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Panoramic Review of the World Population

Prof. Gérard-François Dumont

"One must have the courage to express the evidence..." So said the Viennese Arthur Schnitzler, in the early years of this century, in a work full of pungent aphorisms.⁽¹⁾ And if there is one field in which the evidence is very often omitted, it is surely that of demography. Information on population questions is too often limited to using some simplistic terms which are passed off as the keys to knowledge: exponential growth, demographic explosion, overpopulation, excess...

None of these terms corresponds to the actual demographic situation, nor to the evidence of the state of contemporary populations: can one employ the expression "exponential growth" at a time when the growth rate of the world population has been decreasing since the beginning of the 1970s and when it has even dropped below zero in an important continent, Europe? Can one use the formula "demographic explosion" when the growth of the world population in the course of the 20th century has not conformed to the meaning of the term "explosive", i.e. it has neither been sudden, nor spectacular? Can one dare to use the terms "overpopulation" or "excess population" when 95% of the territories of the planet have a low population density, and one that is even falling in numerous rural regions in developed countries, or in certain small islands? When after years of blind acceptance of demographic myths, certain media end up by realizing implicitly that all these terms are improper, they feel a need to express amazement. Thus, on 11 August 1995, a leading French daily announced what every good demographer who has properly assimilated the logic of the long duration of demographic mechanisms has long known: "the growth of the world population is in a phase of deceleration".⁽²⁾ So surprised was this newspaper by this discov-

ery that it committed the literary inelegance of twice repeating, in the brief article in question, the adjective "unexpected": according to it, this slowing down in the growth rate was "unexpected"; it then described as equally "unexpected" the decrease in the reproduction rate in Africa. Yet there is nothing unexpected in a demographic mechanism which was first described in 1909,⁽³⁾ followed by a more elaborate schematization in 1934⁽⁴⁾ and again in 1945.⁽⁵⁾ The mechanism in question is that of the so-called "demographic transition".⁽⁶⁾

A panoramic review of the world population today requires first of all that we jettison unsuitable or loaded expressions, such as that of "demographic explosion", which risk obscuring the evidence. It then becomes possible to understand the contemporary evolution of the world population; only then can we proceed to study its future prospects.

The expression "demographic explosion" entered into common parlance from the 1960s. In 1968, more precisely on 28 August, the President of the American Association of Sociology, on the occasion of the Association's annual assembly, expressed the view that the world had become a "society of chaos"⁽⁷⁾ due to the "population explosion". The use of this term is corroborated in the French dictionary *Le Petit Robert*. After defining the figurative meaning of the word explosion, "sudden and violent manifestation", this dictionary cites another connotation of this word, namely a "sudden and spectacular expansion", citing as an example the phrase "demographic explosion".

Intellectual inertia

Can the demographic evolution of the last two centuries really be summarized by its sudden and spectacular character? True, the spectacular character, if one considers more particularly the demographic data relating to urban areas, is not totally inexact. But the growth registered in the world's populations is hardly commensurate with the growth experienced in the economic and scientific fields, and no one dares to speak of an economic or scientific explosion.

Even more debatable is the alleged sudden character of this demographic evolution. Demographic growth is not produced

in a very short space of time. Depending on the country, it is spread over several decades, indeed over a period of more than a century. It has not been brusque, but has accompanied the progress of the economy, of medicine and hygiene. It has not been instantaneous, but has manifested itself following different rhythms and in different periods depending on what parts of the world it took place in. It has no longer been unpredictable, so long as the factors capable of explaining it are taken into account.

Using the expression "demographic explosion" is tantamount to accepting a certain intellectual inertia which leads to being surprised by every new phenomenon. The evolution of world population, since the industrial revolution started at the end of the 18th century, is a phenomenon which can be described and understood, which results from a logic. The expression "demographic explosion", as it is generally used, is also a prediction about the future. Implicit in it is the idea of a continuous expansion, an uncontrollable exponential growth of the population.⁽⁸⁾ Do the known data and prospects enable us to corroborate this idea or not? Do they not, on the contrary, oblige us to envisage an implosive phenomenon?

Let us first clarify the known facts, in other words the present state of the world population, the result of the evolution of the seven or eight generations that preceded us, before proposing any prospective analysis.

