed countries, rich in natural resources, where an antiquated economic and social system inhibits the free development of productive forces. The problem is often complicated, he observed, by demographic factors, that is, by a high birth rate and rapid growth of population where the death rate has fallen, tending to hold down the level of living, and to hinder the formation of capital. In this connexion he called upon Mr. R. Dalla-Chiesa, rapporteur of meeting 26, for a comment on the discussion at that meeting with reference to the relationship between the growth of population and the formation of capital, the trend of investments and employment. Mr. Dalla-Chiesa made the following statement:

"Economists dealing with the problem of development generally concentrate on such major economic items as basic resources, national income, actual and potential saving capacity, investment requirements and employment opportunities in order to determine the main targets of an economic development plan. At this Conference, economists have had an opportunity to meet with demographers as well as sociologists. They have had brought home to them the important lesson that population must enter into economic calculations not only in terms of the trend in the number of the people but also in terms of birth and death rates and the consequent distribution of the population by age groups. Information on age composition can suggest much about the economic efficiency of a population. Moreover, under programmes of economic advancement for growing communities, too little attention is usually paid to other human factors that are related to economic growth. What about the endowments of the people, their attitudes to social changes, their moral, religious and political convictions?"

"All these possible ramifications of the general problem with which we are concerned deserve to be explicitly treated, but the limitations of time compel me to single out only a few of them.

"In the under-developed countries there is generally a high ratio of 'dependent' to 'productive' age groups because of the large number of children in their population. As Mr. Molinari has pointed out on the basis of Italy's census data, the people of the less developed countries partly compensate for this economic handicap by beginning to work at an early age and retiring late. But this compensation is not sufficient to bring the numerical relationship between their dependent and productive population into line with that found in economically more

advanced countries, partly because the process in the less developed communities is usually accompanied by a large accumulation of disguised unemployment. How will the dependency ratio in the under-developed countries be affected by changing vital rates? Will the ratio become more favourable if there is a decline in mortality without a concomitant decline in fertility? What would be the effect of the changes in age structure on the amount of capital which such communities must form in order to accelerate economic growth?

"Although the reduction of death rates will lengthen the average span of economically active life of each succeeding generation, this will not, without a corresponding reduction of birth rates, improve the balance between the productive and dependent elements of the population in under-developed countries, *for it is primarily the birth rate, and not the death rate, which determines their age structure.* It has been suggested that if mortality losses among children are avoided, investment in their up-bringing will not be wasted, and thus the productivity of investment for a new-born individual over his life span will be increased, in terms of net addition to the output of the community. On the other hand, it is plainly not sufficient to consider productivity of investment for a new-born individual alone. The reduction of mortality rates, without any change in fertility, will have the effect of increasing the numbers of survivors in all age groups of the population, adults and children alike, and unless there is a concomitant increase in the capacity to invest the result will be to reduce investment per capita when the community as a whole is considered.

"From these considerations a general conclusion can be drawn. A decline of mortality without a decline of fertility, in the under-developed countries, will simply accelerate the rate of population growth without improving the economically inefficient age structure of their population.

"Does this necessarily mean that increasing population pressure will block the economic progress of the under-developed countries? Is not the discrepancy between the amount of savings needed and the amount which can be realized in many cases an insuperable one? Actually this is true only in a very static sense. Excess population may be a valid explanation for poverty only to the extent that we continue to take for granted the existing economic structure of a growing community. But economic development means not only increasing savings and capital formation; it also means adjusting the economic structure of the society, reorganizing the mechanisms of production and distribution, breaking those rigidities of markets and removing those international obstacles which make for economic stagnation. It means finally tapping all the possible resources available, not only natural resources, but also those represented by the 'excess population'; this again involves organizational and institutional changes. We must underline the fact that the institutional implications of economic growth have not yet received adequate attention. They are likely to be as important as the economic ratios involved in savings, investment and income.

"When considering capital requirements on the basis of input/output ratios, we must recognize not

only that there is no single rule of easy applicability but also that there are many intangible factors which rarely receive appropriate attention. I refer primarily to the fact that human decisions—because people are people and not machines—almost invariably make discrepancies between what is planned and what is actually achieved. There are indeed many human reactions which can be safely predicted as liable to change under the influence of varied economic conditions. The urge for economic betterment accompanied by longer life expectancy may make for relatively quick changes in prevailing spending and saving habits. Better health, nutrition, education, gradual urbanization and industrialization, together with the demonstrated achievements of more advanced countries, and finally social emulation may indeed generate new social and moral values. They will, however, become a structural part of society only over a period of time and only in response to internal impulses. They cannot be imposed from without, but only induced from within.

"The importance of moral incentives must be stressed even in connexion with the technical problems of capital formation. It seems indeed very possible to obtain in relatively primitive societies significant increments of real capital formation by operating outside the well known pattern of a strictly monetary economy. This is another stimulating field of inquiry which, together with the institutional aspects already mentioned, merits attention.

"Let me now refer to other technical problems of a more specifically economic nature. It is agreed that the problem of capital formation lies at the very centre of the process of development of economically retarded countries. The traditional relation between demand and supply is fully applicable to the forces that govern the accumulation of capital. It is not sufficient to analyse the capacity to save, whether this capacity be real or potential. An act of investment is actually required. As a result the supply of capital, however important, is only one aspect of the problem. The difficulties that lie on the demand side should not be minimized. They have to do with the difference between the return of an additional investment to the community and its return to the individual investor, which influences the inducement to invest. They have to do with the expansion of the market and with the existence of 'external economies' that permit a reduction of cost per unit of production when the volume of production is increased. They are related to *the ratio of output to capital*, which varies according to the industries concerned, to the status of technology, the environment of different communities, etc. This is a very important and wide field in which hitherto our natural inclination to generalize has brought about an excessive simplification of data. This is another field in which much more research and information is needed.

"It may well be that by using ratios for aggregates that are valid in advanced countries we sometimes tend to exaggerate or minimize investment requirements elsewhere. Moreover, when it comes to determining public policy on such matters as investment and employment, other pitfalls must be avoided. Simple general formulations are very

dangerous, as it is impossible to allow for all differences of practical situations in a policy prescription dictated by cut and dried rules. In the first place, the initial conditions of various countries, in terms of resources, employment, status of technology, etc., may differ in many respects and, what is more important, the prevailing ratio of changes in important quantities, such as population, saving and income, may be significantly different from one country to another. In the second place, although it would seem possible *prima facie* to proceed by steps in the formulation of a policy—that is, by determining first the quantity of capital (savings) needed, the type of investment to be carried out, and the order of priorities—this is not entirely correct. Actually, the type and/or the order of priority has, or may have, a significant repercussion on the quantity of capital needed. In other words, the two aspects are interdependent rather than separately determinable. This interdependence should be kept in mind not only by economists but also by those called upon to contribute to economic planning.

“There is an additional relationship between population and capital formation which deserves a more general systematic analysis than has yet been given. Two alternative views have been expressed on the subject, but the one has not been related to the other. Those who expound the theory of disguised unemployment, or emphasize the potential asset represented by over-population, implicitly take a static view of the human resources of a country. They infer that, even without technological advances, additional equipment, etc., a large part of the population could be removed from their present occupations without affecting total output significantly, and further that released man-power could be effectively used for real capital formation. By stressing this concealed potential for domestic savings, the advocates of this viewpoint emphasized the possibilities for development by effectively tapping local resources. The second view, largely expounded in relation to under-populated countries is more dynamic and concerns itself with population growth. The size of the population and the rate at which it grows are the factors which determine the need for capital. Domestic savings are insufficient and those which exist cannot be tapped efficiently. Foreign aid is called for. Are these two approaches contradictory? Personally, I am more inclined to believe that the difference between them is resolved by the fact that they apply to different situations.

“Is it possible to assess the final impact of economic development on population growth? Is there any possible correlation between trade cycles and vital rates? It is tentatively suggested that an increase in the rate at which *per capita* income grows is likely to produce an increase in the rate of population growth, at least in the short run, but not in all circumstances. A certain degree of correlation may be found also between economic cycles and changes in vital rates. For advanced countries, one might suggest that there is possibly some correlation between the trade cycle and fertility. While this is not equally true in low-income communities, it is not impossible to imagine that there might be some kind of reciprocal relation between the trade cycle and mortality. It must be kept in mind, however,

that a great deal more information is needed before questions of this sort can be adequately resolved.

“I would not like my statement to give the impression that, although there are many subjects which deserve exceedingly close and difficult investigations, the present stock of knowledge concerning our problems is negligible. There is no denying that each individual under-developed country is fully justified in wondering whether or not capital formation will be rapid enough and efficient enough both to supply the needs of the newly-born and to allow a better living to all. It is natural that they should be disturbed, and that the advanced countries should seriously consider the assistance which they can lend financially, technically and trade-wise. But our discussion has persuaded us against either rash hopes or immediate despair. Because of the considerable uncertainties—economic, psychological and institutional—to which attention has been called, we are warned against absolute conclusions and reminded that just as population is dynamic, so also is development. The dynamics of the two are not necessarily contradictory in every respect.”

#### 4. INTERNAL MIGRATION AND POPULATION TRENDS

The Chairman now turned the attention of the meeting to another aspect of population which also has an important bearing on social and economic development, namely, the spatial distribution of population within a country and its changes due to internal migration. This topic had been considered in meetings 17 and 19 of the Conference. Upon the request of the Chairman, Mr. S. Koller, rapporteur of meeting 17, made the following comment on the discussions in both meetings:

“In countries undergoing industrialization, the two most important types of internal migration are the movement of farmers toward new farming areas and the movement from country to city. In highly industrialized countries, there is a greater complexity of movements, connected with regional differences in economic development and industrial specialization.

“It has been found that the main stimulus to the movement of agriculturists to new lands comes early in the process of economic development, and this movement increases in the early stages of industrialization but eventually becomes of minor importance. On the other hand, rural-urban migration in the early stages of economic development cannot be great in proportion to the total population, however large it may be in relation to the population of the cities themselves, which are few in numbers. As economic development occurs, the national rate of rural-urban migration begins to rise. When the industrial transition has gotten into full swing, rural-urban migration tends to predominate over all other forms of internal movement, and to become especially great in relation to the rural and agricultural population. When, finally, urbanization has reached a point where a substantial proportion of the people already live in towns, rural-urban migration is reduced in volume.

“In the countries in process of industrialization at present, in the Far East as well as in Latin

America, the growth of cities due mainly to the external stimulus of international markets and Western culture, has favoured the formation of so-called industrial islands, where the elements of modernism have been introduced and sealed off from the surrounding areas. This is a cause of disequilibrium in the development of these countries, resulting from large regional differences in both living standards and mentality. It has unfavourable consequences also with respect to a proper harmony between social classes.

"In the most highly industrialized countries, the cities may now have reached their saturation point, with some exceptions. In England and Wales between 1939 and 1951, for the first time in a century the rural districts lost no population to the urban areas. In Japan, Tokyo and Osaka continue to be concentration points for migrants. In Germany, the mobility of the expellee population is especially high in smaller communities. In general, there are indications that internal migration rates in highly industrialized and densely populated countries are following a declining trend.

"Studies of short-run variations in the volume of internal migration in industrialized countries show a close positive correlation with business cycles. Contrary to popular opinion, the mobility rate decreases in times of depression and increases in times of prosperity.

