

The Nature of Demography

Hervé Le Bras

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In *The Nature of Demography*, the eminent French demographer Hervé Le Bras presents an imaginative and compelling vision of what demography might become if it were to take seriously the scientific task of theory building and codification. Ranging across a wide array of substantive areas – mortality, fertility, marriage, migration, population projections, population and economic development, life-cycle economics and pensions, social mobility, settlement patterns, population density – Le Bras constructs simple (but not simplistic) mathematical models of population processes.

The focus on process is central to his vision. Demographic measurement ("a sort of land surveying applied to populations") is important, but secondary to the development of demography as an independent scientific discipline: "Demography is a science of processes" (p.345). It is necessary to get down to individual behaviour in real cohorts ("time-lines" in the language of the Lexis diagram), in short, to provide micro explanations for macro-demographic period observations. The latter are seen as unreliable guides to what is really going on, as a consequence of censoring (to which Le Bras devotes three chapters) and of wrong perspective: "this interpretation reverses the true direction of the process, attempting to derive causes from their consequences" (p.94).

Le Bras works almost exclusively with mathematical models, spending little time on less rigorous conceptual or visual models. The models are constructed with an eye to specific empirical observations, and are solved analytically if possible, or by micro-simulation where necessary. A model is considered interesting and useful if it provides insight into the workings of the demographic system.

A model is deemed empirically adequate if it can closely reproduce the original empirical observations. Le Bras does not speak of "validity" or "truth" of a model or theory. He avoids the logical fallacy of affirming the consequent by taking an ecumenical view of theory. Commenting on the large array of

migration models in the literature, he notes that "models are viewpoints on migration. They are not mutually exclusive but combine to form a whole, in the way that architectural drawings made to show plan, section, and elevation complement each other" (p. 316). There is no idea here of truth, much less absolute truth or validity. This view is in keeping with many contemporary philosophers of science who view models and theory as tools – useful or not, but never true in any fundamental sense, and accepted by consensus and convention rather than by proof (for example, Ronald Giere, *Science Without Laws*).

Le Bras' view of micro-simulation is equally relaxed and balanced. There are times when simulation is necessary because no direct observations of process are available. But micro-simulations should be kept as simple as possible; otherwise the simulation becomes a black box, even if the computer can do the calculations. Insight into to process is lost in the complexity of the model. All in all, Le Bras exhibits a sophisticated and thoroughly modern view of theory and modeling – something not commonplace among demographers.

This is a work for mathematical demographers with an interest in theory. Non-mathematical demographers (of which there are many, especially in North America) will find it tough going. The back cover describes it as a textbook for "advanced undergraduates and experienced researchers." And Le Bras notes that the math should pose no problem for "...a secondary school student in his/her final year" (p. 3). This may be so in France, but not in Canada or the U.S., certainly not in sociology departments, where a large portion of population courses are taught, and a large portion of the majors systematically avoid mathematics or hard science. It is relevant to point out that Le Bras majored in mathematics and economics as an undergraduate, and did his Ph.D. at L'Ecole Polytechnique, an institution with a strong engineering flavour. Not all of us have been so fortunate.

Nor can I agree that *The Nature of Demography* is "a general introduction to demography" (p. xi). Too much of workaday demography is missing. One would never know from this work, for example, that a leading industry in contemporary demography is the statistical analysis of large-scale sample survey data, including event histories and longitudinal surveys. This may seem strange, since these deal precisely with individual processes that Le Bras places at the heart of the discipline. But much of this work is data- and method-oriented, and he is interested in rigorous theory. As another example, the reader will look in vain for a discussion of "demographic transition theory," often viewed as a centerpiece of the discipline. Perhaps Le Bras would argue that there is no useful mathematical model of the process.

The demography of family, kinship and households is excluded on the grounds that it is not sufficiently developed to apply the analytic approach Le Bras favours – "we will confine ourselves to the strong core theory that dominates the discipline today and not roam beyond it immediate extensions" (p. 5).

The demography of animal populations (that is, non-human animals) is excluded on the grounds that it has different objectives and uses different methods than human demography – "The elegant models of predation, competition, and spatial dispersal have no equivalent in human societies except at the level of metaphor" (p. 5). This is a nearly universal exclusion in the demographic literature. And the quote is accurate if "in human societies" is read as "among human beings." But it flies in the face of our species' status as both predator (fish, old-growth forests) and prey (the AIDS virus and other micro-organisms). The depletion of fish stocks and the scourge of HIV-AIDS are not just figures of speech.

Taken together these kinds of omissions result in a partial picture of demography as a whole, even when viewed as theory.

It must also be said, sadly, that the book is marred by an inordinate number of errors – it's hard to know to what extent they are typographical, editorial, or translation errors. I doubt they are substantive, since Le Bras is such a meticulous scientist. The original French version (published in 2005) was not readily available to check translations. Taken by itself, none of the errors is serious, but the cumulative effect is to discourage the reader and to undercut confidence in the argument.

Despite these reservations, I heartily recommend *The Nature of Demography* to all who see demography an autonomous scientific discipline with a strong core of theory – rather than just a body of techniques, the application of general statistics to demographic data. It should be consulted regularly and seriously by anyone trying to use or develop demographic theory. It can be read with profit more than once in order to begin to absorb Le Bras' deep and coherent vision of our discipline.