Let us first take the measure of the facts before explaining their causes.

An unprecedented situation

Unprecedented in numbers, the demographic growth of the 19th and 20th centuries is not totally unprecedented in the history of peoples and civilizations. In fact, the evolution of the world population from time immemorial has not been subject to a wholly biological mechanism whose operation has been regular and undeviating. The evolution of the number of human beings on our planet has been influenced by technological, economic, political and cultural changes both at the global and at the regional level.

In 1800 the world population was estimated at 954 million. It first passed the one billion mark in the 19th century and was

estimated at 1,634 million in 1900. The growth in the course of the 19th century is therefore estimated at 71%. This is a rate higher than that of the previous centuries. It is also an average rate: i.e. it conceals the fact that far more substantial demographic increases took place in some countries. For example, the population of the United Kingdom rose from 10.4 million in 1800 to 38.7 million in 1900, equivalent to a growth rate of 272%.

The 20th century has registered a more accelerated growth rate than the 19th. The start of the latter third of our century was to be marked by three indicative figures: in 1967, within the space of a few months, India achieved a total of 500 million inhabitants, the United States passed the 200 million mark, while metropolitan France registered a total of 50 million inhabitants.

The *World Population Data Sheet* of the *Population Reference Bureau* estimated the total world population in mid-1995 as 5,702 billion. The mean projection forecasts a total of 7,024 billion inhabitants on the planet for the year 2010, and 8,312 billion for 2025.

These estimates, which must be relativized in relation to the various hypothetical constructs on which they are predicated, imply a growth of the world population of 283% in the course of the 20th century. The annual total reached (around six billion) and the mean annual growth rate (1.058%) are unprecedented in the history of mankind as a whole, even though this rate is similar to that reached by England in the 19th century.

Various factors

In fact the world demographic growth of the 19th and 20th centuries is the direct result of the radical changes in economic life and public health introduced from the first industrial revolution onwards. The export of these techniques, from the European countries where they were first introduced to the rest of the world, favored by the colonial regime, permitted the expansion registered in almost all the world's populations.

In the countries of the Northern hemisphere, in the 19th and early 20th century, the generating force of this demographic growth was at first industry, and then, but only in a second stage, the progress of medicine and sanitation. In the Southern hei-

sphere, on the contrary, with a time-lag of approximately a century, it was above all medicine which played the main role.

Up till the entry into a period of growth at the end of the 18th century, the duration of human life was largely dependent, in each region, on climatic conditions. The demographic regime was determined by good or bad harvests. Then the adoption of the horse for traction accelerated agricultural yields, while the utilization of its dung as fertilizer made it possible to do away with the triennial rotation of crops. The improvement of road networks and the cutting of canals facilitated transport and as a consequence the building up of stocks and the creation of new jobs.

Medicine, biology and chemistry achieved a decisive advance in the investigation, diagnosis and treatment of diseases. At the same time, the development of networks for the distribution of drinking water, and for the treatment and removal of sewage, ensured the progress of public hygiene.

Benefiting from better living conditions, a sufficient diet throughout the year, improved hygiene, preventative vaccines and various forms of health care, mankind came to discover that what had been unimaginable in previous centuries and millennia was becoming a reality: man can defer death to a considerable degree. It is this formidable change that we term the first demographic revolution.⁽⁹⁾

The demographic growth of the 19th and 20th centuries was in fact the result not of a higher birth rate than in previous centuries, but of a lowering of mortality due to economic and medical/sanitary progress.

In the developing countries, the mechanisms of this lowering responded to a logic which was not only different but more rapid. These developing countries benefited, especially in the course of the 20th century, within a very short time span, from the medical advances progressively achieved, beforehand, in the countries of the North. There, medical science had been developed and diffused for almost a century. In the South, it had been possible within the space of only a few years to apply the knowledge and methods already experimented and tested in the countries of the North, such as systematic vaccinations. The gap between mortality in rapid decline and constant birth rate led to

a high natural surplus, and hence, to simplify, a significant growth rate.

Growth, the deceleration

The 20th century at first experienced a progressively rising average annual rate of population growth, with the generalized recourse to the anti-mortality techniques developed by medicine and advances in public hygiene. On average for the world as a whole, a maximum annual rate of 2.1% was reached at the end of the 1960s. Then this average rate began to decelerate. The curve of the growth of world population is therefore not exponential as one may be led to believe, but rather follows a logistic curve conforming to the scheme⁽¹⁰⁾ of "demographic transition".