"Some other findings of statistical studies on the characteristics of internal migration in industrialized countries can be summarized briefly with the following generalizations: (1) single persons are likely to be more mobile than families. Family migration and the migration of individual females tend to be short-distance movements. (2) For an area where there are large movements in and out, the net effect of migration may depend largely on chance. (3) Population shifts, especially between rural and urban areas, are closely connected with economic development, being both a consequence and a necessary condition of industrialization and related economic changes. (4) Differential migration has an influence on the composition of the population according to age, religion, intelligence and other characteristics.

"During the discussion in meeting 17, special attention was paid to the problem of selective migration and to changes in the composition of population resulting from differences in the characteristics of the migrant and non-migrant groups. Some investigations, e.g. in Germany, have shown that migrant families were in a relatively favourable social position, and that children of such families were in general more gifted and had better developed personalities than non-migrant children. It is an intricate problem to clarify the working mechanism of the selection, and to distinguish the effect of selection itself from the effect of differences in the composition of migrant and non-migrant groups. The conclusion has been offered that migration is selective as such but this question requires further investigation and discussion. Whatever the character of the selection taking place it is unfavourable to the more depressed regions of out-migration and tends to increase the contrast between the wealthy and the poor areas.

"A special problem in the highly industrialized countries is the inter-relationship between internal migration and commuting. The more commuting is possible, the less migration over short distances is necessary. It was shown in a German study that decline in population due to out-migration were characteristic especially of those communities where commuting to places with good opportunities for employment was restricted by local factors or transportation conditions.

"The discussion of the inter-relations between internal and international migration showed divergent opinions. In Europe between 1840 and 1920, the rate of internal migration was low in periods of heavy emigration and high in periods of light emigration. In Brazil, internal migration has been considered as an obstacle to immigration from abroad. Upward fluctuations of internal migration in Europe have coincided with long upward swings in economic growth. This inverse relation needs more intensive study, and attention should be paid to the fact that internal migration in a certain country may depend not only on the situation in that country but also to a certain degree on what happens in neighbouring countries or elsewhere.

"The discussions in both meetings demonstrated that the study of internal migration, which has been one of the most neglected fields of demography, is of the utmost scientific and practical importance. An adequate development of the field depends heavily on the provision of adequate statistical data. In most countries the only source of information (if any) on internal migration is the result of a comparison of the population figures obtained in successive censuses. The difference between the numbers of people enumerated in a given part of the country at two census dates, minus the excess of births over deaths during the interval, gives an estimate of net migration. This is net internal *and* international migration.

"Because it is possible to estimate net migration in this way, the inter-relationship between net migration and population redistribution within countries has been the favourite topic for migration studies. But this is only one of two aspects of the problem; the other aspect is 'migratory mobility'. The total volume of migration is more important for a thorough study than is the net gain or loss. The net effect may be zero in spite of a very high mobility. A large volume of migration may be produced by frequent moves on the part of a relatively small fraction of the population. It should be mentioned that not all compensated migration with a zero effect is wasteful. Some of it represents seasonal movements and some may be necessary for an economically more rational distribution of the labour force.

"Information on the starting place and the end of migration is not sufficient. It is desirable to be informed regarding the chain of moves made by a person or a family in order to see the steps of migration with respect to size of community. The best source of statistics on internal migration is a complete record of all moves of every person from birth to death. The next best system consists in the registration of current moves. Another source is estimates derived from samples within a census

or from special enumerations of household samples, giving the number of persons who, since a certain date, have moved into a different house in the same area or to another area. The last source is the estimates which have already been mentioned, based on population totals from successive censuses.

"The work of developing statistics on internal migration and applying them in analytical studies should be continued and expanded, both for the improvement of scientific knowledge and for the provision of materials that are basic to administrative decisions. In this connexion special attention should be paid to 'migratory mobility' and its effects, and to differential and selective migration. Historical studies would be very helpful, and better statistics are needed urgently. The data should include sub-divisions by age, sex, occupation, status, etc. All the relevant sources mentioned earlier should be exploited in order to obtain more detailed statistical information than has been available in the past. The current sampling surveys of population which are being introduced in more and more countries seem to provide especially good opportunities for this purpose. Furthermore, the population censuses to be taken in or about 1960 should be used in this connexion, not only as a basis for calculating net migration but also as an occasion for asking special questions concerning the moves within a stated period of time."

##### 5. AGING OF THE POPULATION

The Chairman observed that, if internal migration can be regarded as one of the manifestations and consequences of industrialization, there is also another demographic tendency linked with industrialization and urbanization, namely, the aging of the population. This tendency, which has a special bearing on the economic, social, and cultural life of the countries affected, is the direct result of the persistent and prolonged decline of the fertility rate in the industrialized countries. The result is seen in the diminishing percentages of young people and the constantly increasing weight of the elderly and aged groups. This topic had been discussed in meetings 16 and 18 of the Conference. The Chairman called upon Mr. J. Daric, rapporteur of meeting 18, who made the following statement:

"In the discussion of the demographic aspects of aging, at meeting 16, two particularly important questions were raised. The first related to the definition of aging of a population. It appears that this is not a simple problem. There may be different definitions for the actuary, for the sociologist, for the economist, and so forth. In the present state of research, we are limited to the definition which has long been employed by demographers, namely, the increase in the proportion of aged persons in the population.

"The second question is that of determining the demographic causes of aging of the population. It is often thought to be the result of two factors acting simultaneously: the decline of fertility (fewer young people) and the decline of mortality (more old people). In fact, in the present state of affairs, the aging of the populations of Western civilization (the only ones that have experienced this phenomenon) is due solely to the decline of fertility, as the works of Mr. Bourgeois-Pichat have demon-

strated. The decline of mortality—which has affected, up to now, primarily the youngest ranks of the population—has been for that reason a factor of rejuvenation.

"The economic and social consequences of aging of the population were discussed at meeting 18. They are numerous and important. They affect production; they influence all the social problems of aged and even middle-aged people.

"Old people produce less than they consume, and should find in society a sufficient counterpart of producers not consuming all their products. The diminishing number of young people does not compensate for the increasing number of the aged, because the responsibility for an aged dependant is not the same as the responsibility for a child. The kind of social transfer involved is different.

"In this domain, it is not adequate to take refuge in illusions of financial rights, but it is necessary to have the means of paying aged persons what society strictly owes them.

"Four fundamental problems were treated and discussed in the course of this Conference: (1) the economic and financial aspect of the problem of aging of the population; (2) aptitudes and employment of aged persons; (3) psychological, cultural, and social needs of retired persons; (4) influence of aging of the population on social and political institutions.

"On the economic and financial side, the questions are: What are the needs of aged persons? What is the addition to the collective burden represented by aging of the population? How can this charge be met? What are the various retirement systems and how are they financed?

"These questions define the problem of the relation between aging of the population and social security. In effect, whatever system may be used for old-age insurance (whether individual accounting of capitalized contributions or distribution of current contributions among current pensioners) it is the productive adult population that must eventually bear—in addition to the expenses involved in bringing up children—the cost of providing for the needs of the old people who no longer take part in the economic life of the country. No doubt an old man can have built beforehand the house in which he spends his last years. But in the last analysis he cannot store up the provisions which he will require. If the proportion of old people increases the burden to be borne by the productive adult population increases. This fact cannot be denied.

"The problem of employment of more or less aged persons is an extremely important one. Various studies undertaken in Great Britain, the United States, Sweden, France, and other countries have shown that work, economic activity, constitutes—and by far—the best resource whereby aged persons (and those in the later years of middle life) can provide for their needs and those of their families.

"Public opinion is generally not very favourable to the employment of people beyond a certain age, for reasons which differ among different groups: employers, trade-union members, civil servants, etc.



But in fact a great many old men in good health work, either legally (in accordance with the provisions of the social security and minimum wage laws) or illegally (in clandestine employment, under very unfavourable economic conditions, and for low pay which bears down the general level of wages).

"Numerous studies have been made especially in the Anglo-Saxon countries and also in France, on the variations of productivity in relation to age, including laboratory tests and studies under the actual conditions existing in industry.

"To speak of employing old people who are able and willing to go on working is to bring up the problem of transfers to other posts within the enterprise (which requires knowledge of the characteristics both of the jobs and of the workers). When the workers are to be transferred outside the enterprise, it is a problem of placement which arises, possibly with new vocational training.

"To sum up, it is the extensive application of the *science of work* which will permit a solution of these problems.

"But there is a major obstacle, namely age (chronological age), and notably (a) the age of entrance into employment, and (b) the age at which work ceases. These are 'guillotine' ages which pitilessly reject the worker without taking account of his capacities.

"But we must go further and distinguish physiological age (or biological age, that is, true age) from *chronological age* (age according to the civil record). This is a very important problem, brought out clearly by Mr. Laugier, which attracted the keen interest of the Conference. Mr. Laugier emphasized the need, in this and other connexions, for the collaboration of scientists in dealing with social and political problems.

"I turn now to the discussion of the social, psychological and cultural needs of retired persons. Among the needs of a social character, one must consider health needs and housing needs. But it is not enough for the aged to subsist; they must live, in the broader sense of the word. They must incorporate themselves as well as possible into the society. Their needs are very different according to sex, social class, and occupation. No doubt there are some attributes common to old people in general, and just as there is a *child psychology*, there is a *psychology of the aged*. But apart from certain studies, notably in the Anglo-Saxon countries, this field has been little explored. There is room for many sociological and psychological studies, for example, on the problems created by the cessation of gainful work, on the relations between the aged and younger groups in the population, on the place of old people in our civilization, on the problems of their education, their leisure, their cultural activities, etc.

"The effects of aging of the population on social and political institutions are another important matter to be considered. Research on this subject, in every country, is entirely rudimentary. For example, I should mention the influence of aging of population on aging of the electoral body, which may lead to the danger of gerontocracy.

"Proposals for future research flow naturally from this brief exposition. First, there is the matter of purely demographic studies: (a) on better definitions of aging of the population; (b) on still more exhaustive analysis of the causes of aging (simultaneous influence of falling fertility and falling mortality); (c) on the trend in the size of the labour force or active population.

"Next, there is the study of economic, social, and individual consequences of aging of the population: (a) research on the influence of the accumulated assets of old people on old-age insurance and its financing; (b) research on the economics of aging of the population; (c) research on the employment of aged and elderly persons; (d) research on physiological age in relation to chronological age; (e) research on the social, psychological, and cultural needs of aged persons; (f) research, also, on the effects of aging of the population on political and social institutions (here the void is immense).

"The problems of aging of the population are posed and will be posed in increasingly acute form. Research on this subject is gravely needed. It requires, more and more, the collaboration of persons who have very different backgrounds and experiences, but a common anxiety to find satisfactory solutions for these problems."

#### 6. SOCIAL ASPECTS OF POPULATION TRENDS, WITH REFERENCE TO THE PATTERNS OF FAMILY LIFE

Up to this point the relationships between population trends and economic and social factors had been considered only with regard to the population as a whole and such components as age groups and occupational categories. The Chairman pointed out that these relationships cannot be correctly understood without also considering the family, that primordial unit of social and economic organization. He called upon Mr. F. Lorimer, rapporteur of meeting 28, who made the following statement on the basis of the discussion at that meeting:

"One of the major defects in our present knowledge about the determinants and consequences of population trends is inadequate understanding of their social aspects. This is a serious matter because its neglect may invalidate programmes for economic development and cause unforeseen evils. The need for more study of the social aspects has been emphasized by participants in several meetings. I think we can say that this is a rather new emphasis, on which there has been a consensus of opinion in this Conference.