This scheme in effect shows that the demographic evolution of different countries traverses, during an initial stage, a period of marked growth. The duration of this initial stage was particularly short in the developing countries, which benefited within the space of a few decades from the progress accumulated by the North for over a century.

Then - the second stage - mortality no longer drops at the same rate and the birth rate begins to adapt itself to the new conditions of mortality.

The gap between births and deaths is therefore reduced; the annual growth rate declines. Estimated at 2.11% in 1968, population growth thus dropped to 2.03 in 1975, to 1.77 in 1980, to 1.67 in 1985, to 1.61 in 1990 and to 1.53 in 1995. Even though its level remains far from negligible, its tendency to decrease is incontestable. As regards what some might call the slowness of the evolution, the logic of the long duration of demographic phenomena should be borne in mind.⁽¹¹⁾ At the national level, on the other hand, significant decreases in reproduction were achieved in the space of a few years. From 1981 to 1993, the reproduction rate thus fell by 34% in Turkey, 33% in Angeria, 32% in Sri Lanka, 17% in China, 29% in Mexico, 40% in Brazil.

The 1990s have therefore marked a major watershed: the second stage of demographic transition, in other words a significant decrease in childbirth subsequent to a decline in mortality, has spread to virtually every country in the world, including countries which some experts believed were zones with inevitably high

childbirth, such as Muslim countries or countries in Africa.

The deceleration therefore took place in two stages. First, the natural growth rate decreased because the birth rate declined more than the mortality rate. But this diminution in relative figures did not prevent the absolute figures from increasing, since the birth rates applied to a growing population. Moreover, the surplus of births over deaths continued to increase, the annual maximum being evaluated at 93 million at the start of the 1990s.

Subsequently - second phase of deceleration - the decline in the birth rate became sufficiently significant to trigger a diminution of the surplus: it is this that has happened since the years 1993-94, in spite of the increased life expectancy resulting from the lowering of mortality rates.

Aging and depopulation

If one considers the developed countries, the period of transition has ended. The very term transition used to describe their demographic evolution is indeed open to criticism. A transition may be defined as a passage from one situation to another. But the situation subsequent to the "transition" remains an unknown quantity, since no one knows if a demographic régime, and what, is installed after the transition. Are there laws, and if so what, on which the post-transitional demographic evolution depends? If these laws exist, they must concern reproduction. In fact, the evolution of populations is no longer strongly dependent on the laws, or rather the constraints, of mortality. The essential explanatory factor of demographic evolution is henceforth reproduction. And in practically all the countries of Europe,⁽¹²⁾ the levels of reproduction, which will dictate future demographic trends, have fallen below the threshold of simple replacement of generations. The only exceptions to this rule in 1995 were Iceland, Moldavia, Albania and Macedonia.⁽¹³⁾

The situation in North America is comparable. It is also found in Australia, New Zealand, in most of the countries of East Asia (China, South Korea, Hong Kong, Japan, Macao and Taiwan), in Singapore, Armenia, Georgia and in various territories in the Caribbean (Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominican Republic, Martinique, Dutch Antilles). The low levels of

reproduction registered in these areas as a whole have immediate and longer term demographic consequences.

In the immediate perspective, the proportion of under twenty-year-olds in these territories is decreasing: the base of the age pyramid is becoming narrower, and losing its pyramidal form. The population is thus aging. And this in turn has a number of consequences. In the regions with a markedly aging population, deaths prevail over births and the natural demographic balance is negative; this is the case for the whole of Europe due to the negative reproduction rates of Estonia, Lithuania, Germany, Byelorussia, Bulgaria, Hungary, Romania, Russia, Ukraine, Croatia and Italy.

As for the longer term consequences, some are inevitable, others depend of future behavior. One inevitable consequence is that certain generations will in any case remain less numerous than the previous ones, generating relative modifications in the demographic relations: aging of the working population, lower proportion of people of active age in relation to those in retirement. What still remains uncertain is the possible level of depopulation if the low indices of reproduction were to persist.

The evolution of the world population has obeyed a logic over the last two centuries. The size of the total population numbers has been the result not of spontaneous generation, unpredictable in result, incomprehensible in effect, but of scientifically explicable and analyzable mechanisms. Does this knowledge of the demographic past and present of our planet also help to throw light on the future? It is to this question that we shall now try to seek an answer.

Reflecting on the future of the world population means adopting a prospective, or futurological, approach. In demography this approach is subject to the same constraints as other fields. It benefits, however, from specific aids which enable us to quantify different scenarios.

Relativity of prospective analysis

Prospective analysis, "this attention to the future designed to throw light on present action"⁽¹⁴⁾, appears *a priori* relatively easy in demography, since this science enjoys several advantages. First, it can draw on an apparently sound knowledge of current data, point of departure for all prospective analysis. Second, the

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logic of long duration characteristic of demography gives a considerable degree of certitude about the future: for example, we know that the human beings who will be aged 25 or over in 2020 had already been born by 1995. Third, the existing population is only subject to limited changes each year. Annual population fluxes (births, deaths, migratory balance) are mathematically of little significance in relation to the stock (population existing on 1st January in any given year). These fluxes are at the most a few percent, and, besides, the tendency of their variation - the derivative of the curve - may be more or less deduced from the observation of their fluctuations in the course of previous years. It is in this respect that demographic phenomena have a great inertia.

These advantages must however be relativized. Numerous regions in the world have no, or at best a very defective, civil regime.⁽¹⁵⁾ Studies permitting measurements of the age distribution of populations remain insufficient. The official figures are not totally reliable, either: they are of orders of magnitude which may sometimes be open to doubt. The statistics of the United Nations thus indicated 122.5 million inhabitants for Nigeria in 1991, but the result of a more recent census led to this figure being downgraded by 34 million.⁽¹⁶⁾

Similarly, projections predicted 31 million inhabitants for Mexico City in the year 2000. It has now been necessary to revise this figure downwards: a figure of between 19 and 20 million inhabitants has now been forecast. In other words, Mexico City will have lost 10 million inhabitants, a third of its population, because "everyone made a mistake, including the experts of the United Nations, who estimated the population of Mexico City at close to 20 million in 1990", as the Mexican demographer Sergio Camposorteja has admitted.⁽¹⁷⁾ The error originated in the censuses of 1980 and 1990, which grossly overestimated the population of the capital.

The tendency of the rulers of some countries to inflate their population figures for political reasons should also be taken into account. It has thus been necessary to revise downwards the results of the censuses in the former USSR, falsified on Stalin's orders to disguise the scale of the mortality due first to the purges and then to the deterioration in public health. Some rulers of

Third World countries have inflated their population figures to benefit from higher levels of aid from the international organizations. It is therefore necessary, in handling demographic statistics, to maintain a critical attitude by taking into account the methods, the concepts, indeed the philosophy brought into play.

Prospective analysis in demography must therefore be modest.⁽¹⁸⁾ The almost inevitable tendency of all futurology is to start out from the logic of the time in which it is being conducted, and this logic can hardly take into account the unforeseen changes that may intervene. Thus, in a recent past, at a time when ever more complete data were available to us, only a very few people were able to predict or envisage a number of significant variations: the rapidity of the decline of morality in the Third World, more than the decline in the birth rate in the countries of the North, the local recrudescence of certain epidemics, and the appearance of a netirely new pandemic which science is so far impotent to cure.

The implosion scenario

Demographers have formulated prospective hypotheses which essentially lead to two scenarios: that of "implosion" and that of stabilization. The implosion scenario consists in prolonging the current reproduction pattern of the developed countries. It leads to an aging of the population, to depopulation, and then to demographic exhaustion. If generations are only partly replaced, it is mathematically certain that the time will come in which there will be no more generation. It was Jean Bourgeois-Pichat, former director of the Institut national d'études démographiques, who studied this scenario and gave it the name of "demographic implosion".⁽¹⁹⁾

This scenario applies in different ways to the industrialized countries (the North) and to the developing countries (the South), since the situations which form the points of departure of these two major zones are different. In applying this scenario the author presupposes that the countries of the North will progressively align themselves with the low birth rate in Germany, as Italy, Spain or Slovenia have already done. This leads to a population decrease of 2% per year. If this situation were to persist, in other words if the birth rate were to remain low, and if the industrial-

ized countries were closed to movements of population, i.e. to immigration,⁽²⁰⁾ what would be the results? In a first phase, the industrialized countries would continue to experience a slightly positive rate of growth as a result of the demographic momentum already achieved to culminate in 1.4 billion inhabitants in 2020. This effect of momentum would then diminish in time, and the population of the industrialized countries would decline, falling below the one billion mark from 2070 on. The quantitative logic of mathematics, i.e. the continuous application of an annual zero growth rate, would lead to the total depopulation of the industrialized countries from 2250.