"At meeting 28, attention was focused on only one part of this topic, namely, the relation of patterns of family life to social conditions and population trends. This is important, but admittedly other aspects of the subjects that could not be properly considered at this meeting are also important.

"We first discussed studies of traditional family patterns in relatively stable societies prior to or outside the sphere of the modern industrial economy. These studies are important for two reasons.

"They can contribute, first, to scientific *theory* about social processes in all societies. From this



standpoint, as noted by one speaker, it is important to ask the same questions in studying all societies. For example, the development of a theory is handicapped if there are intensive studies of sexual behaviour only in preliterate societies, or if attention is directed to the psychological aspects of family relations in the advanced societies, but not in the the preliterate populations. One neglected topic in earlier ethnological studies was a systematic investigation of relations between culture and population trends, involving the collection and analysis of demographic data. New developments along this line have been given explicit recognition at this Conference. I refer here to meeting 15, and to the three reports on new field studies in the forthcoming UNESCO report on *Culture and Human Fertility*.

"Understanding of traditional patterns in relatively stable societies is also important for an understanding of *transitional* social processes. This brings us to the second sub-topic of the discussion in meeting 28: the impact on family patterns of changes in social and economic conditions. It was stated here that similar innovations, such as the introduction of mechanical industries, may evoke radically different responses in different societies. In some cases, the responses may be *dynamic*, leading to progressive development of the economy and of institutions that are appropriate to the changing society. In other situations, responses may be hostile or confused, tending toward acute social conflict or apathy. These cultural responses have serious consequences, both as regards economic trends and as regards population trends.

"Therefore, we need many well-designed, intensive studies of the responses of different subgroups in one changing situation, and comparisons of responses in similar but somewhat different situations. Examples of such studies were presented at this meeting. They involve investigations of changes in family relations and the analysis of demographic information.

"In addition to such intensive but comprehensive studies, certain topics for special inquiry were suggested, including processes of communication within families, the initiation of social changes (with attention to differential responses by age and sex), and the behaviour of persons who comprise an elite within a society by virtue of social status or education.

"Some *theoretical* topics proposed for inquiry were the role of the 'nuclear family', which was characteristic of *pre-modern* European society, in influencing subsequent economic and demographic development; possible modes of transition from emphasis on large kinship group relations to emphasis on primary family relations and the social orientation of these relations; and differential responses to innovation by societies with emphasis on different types of kinship systems.

"Under our last sub-topic, we considered the social significance of an apparent recent shift in western European societies toward earlier marriage and perhaps toward some increase in size of completed families, especially among those with superior education and economic status. Admittedly, the demographic analysis of these apparent trends is still fragmentary and inconclusive, but some changes

along these lines seem to be indicated. And the interpretation of these changes presents a challenge to new types of research, and the application of new scientific techniques.

"Changes in family patterns appear to be associated with the trend toward suburban residence, and with conditions in suburban communities. One interesting hypothesis presented to this meeting is that family relations in central and eastern Europe, including both Western and Eastern Germany, have been significantly different from those in western societies that have been subject to less intense crises due to war and changing political systems. There has been a tendency in central and eastern Europe toward emphasis on physical security and a retreat from involvement in larger social issues.

"Variations in social status and in lines of social mobility were noted as conditions to be considered in the analysis of family patterns and fertility.

"Attention was also given to large-scale surveys of *attitudes* toward size of family. International comparisons of the results of such studies are possible, and yield interesting suggestions; but these are subject to certain pitfalls. Studies are needed on the relation of such stated attitudes to actual performance under different conditions. Some participants placed greater emphasis on *intensive* studies of attitudes, roles, and behaviour under specific conditions. There was no clear consensus of opinion on the relative importance of various research techniques in this field.

"In concluding the meeting, the Chairman noted the immensity of problems considered here—even with the limitation to problems concerning the family. She emphasized the value of international and inter-disciplinary studies in investigating problems in this field, which, we recognize, is both a very important and very complex subject."

## 7. LEGISLATION, ADMINISTRATIVE PROGRAMMES AND SERVICES RELEVANT TO POPULATION

In view of the very significant effects of social and economic factors upon population trends, and *vice versa*, the Chairman observed, it is natural to consider what steps might be taken, after due reflection and premeditation, to influence the course of population growth. At his request, Mr. E. Grebenik, rapporteur of meeting 11, made the following statement on the results of the discussion at that meeting with reference to measures of population policy:

"The discussion on population policy was divided into three parts. In the first an attempt was made to discuss the basic criteria in respect of which population policy was formulated. It was noted that only few countries had an explicitly formulated population policy but that measures to aid the family in low fertility areas were often designed as part of general social policy. Such devices as family allowances, tax rebates, maternity and child welfare measures, free education and the like are now found in most European countries, but they have rarely been designed explicitly as a stimulant to the birth rate; more commonly they are regarded as part of the measures to reduce social inequalities, and in some cases to reduce infant mortality. It is practically only in France and in Japan that measures

which were specifically regarded as population policies have been carried into effect.

"There are, however, differences in the approach and basic attitudes towards population policy even in the low fertility areas. In Scandinavia and Great Britain, official bodies have considered that an increase of fertility to replacement level was desirable. But it was regarded as axiomatic that any such increase should be brought about by increasing the number of *wanted* children. It followed that information relating to contraception and birth control should be made freely available to those married couples who desired this information. In Great Britain the Royal Commission on Population recommended that advice on the subject should be given as part of the National Health Service. Even policy relating to abortion has become more liberal and the grounds on which abortions could be lawfully performed have been extended either by statute or by judicial decision.

"The French attitude on the subject is different. In theory the sale of female contraceptive appliances is prohibited and birth control is not officially encouraged. The aim of French policy is to increase family size, and there is no desire to restrict themselves to a position where the increase is brought about solely by an increase in the number of wanted children. It appears that the position taken up by some of the countries of Eastern Europe is not dissimilar in that respect from the position of France.

"The criteria on which population policies are formulated are frequently not made explicit. In France the fear that her military strength might decline in comparison with that of her more powerful neighbours, and that the ratio of dependants to the working population would become unduly high, was partly responsible for the pro-natalist policy pursued there; in Sweden the Royal Commission considered it desirable to preserve the elements of a culture and a way of life which they thought valuable.

"In areas of high fertility the criteria on which a population policy is based are, of course, easier to formulate. There it is desired to reduce fertility without at the same time increasing mortality. The meeting was informed of the research projects that were proceeding in India and Japan both in the field of trying to design an efficient and acceptable method of contraception and in testing the attitudes of the population to family limitation.

"To what extent can research help in the formulation of population policy? This was the second question discussed in the meeting, and the discussion impinged on the third topic, that of testing the efficacy of population policies that had been put into operation.

"It was made clear that research could be used in a number of ways. In the first place it could point to the fields in which problems arose and action became necessary; to give an example: surveys in Great Britain taken in the nineteen thirties pointed to the fact that there was a very heavy incidence of poverty among families with small children, and this helped in the campaign for the institution of family allowance. In the second place, research

workers could ensure that the demographer's point of view was taken into consideration when measures of social policy were considered. Finally the research worker could establish the relationship between certain factors, particularly in the field of social medicine. It was felt that a good deal of population policy was based on *a priori* reasoning or on trial and error that research could give it a firmer foundation.

"The difficulties of studying the effects of population policy were stressed. It is generally easier to study the effect of policies designed to reduce mortality, for the attitude to mortality is not generally in doubt. If mortality falls steeply after certain measures have been taken, as for instance after DDT spraying in Ceylon, there is a strong presumption of a causal connexion. But it is considerably more difficult to study the impact of specific measures on fertility, and it is generally easier to show that a particular policy has had no effect than to demonstrate that fertility changes have been due to the impact of certain specific measures. Again, the efficacy of policies designed to reduce fertility is probably demonstrated more easily than that of policies designed to increase it."

During the discussion which followed, Mr. Y. Koya said that the growth of the Japanese population, which will almost certainly reach 100 million during the next 15 years, creates difficult economic problems, particularly in the matter of providing employment for the new additions to the labour force. The people have begun voluntarily to limit the size of their families, giving expression to a desire to escape from increasing pressure on the family finances. The method preferred by the people is induced abortion, which involves a considerable hazard to health, however advantageous the consequent reduction of the birth rate may be. Faced with this problem, the Japanese Government adopted a policy of encouraging the use of contraception as a substitute for abortion. The effectiveness of the measures taken for this purpose, however, was disappointing; the prevalence of abortion did not diminish. The Government has recently established a "Council of Population Problems" in the hope of finding a way out of this difficult situation.

Mr. N. V. Sovani reported that the Government of India has come to realize that the basic disequilibrium between population and resources complicates the task of economic development of that country. The principle of planning population as a necessary and integral part of planning for economic development is recognized in the first five-year plan, which contains some recommendations concerning the measures to be taken for this purpose. To plan population, however, is extremely difficult. Unlike economic planning, this has to be essentially an undertaking of individual families. The Government can assist by creating a favourable environment, and that the Indian Government was endeavouring to do.

It will take time, Mr. Sovani said, for the general run of the people to realize the need for controlling population growth and to practise measures of control. However, recent surveys in both urban and rural areas of India have shown that economic pressure is pushing the people in this direction. The lack of a cheap, reliable, and "fool-proof" contraceptive is a serious difficulty. The Government has been making

efforts to fill this need, including experiments in the use of the "rhythm" method.

In the meantime, Mr. Sovani observed, significant progress has been made in the economic development of India. The possibilities of using the country's large labour force for the formation of capital have not been neglected, and new and improved techniques of production have been adopted with gratifying speed in some cases.

#### 8. GENERAL DISCUSSION OF INTERRELATIONSHIPS OF POPULATION TRENDS AND ECONOMIC AND SOCIAL FACTORS

The Chairman now called for certain synthesis of the discussions concerning the interrelationships between population trends and social-economic factors, with reference to the following practical questions: What are the principal gaps and blanks in the map of knowledge in this field? What are the possibilities of putting existing knowledge to use in concrete actions, in solving important problems of international co-operation? In particular, to what extent can and should demographic knowledge be utilized in working out programmes of economic development for the under-developed countries? He called on Mr. P. M. Hauser, rapporteur of meeting 26, who made the following statement regarding the relevant discussions at that meeting:

"The Conference is fortunate in having two basic documents for its consideration of gaps in our knowledge about the interrelationships of demographic, economic and social change. The first is the significant and monumental work of the Population Division of the United Nations Department of Social Affairs, *The Determinants and Consequences of Population Trends*, which came off the presses during the year. The second is the provisional report of the United Nations Committee of Experts on 'Gaps in existing knowledge of the relationships between population trends and economic and social conditions'. In addition, we have been fortunate in having had presented to us, in a number of papers, thoughtful analyses of the lacunae in our knowledge, based to a large extent on practical field problems encountered in connexion with going programmes of induced economic development.

"The tremendous work of the Secretariat of the United Nations is in some respects dangerous. Its comprehensive review of the literature and succinct summarization of the demographers' fund of knowledge could lead unwary souls to the conclusion that little, if anything, is not known about the interrelationships of demographic, economic, and social factors. It is fortunate that the United Nations has tempered the impact of this important publication by following it so closely with the report of its Expert Committee on gaps in our knowledge. Certainly it would be a grave mistake for demographers or any social scientists, and especially for administrators of economic development programmes, to read *The Determinants and Consequences of Population Trends* without reading the report on gaps in existing knowledge. For the Expert Committee, using the United Nations study as a point of departure, makes its painfully clear that those of us

who are students of population as well as those who are policy makers and administrators of economic development programmes, have much to learn about demographic, economic, and social inter-relationships.

"Our ignorance can be described in several dimensions. First, it may be stated that basic population data—statistics of the type derived from censuses, sample surveys, and birth and death registration systems—are entirely inadequate for most of the world's population. Second, and this is not unrelated to the first point, demographic theory is oversimplified and often obsolete. Third, we have only a limited ability to predict the specific demographic consequences of particular economic or social changes, and even less ability to make predictions in the opposite direction. Fourth, we have hardly begun to use such limited predictive knowledge as we have to trace a sequence of interrelated demographic, social and economic changes. Fifth, we are particularly ill-equipped to provide policy makers and administrators with an adequate factual basis for social engineering purposes. The many gaps in our knowledge are dramatized by the Committee in its fifty recommendations for studies designed to dissipate ignorance in important areas.

"The studies recommended by the Committee are presented under four main headings: (1) Aids to the advancement of knowledge; (2) Research on relatively developed areas; (3) Research on under-developed areas; and (4) Research on the interrelationships of relatively developed and under-developed areas.

"In its recommendations on 'Aids to the Advancement of Knowledge' the Committee stresses the importance of improving the basic resources available to the research worker. Eleven recommendations are made for the improvement of basic data, bibliography, theory and analysis. Two of these recommendations are regarded by the Committee as of particular importance: that of establishing and improving basic population and vital statistics series, and that of preparing an international reference volume of basic demographic statistics for as long an historical period as possible. In connexion with the establishment and improvement of population data, the Committee wisely points to the availability of modern sampling methods which can be used, it might be added, as substitutions for, as well as supplements to census undertakings and vital registration systems.

"Stress is laid also on the importance of developing and deepening theory. The Committee might place even greater stress than it does on the 'utilization of dynamic models which incorporate changes both in the economy and in the size and structure of populations'. The Committee wisely recommends that theory be relatively restricted to a level concerning the relationships of social, economic, and population changes. It will undoubtedly be increasingly fruitful to avoid global speculative theory in preference for heuristic theories of the 'middle range'.

"Twelve specific recommendations are made for research on the relatively developed areas, and twenty-two for research on under-developed areas. Time does not permit even a listing of these recom-

mentations but each may be regarded as revealing a gap in our knowledge. For example, so far as the developed areas are concerned, it is clear that we have much to learn about the inter-relations of population growth and capital formation; internal and international migration and economic development; the impact of technology on population growth; frictions in social change; inter-relations of population, economic and social factors in the backward areas of relatively developed countries; and factors that account for the unrealistic results of a number of recent population projections. Our knowledge is deficient also on many aspects of mortality and fertility considered both as dependent and independent variables; on problems of dependency, especially those arising from the aging of population; on levels of living and their differentials, and on population growth in general, considered as an independent variable in relation to economic and social organization and development.

"In respect to the under-developed areas, we need to know more about 'the population-resource-technology complex' on a regional basis. We need more knowledge about the impact and potential impact of modern technology in medicine and other fields on mortality; and about the factors affecting and likely to affect fertility, particularly the influence of the status of women, education, religion, and value systems. We are particularly ignorant about the differential applicability of various techniques of family planning and on the factors that may affect human motivation in respect to family planning. Much remains to be learned on the effects and potentials of internal and international migration. We have great gaps in our knowledge also about population in its economic roles as producers, on the one hand, and consumers, on the other. Similarly, we have great ignorance of the inter-relations of demographic change and social mobility, and social and economic incentive.

"The Committee of Experts also calls attention to our lack of knowledge on the relationships between the relatively developed and under-developed areas. Research on these interrelationships is important to dispel the tendency to extrapolate observed sequences of change in the more developed areas in efforts to anticipate trends in the under-developed areas. We need more research on the effects of migration in both the developed and the under-developed regions, on the capital requirements related to migration, and on the various costs of migration. Studies of migration from Europe to Latin America seem to be particularly in order, in light of the available information which has been inadequately exploited. Studies are needed on the effects of the various technical assistance programmes on local populations, as well as on economic development. In general, it is to be recognized that the very existence of more highly developed areas creates a setting for economic development and population change in the under-developed areas which differs markedly from that in which the advanced countries began their own development.

"Several of the papers presented play up the differences between the situations in which the more advanced nations began their economic development and those which confront under-developed areas in

the contemporary world. Professor Kuznets pursues this analysis perhaps most vigorously. He points out that the developed countries in their pre-industrial phase enjoyed a much higher per capita income than most under-developed countries today; that the former, unlike the latter, were already in or near positions of economic leadership when they began their development; that they had already experienced a long period of growth and expansion under conditions of political independence; and that they began their rapid population growth after the discovery of new continents sparsely settled and rich with unexploited resources. Moreover, contemporary under-developed countries, as compared with the developed countries in their pre-industrial phase, have much higher rates of population growth, larger populations and higher population densities. In the light of his analysis, Kuznets cautions us about the practice of extrapolating the economic or demographic trends that have been observed in the developed countries to current and prospective levels for under-developed areas. He stresses the importance of studies of individual areas over time periods long enough to permit the analysis of secular trends, in which such factors as size of country, historical heritage, changing world scene and the timing of industrialization are controlled.

"The mere statement of the problem in these terms reveals the serious gaps in our demographic armament for describing, anticipating, or controlling the population factor in economic and social development, or vice versa. Moscoso and Harris, on the basis of their experience with economic development in Puerto Rico, also point to deficiencies in demographic knowledge, as well as in the knowledge of administrators. They propose a more long-term and comprehensive outlook on the part of development planners, and at the same time more attention from demographers to short-term and small-scale population changes. The experience of Puerto Rico indicates that the development planner needs more detailed information on short-run changes in population and the labour force and on the basic factors affecting migration, internal and international.

"In respect to the interrelationships of demographic, economic and social factors, especially as they relate to the under-developed areas, perhaps the greatest gaps in our knowledge are to be observed in the contrast between how much we know that may be utilized rapidly to decrease mortality, and how little we know that can be utilized either rapidly to decrease fertility or rapidly to increase productivity and output. . . .

"In recognizing our ignorance, we demographers have taken a long step forward in acquiring knowledge. We know a great deal about what might be done to dispel our ignorance. The demographer at this stage needs the co-operation of the various international bodies, of individual governments, and of private institutions to fill the gaps in basic demographic information and to pursue meaningful and significant analyses. In the more developed areas no less than in the under-developed areas, opportunities to build the edifice of knowledge we need are not now being adequately exploited. Studies of the type proposed by the Committee of Experts are badly needed in the more developed areas. Pro-

grammes of compiling basic population and vital statistics are urgently needed as adjuncts of economic development programmes in the under-developed areas. Recent developments in the theory and practice of sampling human populations make feasible the collection of demographic data and the conduct of special studies to obtain valuable information even where no censuses have been taken or no vital registration systems exist.

"I have attempted to highlight the gaps in our knowledge of the relation between economic and social factors and population trends which became evident in meeting 26. In a more fundamental sense, the proceedings of this entire World Population Conference will blueprint areas of demographic ignorance, as well as areas of knowledge. It is now the task of us who are demographers, with the collaboration of our colleagues in the other sciences, to use this blueprint to construct a more adequate edifice of demographic fact, theory, and wisdom."

In the course of the discussion following Mr. Hauser's statement, Mrs. A. Myrdal proposed, as a conclusion to be drawn from the discussions in all the meetings, that there is a need not only for more extensive basic research but also for more general utilization of scientific information for social action, policy-making and planning. The latter purpose could often be served without specific new projects or research, by governments and public authorities reorganizing their statistical and fact-finding services so as to provide more effective guidance for policy. Mrs. Myrdal offered three examples to illustrate this point. First, public discussions relating to the family and the role of women could be enlightened by widely disseminating certain facts that would be derived from a properly organized system of statistics, such as the fact that in countries like the United States women have their last child, on the average, soon after the age of 25, when they still have some 50 more years to live. In such circumstances it is clear that child-rearing cannot be a life-time occupation, and this has evident implications in relation to questions of labour supply. Second, public opinion polls and survey techniques could be used, in addition to the customary forms of demographic analysis, for more realistic prognoses of future trends in marriage and birth rates. Third, valuable guidance for social legislation could be obtained from studies on the actual cost of children; such studies, which have already been begun in some countries, show the costs to be much greater than most experts and legislators have presumed.

Mrs. Myrdal said that the results of inquiries in this field would be the more useful to Governments if they were undertaken in several countries, and different types of countries, in such a way as to permit international comparisons. Mr. D. V. Glass concurred in this view, adding that it would be better to have less originality of research in various countries and more co-ordinated planning for internationally commutative results. Research workers should have boldness of vision combined with a certain humility, not to exaggerate the power of their science. Mr. Glass admonished them to set their studies in the context of what is known of society. He warned that the need for more research should not be made an excuse for delaying action on urgent issues of policy.

Mr. T. V. Ryabushkin thought that a positive contribution of the Conference had been the submission of documents showing the lack of realism in "neo-Malthusian" theories. Many experts from different countries, holding different political views, had shown by their interventions in the discussion that "neo-Malthusianism" is incompatible with the scientific principles of demography, economics, and sociology and contrary to the basic principles of humanitarianism. Even with present techniques, the right use of resources would ensure a satisfactory standard of living for two or three times the present population of the world. "Neo-Malthusian" efforts to reduce the population or to restrict its growth are therefore, Mr. Ryabushkin said, unscientific and reactionary.

Mr. B. Minc observed that the discussions and papers had shown the existence of two fundamentally different points of view on population problems. According to the first point of view, the solution of population problems is entirely possible, for the resources at the command of society are clearly unlimited. The development of technology at a constantly accelerating pace leads to the discovery of new resources and a great enhancement of productive power. Man is the most valuable productive agent, and therefore the way to economic development and progress is by transformations in the systems of production and distribution which will create conditions favourable to population growth. The second point of view is not centred on developing productive resources and improving the system of production and distribution, but on checking the growth of population. That way leads, Mr. Minc said, to stagnation of productive forces and reduction of material welfare. To refute this latter view, he outlined the achievements of the social regime which, in the territories between the Pacific Ocean and the Elbe, completely solves population problems. Mr. Minc added that, regardless of these differences in point of view, there should be one common cause for all men of science: the cause of peace. This cause should be particularly important for demographers, who well know what a demographic catastrophe war is.

Mr. F. Janouch thought that the discussions had clearly shown the sufficiency of all kinds of resources required for human needs, and the lack of any necessity for measures of depopulation. He also emphasized the importance of social and economic factors for the development of nations and of all humanity, noting in this connexion that the rate of natural increase of the Czechoslovak population is now three and one-half times higher than the pre-war rate, and that industrial production has increased very rapidly since the war. Mr. Janouch invited the attention of the Conference to the contrast between the optimism of the opponents of "Malthusianism" and what he called the "dead-end" hesitancy of those who had not been able to free themselves from the scientific ignorance of this theory. He hoped for a practical realization in international circles of what progressive scientists had proved.