Let us now examine the case of the underdeveloped countries, again in the context of the "demographic implosion" scenario. The birth rate of the developing countries would, according to this scenario, progressively decline to align itself with that of Germany, something which some former Third World countries in the Far East (South Korea, Hong Kong, Taiwan) have already done. The population of the underdeveloped countries, which comprised some four billion inhabitants in 1990, would continue to grow to peak at 8.4 billion in 2080. Then the population would begin to fall. If the rate of decline were maintained during all the ensuing generations, the population of the underdeveloped countries - and hence that of the whole planet - would end up by disappearing by... 2400. The result of these projections, of course, seems just as unrealistic as their antithesis: the doom-laden predictions betraying an obsessive fear of the overpopulation of our planet.⁽²¹⁾

Variety of hypotheses and diversity of results

Alongside the scenario of demographic implosion, we may consider the scenarios adopted by the United Nations in the demographic projections it periodically makes. Let us examine the projections published in 1992,⁽²²⁾ which predict evolutions up till the year 2150 according to five different reproduction hypotheses. But the United Nations only considers one mortality hypothesis: between now and the year 2075, according to this scenario, life expectancy will increase without blips to reach for the planet as a whole 87.5 years for women and 82.5 years for men. The

single undifferentiated nature of this hypothesis is debatable: it excludes in the first place all the factors susceptible of curbing the increases in life expectancy;⁽²³⁾ it also excludes the contrary hypothesis of gerontologists who hope that a great leap forward may be made thanks to scientific advances and that the term of life may be extended to 140 years,⁽²⁴⁾ i.e. twenty years more than the "six score" promised by Frosine to Harpagnon.⁽²⁵⁾ Moreover, it reckons on linear progress in life expectancy, which presupposes that the combination of medical advances, the amelioration of living standards and the behavior of individuals will generate this regularity.

As regards reproduction, the United Nations take into account the decline observed since the late 1960s and prolong it in conformity with the mechanism of demographic transition. The "low" reproduction scenario will lead to a birth rate of 1.7 child per woman in 2025, and that of "high" reproduction to one of 2.5 in 2050.

The United Nations propose three other scenarios corresponding to three intermediate birth-rate hypotheses: "semi-low", "mean", "semi-high". The results of these scenarios are very divergent. In the high hypothesis, the world population, estimated at 5.3 billion inhabitants in 1990, will reach 9.44 billion in 2025 and 28.025 billion in 2150. In the low hypothesis, these figures become 7.591 billion in 2025 and 4.299 in 2150, i.e. a total lower than that already reached in the 1990s, in spite of a 50% increase in life expectancy. The great elasticity of the hypotheses leads to an extreme variability of the results.

Can one consider this or that scenario as impossible? To answer this question, let us take an example in the previous projections, those elaborated country by country in 1984.⁽²⁶⁾ The results then proposed correspond to different hypotheses, including the "weak" hypothesis, which presupposes the most accentuated decline in the birth rate. This "weak" hypothesis forecast a certain level of reproduction for the period 1990-1995, for the countries of Africa for example. Now the demographic and health surveys (DHS) conducted since then have revealed a birth rate actually lower than the "weak" hypothesis in two thirds of the African countries surveyed, i.e. twelve countries out of nineteen: Ghana, Guinea, Nigeria, Kenya, Uganda, Botswana,... This example un-

derlines the difficulty of determining what are the most reliable hypotheses, since in the case in point the reality was found outside the various hypotheses adopted.