Father V. F. J. Fallon regretted that there had been no place in the Conference programme for discussion of historical demography. An analysis of history would suggest the following thoughts: (1) if the under-developed countries are to attain a satisfactory level of living, the rest of the world must help them

or at least not hinder them. But at present, the more prosperous countries are hindering the progress of their less fortunate neighbours by measures which are opposed to free trade and free migration. (2) If similar measures had been in force during the eighteenth and nineteenth centuries, perhaps the most prosperous countries would not have attained the power and affluence which they now possess. (3) If the limitation of births had been practised at that time, the countries which are now most prosperous might not have received the influx of immigrants which enriched them and gave them their present weight and prestige in the world. (4) If, at the beginning of the nineteenth century, experts had undertaken to estimate the future development of energy resources, they would surely not have imagined the marvellous transformations which have been effected in the utilization of coal, steam, electricity, oil, and nuclear energy. The vitality of nations, Father Fallon said, depends less on what they are and what they possess than on their confidence in life and in the future.

Mr. A. Arca Parró defined the essential question in the following terms: What are the most suitable methods of preventing an impairment of living standards in the so-called under-developed countries due to failure of production to keep pace with their accelerated population growth, or of correcting such a tendency if it develops? He expressed the conviction that differences of opinion on this point were due not merely to differing ideologies or political views, but mainly to differing individual conceptions of the demographic, economic, and social changes taking place in these countries, and of their significance. Each observer, he said, studies and interprets these phenomena not only in accordance with his scientific training but also under the influence of the society from which he comes. Thus some participants in the Conference suppose that the trends of population in the under-developed countries will follow the same course which they previously followed in the countries now highly industrialized. Apart from differences in time and space, Mr. Arca Parró said, there are other factors of cultural, social, and economic environment, etc., which differentiate societies even within the same geographical areas. Ways and means which may have been used in certain countries to reduce the birth rate, for example, may be unacceptable or ineffective in other countries. The orientation of a population policy can therefore be determined only on the basis of specific studies relevant to the countries in question.

Mr. Arca Parró listed the following questions, to the clarification of which research might be directed in order to reach a better understanding of world population problems: (1) In what measure can new statistical techniques provide, on short order, reliable information concerning the true demographic, economic, and social conditions in countries where such information is lacking? (2) To what extent have the so-called under-developed countries already adopted social, economic, political, and other measures tending to solve the problems that are supposed to result from their demographic situation? (3) What are the real reasons why the rural people in the economically less developed countries consider a large family to be necessary, and why do city dwellers prefer to reduce the size of their families? (4) What is the possibility and the prospect that scientific and technological developments will transform the production of food and other goods and services sufficiently to dispel the dangers which some believe to be as imminent now as they were in Malthus's time?

Mr. A. Sauvy, the last speaker, expressed the opinion that the discussions of interrelationships among demographic, economic, and social factors at this Conference had done much to bridge the long-standing gap between demography and economics. Demography had long been identified with statistics while economics had remained primarily a theoretical field. Moreover, before World War II the economists had been preoccupied largely with the problem of depressions, and only now were they returning to the vital problem of economic growth. Economics, Mr. Sauvy said, is not the science of wealth; it is a human science.

"Let us not be too proud of our accomplishments," Mr. Sauvy continued. "We have hardly solved any problems, but—and this is important—we have established communications among ourselves. We have broken the barriers between scientific disciplines that have hitherto been too much separated. Men from the East and West have met here. This is a first achievement. The essential fruit of our work will not be harvested today. It will be the result of a long maturation. Let us not avoid great problems. We do not have the right to retire into a scientific ivory tower. Let us not part satisfied with the illusion that we have fulfilled our duty. We have great and heavy responsibilities. Our task is only beginning."

### Meeting 32

#### CLOSING OF THE CONFERENCE

##### Report on the meeting prepared by the United Nations Secretariat

The final meeting of the World Population Conference was called to order by Mr. L. Hersch, Chairman, on the afternoon of 10 September 1954. The Chairman gave the floor first to Mr. J. D. Durand, Secretary of the Conference, who made the following statement:

"At the inaugural meeting of this Conference in the Campidoglio, Mr. Georges-Picot brought a mes-

sage of welcome to the participants from the Secretary-General of the United Nations and a message of thanks to all the organizations and individuals who had so generously aided the United Nations in making the preparations and providing the facilities for this undertaking—the Government of Italy and the city of Rome, the Hospitality Committee, the Preparatory Committee, the Food and



Agriculture Organization and other Specialized Agencies of the United Nations which co-operated in the sponsorship of the Conference, and especially the International Union for the Scientific Study of Population.

"Mr. Georges-Picot was unfortunately not able to remain in Rome until the end of the Conference, and it therefore becomes my privilege, now that your labours are finished, to thank all the participants, on behalf of the Secretary-General, for the contributions of their time and effort in preparing papers and presenting the results of their studies during these meetings. I am sure that the councils of the United Nations and the Member States will appreciate the results of your deliberations as an aid in formulating wise policies and devising effective programmes of action in the relevant fields. I hope that as you return to your homes you will take with you a sense of accomplishment as well as the memory of some pleasant days at the World Population Conference.

"The United Nations owe special gratitude to the individuals who have organized the various meetings of the Conference. Each of them has devoted a large part of his time during the last year to the preparation of the programme and the arrangements for the collaboration of the most qualified experts on each subject. Without their constant effort the United Nations Secretariat would not have been able to bring this project to a successful conclusion.

"Speaking for the Conference staff, I wish to thank particularly the rapporteurs of the meetings, who have been working against the clock throughout the last two weeks, at what sacrifice of artistic, gastronomic, and other pleasures I can only imagine, in order to put the draft summaries of their meetings in your hands before your departure. Each participant is invited to send any comment on these draft summaries to the Secretary of the Conference. Such comments will be forwarded to the rapporteurs for their consideration in preparing definitive versions of the reports.

"I hope that it will be possible for the United Nations Organization to publish the proceedings of the Conference, including the texts of the written communications as well as the summaries prepared by the rapporteurs. In that event each participant will be informed of the arrangements for distribution of the publication.

"In speaking of those who have assisted in the work of this Conference, I have so far omitted the staff of the Food and Agriculture Organization, because I wished to reserve for the last a special word of appreciation to them. To us they have been both cordial hosts and tireless collaborators, and I am sure that I can speak for every member of the staff of the United Nations here present as well as for the Secretary-General in thanking them wholeheartedly for this excellent example of co-operation among the family of the United Nations organizations."

The Chairman then called upon Sir Herbert Broadley, Deputy Director-General of the Food and Agriculture Organization of the United Nations who spoke as follows:

"In the absence of Dr. Cardon I am glad to have this opportunity of saying how honoured we in FAO feel at having had the opportunity of providing the accommodation and some of the services for this important Conference. It has been a Conference of special interest to the United Nations and all the Specialized Agencies. After all, what we are concerned with are human beings: their health, their education, the conditions under which they work, the food they need, which is the justification for our having been established. We are not only concerned about the number of people in the world, but with the richness of the life they enjoy. It would be a tragedy if an increase in numbers reduced that richness and led to a lowering of human standards over the three score years and ten which have hitherto been regarded as our reasonable share of this world's experience.

"Unfortunately, owing to the absence of my Director-General, I have been a somewhat intermittent visitor to the various sessions which have been held over the past two weeks. My impression has, however, been that we leave this Conference with a much better understanding of population trends and the factors affecting them than we do of the ways and means of ensuring to the increasing population of the world the food, the clothing, the education, the leisure, and the standards of living which human beings have the right to demand. Philosophers in the past may have described our life as solitary, bare, nasty, brutish and short, but the modern world is no longer prepared to accept this as their lot. It is not a question of maintaining present standards for an increasing world population; it is a problem of ensuring a better life to all and the benefits of progressive civilization to those parts of the world which we still describe as 'underdeveloped countries'. It was to this end that the international organizations in the United Nations family were created and it is a task we are endeavouring to carry out.

"Perhaps one of the chief lessons we can learn from this Conference is—not so much our ignorance as our inadequate knowledge of the world's resources. At the session over which I had the honour to preside emphasis was placed upon the importance of preparing a factual objective study of the world's potential resources for feeding, clothing and housing its increasing population. As I told that Session, we in FAO are very conscious of this end and are anxious to take the lead in such an undertaking. I trust that when the next World Population Conference is held we shall be able to provide a much more reliable appreciation of the world's resources and the most effective way of utilizing them in the interests of mankind.

"It is not merely a question of evaluating those resources; their utilization is just as important. One of the most encouraging developments of the last few years has been the technical assistance programme launched by the United Nations and the Specialized Agencies for the economic development of the less developed parts of the world and raising standards of living everywhere. Apart from its efforts to maintain peace in the world I would rate that programme as perhaps the greatest task which the United Nations family has undertaken and the



greatest contribution it can make to improving the happiness of mankind. Many countries are themselves carrying out their own programmes which have the same objectives as has the United Nations programme. And together they represent a movement of self-devotion to a great ideal which has little parallel in the world's history.

"It was the English orator Burke who complained that

'The age of chivalry is gone

That of sophists, economists and calculators has succeeded'.

"I would not accept this despairing judgment that the age of chivalry is gone. The extent of the Technical Assistance Programme is proof of its existence. To make effective that spirit of chivalry which still exists we do need the help of the sophists, the economists and calculators to guide us aright. It would not be right to classify those who have participated in this Conference as sophists, but we have been particularly indebted to the economists and calculators in our deliberations.

"Although this Conference has avoided decisions and resolutions, it has not merely been an exchange of opinion. I am sure that it has provided an opportunity for a formation of ideas. Speeches have necessarily been brief. But the contacts established and the exchange of ideas which has taken place outside the Conference halls has, I am sure, been a great stimulant to all of us. The delegates will not return to their countries merely burdened with a volume of documents which will increase their excess luggage charges on the air routes of the world; they will return stimulated by the exchanges which have taken place with their colleagues. Fertility has played a great part in the subject matter of the discussions, but I would rate higher in the ultimate effect on human life the fertility of ideas which this Conference has stimulated than the fertility of the human race in reproducing itself. I am sure that out of this Conference will spring an increased knowledge, the guidance for wise action in meeting the world's problem for the future, and to that end I am happy that this Conference should have been held in this wonderful building which the Italian Government has provided for the Food and Agriculture Organization. Perhaps one day we may have the honour of a further Population Conference. In the meantime I trust that the delegates will carry away with them not only all the benefits of intellectual exchanges which have taken place but an appreciation of good will towards FAO and the work we are trying to carry out."

The Chairman closed the Conference with these words:

"Dear Colleagues and Friends, Ladies and Gentlemen: Our Conference is about to end. In looking back at what has been accomplished, I think we can say that the Conference has not disappointed our hopes. We have not been idle throughout the period from 31 August up to today, 10 September. We have held 30 business meetings, not including the opening meeting and this the closing meeting; approximately 400 communications were submitted by some 500 participants who came to the Conference from 70 countries. We have discussed

problems that are purely theoretical and technical, as well as problems that are practical. On some points there seemed to be unanimity. On others, especially those connected with the ideologies of the participants and their sociological, political or moral concepts, differences continue to exist, and it was only natural to expect that they would. It will be apparent to all, however, that the discussions have been completely free and courteous throughout. Every viewpoint has been freely expressed, given a hearing, and, as is only fitting in a scientific gathering, subjected to courteous and frank discussion. In this respect, may our Conference serve as an example to other gatherings, to other conferences and to persons in other places.

"Permit me, coming as I do from Switzerland, to ask you to imagine yourselves for a moment in an Alpine scene. In these high altitudes you may, in some places see streams and rivers fairly close to each other, some of which flow into a tributary of the Rhine and thus go north, while others flow into a tributary of the Rhone and thus go south, to the Mediterranean, and still others flow into a tributary of the Danube off to the east. That is the picture in my mind's eye at the present moment. From this Conference too some of the participants will go off to the north, others to the south, some to the west, and others to the east, the Middle East and even the Far East. I only hope that when we are back in our own countries, separated from one another by mountains, seas, oceans and other barriers, we will still remember this free and courteous discussion among men equally bent on a search for the truth and the greater well-being of those whose need is great. Perhaps this spirit, which unites us here and which has been the constant hallmark of our work, will help to spread more understanding among men and thereby facilitate the solution of certain population problems of supreme practical importance. That would by no means be the least significant achievement of our Conference.

"Even now, however, the Conference may lay claim to certain rather substantial accomplishments. It has in various ways brought to light the multitude and variety of the links between demography and social phenomena in general and has thus at long last broken through the narrow circle of pure demography and the scientific isolationism so dear to the demographers of the 19th and the early 20th centuries. At the same time, it has shown how futile were the over-simplified concepts of a universal law of population, valid irrespective of time and place, in any age, country or sociological situation. It has in particular eliminated the split between demography and economics which has done such harm to both sciences. I doubt whether it will be possible, after this Conference, to continue to disregard the interdependence and the mutual action and reaction of population and economics. Our Conference has thus drawn attention to the need for considerable economic and scientific assistance to economically under-developed populations in order to help them to escape from the vicious circle of poverty and relative over-population. It has also, it seems to me, indicated some rational methods of approach to practical measures. And even where the discussion did not result in unanimous conclusions, the infor-

mation on the experiences in different countries and the very diversity of the ideas expressed here will help politicians to see more clearly the various aspects of the problems and the different solutions available. Our Conference has thus shown that collaboration between scientific research and the world of practical action is possible and may prove fruitful both for demography and in the field of policy.

"Our Conference has, moreover, dealt not only with the large, rather general problems that preoccupy the politicians and fascinate the public, but also to a considerable extent with the study of technical or what might be called more specific problems. The accuracy of population statistics, methods of analysing such statistics, the precise definition of certain demographic concepts, the true scope of certain numerical indices, the correlation between certain population phenomena and the psychological and intellectual characteristics of given populations are some of the subjects that have also found a place in the communications and deliberations of this Conference.

"Of course, I do not mean to say that the final word on demography has been spoken at this Conference nor even that every aspect of the problems was touched upon. For example, I do not think that this Conference sufficiently explored the maze of theoretical and practical problems connected with international migration. I also feel that in the several meetings devoted to the interdependence of economics and population, the Conference placed special emphasis on the interaction of population and production and on the demographic conse-

quences of the distribution of wealth, but overlooked entirely the effect of population movement and composition on the distribution of national income. Perhaps, too, not sufficient attention was given to the analysis of certain population concepts and indices, and similar topics.

"However, will science ever be able to say her last word? And has any conference ever said all that science can say? The very shortcomings of our Conference, the divergency of the opinions expressed and the inadequacies revealed in available data and certain methods will suggest and stimulate more complete observations, deeper analysis and additional and more reliable information. And I cannot but take this opportunity to stress the fact that criticism of one or another of the communications was often gracefully accepted by the author in all scientific good faith.

"On behalf of the Conference I wish to express our deep gratitude to all who contributed to its success by presenting scientific communications or participating in the discussions.

"In conclusion I heartily join, on behalf of the Conference, in the thanks that Mr. Durand, Acting Director of the Population Division of the United Nations, expressed on behalf of the Secretary-General of the United Nations to all who helped us in our task, and I wish you all, my friends, new and old, a safe journey home, good health, happiness and rewarding work.

"I declare the World Population Conference closed."

## **ANNEXES**

## *Annex A*

### OFFICERS OF THE CONFERENCE AND MEMBERS OF COMMITTEES

#### OFFICERS OF THE CONFERENCE

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Mr. W. Brand	Deputy Secretary

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World Health Organization	Mr. M. Pascua Mr. M. Pizzi
International Union for the Scientific Study of Population	Mr. L. Hersch Mr. F. Lorimer Mr. P. Depoid

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Mr. L. Livi	Università di Roma, Roma, Italia
Mr. G. Mortara	Instituto Brasileiro de Geografia e Estatística, Rio de Janeiro, Brasil (invited on the recommendation of the Inter-American Statistical Institute)
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Mr. P. K. Whelpton served as Chairman and Mr. P. Depoid as Secretary of the Committee.

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 Mr. D. V. Glass (United Kingdom)  
 Mr. G. Goudswaard (Netherlands)  
 Mr. F. Lorimer (United States)  
 Mr. G. Mortara (Brazil)  
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## GUATEMALA

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## HOLY SEE

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*Mr. R. A. Gopaldaswami	Government Agricultural Department, Fort St. George, Madras, India	14:III
Mr. Shital Prasad Jain	Director, Labour Bureau, Government of India, 3, Inveram, Simla, India	3:IV 4:I 8:I
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Dr. Vishwambhar Nath	Deputy Director, Programme Evaluation Organization, Planning Commission, Government of India, New Delhi, India	19:II
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Dr. Kizhakke C. K. E. Raja	Ministry of Health, New Delhi, India	
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Mr. Fuad Massa	Chief, Census Department, Baghdad, Iraq	
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Prof. Michael D. McCarthy	Deputy Director, Central Statistics Office, Dublin, Ireland	6:I
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Prof. Lanfranco Maroi	Presidente dell'Istituto Centrale di Statistica d'Italia, Rome, Italy	
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*Mr. Tatsuo Honda	Chief, Research Department, Institute of Population Problems, Welfare Ministry, Tokyo, Japan .....	8:I
*Prof. Seichi Izumi	Associate Professor, Institute for Oriental Culture, Tokyo University, 43, Komagome-Sendagi-cho, Bunkyo-ku, Tokyo, Japan .....	12:II
Prof. Ken'ichi Kishimoto	Research Institute of Environmental Medicine, Nagoya University, 2-43, Tokugawa-cho, Chikusa-ku, Nagoya, Japan .....	23:VI
*Prof. Yūsaku Komatsu	Professor of Mathematics, Tokyo Institute of Technology, 845, 4-chome, Totsuka-machi, Shinjuku-ku, Tokyo, Japan .....	23:VI
Dr. Yoshio Koya	Director, National Institute of Public Health, 2113, 4-chome, Shimoochiai, Shinjuku-ku, Tokyo, Japan .....	8:I
Dr. Akira Kusukawa	Department of Public Health, Kyushu University School of Medicine, Fukuoka, Japan	
*Prof. Ei Matsunago	Assistant Professor of Legal Medicine, Sapporo University of Medicine, Minami 1, Nishi 17, Sapporo, Japan .....	23:VI
Prof. Shinichi Mihara	Population Problems Research Council, The Mainichi Newspaper, Tokyo, Japan .....	17:II
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Dr. Yasuki Mori	Director, Municipal Hospital, Matsuba-cho, Toyohashi City, Aichi Prefecture, Japan	
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Prof. Shigeo Nojiri	Tokyo University of Education, No. 20, 3-chome, Nakamura-Minamicho, Nerima-ku, Tokyo, Japan .....	17:II 22:V
Prof. Kanetaro Nomura	Keio University, 146, Daigiri, Goshogaya, Fajisawa-Shi, Kanagawa-Ken, Japan .....	28:VI
Dr. Ayanori Okasaki	Director, Institute of Population Problems, 51, Shirogane-Sankocho Minatoku, Tokyo, Japan .....	9:IV
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## LUXEMBOURG

M. Alphonse Schwinnen	Chef du Service d'études et de documentation économiques, Ministère des affaires économiques, Luxembourg, Grand-Duché de Luxembourg	
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## MEXICO

Dr. Gonzalo Aguirre Beltrán	Instituto Nacional Indigenista, Paseo de la Reforma No. 336, Mexico D.F., Mexico .....	15:VI
Sr. Réne Espinosa Olvera	Bufete Estudios Económicos, Universidad Nacional de México, Sierra Amatepec No. 150, Lomas Barrilaco, Mexico D.F. 1°, Mexico .....	19:II
Sr. Horacio Flores de la Peña	Banco Nacional de Crédito Agrícola y Ganadero, S.A., Sonora No. 49-402, Col. Condesa, Mexico D.F., Mexico .....	22:V
Dr. Alberto P. Lón	Instituto de Salubridad y Enfermedades Tropicales, Mexico 17, Mexico	23:VI

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## NETHERLANDS

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Dr. Gunther O. K. Beijer	Honorary Secretary, Research Group for European Migration Problems, Pauwenlaan 17, The Hague, Netherlands .....	10:II
Prof. P. de Wolff	Director, Municipal Bureau of Statistics of Amsterdam, O.Z., Achterburgwal 185, Amsterdam-C, Netherlands .....	2:I 9:IV 25:VI
Dr. Jan Godefroy	Catholic Institute for Social-Ecclesiastical Research at the Hague, Raphaëlstraat 27 <sup>II</sup> , Amsterdam, Netherlands .....	6:I
Prof. G. Goudswaard	Director, Permanent Office, International Statistical Institute, Oostduinlaan 2, The Hague, Netherlands .....	9:IV
Prof. Sjoerd Groenman	Director, Institute for Social Research in the Netherlands, dr. J. P. Thijsselaan 85, Utrecht, Netherlands .....	6:I 28:VI
Prof. Evert Willem Hofstee	Professor of Rural Sociology, Agricultural University of Wageningen, Rijksstraatweg 2 A, Wageningen, Netherlands .....	17:II
Dr. Philip J. Idenburg	Director-General, Central Bureau of Statistics, Oostduinlaan 2, The Hague, Netherlands	
Dr. J. Meerdink	Associate Director, Municipal Bureau of Statistics of Amsterdam, O.Z., Achterburgwal 185, Amsterdam-C, Netherlands .....	2:I 9:IV 25:VI
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Prof. Antoine Oldendorff	Professor of Sociology, University of Nijmegen, Canisiussingel 25, Nijmegen, Netherlands	
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Mr. Jack E. van Dierendonck	Head, Division, of Economic Affairs, Ministry of Social Affairs and Public Health, The Hague, Netherlands	
Prof. Willem F. Wertheim	Professor of the Sociology of Indonesia, Amsterdam University, Stadionkade 12, Amsterdam, Netherlands .....	15:VI
*Mr. G. H. Zeegers	Director General, Roman Catholic Institute for Social-Ecclesiastical Research, Paul Gabrielstraat 30, The Hague, Netherlands .....	10:II
<i>Netherlands New Guinea</i>		
Dr. H. J. T. Bijlmer	Director of Public Health, Hollandia, Netherlands New Guinea	

## NEW ZEALAND

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## NORWAY

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Mr. Bjornulf Bendiksen	Chief of Census, Central Bureau of Statistics, Dronningensgt. 16, Oslo, Norway	
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Mr. M. A. Sabzwari	c/o Bureau of the Census, Washington, D.C., U.S.A.	
Mr. Mohammad Yusuf	Chief Statistical Officer, Central Statistical Office, Ministry of Economic Affairs, Karachi, Pakistan .....	7:VI
Dr. Mohammed Zia-ud-Din	Institute of Statistics, Punjab University, Lahore, Pakistan .....	8:I