Another question: should one consider the most reliable scenario of all that defined as the "mean", according to which reproduction is aligned to the level of the rate of replacement of generations (2.1 children per woman) if health conditions are good? No one can answer this question, since this scenario is only the mean of a mathematical point of view. It is not even mean with regard to the various factors capable of influencing the evolution, since it admits that some of them exert a strong and others a weak influence. This "mean" scenario projects a world population of 6,261 billion in the year 2000,⁽²⁷⁾ 10,019 in 2050, 11,186 in 2100 and 11,543 in 2150. It thus leads to a stabilization of the world population.

The U.N. scenarios, however useful they may be for reflection, justify, apart from the above remarks, other reservations. They propose a single undifferentiated reproduction index, applied to the whole of the world population. Moreover, they envisage, as in the mean scenario, 2.1 children per woman in every country of the world; this is to overlook the fact that almost all the industrialized countries have already, in the course of the last third of the 20th century, passed well below the replacement threshold.

Strong logics

All these observations give rise to numerous uncertainties about the future. They enable us, nonetheless, to clarify our reflections by emphasizing, in conclusion, the main demographic results of the past and the prospects for the future.

The results of the first demographic revolution⁽²⁸⁾ of the 19th and 20th centuries may be summarized in four points:

a) The decline in mortality and the struggle against the three scourges (infant mortality, maternal mortality and child mortality) permitted an *unprecedented and considerable increase in life expectancy* at birth. It doubled, even tripled according to country. In the course of these last two centuries, the most important development was that of longevity.

b) This increase in the duration of human life, combined

with a significant gap between the childbirth and mortality rates when the countries were traversing the first stage in the demographic transition, led to a *significant growth of the world population*: over 71% in the 19th, over 283% in the 20th century.

c) These developments had as their result the *peopling of regions virtually unsettled by man* in 1800 and contributed to an *urbanization without precedent*. But outside the urban areas, the population density more often than not remained low.

d) The *deceleration* in world population growth, which began in the early 1970s, accelerated in the 1990s, leading to a decline in the annual surplus of births over deaths.

As for the prospective approach, it leads to different conclusions depending on the time-scale adopted. If one limits oneself to a human span, i.e. to a period of some fifty years, three tendencies would seem to be confirmed.

a) Taking into account the progress either achieved or predicted in the field of the decline in mortality, a global growth of the world population is virtually certain, if only due to the effect of momentum, save for major catastrophes on an unimaginable scale: fatal epidemics, wars,⁽²⁹⁾ natural disasters. But it is likely to be a decelerated growth, without any comparison, in percentage terms at least, with that of the 20th century. It might be *three times less*, in accordance with the processes of deceleration.

b) This global evolution is not homogeneous; it covers very different regional realities, and in particular those which - in simplified terms - distinguish the industrialized countries (old and new) from the others. The former are almost certain to see the *aging* of their populations further accentuated in significant proportions.⁽³⁰⁾ Many of them, unless there is a new and significant prolongation of longevity (which will pose problems of its own), and unless there is a spectacular recovery in their reproduction rate, will experience a *decrease in their population*, indeed an abandonment of certain regions, susceptible of generating migrations with their multiple consequences.

c) As for the developing countries, by virtue of the relative youth of their present population, they are likely to register a significant increase in their population, in spite of a progressive decline in their reproduction rate and the persistence or appearance of a certain overmortality in certain regions.

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Everything is possible

In the mid term, in the demographic sense of the expression, i.e. over three or more generations, or more than a century, the possible futures are very variable. But they can be placed between two evolutions which seem to form a floor and ceiling.

The floor is represented by the "demographic implosion" scenario. One may ask oneself whether this direction has not been taken in the countries which, having a reproduction rate in the long term equal to or lower than 1.7 child per woman, will experience not only an aging, but a natural diminution of 20% of their population per generation.⁽³¹⁾ This scenario could only be extended to a world scale if the countries of the Third World, on achieving development and having completed their demographic transition, were to adopt the demographic regime of their predecessors, following the example of Japan and other newly industrialized countries of the Far East.

The ceiling would result from the end of registering, in the structures of the world population, the first demographic revolution, in other words the substantial decline in mortality, accompanied by a reproduction rate which would remain fairly high.