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Mr. Ivar Torsten Uhnborn	Snorrevägen 17, Bromma, Sweden	
Dr. Erland von Hofsten	Chief, Statistical Division, Social Welfare Board, Stockholm, Stavgardsgatan 28, Bromma, Sweden .....	28:VI
Prof. Sten G. W. Wahlund	University of Stockholm, Herrgardin, Nävckvarn, Sweden .....	11:II ✓
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## SWITZERLAND

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Prof. Emil Gsell	Professeur d'économie commerciale et de statistique, Université commerciale, St. Gallen, Suisse	
Prof. Liebmann Hersch	President, International Union for the Scientific Study of Population, 17, rue Toepffer, Geneva, Switzerland	
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Mr. Walter Werner Ott	Mottastrasse 2, Bern, Switzerland	
Prof. Walter Wegmüller	Professor of Mathematical Statistics, University of Bern, Aegertenstrasse 1, Bern, Switzerland	
Dr. Hans Wiesler	Bureau de statistique du Canton de Zürich, Kaspar Escherhaus, Zürich 1, Switzerland .....	27:IV

## SYRIA

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Prof. Johannes Lodewikus Sadie	Department of Economics, University of Stellenbosch, Stellenbosch, Union of South Africa .....	16:III 18:III
Prof. Henry H. Sonnabend	Managing Director, Corporation Building, Planned Town Ashkelon, Johannesburg, Union of South Africa .....	15:VI

## UNION OF SOVIET SOCIALIST REPUBLICS

Prof. Ivan I. Kuzminov	Academy of Sciences of U.S.S.R., Bolshaia Kaluzhkaia 14, Moscow, U.S.S.R.	
Prof. Innokentii U. Pisarev	Academy of Sciences of U.S.S.R., Bolshaia Kaluzhkaia 14, Moscow, U.S.S.R. ....	9:IV
Prof. Timon V. Ryabushkin	Academy of Sciences of U.S.S.R., Bolshaia Kaluzhkaia 14, Moscow, U.S.S.R. ....	26:V

## UNITED KINGDOM

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*Mr. Fritz Schumacher	Holcombe, Wealdway, Caterham, Surrey, England .....	20:V

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Mr. Alan Traviss Welford	Director, Nuffield Unit for Research into Problems of Ageing, The Psychological Laboratory, Downing Street, Cambridge, England	18:III
*Sir Harold Wiles	Deputy Secretary, Ministry of Labour and National Service, 8 St. James' Square, London, S.W. 1, England	18:III
Prof. Solly Zuckerman	Professor of Anatomy, University of Birmingham, Birmingham, England	20:V
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<i>Cyprus</i>		
Mr. Robert Raine Oswald	Government of Cyprus Secretariat, Nicosia, Cyprus	
<i>East Africa</i>		
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Mr. Cyril John Martin	Director, East African Statistical Department, P.O. Box 1101, Nairobi, Kenya, East Africa	5:IV
<i>Federation of Rhodesia and Nyasaland</i>		
Mr. Clyde James Mitchell	Director, Rhodes-Livingston Institute, Post Box 900, Lusaka, Northern Rhodesia	
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Mr. Keng Swee Goh	Department of Social Welfare, Singapore, Malaya	
Mr. Ernest J. Phillips	Registrar of Malayan Statistics, Statistics Department, Singapore, Malaya	
*Mr. T. E. Smith	Department of Social Welfare, Old Supreme Court, Singapore 6, Malaya	14:III
Dr. You Poh Seng	Statistical Unit, University of Malaya, Cluny Road, Singapore 10, Malaya	8:I

## UNITED KINGDOM (continued)

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- Mr. Marc Victor M. Herchenroder Central Statistical Office, Rose Hill, Mauritius ..... 8:I

*North East Africa*

- Mr. Girgis Abdo Marzouk Department of Statistics, P.O. Box 700, Khartoum, Sudan, North East Africa ..... 4:I

*Uganda*

- Mr. John Ernest Goldthorpe Makerer College, Kampala, Uganda ..... 15:VI

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- Prof. Anne Anastasi Professor of Psychology, Fordham University, 121 East 38th Street, New York 16, N. Y., U.S.A. .... 25:VI
- Prof. C. Arnold Anderson Professor of Sociology, University of Kentucky, Lexington, Kentucky, U.S.A. .... 27:IV
- Mr. Samuel W. Anderson Assistant Secretary of Commerce, Department of Commerce, Washington 25, D.C., U.S.A. .... 24:V
- Dr. Marshall C. Balfour Rockefeller Foundation, New York, N. Y., U.S.A.
- Prof. George W. Barclay Assistant Professor of Sociology, Columbia University, New York, N. Y., U.S.A. .... 19:II
- \*Mr. Calvin L. Beale Agricultural Marketing Service, U.S. Department of Agriculture, Washington 25, D.C., U.S.A. .... 6:I
- Dr. Donald J. Bogue Associate Director, Scripps Foundation for Research in Population Problems, Miami, University, Oxford, Ohio, U.S.A. .... 9:IV
- Dr. Mary Jean Bowman Department of Sociology, University of Kentucky, Lexington, Kentucky, U.S.A. .... 27:IV
- Dr. Robert C. Cook Director, Population Reference Bureau, 1507 M Street NW, Washington 5, D.C., U.S.A. .... 23:VI
- \*Prof. Farrington Daniels Chairman, Department of Chemistry, The University of Wisconsin, Chemistry Building, Madison 6, Wisconsin, U.S.A. .... 20:V
- \*Prof. Kingsley Davis Bureau of Applied Social Research, Columbia University, 427 West 117 Street, New York, N. Y., U.S.A. .... 19:II
- Mr. Calvert L. Dedrick Coordinator of International Statistics, Bureau of the Census, Washington 25, D.C., U.S.A.
- Prof. Robert M. Dinkel Professor of Sociology, Guilford College, 1100 South Elm Street, Greensboro, North Carolina, U.S.A. .... 6:I
- Dr. Harold F. Dorn Head Office of Biometry, National Institutes of Health, Bethesda, Maryland, U.S.A. .... 2:I
- Dr. Louis I. Dublin The Institute of Life Insurance, 488 Madison Avenue, New York, N. Y., U.S.A.
- Dr. Louis J. Ducoff Assistant Chief, Farm Population and Rural Life Branch, Agricultural Marketing Service, Department of Agriculture, Washington 25, D.C., U.S.A. .... 9:IV
- Mr. Warren W. Eason The John Hopkins University, Baltimore, Maryland, U.S.A. .... 26:V
- \*Dr. Hope T. Eldridge 415 Central Park West, Apt. 6D, New York, N. Y., U.S.A. .... 9:IV
- Prof. Harold Francis Falls Associate Professor of Ophthalmology, Institute of Human Biology, University Hospital, Ann Arbor, Michigan, U.S.A. .... 23:VI
- Prof. Nelson N. Foote Director, Family Studies Center, University of Chicago, Chicago 37, Illinois, U.S.A. .... 28:VI
- \*Prof. Clellan S. Ford Professor of Anthropology, Yale University, New Haven, Connecticut, U.S.A. .... 8:I
- \*Dr. John L. Fuller R. B. Jackson Memorial Laboratory, P.O. Box 847, Bar Harbor, Maine, U.S.A. .... 23:VI



UNITED STATES OF AMERICA (*continued*)

Rev. William J. Gibbons, S.J.	Loyola College, 4501 North Charles Street, Baltimore 10, Maryland, U.S.A. ....	12:II 21:VI
*Prof. Noel P. Gist	Department of Sociology and Anthropology, University of Missouri, Columbus, Missouri, U.S.A. ....	19:II
Mr. Paul C. Glick	U.S. Bureau of the Census, Washington 25, D.C., U.S.A. ....	28:VI
Prof. Grace A. Goldsmith	Professor of Medicine, Tulane University School of Medicine, New Or- leans, Louisiana, U.S.A. ....	22:V
*Dr. Margaret Jarman Hagood	Chief, Farm Population and Rural Life Branch, Department of Agricul- ture, Washington 25, D.C., U.S.A. ....	5:IV
Dr. Charles Horace Hamilton	Head, Department of Rural Sociology, North Carolina State College, 1515 Duplin Road, Raleigh, North Carolina, U.S.A. ....	2:I
Prof. Oscar Handlin	Professor of History, Harvard University, Cambridge 38, Massachusetts U.S.A. ....	12:II
Prof. Philip M. Hauser	Professor of Sociology, University of Chicago, Chicago 37, Illinois, U.S.A. ....	26:V
Prof. Rudolf Heberle	Professor of Sociology, Louisiana State University, Baton Rouge 3, Louisiana, U.S.A. ....	17:II
*Prof. George W. Hill	Co-ordinator, Department of Sociology and Anthropology, University of Venezuela, Caracas, Venezuela .....	12:II
Prof. Allan R. Holmberg	Department of Anthropology, Cornell University, Ithaca, New York, U.S.A. ....	
Mr. Robert L. Hubbell	U.S. Mission to the North Atlantic Treaty Organization and European Regional Organizations, 2, rue St. Florentin, Paris 1, France	
*Mr. William Hurwitz	Chief Statistician, Bureau of the Census, Washington 25, D.C., U.S.A....	3:IV
*Prof. Edward P. Hutchinson	Professor of Sociology, University of Pennsylvania, Philadelphia 4, Pennsylvania, U.S.A. ....	12:II
*Mr. Walter Isard	Center for Urban and Regional Studies, School of Architecture and Planning, Massachusetts Institute of Technology, Cambridge 39, Massa- chusetts, U.S.A. ....	20:V
Dr. Abram J. Jaffe	Director, Manpower Program, Bureau of Applied Social Research, Columbia University, N. Y., U.S.A. ....	21:VI 29:III
*Prof. Felix M. Keesing	Professor of Anthropology, Stanford University, Stanford, California, U.S.A. ....	15:VI
*Prof. Charles E. Kellogg	Assistant Administrator for Soil Survey, Soil Conservation Service, U.S. Department of Agriculture, Washington 25, D.C., U.S.A. ....	22:V
Dr. Dudley Kirk	The Population Council, Inc., 230 Park Avenue, New York, N. Y. U.S.A.	10:II
Dr. Clyde Vernon Kiser	Milbank Memorial Fund, 40 Wall Street, New York 5, N. Y., U.S.A. ..	21:VI
*Prof. Simon Kuznets	Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia 4, Pennsylvania, U.S.A. ....	26:V
*Prof. Everett S. Lee	Assistant Professor of Sociology, University of Pennsylvania, Philadel- phia 4, Pennsylvania, U.S.A. ....	17:II
Prof. Michael Lerner	Department of Poultry Husbandry, University of California, Berkeley 4, California, U.S.A.	
Prof. Frank Lorimer	The American University, Washington 16, D.C., U.S.A. ....	15:VI 24:V
*Prof. George F. Mair	Assistant Professor of Economics, Smith College, Northampton, Massa- chusetts, U.S.A. ....	29:III
Mr. W. Parker Mauldin	Chief, International Population Statistics Section, Population and Hous- ing Division, Bureau of the Census, Washington 25, D.C., U.S.A. ....	3:IV
Dr. Stacy May	International Basic Economy Corporation, 30 Rockefeller Plaza, New York 20, N. Y., U.S.A. ....	20:V
*Mrs. Ann Ratner Miller	University of Pennsylvania, Philadelphia 4, Pennsylvania, U.S.A. ....	17:II
Prof. Wilbert E. Moore	Professor of Sociology, Princeton University, Princeton, New Jersey, U.S.A. ....	9:IV
Dr. Iwao Milton Moriyama	Chief, Mortality Analysis Branch, National Office of Vital Statistics, U.S. Public Health Service, Washington 25, D.C., U.S.A. ....	2:I

UNITED STATES OF AMERICA (*continued*)

Mr. Frank S. Morrison	Chief, International Vital Statistics Cooperative Program, National Office of Vital Statistics, Washington 25, D.C., U.S.A. ....	29:III
Mr. Robert Julius Myers	Chief Actuary, Social Security Administration, U.S. Department of Health, Education and Welfare, Washington 25, D.C., U.S.A. ....	13:III
*Prof. James Neel	Department of Human Genetics, University of Michigan, Ann Arbor, Michigan, U.S.A. ....	23:VI
Prof. Lowry Nelson	Professor of Sociology, University of Minnesota, St. Paul 1, Minnesota, U.S.A. ....	
Prof. Frank W. Notestein	Director, Office of Population Research, Princeton University, Princeton, New Jersey, U.S.A. ....	26:V
Mr. Frederic H. Osborn	Director, The Population Council, Inc., 230 Park Avenue, New York, N. Y., U.S.A. ....	
Dr. Sigismund Peller	164 East 81st Street, New York 28, N. Y., U.S.A. ....	11:II
*Mr. Leon Pritzker	U.S. Bureau of the Census, Washington 25, D.C., U.S.A. ....	3:IV
Prof. Malcolm Jarvis Proudfoot	Associate Professor, European Geography and Political Geography, Department of Geography, Northwestern University, Evanston, Illinois, U.S.A. ....	10:II
*Prof. Stephen W. Reed	Yale University, New Haven, Connecticut, U.S.A. ....	15:VI
Dr. Norman Burstson Ryder	Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio, U.S.A. ....	5:IV
Prof. Calvin Fisher Schmid	Professor of Sociology, University of Washington, Seattle 5, Washington, U.S.A. ....	29:III
*Dr. J. P. Scott	Chairman, Division of Behavior Studies, R. B. Jackson Memorial Laboratory, Hamilton Station, P.O. Box 847, Bar Harbor, Maine, U.S.A. ....	23:VI
Mr. Clarence Senior	Chief, Migration Division, Department of Labor, Commonwealth of Puerto Rico, 21 West 60th Street, New York 23, N. Y., U.S.A. ....	10:II
Dr. Henry S. Shryock, Jr.	Assistant Chief, Population and Housing Division, U.S. Bureau of the Census, Washington 25, D.C., U.S.A. ....	6:I 9:IV
Mr. Jacob Stuart Siegel	Population and Housing Division, U.S. Bureau of the Census, Washington 25, D.C., U.S.A. ....	6:I
Prof. Thomas Lynn Smith	Professor of Sociology, University of Florida, Gainesville, Florida, U.S.A. ....	18:III
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Prof. Joseph John Spengler	Professor of Economics, Duke University, Durham, North Carolina, U.S.A. ....	24:V
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Dr. Irene B. Taeuber	Office of Population Research, Princeton University, Princeton, New Jersey, U.S.A.	
*Prof. William Taylor Thom, Jr.	Professor of Geology, Princeton University, Princeton, New Jersey, U.S.A. ....	20:V
Prof. Dorothy Swaine Thomas	Research Professor of Sociology, University of Pennsylvania, Philadelphia 4, Pennsylvania, U.S.A. ....	17:II
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UNITED STATES OF AMERICA (*continued*)

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Prof. Pascal K. Whelpton	Director, Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio, U.S.A. . . . . .	5:IV
Dr. Faith M. Williams	Chief, Office of Labor Economics, U.S. Department of Labor, Washington 25, D.C., U.S.A.	
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Dr. Thomas Jackson Woofter	2300 North Richmond Street, Arlington, Virginia, U.S.A.	
*Dr. O. Zaglitz	Chief, Monetary Policy and Research Branch, Foreign Agricultural Service, U.S. Department of Agriculture, Washington 25, D.C., U.S.A.	22:V
Mr. Carle Clark Zimmerman	Harvard University, Cambridge, Massachusetts, U.S.A.	

*Puerto Rico*

Mrs. Elydia Fort de Ortiz	Chief, Labor Force Section, Bureau of Labor Statistics, Government of Puerto Rico, San Juan, Puerto Rico . . . . .	9:IV
Prof. Millard W. Hansen	Director, Social Science Research Center, College of Social Sciences, University of Puerto Rico, Río Piedras, Puerto Rico . . . . .	21:VI
Mr. José L. Janer	Chief, Bureau of Demographic Registry and Statistics, Department of Health, San Juan, Puerto Rico . . . . .	4:I
*Mr. Teodoro Moscoso	Director, Development Corporation of Puerto Rico, San Juan, Puerto Rico . . . . .	26:V
*Prof. José Mariano Ríos	Agricultural Experiment Station, Río Piedras, Puerto Rico . . . . .	22:V
Dr. Joseph M. Stycos	Social Science Research Center, University of Puerto Rico, Río Piedras, Puerto Rico . . . . .	8:I 28:VI

## VENEZUELA

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*Prof. Erich Michalup	Department of Economy, University of Caracas, Caracas, Venezuela . . . .	3:IV

## YUGOSLAVIA

Dr. Borislav Blagoev	Doyen de la Faculté d'économie, Université de Skoplje, Skoplje, Yougoslavie	
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M. Milos Macura	Directeur de l'Office statistique de la republique populaire de Serbie, Ravanicka 34, Belgrade, Yougoslavie . . . . .	9:IV
M. Kosta Mihailovic	Directeur de l'Institut économique de Serbie, Narodnog Fornta 68/I, Belgrade, Yougoslavie . . . . .	22:V
Dr. Bojan Pirc	Chef de la statistique du mouvement de la population et de la santé publique, Office fédéral de statistique, Kneza Milosa 20, Belgrade, Yougoslavie	
Dr. Vladimir Serdar	Professor, Faculty of Economics, University of Zagreb, Zagreb, Yugoslavia	
Prof. Dolfe Vogelnik	Faculty of Economics, University of Ljubljana, Ljubljana, Yugoslavia	

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Mr. Mordecai Ezekiel	Deputy Director, Economics Division	
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Mr. Walter Hubert Pawley	Chief, Program Analysis Unit, Agriculture Division . . . . .	22:V
Mr. K. K. P. N. Rao	Chief, Food Consumption and Management Section, Nutrition Division	22:V
Mr. Felix Rosenfeld	Economics Division	

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Mr. Pandurang V. Sukhatme	Chief, Statistics Branch, Economics Division	
Mr. Kanagaratnam Williams	Statistics Branch, Economics Division	
Mr. P. Sartorius	.....	22:V
<i>Intergovernmental Committee for European Migration</i> (63, rue des Paquis, Geneva, Switzerland)		
Mr. Giovanni Falchi	.....	10:II
Dr. Robert Rochefort	.....	10:II
<i>International Bank for Reconstruction and Development</i> (1818 H Street NW, Washington 25, D.C., U.S.A.)		
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*Prof. Egbert de Vries	Chief, Agricultural Division	22:V
Mr. Leonard B. Rist	Director, Economic Staff	
<i>International Labour Office</i> (Geneva, Switzerland)		
Mr. Francis Blanchard	Chief, Manpower Division	
Prof. Lucien Féraud	Actuary-Consultant	16:III
Mr. Attilio Oblath	Manpower Division	10:II
<i>Office of the United Nations High Commissioner for Refugees</i> (Palais des Nations, Geneva, Switzerland)		
Mr. John Alexis Alexander		
<i>Organization for European Economic Co-operation</i> (2, rue André Pascal, Paris 16, France)		
Mr. Harold Ford Rossetti	.....	10:II
<i>United Nations Educational, Scientific, and Cultural Organization</i> (19, avenue Kléber, Paris 16, France)		
Mr. Leonardo Diaz González	Department of Social Sciences	
Mr. Otto Klineberg	Head, Division of Applied Social Sciences	
Mr. Bangnee Liu	Head, Statistical Division	27:IV
Mrs. Alva Myrdal	Director, Department of Social Sciences	
Mr. Herbert Moore Phillips	Department of Social Sciences	12:II
<i>World Health Organization</i> (Palais des Nations, Geneva, Switzerland)		
*Dr. M. Jungalwalla	Regional Office for Southeast Asia, New Delhi, India	4:I
*Dr. E. J. Pampana	Chief of the Malaria and Insect Control Section	4:I
Dr. Marcelino Pascua	Director-Consultant on Health Statistics	2:I 4:I
Dr. Mario Pizzi	Chief, Epidemiological Information and Morbidity Statistics Section	
*Dr. Satya Swaroop	Regional Office for Southeast Asia, New Delhi, India	4:I
<i>Council of Europe</i> (Strasbourg, France)		
Dr. Fritz Below	Section statistique et recherche du Secrétariat	
<i>United Nations Secretariat</i> (New York—unless otherwise specified)		
Miss Edith Adams	Population Branch, Bureau of Social Affairs	3:IV-
*Dr. Arne Barkhuus	Department of Trusteeship and Information from Non-Self-Governing Territories	4:I
Mr. Jerzy Berent	Population Branch, Bureau of Social Affairs	16:III
Mr. Jean Bourgeois-Pichat	Population Branch, Bureau of Social Affairs	5:IV-
Mr. Willem Brand	Population Branch, Bureau of Social Affairs	
Mr. Octavio Cabello González	Centro Interamericano de Bioestadística, Luis Thayer Ojeda 750, Santiago, Chile	29:III

INTERNATIONAL ORGANIZATIONS (*continued*)

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Mr. Barrie Nicholas Davies	Economic Commission for Europe, Palais des Nations, Geneva, Switzerland .....	9:IV	
Mr. John D. Durand	Assistant Director in charge of Population, Bureau of Social Affairs ..		
*Mr. Norbert F. Falzon	Statistical Office .....	9:IV	
Mr. Lefkos P. Georgiades	United Nations Mission to Libya, P.O. Box 358, Tripoli, Libya		
Mr. Halvor Gille	Population Branch, Bureau of Social Affairs .....	6:I 11:II	-
Mr. John V. Grauman	Population Branch, Bureau of Social Affairs .....	13:III	-
*Mr. Nathaniel B. Guyol	Statistical Office .....	20:V	
Mr. Folke Hilgerdt	Bureau of Economic Affairs .....	20:V	
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Mr. Max Lacroix	Statistical Office		
Mr. Forest E. Linder	Chief, Demographic and Social Statistics Branch, Statistical Office ....	3:IV	
Mr. Richardo Luna Vegas	Statistical Office .....	9:IV	
Mr. Gunnar Myrdal	Executive Secretary, Economic Commission for Europe, Palais des Nations, Geneva, Switzerland		
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*Mr. H. W. Singer	Bureau of Economic Affairs .....	24:V	
Dr. Vasilios G. Valaoras	Population Branch, Bureau of Social Affairs .....	2:I	-
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