Whatever the pertinence of these conclusions, it remains necessary to recall that all the quantitative projections of population are subject to caution, since they are based on a regrettably approximate knowledge of the existing situation which forms their point of departure. A great deal of progress still remains to be made in the field of demographic statistics. In many countries, total population numbers remain a matter of guesswork; the birth and mortality rates, and the distribution of the population by age, are uncertain.

Even supposing that "demographic implosion" is no more than a scenario which it would be verging on absurdity to push to its logical conclusions, the utilization of this formula would nonetheless appear to be pedagogically necessary. It leads us to interrogate ourselves about what the much-used term "demographic explosion" really means. It also enables us to leave well-beaten tracks, to maintain a critical spirit in the face of the claims of a neo-malthusian vulgate which tends to consider that the future is subject to the infallible rules of geometric progressions,⁽³²⁾ without

the idea even seeming to cross some people's minds that a rapid, even accelerated decline in the birth rate in the Third World is envisagable, when it is already manifesting itself in many countries. It also enables us to consider the risks of a rise in mortality, at a time when the pressures of endemic diseases or the breakdown of economic life have already confirmed this possibility in various regions.

Hence, the scientific approach enables us at once to gain a better understanding of contemporary demographic history, to reflect on population prospects for the future and, as a consequence, to elucidate present action. To this end, however, it remains essential to grasp the limitations of the global approach to world population, and to take into account the importance of regional and local diversities. For example, what is comparable between the population of Taiwan and Uganda, apart from their total numbers, 21.2 million inhabitants for the former, 21.3 for the latter? Ohterwise they are poles apart: in population density (respectively 588 and 107 inhabitants/km²), birth rate (16 and 52 per thousand), mortality rate (5 and 19 per thousand), infant mortality rate (6 and 115 per thousand), the overall reproduction index (1.8 and 7.3 children per woman), the proportion of under-fifteens (25 and 47%), the proportion of over sixty-five (7 and 3%), the life expectancy at birth of the female population (77 and 46 years), the life expectancy at birth of the male population (72 and 44 years), the urbanization rate (75 and 11%), the per capita gross domestic product⁽³³⁾ (15,663 and 1,240 US dollars), and so on.

This example clearly underlines the absurdity of all global demographic policy, and the need for demographic policies to be geared to the extremely diverse situations of the various countries, in conformity with the principle of subsidiarity. Thus a panoramic review of the world population can do no more than give us a global elucidation of the situation and invite us to pay due attention, within this world population, to the diversity of the world's populations.

Notes

- (1) A. Schnitzler, *La transparence impossible- Aphorismes*, Paris: Ré édition Rivages, 1990.
- (2) *Le Monde*, 11 August 1995, p. 4.
- (3) A. Landry, *Sciencia*, 1909.
- (4) A. Landry, *La révolution démographique*. Paris: INED, new edition 1982.
- (5) F.W. Notestein, 'Population, the long view', in Th. W. Schultz, *Food for the World*, Chicago: University of Chicago Press, 1945, pp. 36-57.
- (6) Gérard-François Dumont, *Le monde et les hommes. Les grandes évolutions démographiques*, Paris: Editions Litec, 1995.
- (7) Philip M. Hauser, *American Sociological Review*, December 1968. This presidential address is all the more striking as Hauser, then Professor at the University of Chicago, had been the only American university professor to have presided over the American Society of Sociology (1967-68), the American Association of Statistics (1962) and the American Association of Population (1950). Cf. Salustiano del Campo. preface to the Spanish translation of Philip M. Hauser's text published under the title *La Sociedad caotica*, Barcelona: Ariel. 1972. p. 8.
- (8) Philip M. Hauser. in his aforecited address, (see note 7), thus considers that there is little chance of any reduction in growth prior to the year 2000 and that the high birth rates will be maintained. This point of view would be totally belied by the facts.
- (9) It is the first with regard to contemporary history, but we have seen that history has experienced other demographic revolutions in the past, such as that of the neolithic (of. Pierre Chaunu. *Trois millions d'années*, Paris: Robert Laffont. 1990, p. 346), triggering off what Pierre George has called - in essence-immobile populations (*Population et peuplement*, Paris: PUF, 1980, p. 111).
- (10) This term "scheme" seems to us preferable to the over pretentious use

- of the word "theory". For this theory "consists, for a large part, of a pure description of historical events". Cf. Jean-Claude Chesnais, *La transition démographique*. Paris: PUF, 1986, p. 580.
- (11) Gérard-Françonis Dumont, 'Démographie, science sociale', in *La vie, la mort, la foi. Mélanges à Pierre Chaunu*, Paris: PUF, 1993.
 - (12) Gérard-François Dumont, 'La géographie des régimes démographiques en Europe', in *Mélanges à Xavier de Planhol*, Paris: PUPS, 1995.
 - (13) 1995 figures of the *World Population Data Sheet*.
 - (14) Michel Godet, *De l'anticipation à l'action*. Paris: Dunod, 1992.
 - (15) Some countries have enforced a strict embargo on their statistical information, such as North Korea from 1964 to 1989. Cf. Nicolas Eberstadt, 'Population et main d'oeuvre en Corée du Nord', *Population*, XXXXVIII, n°. 3, May-June 1993, p. 683.
 - (16) *Population et sociétés*, n°. 272, October 1992.
 - (17) *Le Monde*, 30 September 1994, p. 17.
 - (18) Gérard-François Dumont, *Démographie*, Paris: Dunod, 1992, Chapter V.
 - (19) Jean Bourgeois-Pichat, 'Du XXème au XXIème siècle: l'Europe et sa population après l'an 2000', *Population*, vol. XXXXIII, January-February 1988, pp. 9-42.
 - (20) This simplistic hypothesis is of course erroneous. Cf. Gérard-François Dumont. *Les migrations internationales. Les nouvelles logiques migratoires*, Paris: Editions Sedes, 1995.
 - (21) Gérard-François Dumont, *Le monde et les hommes. Les grandes évolutions démographiques*, Paris: Editions Litec. 1995.
 - (22) United Nations. Long-Range World Population Projections, Two Centuries of Population Growth, 1950-2150'. New York: Uno, 1992.
 - (23) In this regard, the report of the World Health Organization on sexually transmitted diseases (STD), announcing 333 million new cases of disease for the year 1995 alone, is disquieting since "maltreated cases of STD considerably increase the risk of contracting AIDS". *Le Figaro*,

28 August 1995.

- (24) Roy Malford, *La vie la plus longue*, Paris: Laffond, 1984.
- (25) Jean-Baptists Poquelin, called Molière. *The Miser*. Act II. scene 6. First performance: 9 September 1668. The person considered the oldest in the world, Jeanne Calment, who lives at Arles in France, was born on 21 February 1875, and thus celebrated her 120th birthday in 1995.
- (26) United Nations, 1986, World population prospects, estimates and projections of, assessed in 1984, *Population Studies*, n°. 98.
- (27) Whereas Philip M. Hauser in 1968 cited a mean prospect of 7.5 billion, i.e. 20% less. Moreover, these figures are normally excessive, since they are based on a reproduction rate higher than that of the most recent estimates, for instance in Africa.
- (28) On the modalities of this revolution, of. Gérard-François. *Le Festin de Kronos*, Paris: Fleurus-Essais, 1991; *Il Festino di Crono*. Milan: Edizioni Ares, 1994; *El Festin de Cronos*, Madrid: Ediciones Rialp, 1995.
- (29) It may be remarked that an event as spectacular as the Second World War, while it had a profound influence on the vitality of the European populations, marked only a barely distinguishable deceleration in the growth of the world population as a whole.
- (30) Gérard-François Dumont, 'Le vieillissement, un phénomène social majeur'. *Revue des Deux Mondes*, March 1993, pp. 104–124.
- (31) I.e. every 25 or 30 years.
- (32) Claims which lead to such patent absurdities of the kind: 1.189 billion inhabitants in Turkey in 2070 as against 35 million in 1970, and 2.23 billion in Mexico as against 50 million in the same year. Cf. Alfred Sauvy, *Croissance zéro?*. Paris: Calmann-Lévy. 1973. p. 125. An explanation of this intellectual short-sightedness is no doubt to be sought in the proud disdain which manuals of statistics show towards the logistic curve, which may be considered as the universal curve of the

evolution of natural populations. Computer programs generally ignore it, although it was included among the applications in Basic proposed for the Sharp PC-1500, one of the first pocket computers, in 1982!

- (33) The figures in question are at 1990 prices and purchasing power, reconverted into 1994 dollars.

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